METROPOLITAN EMERGENCY SERVICES BOARD
9-1-1 TECHNICAL OPERATIONS COMMITTEE AGENDA

May 16, 2019, 10:00 a.m.

1. **Call to Order** – Committee Chair, Christine McPherson

2. **Approval of Agenda** – McPherson

3. **Approval of Minutes of April 18, 2019 Meeting** – McPherson

4. **Action Items**
   A. New Classes of Service – Draft Survey - Broman

5. **Discussion Items**
   A. Winter Storm-Related Incident Coordination with State Patrol – Tabled
   B. Telecommunicator Resiliency Training / Support Grant – Eggimann
   C. Fraud / Identity Theft Procedure – Sprynczynatyk
   D. Wireless Dispatchable Location Testing – Eggimann
   D. Review the Unassigned Future Issue list - Eggimann

6. **Reports**
   A. PSAP Operations Round Table Work Group – Morrissey
   B. SECB NG9-1-1 Committee Report – Pass/Scanlon/Pankonie
   C. Legislation – Eggimann/Rohret
   D. 9-1-1 Network Report – Eggimann
   E. 9-1-1 Data Report – Broman

7. **Adjourn**

Metropolitan Emergency Services Board
9-1-1 Technical Operations Committee
Meeting Notes
April 18, 2019

Members Present:

Laura Anderson, Sherburne
Jon Eckel, Chisago
Carrie Bauer, Scott
Heidi Hieserich, MAC
Jeff Lessard, U of M
Christine McPherson, Minneapolis
Tony Martin, Edina
Darlene Pankonie, Washington
Cheryl Pritzlaff, Dakota
Jon Rasch, Ramsey-alternate
Jim Scanlon, Bloomington
Kevin Schwartz, Hennepin
Marv Solberg, St. Louis Park
Lisa Vik, Eden Prairie
Tim Walsh, Carver
Val Sprynczynatyk, Anoka

Guests Present:

Marcia Broman, MESB
Robin Carter, U of M-alternate `
Pete Eggimann, MESB
Mary Ehrsam, Solacom
Shawna Gallus, Sherburne-alternate
Scott Haas, Scott-alternate
Matthew Hoffer, CenturyLink
Jake Jacobson, CenturyLink
Dustin Leslie, ECN
John Olsen, IES
Lauren Petersen, MAC-alternate
Kari Morrissey, Anoka-alternate
Jill Rohret, MESB
Scott Wosje, Northland Business systems
Martha Ziese, MESB

1. Call to Order:
Christine McPherson called the meeting to order at 10:00 a.m.

2. Approval of Agenda:
Corrected the agenda item numbering to change the second item "5D" to 5E to continue the alphabetical order. Request was made to add an additional item 5.F – 9-1-1 Education
M/S/C – Jon Eckel moved to approve the April 2019 agenda. Jon Rasch seconded. Motion carried.

3. Approval of Minutes
Dan Craige's name was misspelled and Jon Rasch was listed twice.
M/S/C – Dar Pankonie moved to approve corrected minutes for February 21, 2019. Val Sprynczynatyk seconded. Motion carried.

4. Action Items
4A. New Classes of Service- Impact on CAD
Marcia Broman gave background information and summarized the request for a recommendation from the committee on how they wanted the transition to several new class of service codes that are starting to be used by some wireless carriers. Broman is particularly interested in the impact a new, unexpected COS code received in ALI would have on the CAD systems at the PSAP. Jon Eckel said that CAD breaks

whenever incorrect information is loaded. Rasch asked if the new codes would help the TCs know how the ALI address was determined? Broman reported that Comtech has said they pass on whatever the wireless carrier sends. Eckel said that the standards development work needs to get ahead of this so that the carriers are consistent in what they send to the 9-1-1 system.

M/S/C - Christine moved for the MESB to put together a survey to send to PSAP Managers that determines how class of service is used in their CAD, readiness and how mapping is being done and other suggestions. Sprynczynatyk seconded. Motion carried.

5. Discussion Items
5A. Winter Storm-Related Incident Coordination with State Patrol – (remained tabled)

5B. Telecommunicator Resiliency Training/Support Grant
Eggimann said the RFP draft is complete and will go out next week. The response deadline will be 30 days from when the RFP is released. The RFP asks for a vendor to develop training material to support enough train-the-trainer classes to enable the PSAPs to all send their training staff to a class. The PSAP trainers could then provide the training to their individual PSAP staff members.

5C. Outstanding Leadership Award Nominations
Eggimann reported that Heidi Hieserich (non-elected) and former Sen. Jane Ranum (elected official) were selected as the Leadership Award nominees for the metro region. Their names have been submitted to ECN for consideration. The award will be given at the ECN Communications Conference in St. Cloud. Hieserich thanked the committee and said she was honored by being nominated.

5D. Law Enforcement Ping for Location
Eggimann said a request was made to the carriers to provide information on their processes when asked by a PSAP to locate a cell phone on their network. AT&T provided a good summary of their processes and procedures that was included in the meeting packet. Several committee members commented and indicated that each carrier's process was different again now. At one time CTIA had gotten the carriers to agree to all use the same exigent circumstances form, but apparently that is no longer true. It was also noted that the location information being provided by RapidSOS was very helpful, as it updates in real time on the Rapid Lite web interface as the person carrying the phone moves. Eggimann said he would bring this up again with NENA to see if we can get the carriers to move back to a standardized process.

5E. Review the Unassigned Future Issue list
The committee reviewed the list which is carried from month-to-month at the end of the previous meeting minutes. There was some discussion on the variation on how different jurisdictions handled identify theft and fraud cases. Val Sprynczynatyk offered to work with her Co. Attorney to see if they would be willing to take this issue to the MN Co. Attorney's Association and ask the association to try to reach consensus on a standard process for handling these types of calls. Tony Martin also offered to share the process used in Hennepin Co. with the committee.

5F. 9-1-1 Education
Pankonie said, this being 9-1-1 Education month, and 9-1-1 Telecommunicator Week, she wanted to put information on social media reminding the public about 9-1-1 services and recommendations on how to use 9-1-1. She had considered put out a public service announcement. The end of the announcement

said, “Only call 9-1-1 if you need an immediate response from police, fire or EMS”. That is not the message Pankonie would like to convey. Her preferred message is “If”, not “only if”.
The committee members discussed Pankonie’s concern. It became clear that many of the PSAPs relied on having many of their calls come in on their admin lines and only two or three PSAPs encouraged their residents to use 9-1-1 for all calls where the caller expected a physical response from law enforcement, fire, or EMS. One PSAP agreed with the NENA message that 9-1-1 should only be used when an immediate response was needed. No consensus on messaging was reached.

6. Reports

6A. PSAP Operations Round Table Work Group

Kari Morrisey reported that Hieserich had sent out the PSAP salary survey to the metro area PSAPs. The previous PSAP Manager at the Airport had done the surveys in the past and several PSAPs have found the information useful in their budget negotiations. As in the past Hieserich will share the results with the other participating PSAPs.

Morrisey said the group had asked the Training Curriculum work group to meet and discuss if there was merit in trying to get the metro area 9-1-1 leadership and managers to use a new term in place of “PSAP”. The issue had come up after a new report about the Nashville TN PSAP having trouble attracting and retaining personnel when the Nashville 311 center personnel were paid on a higher wage scale. It was apparent to the group that the decision makers in Nashville didn’t understand what the PSAP personnel were responsible for and the nature of their work, or they would not have permitted the pay inequity issue to occur. One suggestion was to start calling our 9-1-1 centers “Emergency Response Coordination Centers (ERCC). It was noted that APCO has quit using “PSAP” and is using “Emergency Communications Centers (ECC) instead. Scott Haas said that there has been some talk about renaming the Emergency Management Emergency Operations Centers (EOC) to “Emergency Coordination Centers”. Eggimann noted that “PSAP” is used frequently in statute and rules and will need to be retained, but the original definition of PSAP as the location where 9-1-1 calls were terminated is sufficient to meet the requirements outlined in the statutes and rules. An “ERCC” could also be a “PSAP”, but the definition of an ERCC could include many more duties and responsibilities than just answering 9-1-1 calls. Morrisey told the committee that she would report back on what the Training Curriculum came back with.

6B. SECB NG9-1-1 Committee report

Pankonie said the NG9-1-1 Committee met yesterday. She reported that committee members should be aware that there is a new “Aviation” tab on the StatusBoard site that will indicate if there is a MN State Patrol flight crew on duty. The committee members were also told that information that PSAPs can enter as free text on StatusBoard are lost as the site resets periodically. (e.g. cache resource list)

Pankonie reported that the committee decided to drop the August 2017 service disruption as a regular agenda item, but that did not mean that the ongoing work between ECN, the MESB, and CenturyLink to try to prevent and mitigate the risk of a similar disruption would stop. That work will continue. As part of that ongoing work, a table top exercise regarding communications during a 9-1-1 system disruption took place on April 9. The meeting was well attended by representatives from both metro and greater MN PSAPs, the MESB, ECN, CenturyLink, and West. Angela Eastman from Washington Co. Public Health facilitated the table top discussion. There was consensus that the exercise was productive and identified several items that the participants will need to follow up on.

Pankonie requested that the committee members consider participating in a work group tasked with creating a standardized list of emergency response agencies in the state. This work is related to mapping emergency response areas for NG9-1-1 which will require a standardized unique name for every agency. Contact Pankonie if you want to be a part of that work group.

Pankonie also said that ECN is looking for up to 10 agencies that would be willing to participate in an internal network assessment at their PSAP. The assessment would be conducted by Mission Critical Partners under a contract with ECN, so there would not be any cost to the PSAP. The information gathered should be useful for future planning, as well as identifying any areas of concern for the participating agency. Members should contact Dan Craigie if they are interested in participating in the assessment.

The committee also discussed a text message that Chisago Co. reported receiving that appeared to be similar to an automated voice robo call. The message contained a link with an invitation to join a gaming site. The MESB has asked CTL and West about what screening or security processes they have in place to prevent this type of message from being sent to 9-1-1, transmitting malware, or blocking access to 9-1-1 for legitimate text messages.

