Highlights and Key Takeaways from Precision Data Webinar August 19, 2020

Hosts
Ross Baldwin, South Hampton GIS Director and Chair of the Regional Committee of the NYSGISA
Alan Leidner, President, NYC GISMO

Support
Michelle Westfall, NYS ITS
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Presenters
Frank Winters, NYS GIO
Doug Schuetz, Acting Commissioner for Planning and Public Transportation, Rockland County
Jim Daly, GIS Director Suffolk County

Expert Panel
Professor Sean Ahearn, Hunter College; Director, CARSI Lab
Dr. Nadine Alameh, CEO, Open Geospatial Consortium
Dr. K.C. Rondello, Professor Public Health and Emergency Management, Adelphi University

Notes:

1) **Location data is essential for fighting a pandemic**: As established by Dr. John Snow who mapped cholera cases in London in the 1850's, knowing the location of disease victims is essential to developing strategies to stop disease spread. An epidemic occurs in space and time, and when this information can be captured accurately, many options for dealing with it are made possible. In particular, early identification and mitigation of evolving hotspots can significantly reduce spread. Further, Dr. Snow, a surgeon who had a novel idea, was not a likely contributor to geographic studies. This highlights the need to make data available widely as we will be unable to predict who will make meaningful contributions.
2) **Geocoding COVID related location data**: There was agreement that COVID related location data for individuals testing positive, and for those hospitalized, along with accurate time stamping was essential to understand the spread of the virus. More than one participant said, "standardized location data is key." The NYS GIS Program Office has spent years developing its Street Address and Maintenance (SAM) database for the entire state, which serves as the foundation for 9-1-1 address lookup and validation functions. (Across the U.S. 9-1-1 emergency response systems based on location save thousands of lives annually.) Frank Winters reported that more than 500,000 edits were made on its SAM data in the past year alone (https://gis.ny.gov/streets/). Many NYS counties and municipalities – including New York City - synchronize their own street

address databases with SAM, and develop geocoding applications of their own. Mapping in every jurisdiction in NYS can be done to the address point and typically within a building footprint. Data aggregation is possible to any unit of geography. For example: Data aggregated to ZIP code could be quickly remapped to school district to better understand disease patterns related to school re-openings.

3) **Scaling Data For Different Uses**: Once the locations of COVID positive individuals are geocoded, they can be either mapped individually to a building or address point, or grouped into any administrative, neighborhood or service area needed. It is useful to group data into census tracts and match it with socio-economic data. Grouping incidence by neighborhood boundaries may reveal vulnerabilities of people with similar characteristics. At the other end of the spectrum it is possible to apportion data into ZIP Code and County boundaries to see patterns of disease incidence in larger geographic areas. Doug Schuetz showed the same data aggregated to areas ranging from Zip Code to small grid cells revealing radically different insights, and Jim Daly showed data mapped to the address point. It was noted that how you map data depends on the audience you are addressing. It was easy to see why address precision data is so useful to identifying hotspots and spread patterns. It was understood that COVID data mapped to the address point needed to be kept behind a firewall for internal use only and not released to the public.
4) **Geocoding address at initial input**: There was agreement that location data needed to be digitized and geocoded at the earliest possible moment, preferably at the first point of contact with possibly infected individuals. There needs to be a uniform procedure for information capture. Ideally, at testing stations, laboratories and at hospitals. Name, location and time information should be captured digitally, immediately geocoded, and entered into a central database for easy and secure access to those with authorization.
5) **Design data supply chains ahead of time**: The current COVID data management process was set up in an emergency driven, ad hoc manner without GIS experts being at the table. Data collection, aggregation, processing and sharing methods were improvised and made data access difficult. Speakers and expert panelists strongly felt that GIS personnel should have been involved in pre-pandemic planning and given the responsibility for the development of systems and procedures to better manage location data. Methods could have been designed for digital input and geocoding of location data – perhaps through the use of a smart phone application where those going for a COVID test first enter their address, have it geocoded and generate a bar code for rapid reading at a test site. One presenter found that as much as twenty percent of the location data obtained from the central COVID database was flawed despite the use of a “data scrubbing robot”. Local DOHs should be able to immediately draw clean data from the central database (via REST services and standardized interfaces) for use in the support of local disease suppression operations.