6C. Legislation

Jill Rohret said there were discussions on some minor update changes to Minnesota Statute 403 that are expected to pass both the Senate and House. The CPR training bill was included in the House Omnibus bill but not in the Senate bill. ECN submitted a fiscal note regarding the CPR bill that included funding for training. The House version of the bill contains a one-time appropriation of $50,000. ECN's fiscal note contained a much higher level of funding would be needed to conduct the necessary training. Rohret also reported that there is a provision in the House public safety bill funding an initial request from the Medical Resource Control Centers for an additional $683,000 in funding, which would bring their total funding from the 911 surcharge account to over $1.3m. That request for additional 911 surcharge funding was subsequently dropped and they are now requesting an additional $200,000 from the general fund to augment the funding they are currently receiving from the 9-1-1 surcharge.

Pankonie said she was stunned by the MRCC request at the last SECB meeting. None of the PSAPs in the metro area get that amount of money. Neither do the secondary PSAPs. It's important we get all the facts regarding these allocations going forward.

Rohret said is it known that the money is coming out of the 9-1-1 fee that does not go then to the PSAPs? It is considered a fee diversion issue. Legislature in the past has been hesitant to increase this fee. There are a lot of issues involved in this 9-1-1 fee. There are a lot of eyes on this right now.

6D. 9-1-1 Network Report (Written Report Attached)

Eggimann reported to the committee members that the investigation into the firewall issues related to text message delivery that was identified at Carver has been investigated and a list of questions has been sent to West. West has not responded yet.

6E. 9-1-1 Data Report (Written Report Attached)

Marcia Broman said that the MN Geospatial Advisory Council (GAC) Standards Committee has been reviewing the comments received regarding the proposed Minnesota Road Centerline Standard (MRCS). If the comments can all be addressed, the GAC may approve the standard at their May 29 meeting.

Marcia also reported that Pamela Oslin has now joined the MESB full-time staff member and will focus on GIS data and 9-1-1 system location data in the ALI system.

7. Adjourn 11:40

Metropolitan Emergency Services Board
9-1-1 Technical Operations Committee
Action Sheet
May 16, 2019

Agenda Number 4.A. – New Classes of Service – Draft Survey

Recommendation:
At the April committee meeting a request made for the MESB staff to develop a survey form to gather information from all metro PSAPs on the impact new wireless class of service codes in ALI would have on PSAP operations. MESB staff recommend that the committee review the draft survey, make recommendations on changes or additions, and approve the final form for distribution.

Background:
During the investigation by the MESB of a report by a PSAP of receiving a wireless call with a WPH1 COS that contained a civic address in ALI, the MESB staff became aware that some wireless carriers were now sending position source codes to the mobile positioning centers (West and Comtech) that correspond to new COS that have been defined in NENA-STA-015.10-2018. The MESB staff investigation found indications that Comtech and West are handling the new position source codes differently, with Comtech utilizing the new COS and West converting the new source codes to the existing COS of either WPH1 or WPH2. The MESB staff continue to investigate and are trying to confirm both the current source code handling and the timeline for the use of the six new COS codes defined in the NENA standards.

The MESB staff would like input from the committee on:

1. What impact the new classes of service will have on current CAD systems (e.g. Will it require programming changes/costs to add the new COS codes and to control how the ALI information is mapped when a civic address and x,y coordinates are delivered in the same ALI record.)
2. Should the MESB attempt to coordinate a specific implementation date with the carriers and MPCs to allow the PSAPs to be prepared by that date, or can PSAPs handle these changes as they occur as each of the carriers and MPCs make changes according to their own carrier / MPC provider timelines?
    a. If the PSAPs want a specific date for the implementation of the new classes of service how far out should that date be? How much prep time is needed?

Issues and Concerns:
Inconsistent or confusing ALI information, as well as inconsistent map display of location information at the PSAP may have a negative impact on the coordination of the response to a call for service.

Financial Impact:
Changes to CAD programming or configuration may require action or assistance from the CAD vendors to enable the mapping to perform and display correctly. The CAD vendors may charge the PSAPs for these services.

Motion:

New Wireless Class of Service Survey

Currently, the ALI data received at your PSAP with a 9-1-1 call has a "Class of Service" indicator field. For wireless calls, that indicator value is "WPH1" or "WPH2." In addition, for wireless calls, latitude/longitude fields are populated in ALI indicating approximate coordinate location. NENA is in the process of recommending that several new "Classes of Service," beyond WPH1 and WPH2, be added to deal with anticipated changes as the wireless carriers begin to use different or enhanced methods for deriving caller location.

PSAPs may currently use different methods in their CAD and/or mapping systems to map for call takers the coordinate location received in the ALI data of a wireless call. For example, some PSAPs may only be mapping calls with ALI having the "WPH2" Class of Service; others may be mapping any call that has the latitude/longitude fields populated in the ALI data. In the first case, PSAPs may need to modify their CAD and/or mapping interface in order to accommodate new wireless "Classes of Service" as recommended by NENA.

The MESB is seeking to understand the current method your PSAP uses for mapping caller location in your CAD and/or mapping system. In addition, if your PSAP would need to make modifications to your CAD and/or mapping interface to allow mapping of caller location associated with new wireless "Classes of Service," we would like to understand the time interval you feel your PSAP would need to do so. Thank you.

(Note: the order and overall format of the data elements/fields in the ALI data stream are not anticipated to change at this time with the NENA recommendation. There would just be several new 4-character values potentially showing up in the current "Class of Service" field.)

Please respond to the following questions on behalf of your PSAP:

1. **Which of the following is your PSAP's current method for mapping caller location using ALI:**
    a. Key off of the "Class of Service" field (e.g. only maps WPH2 calls)
    b. Key of the presence of coordinates in the latitude/longitude fields regardless of the "Class of Service" in the ALI retrieval
    c. Other (please describe) _____

2. **If new wireless 4-character "Class of Service" field values were received in ALI, would your PSAP need to modify any CAD and/or mapping interface in order to have the ability to map the caller location from ALI?**
    a. Yes
    b. No

3. **<u>If you answered "yes" to #2</u>, what lead time would your PSAP require in order to add the ability to map caller location for new wireless "Classes of Service"?**
    a. Specify timeframe_____

E911 Location Test Bed

Dispatchable Location Summary Report

Prepared by

ATIS Test Bed Program Management

April 2019

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2 EXECUTIVE SUMMARY

Dispatchable Location (DL) testing in the E9-1-1 Location Technologies Test Bed was conducted during the second half of 2018 to assess the state of this emerging location technology during this early stage of National Emergency Address Database (NEAD) provisioning. Testing occurred in two regions of the country – in and around Atlanta and San Francisco – in 25 buildings within four morphologies, from 230 test points, following the guidelines established in the ATIS-0500035 standard. 30,090 simulated 911 calls were made from 24 test devices. Outcomes were captured for each call, then compared to truth, to quantify Dispatchable Location performance. This document summarizes and explains the results observed in this campaign.

This Dispatchable Location test campaign was preliminary, and it is important to acknowledge certain key limitations:

1. Only five Google Android (Android) mobile device models were tested, as only these devices so far support the necessary reporting and signaling needed to enable Dispatchable Location. Apple iOS (iOS) devices do not support the necessary functionality, and thus could not be used in this testing.
2. The National Emergency Address Database (NEAD) – the 'Reference Point' database that associates WiFi Access Point and Bluetooth Beacon identities with validated civic address information, and that provides a secure system for database access and maintenance – is in an early stage of provisioning. For testing to yield the necessary insights into wireless network performance, test buildings were intentionally chosen with at least some, even if limited, NEAD database coverage. Consequently, results of this campaign tend to skew towards an optimistic assessment of database completeness.
3. ATIS-0500035 defines a complete set of 20 test buildings of diverse types and sizes in each test region. Due to the limitations in the provisioning of the NEAD, only a subset of 25 buildings – 13 in San Francisco and 12 in Atlanta – were feasible to acquire. The test buildings were sufficiently diverse to provide a good indicative Dispatchable Location performance in the test areas, but the results in some morphologies are somewhat limited and influenced by the specific buildings used.

Given these limitations, these results reflect the capabilities of an emerging technology, rather than the capabilities of a complete, ready-to-deploy system.

This campaign demonstrated the fundamental ability of Dispatchable Location technology to deliver accurate civic addresses. It also identified the current limitations of this technology at this early stage. The following metrics capture the bottom-line Dispatchable Location performance observed:

- 82.6% of valid test calls resulted in some kind of Civic Address delivered (be it correct or incorrect.) This metric is somewhat analogous to yield in geodetic positioning systems. Inversely, 17.4% of valid test calls produced no Civic Address.
- 74.0% of valid test calls produced a correct street address and 8.6% of valid test calls produced an incorrect street address (an address of a neighboring building.)
- 38.7% of valid test calls produced an accurate DL2 or DL1 result – a result that meets the requirements for actionable Dispatchable Location as defined in the ATIS-0500035 and ATIS-0700028v1.1 standards.

An important conclusion of this testing is that reference point density in the NEAD database is not yet at sufficient levels to assure optimum performance. Low reference point density was found to cause instances where erroneous civic address details were reported, incorrect street addresses of neighboring buildings were reported, or no civic addresses were reported at all, which are reflected in the metrics above.

However, this testing also shows that higher NEAD database density can be expected to significantly improve performance. Analysis based on the data gathered in this campaign suggests that a NEAD database Provisioning Density[1] higher than 50%, possibly in the 50% to 75% range, would likely translate into significantly improved overall performance in medium and large structures. A target Provisioning Density[1] of 100% would be more appropriate for single family homes and stand-alone structures, unless Assisted-GPS (A-GPS) geodetic fixes (not hybrid fixes relying on WiFi) can be used as an effective cross-check to avoid Dispatchable Location results with erroneous civic addresses.

Note that the sources used to increase Reference Point density in the NEAD should encompass a broad diversity of building and use types, so that the resulting performance improvements apply broadly in high-density multi-unit commercial and residential structures, as well as in suburban and rural stand-alone structures. While content is added to the NEAD, eSMLC logic improvements can be implemented to mitigate the most harmful effects of low Reference Point density.

If support for Dispatchable Location is added to iOS devices (which is unlikely), and when substantial more Reference Point data is added to the NEAD, and Dispatchable Location processing logic is refined in wireless networks, a subsequent campaign of testing would be an appropriate step to undertake prior to launching Dispatchable Location capabilities into operational 9-1-1 settings.

[1] Provisioning Density is defined in Section 5.4.

3 BACKGROUND & TEST METHODOLOGY

To characterize the performance of each wireless operator's emerging Dispatchable Location system, 30,090 test calls were placed in aggregate on the wireless networks of the three national wireless carriers – Verizon, T-Mobile, and AT&T – participating in the Dispatchable Location test campaign. Approximately one third of the test calls were placed using each operator's wireless network and Dispatchable Location system. The calls were placed from 230 test points in 12 buildings in the Atlanta area and 13 buildings in the San Francisco Bay Area, between 4 September 2018 and 2 November 2018. Buildings were chosen in dense urban, urban, suburban, and rural morphologies, consistent with the ATIS-developed consensus test methodology defined in ATIS-0500035.

3.1 Mobile Devices Used

Five models of Android mobile devices were used in this testing. Due to a lack of support for the signaling needed to report Reference Point identities observed by the mobile device to the eSMLC, iOS handsets could not be used in this testing.

3.2 Building Selection

Test buildings were selected from within the ATIS-specified test areas defined in the ATIS-0500031 specification, with the addition of a new rural polygon in southern Santa Clara County (south of San Francisco) as defined in ATIS-0500035, to address current Reference Point geographic limitations.

Within the target test areas, test building selection was based on a number of factors including accessibility and permission of building management, meeting the required characteristics defined in ATIS-0500035 (building types, number of required test points per building, presence of segmented & addressable spaces, etc.), availability of building floor plans (needed for ground truth assessment), and adequate Reference Point density.

As discussed in Section 7.4 of ATIS-0500035, smaller buildings were chosen to generally have one or two provisioned reference points, noting that two reference points often correspond to one single WiFi access point operating in both the 2.4 and 5 GHz bands. At least one single family home was chosen not to have any provisioned reference points to examine this important scenario where the influence of neighboring buildings dominates. Mid-size buildings had a wider range of provisioning density, representative of the current and still limited level of NEAD provisioning, with several such buildings – especially commercial – actually having very few provisioned reference points. The larger test buildings selected had Reference Point densities generally representative of the broad area in which they were located, although truly large buildings with very few provisioned reference points were not selected, since obtaining predominantly null Dispatchable Location results was considered to be wasteful of precious test

resources in very expensive-to-test large buildings. Note that testing relied on existing Reference Points in the NEAD; no Reference Points were added for purposes of the Test Bed.

Table 3-1 and Table 3-2 show the buildings selected for Atlanta and San Francisco, respectively. The tables show for each building the morphology, use category (residential vs. commercial), building type as defined in ATIS-0500035, and number of test points used within each structure. Every effort was made to achieve the mix of building types called for in ATIS-0500035, though this was not always possible given Reference Point availability and other logistical factors. Indeed, given the growing list of building selection criteria, site selection became an increasingly difficult task.

Table 3-1 Atlanta Building Morphology and Characteristics for Dispatchable Location Testing

Region	Building ID	Morphology	Use Category	# TPs	Building Type
Atlanta	ATLDBC103	Dense Urban	Residential	15	Apartment/Condo high rise.
Atlanta	ATLRBC108	Rural	Residential	4	Residential 2 story
Atlanta	ATLSBC08	Suburban	Commercial	10	Mall/commercial center
Atlanta	ATLSBC101	Suburban	Residential	10	Apt/condo complex 3-4 story, larger foot print
Atlanta	ATLSBC104	Suburban	Residential	11	Residential mid or high rise
Atlanta	ATLSBC106	Suburban	Commercial	6	Hotel/Motel standalone 2-3 story
Atlanta	ATLSBC109	Suburban	Residential	4	Individual home next to larger apartment complex
Atlanta	ATLSBC110	Suburban	Commercial	12	Commercial mid or high rise
Atlanta	ATLSBC99	Suburban	Residential	4	Individual home in middle of single-family homes
Atlanta	ATLUBC102	Urban	Residential	15	Residential - Mid or High rise
Atlanta	ATLUBC107	Urban	Commercial	10	Museum/Exhibition hall
Atlanta	ATLUBC111	Urban	Residential	10	Residential low rise (3-4 story)

Table 3-2 San Francisco Building Morphology and Characteristics for Dispatchable Location Testing

Region	Building ID	Morphology	Use Category	# TPs	Building Type
SF	SFDBC101	Dense Urban	Commercial	10	Commercial High-rise - concrete
SF	SFDBC103	Dense Urban	Commercial	7	Commercial Low/Mid-rise surrounded by high rise
SF	SFDBC104	Dense Urban	Commercial	15	Commercial Mid/High-rise
SF	SFRBC107	Rural	Commercial	4	Public or retail 2-story (or equivalent)
SF	SFRBC108	Rural	Residential	4	Residential 1-2 story
SF	SFSBC102	Suburban	Residential	12	Residential Mid or high rise
SF	SFSBC105	Suburban	Commercial	12	Commercial mid or high rise

SF	SFSBC109	Suburban	Commercial	7	Hotel/Motel standalone 2-4 story
SF	SFSBC110	Suburban	Residential	4	Individual home in middle of single-family homes
SF	SFUBC100	Urban	Residential	10	Residential Low rise (3-4 Story)
SF	SFUBC106	Urban	Residential	15	Apartment/Condo high rise
SF	SFUBC111	Urban	Commercial	8	Museum/Exhibition hall
SF	SFUBC112	Urban	Commercial	11	Commercial mid/high rise

Since Reference Point density was taken into account when selecting test buildings to avoid the situations where no civic addresses at all were produced, yielding very little insight in to Dispatchable Location system performance, the NEAD database encountered during testing was equivalently better than would have been encountered with truly random building selection – by how much it is not possible to say. Likewise, Dispatchable Location performance was likely better than would otherwise have been expected – again, it is not possible to say by how much. Therefore, these results provide insight into the capabilities of an emerging technology, rather than express the performance of a system ready to be activated in 9-1-1 operational scenarios. Indeed, one important insight from this testing is that Reference Point density is not yet at needed levels, as discussed in Sections 4 and 5.

3.3 Call Processing

The test methodology used followed the requirements defined in ATIS-0500035. Calls were placed from 12 test mobile devices simultaneously in each market, four provided by each wireless operator. Logs from the eSMLCs and test mobiles were collected and associated, and used to determine the Dispatchable Location civic address produced by the three operators' systems for each test call. Note that the Dispatchable Location system was not able to produce a civic address for every call.

Further Enterprise Solutions (FES), the testing vendor, compared the civic address and Class of Service (CoS) produced for each test call (if any) to the known true test point location at the time of call, using manual and automated means, and these determinations were used to produce a variety of Dispatchable Location performance metrics.

3.4 Class of Service Assessment

Three 'levels' or Class of Service (CoS) indicators are output by the eSMLC with each Dispatchable Location civic address reported, with the following interpretations:

- Dispatchable Location Level 2 (DL2) – the highest level of performance. DL2 indicates that the reported Dispatchable Location is known to the specific unit number.

- Dispatchable Location Level 1 (DL1) – medium-level performance. DL1 indicates that the reported Dispatchable Location is known to the quadrant or zone of the building on the correct floor or on the floor immediately above or below the correct floor.
- Civic Address (CVC) – the lowest level of performance. CVC indicates that the reported street address is known, but no further information including a unit number is available, or if a unit number is available it does not meet the DL1 requirements. For multi-unit buildings, CVC is not considered actionable Dispatchable Location by public safety (see the note regarding single-family homes below.)

The Class of Service reported by the eSMLC with each output civic address is the 'reported CoS'.

To determine what the 'true CoS' should have been for each result, FES engineers applied the following criteria:

- Truly DL2 if: the reported street address and unit number are correct.
- Truly DL1 if: the reported CoS is not DL2, the reported street address is correct, and the reported unit number is present and fell within the same 'quadrant' on the correct floor or +/-1 floor. Note that unit numbers immediately outside the quadrant or clearly in site of true position were considered valid. (Note also that civic addresses with floor numbers, but without unit numbers, where not present in the NEAD for any of the buildings tested). DL1 assessment requires building quadrants to be manually defined, as discussed below.
- Truly CVC if: the reported CoS is not DL1 or DL2, and the reported street address is correct.
- Note that for a single-family home, reported CVC or DL1 are considered equivalent to DL2. This assumes public safety has access to a high-quality CAD map display, which is a reasonable assumption for many PSAPs.

Comparing reported CoS to the true CoS for each test call is the basis for the Dispatchable Location metrics defined in Section 4.1.

3.4.1 Quadrant Definition

Quadrant boundaries are necessary in order to make the DL1 assessments. Thus, quadrant boundaries were created by FES based on principles driven by how first responders would naturally orient themselves when entering a floor of the building, including the following:

- Aligned with building orientation
- Aligned symmetrically
- Areas roughly equivalent
- Avoided dividing units
- Intuitive and naturally clear.

4 SUMMARY OF RESULTS

This section presents the key summary results from this Dispatchable Location test campaign.

4.1 Core Dispatchable Location Performance Metrics

Dispatchable Location performance cannot be quantified using the same metrics so familiar from geodetic location systems. The geodetic numerical quantification of accuracy, which is essentially an *analog* measure of quality, has no equivalent in Dispatchable Location. The outputs of a Dispatchable Location system when compared to truth are inherently *binary* – for example, the street address produced is accurate or not. Therefore, Dispatchable Location quality metrics must quantify the extent each binary outcome is produced in a given sample set. The following metrics have been found to best quantify overall, bottom-line, end-to-end Dispatchable Location performance:

- ***Civic Address Delivered Percentage***:
  The percentage of valid test calls which resulted in some kind of Civic Address delivered (be it correct or incorrect.) This metric is somewhat analogous to yield in geodetic positioning systems. In this campaign, **82.6%** of valid calls delivered a civic address.
- ***Civic Address Correct Percentage***:
  The percentage of valid test calls which produced a correct street address. This inverse of this metric, the percentage of valid test calls which produced an *incorrect* street address, is also of interest, as it quantifies a particularly problematic failure condition – the reporting of neighboring street addresses. In this campaign, **74.0%** of valid calls produced the correct street address, while **8.6%** of valid calls produced an incorrect address. Note how the sum of these two numbers totals to the Civic Address Delivered Percentage.
- ***DL2/DL1 Accurate Percentage***:
  The percentage of valid test calls that produced successful DL2 or DL1 civic addresses and thus met the Dispatchable Location success criteria defined in ATIS-0500035. Such fixes are considered 'actionable' or 'usable' for dispatch purposes. The definition of this metric was arrived at through extensive deliberations within ATIS between public safety, wireless carriers, and other entities involved in the 9-1-1 ecosystem and was embodied in ATIS-0500035 and 0700028v1.1. This metric is calculated by dividing the number of test calls where the reported CoS is either DL2 or DL1, and true CoS is either DL2 or DL1, (including calls where a true DL2 is reported as DL1, and vice versa) by the total number of valid calls. Note that calls from within single family homes or other small stand-alone structures reported as CVC are considered DL2, and are thus included in this definition, as long as the returned civic address is in fact correct.