Dr. Nadine Alameh notes that "location services" (integrating space and time) is a less restrictive term than "GIS" and believes Location/GIS services are not just the domain of a department/government/division, but is a capability that needs to be integrated and leveraged across an enterprise to deliver its full value. The integration necessary is not just technical but also a collaboration involving people, capabilities and policies.

6) **DOH and HIPPA**: Many jurisdictions have had trouble establishing working relationships with their Departments of Health, and have been denied access to patient location data due to DOH interpretation of HIPAA requirements. Establishing a good working relationship between GIS staff and DOHs is essential for future responses to COVID and other diseases. DOH's should not remain isolated and should not push outside GIS support away. There should not be a HIPAA issue if GIS offices are given personal location information under strict DOH supervision. These relationships and standards needed to be worked out in advance, but never were.
7) **Contact Tracing:** Contact tracers should be working with accurate location information. Cases assigned to them should be accompanied by a map pinpointing the location of the patient. The location of contacts provided by the patient should be immediately captured digitally and geocoded. Ideally, there should be the ability to identify and record locations visited by the patient as well as transportation routes and modalities. Various spatial analytics can be used to identify super spreader events and key linkages between those who have been infected and exposed.
8) **9-1-1:** One important use of patient location information is to provide emergency responders with a heads up that there may be a person with COVID at a location to which they are responding. Some County DOH's have allowed patient information to be provided for this purpose. Suffolk County provides emergency responders with the locations of people who have tested positive looking back 14 days.
9) **Wastewater Testing:** This was mentioned by Frank Winters as a promising way to determine the presence of COVID within a building, block, neighborhood or sewershed. This might be useful for large institutions such as colleges, housing developments, etc.
10) **Smart Phone Proximity:** There was discussion about how smartphones can be used to alert persons who have been in contact with someone who has tested positive for COVID (Google/Apple application). Also discussed was using smartphone movement data to understand whether people were travelling in ways that made COVID more difficult to contain (e.g. to super spreader events, or from high disease areas to low disease areas.)
11) **National Address Database:** For national efforts to combat pandemics like COVID, it was recommended that the U.S. support an effort to build a national geocoding database and application, made up of data contributions from states, counties and municipalities. This would greatly facilitate disease tracking across jurisdictional boundaries, and would support many other applications as well. (Build the national database by fitting together data from the jigsaw puzzle of the nation's state and local governments).

12) **Social Vulnerability Index:** Jim Daly found that the social vulnerability index developed by the CDC turned out to be an accurate predictor of where COVID incidence was the highest in Suffolk County. https://svi.cdc.gov/ More use should be made of this predictive tool.
13) **Cost Benefit:** A.J. Gupta, a member of the OGC, recommended that the GIS community do a better job demonstrating value: Show how GIS has saved lives and what that value might be. Others mentioned developing a GIS video to sell GIS to the different government agencies that could make valuable use of it if they know more about it.
14) **Other GIS Uses In a Pandemic:** Precision GIS data was also needed to support logistical operations to get PPE, food and other vital supplies to distribution points based on need. Also, GIS was needed to map retail and other commercial locations to support jurisdictions as they re-opened and worked to restore economic activity.
15) **Relations with DOH:** There was agreement that State and County DOHs and GIS offices needed to work together. GIS experts need to be at the planning table way in advance of any event, to put appropriate data gathering and analysis measures in place and to establish collaboration protocols. It was stated that to combat a pandemic a high quality, high capacity data infrastructure was among the most important components.
16) **Spatial Data Infrastructure:** Underlying all the above is the need for a national and for regional spatial data infrastructures (SDI) including the policies and standards needed to connect all the different Location/GIS services with the requirements of stakeholders, moving us from data to information and intelligence, and creating as much value as possible.