Of the 30,090 test calls placed in this campaign, 28,583 were considered 'valid', and it is this number that is the denominator for the percentage calculations listed above. A valid call is one

where the call completed, it did not drop prematurely, and the eSMLC log existed and could be associated with the mobile log.

Table 4-1 shows a visual interpretation of these new Dispatchable Location metrics in the context of a grid juxtaposing reported CoS (along rows) versus true CoS and some other truth conditions (along columns). Each cell of the grid contains a percentage, which is the ratio of the number of calls meeting the conditions noted in the row and in the column, relative to the total number of valid fixes. The sum of all these percentages totals to 100%, thus this grid visually conveys the distribution of all valid test calls.

Table 4-1 Core Metrics Visualized in the Context of Reported CoS versus True CoS

	True Class of Service (Other Truth Conditions):					**No DL Reported**
Reported Class of Service:	**DL2**	**DL1**	**CVC (considered DL2)** (street address correct & from a single-family home – considered DL2)	**CVC** (street address correct)	**CVC** (street address INCORRECT)	
Reported DL2:	9.6%	4.7%	0.5%	2.1%	1.9%	17.4%
Reported DL1:	4.2%	15.2%	1.0%	5.9%	0.3%	
Reported CVC:	1.0%	14.0%	3.6%	12.2%	6.4%	

Metrics Key:

Civic Address Delivered Percentage: **82.6%** of valid calls resulted in some kind of Civic Address delivered (be it correct or incorrect.)

Civic Address Correct Percentage: **74.0%** of valid calls delivered a civic address and it was correct.

Civic Address Incorrect Percentage: **8.6%** of valid calls delivered a civic address but it was *incorrect* (from a neighboring building).

DL2/DL1 Accurate Percentage: **38.7%** of valid calls produced successful DL2 or DL1 civic addresses.

As an example, the percentage of valid calls where the reported CoS was DL2 and the true CoS was DL2 can be seen to be 9.6%. Similarly, the percentage of valid calls where the reported CoS was DL1 but in truth DL2 should have been reported was 4.2%. In both these cases, the correct unit address of the "door" is identified in the result, but when DL2 is indicated the network is more confident of that outcome. The opposite situation occurred in 4.7% of the calls (DL2 reported when it should have been DL1), thus the specific unit address reported would be found to be close to where the emergency actually is (same corner of the building and possibly +/- 1 floor). Groups of cells also have meaning – for example, the total percentage of valid calls where DL2 was reported can be calculated to be 18.7% (the sum of the percentages along the 'Reported DL2' row.) On the far right of the grid, it can be seen that the percentage of valid calls where no Dispatchable Location civic address or CoS was reported at all is 17.4%.

All the metrics defined above are various combinations of grids, as shown in the key. For example, the *Civic Address Delivered Percentage* can be seen to be the cells within the dashed black oval, totaling 82.6%. Likewise, the *DL2/DL1 Accurate Percentage* is shown in blue shading and totals 38.7%.

4.2 Performance by Building

Figure 4-1 shows the *Civic Address Correct Percentage* (in **green bars**) and the *Civic Address Incorrect Percentage* (in **red bars**) for each building. Note that the sum of these two quantities – the total height of the bar for each building – also represents the *Civic Address Delivered Percentage*. From this figure, two observations are apparent:

- In every building, at least some calls reported no civic address, and in a few buildings, including ATLRBC108, ATLUBC107, and SFSBC109, most calls did not report a civic address. This phenomenon is widespread, and does not correlate to test region or morphology.
- Incorrect neighboring civic addresses occur in most buildings, and in one building (ATLSBC109) every reported address was incorrect. Again, this phenomenon is widespread but its extent varies.

In both cases, low reference point density is a key factor, as will be shown below and described in detail in Section 5.

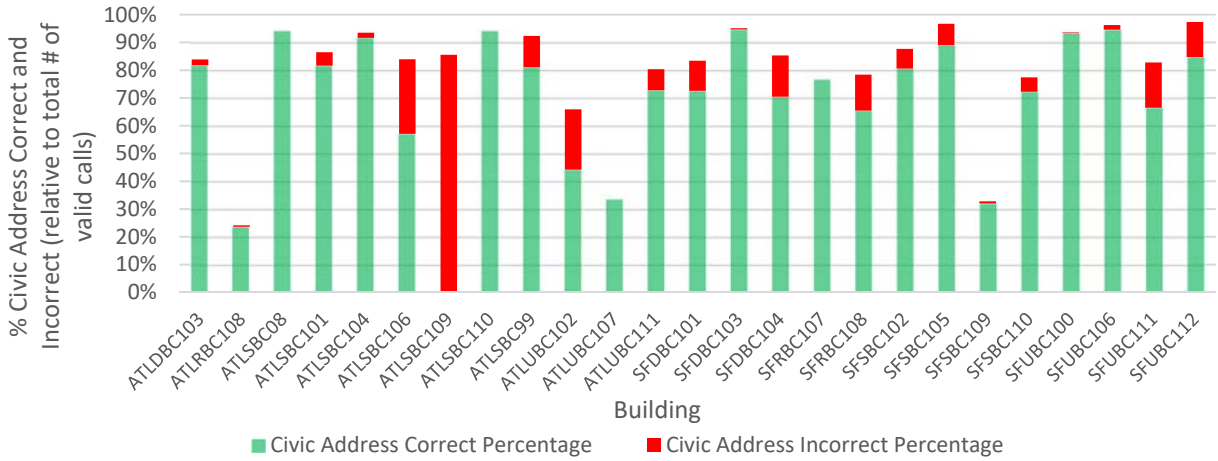

Figure 4-1 Civic Address Correct and Incorrect by Building

Figure 4-2 shows the *DL2/DL1 Accurate Percentage* by building. From this figure it is apparent that DL2/DL1 performance is quite varied across morphologies and buildings, with several buildings producing no DL2/DL1 results at all and the best building achieving 81%. By examining Figure 4-1 and Figure 4-2, it is apparent that low *Civic Address Delivered* and *Civic Address Correct* percentages play a role in a low *DL2/DL1 Accurate Percentage*. Low reference point density contributes strongly to a low *DL2/DL1 Accurate Percentage*, as will be addressed in more detail in Section 5.

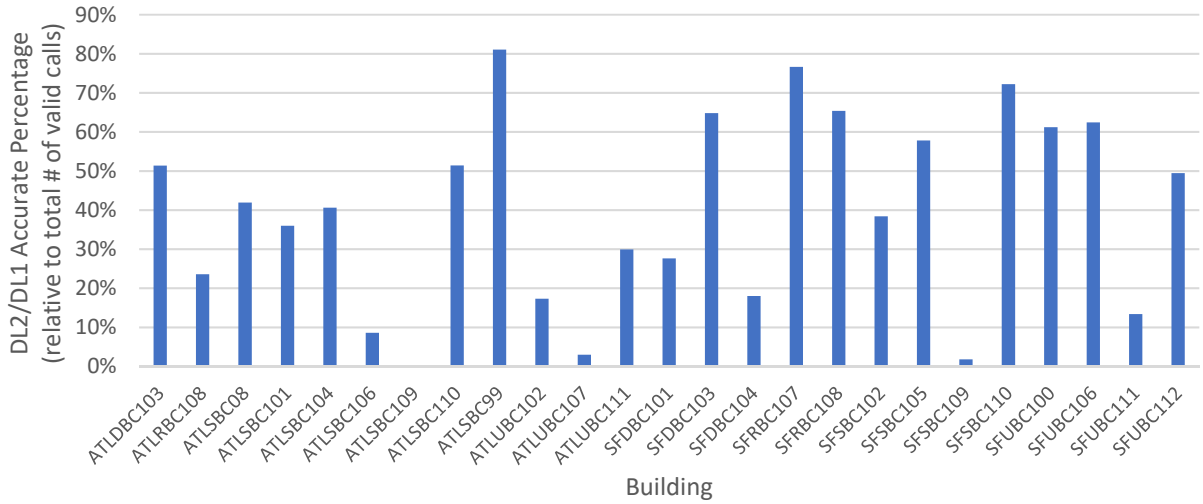

Figure 4-2 DL2/DL1 Accurate Percentage by Building

4.3 Performance by Morphology

Figure 4-3 shows the *DL2/DL1 Accurate Percentage* by morphology. This percentage increases somewhat for suburban, then significantly for rural, due to the greater number of single-family home stand alone structures, which are included in this metric as long as the delivered civic address is accurate, as described in Section 4.1.

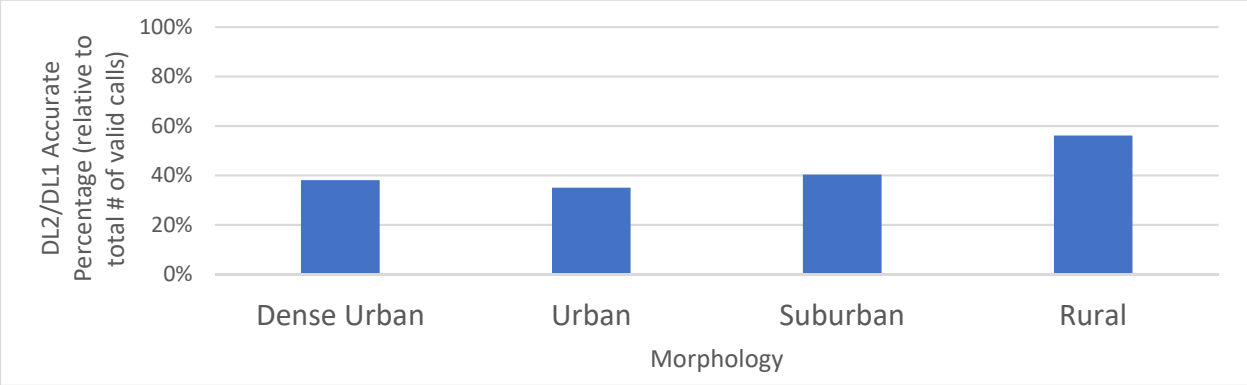

Figure 4-3 DL2/DL1 Accurate Percentage by Morphology

4.4 Performance by Test Region

Table 3-1 shows the core Dispatchable Location metrics broken out by test region. From the table, it can be seen that performance in the Atlanta area is somewhat lower than that observed in the San Francisco Bay Area. This is caused by the somewhat lower RP densities in the selection of test buildings and the particularly poor performance at the ATLSBC109 house, which did not have any provisioned reference points, as discussed in Section 5.1.

Table 4-2 Core Dispatchable Location Metrics by Test Region

Test Area	Civic Address Delivered Percentage	Civic Address Correct Percentage	Civic Address Incorrect Percentage	DL2/DL1 Accurate Percentage
Atlanta Area	78.1%	68.4%	9.7%	32.8%
San Francisco Bay Area	86.8%	79.2%	7.5%	44.1%

5 KEY FINDINGS

Low Reference Point density in the NEAD database is causing instances where erroneous civic address details are reported, an incorrect street address of a neighboring building is reported, or no civic address is reported at all. This problem typically plays out as follows:

- A mobile device receives the WiFi signals – on average about 45 unique MAC addresses – and transmits these identities to the eSMLC. Typically, in all but the most rural and isolated suburban buildings, the number of MAC addresses observed by the handset is substantial.
- The eSMLC may filter these identities further, then queries the NEAD. On average, ~38 identities are queried.
- The NEAD finds on average only about 3.5 of these MAC addresses – about a tenth of those queried – and returns their civic information to the eSMLC. This is a key problem – low reference point density in the NEAD results in a low number of the queried identities being found.
- The eSMLC reconciles the NEAD information, along with other information available, to produce a civic address, where possible. Factors such as WiFi measured signal strength are taken in to consideration, as well as geodetic information and possibly other factors.

With so few of the queried WiFi MAC addresses present in the NEAD, the critical Reference Point(s) – those that are very close to the mobile device – may not be returned, and therefore cannot be associated to a civic address by the eSMLC. The following harmful effects can ensue:

1. The eSMLC may choose inappropriate Reference Point(s), specifically those associated with neighboring building(s), causing it to report the address of a neighboring building.
2. The eSMLC may only find less ideal Reference Point(s) within the correct structure, often those more distant, reducing the quality of the returned Dispatchable Location.
3. The eSMLC may not find a suitable Reference Point at all, resulting in no civic address being returned and no Dispatchable Location.

Note that with greater NEAD Reference Point density, these effects can be substantially mitigated, thus improving overall performance, as described in Section 5.4.

The following sections quantify the extent of each of these effects, and provides some specific examples.

5.1 Address of Neighboring Building Reported

One undesirable and potentially dangerous effect (in 9-1-1 scenarios) is when the address of a neighboring building is returned. Of the 28,583 valid test calls, 2,456, or 8.6%, reported the address of a neighboring or nearby building. Figure 5-1 shows the percentage of valid calls reporting an incorrect address, broken out by building and by the reported Class of Service.

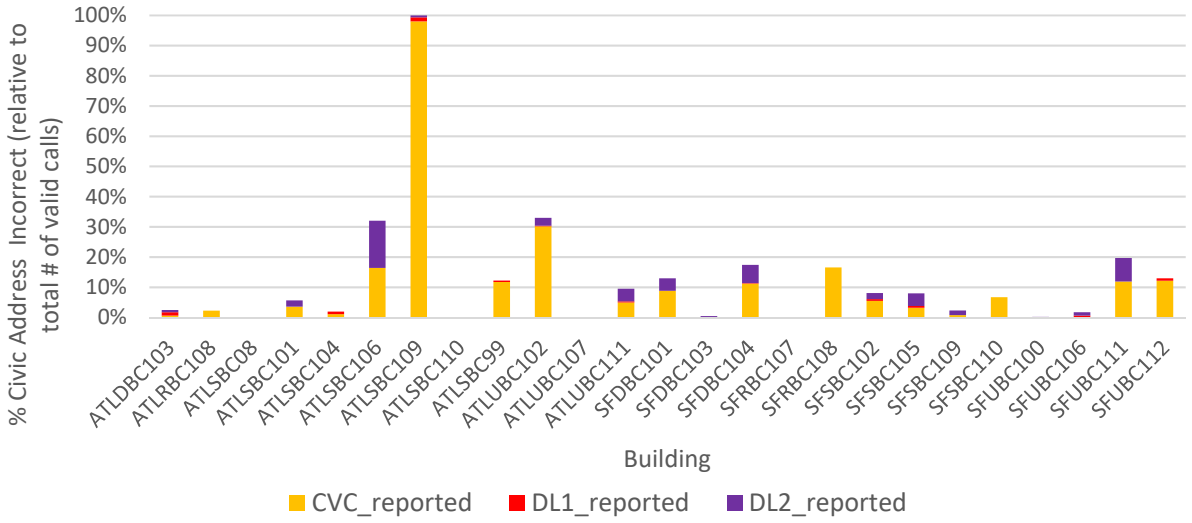

Figure 5-1 Percentage of Incorrect Civic Addresses by Building and Reported Class of Service

For most buildings, the NEAD returned at least some neighboring building addresses, thus this effect is widespread, it is not limited to only a few problem areas, and it occurs in all morphologies and building types. While the CVC Class of Service is most commonly reported in this situation, DL2 and DL1 are also sometimes reported, as indicated by the color in Figure 5-1. Reporting DL2 or DL1 is problematic, as these Classes of Service imply higher confidence in the result.

ATLSBC109, a single-family suburban residence in Atlanta, illustrates this effect. This two-story stand-alone structure had one Reference Point provisioned in the NEAD, but this MAC address was never observed by any mobile during testing, and thus it is believed to be no longer physically present or active at this location. This NEAD record was likely stale.

Because this building lacked a current reference point in the NEAD, the eSMLC chose Reference Points from neighboring structures for 449 of 525 test calls placed from this structure, as shown in Figure 5-2 – mostly to the building across the street but also to buildings as far as four houses away. The remaining calls reported no address at all. This example highlights the risks of attempting to use Dispatchable Location where there are no valid Reference Points nearby.

At the same time, Geodetic X/Y positioning performance for ATLSBC109 was strong. Figure 5-2 shows the Assisted-GPS (A-GPS) geodetic fixes in **blue** and hybrid solution types fixes in **red**. A-GPS fixes were generally quite accurate, with commensurate uncertainties, suggesting that they could be used to cross-check and help validate Dispatchable Location results, particularly in suburban conditions. Note, however, that there is evidence that some hybrid geodetic fixes containing WiFi content biased towards the dominant WiFi Access Point across the street, suggesting that Dispatchable Location and WiFi-based geodetic fixes may share a common bias since they are based on the same WiFi signal observations. Thus, caution should be exercised when performing Dispatchable Location cross-checking using WiFi-based geodetic fixes.

Requiring higher WiFi signal strength thresholds, particularly for the CVC class of service, is another approach that can help reduce inaccurate address reporting. Such a change can be implemented in the logic of the eSMLCs now, in parallel with efforts to increase Reference Point density.

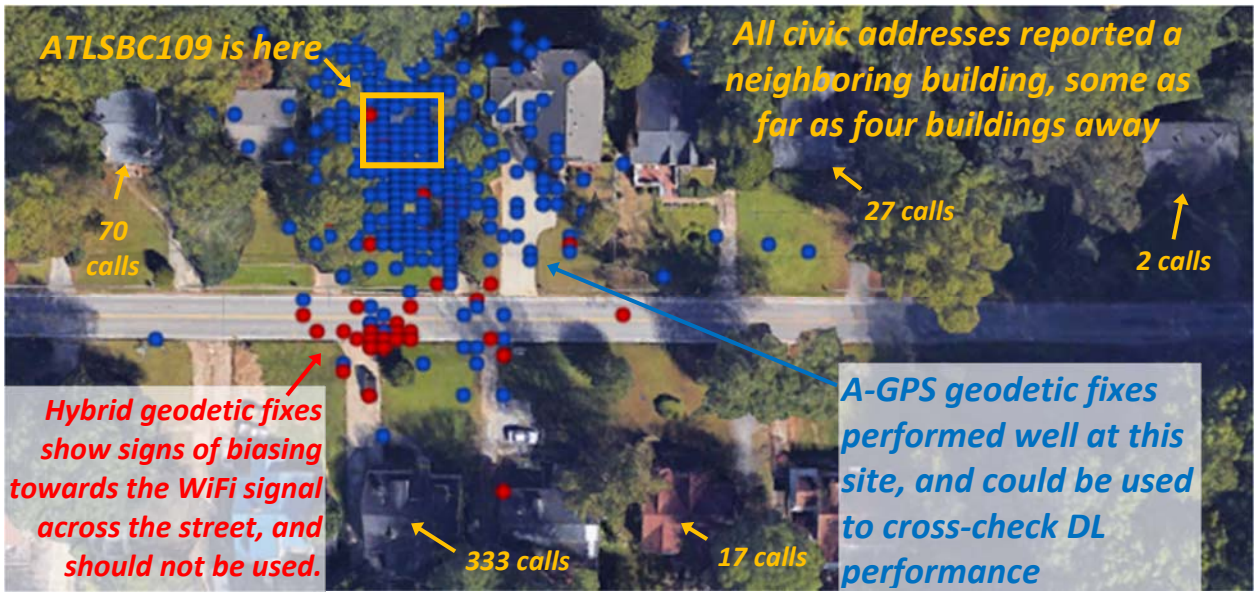

Figure 5-2 ATLSBC109 Example of Neighboring Addresses Being Reported, and the Potential to Use A-GPS Geodetic Fixes to Cross-check DL Results

5.2 Reduced Dispatchable Location Quality

Building SFDBC104 illustrates how low NEAD Reference Point density results in reduced Dispatchable Location quality in a large commercial structure. Building SFDBC104 is a historic 16-floor steel-frame commercial structure in San Francisco's Financial District. At the time of test planning, a total of 19 Reference Point records were present in the NEAD for this large structure, from only 14 unique identifiable units (suites). Several floors have no Reference Points at all. Furthermore, there is evidence that several records in the NEAD database for this building were out of date.

In addition to having a significant number of calls where a neighboring building address was reported, numerous calls were reported as DL1 or DL2, but should have been reported as CVC, caused by a lack of NEAD Reference Points close to the test points. Test Points 6 illustrates this effect and is used as an example here.

Figure 5-3 shows Test Point 6 in Suite 600 on the sixth floor, and the locations of the Reference Points in Suites 635, 612, and 609, which were the basis for the reported Dispatchable Location results. All of these Reference Points were in a different quadrant of the building; thus, the Class of Service should have been CVC, but DL1 was reported. In fact, there were no Reference Points in the Southwest quadrant of the sixth floor where Test Point 6 is positioned, or in this

quadrant in the adjoining fifth and seventh floors, thus neither a DL1 nor a DL2 Class of Service was possible with the population of NEAD Reference Points present during testing. Had a NEAD record existed in Suite 600, or in this quadrant, it would very likely have been stronger than the more distant Access Points, and a correct DL2 or DL1 civic address would likely have occurred.

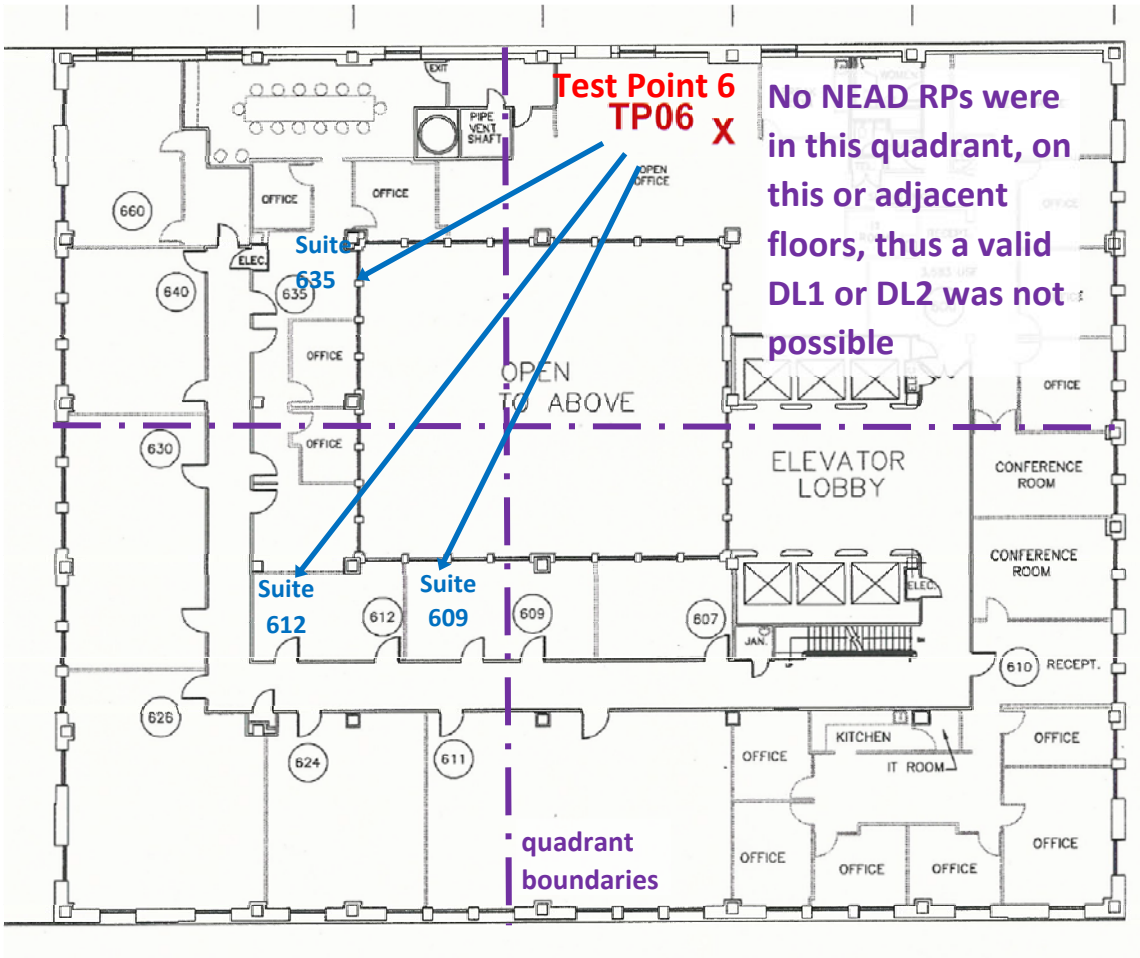

Figure 5-3 SFDBC104 Example of Reduced Dispatchable Location Quality Caused by Low Reference Point Density

5.3 No Civic Address Returned

Figure 4-1 showed that in nearly every building there are at least some calls where no civic address was returned at all, and in quite a few buildings a significant portion of calls did not report a civic address. To understand the role of NEAD database incompleteness in this, it is instructive to examine the relationship between the average number of MAC Addresses returned by the NEAD and the Civic Address Delivered Percentage. In Figure 5-4, for each building, the average number of MAC addresses found per call is scatter-plotted against the Civic Address Delivered Percentage to illustrate the correlation. The buildings with the lowest average number of MAC Addresses returned by the NEAD – ATLRBC108, SFSBC109, and ATLUBC107 – all have some of the lowest percentages of calls where a civic address is returned.

Then in general, as the number of MAC addresses found in the NEAD increases, the percentage of civic addresses returned also increases.

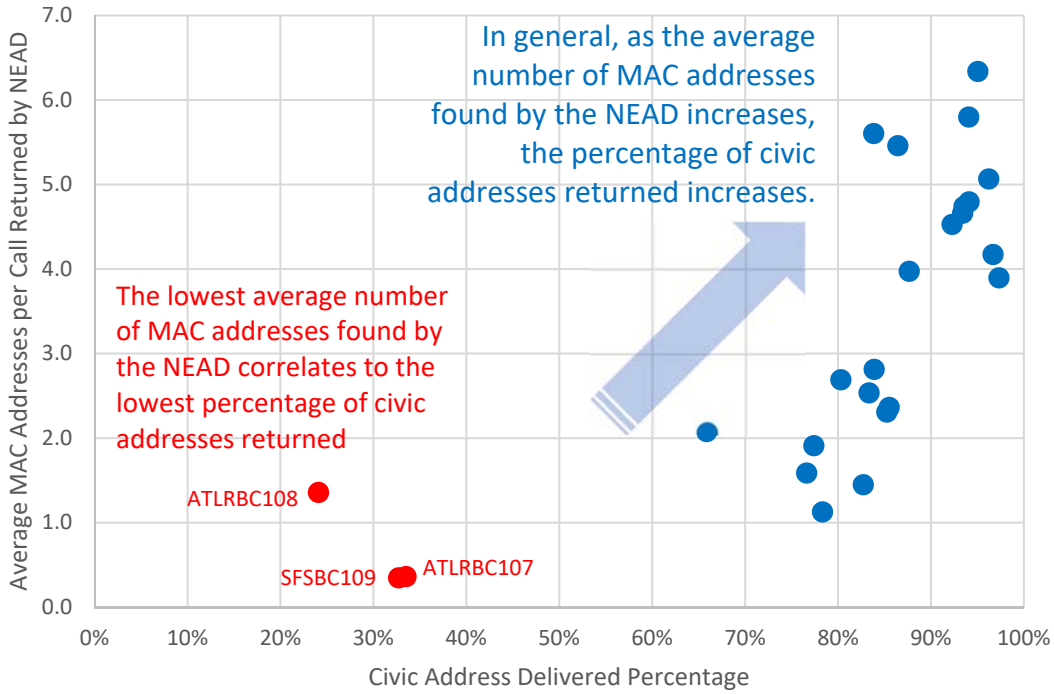

Figure 5-4 Correlation Between Database Incompleteness and Civic Address Delivered Percentage

Correlation does not assure causality, of course, but it is intuitive that increasing the number of valid MAC addresses contained in the NEAD, and thus increasing the average number of MAC addresses returned for each call, will significantly increase the number of calls where a civic address is returned, thus improving overall Dispatchable Location performance.

Note that by design, both the geodetic position and civic address are delivered to the PSAP, thus if the civic address is not present, the geodetic position will likely still be available. Never the less, the goal is to maximize the availability of Dispatchable Location. When both a geodetic position and civic address are present, the PSAP operator has the opportunity to leverage both.

5.4 Relationship Between Provisioning Density and Dispatchable Location Performance

Sections 5.1, 5.2, and 5.3 described how low Reference Point density in the NEAD database is causing a variety of Dispatchable Location performance issues. The logical next question is: how much Reference Point density is needed to improve performance? Figure 5-5 offers some intriguing clues that begin to answer this question.

In Figure 5-5, the *DL2/DL1 Accurate Percentage* for each building – the ultimate bottom-line Dispatchable Location performance measure – is scatter-plotted against the 'Provisioning Density' for that building to illustrate the correlation. 'Provisioning Density' is an analytical

assessment of the completeness of the NEAD database for a given structure; it is defined as the fraction of units (apartments, suites, separate rooms or partitions) in a building in which one or more reference points are provisioned in the NEAD.

Again, correlation does not assure causality, but it is intuitive that increasing NEAD database completeness will translate in to improved bottom-line Dispatchable Location performance. By extrapolating from the buildings in this test campaign – none of which achieved 100% *DL2/DL1 Accurate Percentage* – a trend emerges that suggests an acceptable Provisioning Density could be somewhere in the 50% to 75% range for medium and large commercial and residential structures.

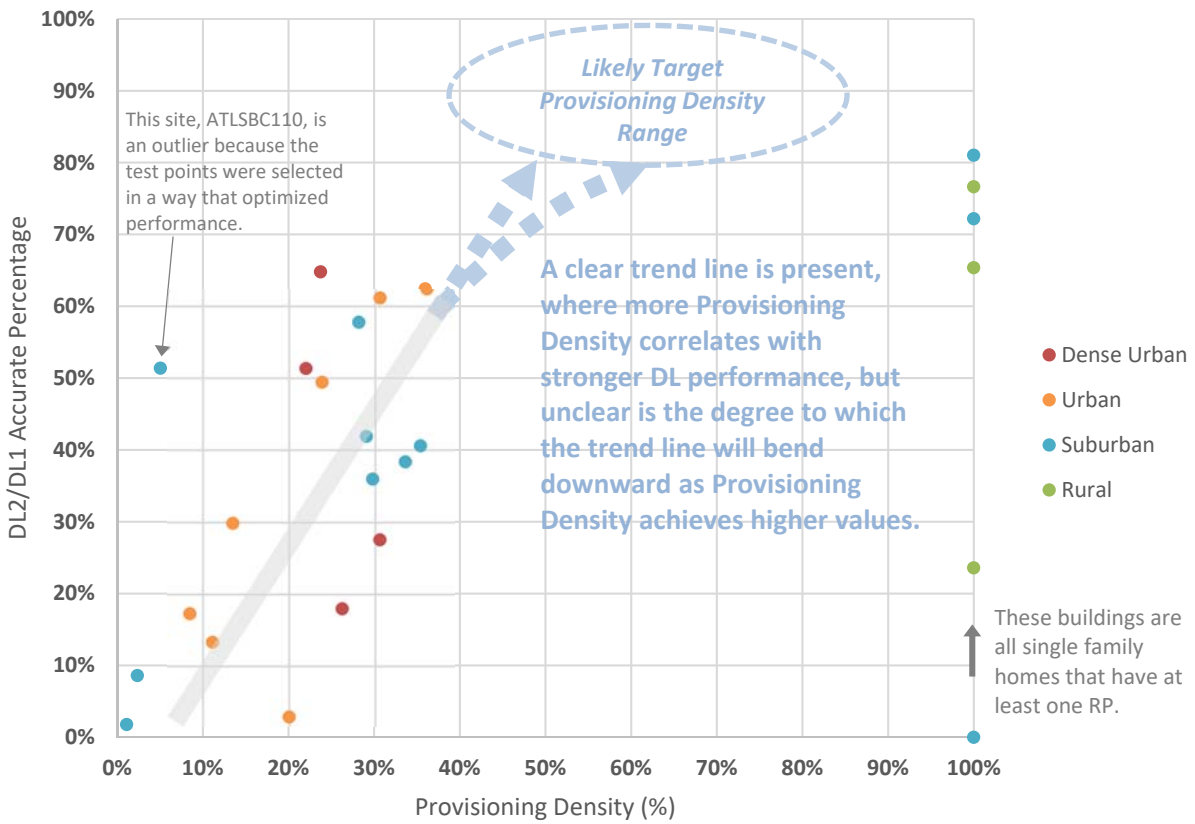

Figure 5-5 Dispatchable Location Performance by Building as a Function of Reference Point Density

Single-family and other small stand-alone structures however may need 100% Provisioning Density, to avoid reporting neighboring buildings or reporting no address at all, as discussed in Sections 5.1 and 5.3.

When testing occurred, the number of Reference Points in the test areas corresponded roughly to 14% of the population in San Francisco and 19% in Atlanta. While the exact relationship between Provisioning Density and Reference Point count relative to population has not yet been characterized, given the findings of this testing, a NEAD Reference Point count relative to population greater than 30% will likely be needed to achieve reliable Dispatchable Location

across a wide cross section of buildings. Note that the sources used to increase Reference Point density in the NEAD should encompass a broad diversity of building and use types, so that the resulting performance improvements apply broadly in high-density multi-unit commercial and residential structures, as well as in suburban and rural stand-alone structures.

6 RECOMMENDATIONS

This section describes recommendations emerging from performing Dispatchable Location testing in the Test Bed.

6.1 Database Expansion Recommendations

Expanding the size and quality of the NEAD database is a critical next step to improve Dispatchable Location performance. The following steps are recommended:

1. Continue to pursue other sources of NEAD Reference Points. Pay close attention to commercial and civic buildings, such as hotels, stadiums, museums, and mid/high-rise commercial structures, as these may benefit less from the next likely source: cable-company-provided Reference Points.
2. Add Bluetooth Reference Points to the NEAD and take steps to enable complete transmission of Bluetooth identities from the mobiles to the eSMLCs. This would provide additional higher-accuracy Reference Points and higher quality Dispatchable Location outcomes.

6.2 eSMLC Measures to Mitigate Harmful Effects of Low Reference Point Density

Low NEAD reference point density was found in some cases to cause erroneous Dispatchable Location details to be reported, incorrect addresses of neighboring buildings to be reported, or no civic address to be reported at all, as discussed in Section 5. While the size (and quality) of the NEAD database increases, steps can be taken now within the eSMLC to mitigate some of these harmful effects, including:

1. Require stronger WiFi signal strengths at the eSMLC when deciding if a NEAD record can be used for CVC Class of Service result. This can help avoid the most harmful effect, erroneous street addresses, though at the cost of some reduction in CVC results.
2. Optimize the RSSI thresholds used in determining DL2 versus DL1 and implement more sophisticated processing logic, including for example clustering and majority logic-based Dispatchable Location decisions.
3. Leverage external information available at the eSMLC where possible, including high-quality, high-accuracy A-GPS geodetic location fixes, to cross check Dispatchable Location choices, to help filter out erroneous results. Care should be taken, however, when the geodetic location method for a given call relies heavily on crowd sourced WiFi, since it could, in some circumstances, reinforce biases in the civic result, which also tends to be based on dominant WiFi signals.

6.3 Public Safety Community Recommendations

The following are recommendations for the public safety community:

1. In the CAD systems, visualize Dispatchable Locations in conjunction with reported geodetic positions, so that PSAP operators have the full context of the solutions provided.
2. Carry out a public safety educational campaign to explain the expected strengths and near-term limitations of Dispatchable Location as a function of the stage of maturity of the NEAD. Utilize the insights gained from both this Dispatchable Location test campaign and the end-to-end Dispatchable Location testing to the PSAP recently performed.

6.4 Retest Once Database Expanded & New eSMLC Features Available

If significant more Reference Point data is added to the NEAD, Dispatchable Location processing logic is refined in wireless networks, and both Android and iOS devices support the NEAD, a subsequent campaign of testing would be an appropriate step to undertake.

Meeting Agenda: PSAP Roundtable

Date & Time: Tuesday April 16th, 2019 1000-1200

Location: Metropolitan Emergency Services Board (MESB)
2099 University Ave W
St. Paul, MN 55104

Host contact: Kari Morrissey 763-324-4758

Agenda Items:

1. Introductions
2. Additions, changes to the agenda
3. Training (new employee and continuing ed.)
    a. Current in-service opportunities:

    Dakota considering hosting a CTO course, Anti-bullying in the comm center, and an EMD course as they will be utilizing EFD later this year.
    Group should consider having APCO/NENA host a course, possibly twice, once in Metro and once outstate (St. Cloud).
    Edina - EMD
    Anoka – Leadership course
    Lavae offered to bring these training ideas to the chapter.

    b. Metro curriculum change/maintenance process – group needs to meet quarterly, before changes will be discussed at this committee before bringing to larger group.
    c. CTO training/roundtable discussion update –
    Anoka is using bench marks in their training program; an example used was transferring a call; function is performed and then signed off. Also using self-evaluation forms.
    MACC – uses self-evaluation for trainee every pay period.
    Mpls – would like to create a proficiency exam to check for skills and knowledge after sign-off and continuing education.
    Discussed typing proficiency in trainees: suggested using a listening typing test vs using a reading test to more accurately reflect the job skill.
    Scott Co loaded a typing test onto the workstations so staff can play/type.
    CTO Roundtable – was hosted on a Saturday did not have a large a turnout. Topic this quarter was classroom training schedule; work life balance presentation.
    Washington County hasn't been getting updates for CTO meetings. Everyone should be checking basecamp for meeting updates. Kari will review emails on sign in sheets and add to lists.
    MESB- looking for some resiliency training. RFP going out on 4/22 for grant funding. Suggest doing several sessions so trainers could take back to centers for in-house training.
4. Events and exercises (plans, meetings, 205's, impact on operations)

Anoka holding a mass casualty training – need role players. Kari will post on base camp.
Henn Co regional response training – mass casualty situation at a school in Plymouth in mid-July. Tony will send information out. There will be a dispatcher break out portion to the training.
Large table top exercise. $35 per person.
Anoka having PGA for next 7 years.

a. General training questions, updates, etc.

5. Standards – no update.
6. PSAP technical updates and info (CAD, radio, phone and other systems)- Rapid Lite, Edina using Smart 911 in Edina/Richfield. Agency pays by the console. Residents must update every 6 mos. Has multiple platforms to provide data. Another resource for staff to utilize. Some agencies using Rapid Lite for every call, shows accuracy, gets staff to utilize and become more familiar with the program.

7. Pulse point, Vitals being used in some agencies. Sends info to first responders of an incident. Ramsey had a save at Rosedale mall where off duty fire fighter received notice and could respond – was successful outcome.

8. QA/QI – general updates, questions, etc. No updates from group.

9. PSAP operational updates and information (management, staffing, schedules, major changes) – around the table updates from each agency

State – 7 openings for dispatch
UMPD – fully staffed
Transit – new rapid transit – all electric busses. Phones all along Penn & Brooklyn Center. For new line. Transit is calling EMS directly for some instances. Any agency can call Transit if this is an issue.
Carver – down 2 (4 in backgrounds) – working on continuing education. Review of policy.
Washington Co – hired 1, will be posting for 1 more using grant money. Position guaranteed for 2 years with the intention of moving into an open position.
Henn Co – posted for new Director. (posting closed and it is unknown when interviews will take place. Still down 10. 12 currently in training.
Dakota – interviewed 16 for psych's -9 started yesterday. 5-week academy / used to be 2 weeks. Have new mentoring program. Will put on base camp. Remodeling of center is done. New layout seems to be liked so far.
Edina – down 2 FTE's. Have been hiring good candidates but leave due to the stress. Two currently in backgrounds. Now using US digital for fire dispatching. Have now combined Edina & Richfield on same main channel.
Ramsey – done with academy – at 57/60 for summer. Center has a mentorship program and peer support team. Will provide 40 hours of peer support training (still looking for this type of training).
Anoka - Down 4. Still have 2 in training. Supervisors required to work 4 hours at each position a month. Helps with feeling part of the team. Held meetings with staff while supervisors covered the floor. Two leads are doing QA. Then those 2 leads QA each other's calls for consistency.
MACC – technically at full staff/3 in training. Closed posting and tested for another list.
Planning for new facility, new Public Safety Bldg. in 2022. Part of Airport Operations center.

Trying to address the airport terminals, how to integrate that into CAD for routing and recommend.

PSAP salary survey may be coming out since it's been a while from last survey. It's time to update.

Pete/MESB – is there a difference for PSAP's that use a protocol – does that affect their stress levels? It's a long-term transition. MESB discussion reference Nashville 311 paying higher than 911 and how that created a significant problem. 911 might be better titled Emergency Response Coordination Center vs Emergency Communications. Idea to explore a regional Q & A program?

TC Week – Troopers Assoc. donated gift cards. Interviewed 6 dispatchers and posted on their website.
UMPD – Made custom cards with for each employee. Custom lanyards, donuts, sloppy joes, cake, Friday – diff events throughout the week.
Transit – low key, magnets and bingo – relaxed dress code.
Carver – different days, food, supervisors bought thin gold line merchandise for all staff. Games – celebration progresses each year.
Washington Co – theme days, popcorn, gifts (frame with thin gold line) different departments bring things for staff. Recognition wall, activities, SO posts on FB for recognition.
HENN – around the world theme – diff food, organized by committee, funding from candy and snack funds.
Dakota – themed week, food, agencies bring food, games, prizes, gift challenge coin with mission statement)
Edina – theme days, shift has things. Gifts/pull overs. 2 Proclamations are being done.
ANOKA – steps challenge, games, food, slipper day. Bumper sticker magnet.
Mpls – Goes all out, theme is under the sea. Different food days all week. 2 Open houses – Wed afternoon with Mayor reading the proclamation. Another in the evening to include the middle and night shift staff (Everyone welcome to join us). Must rethink things next year as city has changed the recognition and food & beverage policy which has big impact to this celebration.

APCO/NENA – Dispatcher night at the Twins game is being considered.

Next meeting - July 9th

Metropolitan Emergency Services Board
9-1-1 Technical Operations Committee
Network Report
May 16, 2019

Agenda Number 6.D.

1. Text-to-9-1-1:
The St. Louis Park PSAP is the next metro PSAP preparing to implement text messaging and is currently scheduled to go live on June 5th. Washington and Scott Co. will then be the only remaining primary PSAPs in the metro area that have not yet implemented text capabilities on their answering applications. Both PSAPs are planning to implement text messaging concurrent with their next 9-1-1 answering application upgrade.

2. Firewall Implementation:
The team working on the ESInet firewall implementation project is now focusing on turning up some of the greater MN PSAPs. It is not known at this time when the team will come back to the metro area. The MESB will pass on additional firewall implementation dates as they become available.

The team has a better understanding of the issue identified at Carver Co. and will work with West and the 9-1-1 answering application vendors on possible solutions. The issue at Carver occurred when the VESTA received the text call invitation from West on one network path and acknowledged the invitation on a different network path. This split path response was interpreted by the firewall as abnormal traffic and was blocked. Element has now identified the same issue at one of the greater MN PSAPs which prevented text messages from processing normally. ECN and the MESB are working with CenturyLink and West to resolve the issue.

3. NG9-1-1 ESInet:

In April 2018, NENA published a new NG9-1-1 ESInet Design document that outlines new modifications to the existing ESInets in use today. The new design focuses on increasing reliability and resiliency by incorporating multiple network service providers using different network protocols (e.g. MPLS, Ethernet, cable broadband Internet, wireless carrier broadband Internet). The NG9-1-1 ESInet would support multiple public safety applications (e.g. CAD, logging, CAD-to-CAD interoperability, cloud-based applications, shared/hosted applications, etc.) in addition to supporting 9-1-1. The MESB believes the NG9-1-1 ESInet configuration will offer valuable new COOP options for our PSAPs that today's ESInet cannot support. The MESB will continue to work with ECN to develop an implementation strategy to bring the metro area ESInet configuration into compliance with the NENA design recommendations.

Metropolitan Emergency Services Board
9-1-1 Technical Operations Committee
9-1-1 Data Report
April 18, 2019

1. **Statewide GIS Data Standards:**
    a. The Minnesota Geospatial Advisory Council (GAC) Standards Committee has finished their review and revision of the **Minnesota Road Centerline Standard** (MRCS) schema based on the last public review comments. The committee is sending forward an updated schema, with a recommendation for approval, to the full GAC for consideration at its meeting on 5/29/19.
    b. MnGeo staff continues to work on a proposed state **PSAP/Emergency Service Zone Polygon Schema Standard** that would be proposed through the GAC standards and possibly SECB standards processes**.** MESB has shared with MnGeo its experience with and schema used for the polygon layer that it maintains on behalf of its member PSAPs.
    c. The SECB NG911 Committee will create a workgroup to develop a list of **standardized statewide response agency names.** MnGeo will then incorporate these into domains that will be needed for the PSAP/Emergency Service Zone Polygon layer standard.
    d. MESB encourages continued **communication and planning between PSAPs and County GIS Departments** with regard to the ongoing maintenance of the geospatial datasets (road centerline and address points) that will be used in statewide NG9-1-1 core services. In most cases, these datasets also form the foundational data used in PSAP CAD and mapping systems. PSAP managers are encouraged to assist in communicating the **vital role GIS has to their current and future PSAP operations**.

2. **Regional GIS Data Aggregation:**
    a. **Centerline:** The MetroGIS/Met Council continues to process updates of the MRCC nightly to the MN Geospatial Commons website. Each metro county's most recent centerline data that has been uploaded to the portal and passed validations is included in the regional dataset. Nine of the ten metro counties are using this process for MRCC updates. Sherburne County has formatted to the MRCC schema and is working through validation errors.
    b. **Address Points:** The MetroGIS/Met Council continues to process updates of the Regional Address Point dataset (in the statewide schema) nightly to the MN Geospatial Commons website. Each metro county's most recent address points that have been uploaded to the portal and passed validations are included in the regional dataset. Nine of the ten metro counties are using this process for submitting address point dataset updates. Sherburne County is aware of the standard schema used by the metro area and will be updating their distribution as they are able to do so.

3. **Regional PSAP/ESZ Boundaries:**
    a. **Recent changes to regional PSAP/ESZ boundary polygons:** Updates were made to reflect annexations, minor boundary adjustments, ELT changes, and/or ESZ/ESN merges in Ramsey, Chisago, Sherburne, and Scott Counties.
    b. MESB published the **metro Regional PSAP/ESZ polygon dataset** to MetroGIS/Met Council for the Regional Data Viewer project. This dataset was deemed public by the Minnesota Data Practices Office.

4. **Regional 911/GIS Data Synchronization:**
    a. MESB has begun the process of running updated geocoding validations on the metro regional data. Results statistics will be shared with PSAPs and county GIS departments when they are available.
    b. MESB documented its expectations for a **GIS-derived MSAG and transitional data management trial** with CenturyLink/West originally outlined in the statewide contract with CenturyLink. It is undetermined whether the trail will proceed. MESB is also considering alternatives for integrated regional GIS/MSAG maintenance.

5. **Regional Data Viewer:**
    a. MESB and MetroGIS continue to work together on an early prototype of the **Regional Data Viewer** designed to facilitate communications and data content QA/QC associated with the regional geospatial datasets central to the business needs of E9-1-1 and NG9-1-1. The viewer will be helpful as a reference for PSAP Data Coordinators in MSAG maintenance work and for telecom service provider staff seeking to validate 9-1-1 addresses. The map can also display data of interest to users in the broader public safety community. When a refined prototype is ready, content overviews, demonstrations, and user testing/training are planned.
    b. MESB presented to the **MetroGIS Policy Board** on the increasing role of GIS in public safety. MESB acknowledged the vital role the county GIS departments are playing in preparing and maintaining the geospatial datasets that will be foundational for NG9-1-1 core services. The Policy Board also heard an overview and saw the early prototype of the Regional Data Viewer.

6. **Wireless Cell Sector/Routing Data:**
    a. As previously reported, cell sector routing and ALI information updates for the **SPPCS VoLTE deployment** in the 10-county metro area were completed by MESB on behalf of metro area PSAPs. Once Pete Eggimann is aware of Sprint's VoLTE testing plans, he will be sharing the schedule with metro PSAPs.
    b. MESB has engaged with T-Mobile on beginning the **cleanup of wireless ALI data screen content and creation of a cell site geospatial dataset** for the T-Mobile data. T-Mobile has agreed to assign Danny Neds to this project. MESB has requested audit files ("rollups") of all existing data for macro, femto, and small cells in the metro region to begin the effort. Previously, MESB had performed similar work with the cleanup of Verizon, AT&T Mobility, and Sprint data.
    c. **Wireless routing updates** for all carriers are being handled between Comtech (VZW), West Mobility (ATTMO, SPPCS), T-Mobile and the MESB (on behalf of all metro PSAPs) using routing spreadsheets exchanged via email. MESB is sending routing directly back, rather than sending it through the PSAP for final review. MESB PSAPs can always email ***mesbgis@mn-mesb.org*** and request that MESB review the routing for a specific sector or call.

7. Increasingly, **911NET ALI discrepancy reports** are related to businesses that have converted to IP based phone systems/services, yet 9-1-1 has not been (re)configured properly. Due to the complexity of these new phone arrangements, they tend to involve lengthy investigations and often rely on resolutions by the business' IT department. PSAPs are encouraged to continue to submit ALI DRs on 9-1-1Net.