Integration of Social Network Analysis (SNA) and Spatial Analysis (GIS)
July 17, 2018

Erin Farley: Okay.

Erin Farley: Good afternoon, everyone. My name is Erin Farley, and I am one of JRSA's research associates. For those of you who are less familiar with JRSA, it stands for the Justice Research and Statistics Association. We are a national non-profit organization dedicated to the use of research and analysis to inform criminal and juvenile justice decision-making. We are comprised of a network of researchers and practitioners, which at the core include directors and staff from state statistical analysis centers.

Erin Farley: Before we go any further, I just want to thank our partners at the Bureau of Justice Statistics for helping us make this webinar possible.

Erin Farley: It is my pleasure today to welcome you to our webinar on Integration of Social Network Analysis and Spatial Analysis. It is going to be presented by George Kikuchi, Matt Lattanzio, and Kevin Thomas. Together they conduct research and analysis for the Philadelphia Police Department. Just as a side note, I had learned about them and their interesting work through their presentation at last year's American Society of Criminology conference. I wanted to welcome them and thank them for making the time to present to our audience today.

Erin Farley: With that, if we don't have any issues, I'm going to pass it to George, Matt, and Kevin. Welcome.

George Kikuchi: Good afternoon, guys. This is George. I have Matt and Kevin with me in the room. If you have difficulty hearing us, feel free to note it in the text. Otherwise, we'll go ahead and get started.

George Kikuchi: There will be three parts to our presentation, first starting with Kevin giving an overview of how PPD's analytics are structured. We will move on to specific research questions and research topics revolving around how we have been integrating link analysis, social network analysis, within the context of spatial analysis. That will be done by George, myself, and Matt of two separate presentations.

George Kikuchi: Erin, are you seeing the screen okay? I just want to make sure we're good to go.

Erin Farley: Yeah. I am. It is a little bit big on mine, so I don't know if any of the audience is seeing it. What you can do is you can look down in the left-hand corner. For some reason, mine's at 116%. You can just minimize it so you can see the whole screen if anybody else is experiencing that. It looks great!

Kevin Thomas: Good afternoon, everybody. Thanks, George and thanks Erin for having us speak. Happy to do it and happy to learn from you guys as well, so looking forward to working with you guys more in the future.
Integration of Social Network Analysis (SNA) and Spatial Analysis (GIS)
July 17, 2018

Kevin Thomas:  My name is Kevin Thomas, I'm the Director for the Research and Analysis Unit at the Philadelphia Police Department. I'm probably the least important and least exciting of all these slides, so I'll try to get through my part fairly quickly so that you can get to the good stuff.

Kevin Thomas:  George was thinking that it might be good to see how we came to be and what the process has been for us. What we're finding is it's been a little bit different. Every police department has its own character and own evolutionary process. We had ours, so hopefully there's something in here that's interesting.

Kevin Thomas:  At that point, we'll go into the analyzing shootings through social network analysis and spatial analysis, and then analyzing social and geographic gang connections.

Kevin Thomas:  Just a quick overview of Philadelphia:

Kevin Thomas:  We're currently the Research and Analysis Unit as part of the overall intelligence bureau, but that's not necessarily how we started. Originally, about five or six years ago, really the only thing in terms of analysis at the Philadelphia Police Department were some GIS folk that did a lot of client mapping and hot-spot mapping and things of that nature. There has been some real recent pushes here to increase the analytical capacity.

Kevin Thomas:  Originally, we were primarily a small unit that was put together under Charles Ramsay back in 2013. Basically, the way I joke about it is they put all the nerds in one big group. They took the GIS people, they took the UCR Reporting people, the statistics section, then we had one analyst at the time. They put that all under one Research and Analysis Unit and I directly reported to the deputy commissioner. Over that time we grew, but really where it all started was with the data.

Kevin Thomas:  Prior this unit forming, there was a big evolution going on. I apologize for the slide, I know it looks like it's from 1995 and some things have changed about it, but I thought we would at least use it. This was our focus to begin. This started out of the GIS that had been working on aggregating data and trying to create a platform or a central hub for data to be shared with analysts, real time, applications, dashboards. I'm sure you've seen this type of slide many times from GIS people.

Kevin Thomas:  We understood that it all really has to start with the data. You can get all the analysts and cool apps and stuff that you want, but at the end of the day, it has to connect to data and information, and that data has to be made available and standardized in such a manner that you have consistency across that. That was a big issue at the police department with a lot of our aging systems. There was a lot work done between 2008 and 2012 to take the legacy GIS system, upgrade that into a true, fully tiered system, staging production and development environments. That was far more robust.
Kevin Thomas: At that point, when I came on board in 2013, a lot of that work had been completed and we put the Research and Analysis Unit together. At that time, Deputy Commissioner Noble Joyce under Charles Ramsay was really interested in focusing on evidence-based fleecing practices. In fact, there was a few things that were already going on internally to the department. This is just a smattering of them. I'm not going to read them all off, but some of the bigger ones that you may have heard of, let's see, The Philadelphia Foot Patrol Experiment. That was done with temple units Versy and Jerry Radcliffe. The Policing Tactics Experiment, which analyzed foot patrol and the [inaudible 00:07:01] and policing in offender-focused approaches. There was hypothesis testing, which was really focused on problem solving and that's a recent one that we have recently finished up. We've also done full randomized control trials with things like Hunch Lab, which is predictive policing software. As well as testing randomized control trials looking at acoustic gunshot sectors and focused deterrents and body cameras.

Kevin Thomas: I joke that these things take time, but unfortunately, that's really the truth. A lot of times, these academic efforts take years and years to happen and mayors change and commissioners change. So we were really working on building analytical capacity internally, so that we could maybe not do the gold standard of research, but perhaps do research that maybe meets a bronze or silver standard that's good enough to be able to help our decision-makers identify what works what what doesn't.

Kevin Thomas: That quote up there came from Ramsay's crime-fighting strategy, which I think is really the genesis of our group. We must understand what works, how it works, when it works, and where it works to answer these questions providing foundation for evidence-based fleecing strategies. Since that time, Ramsay has left and now we're under Commissioner Ross. That's still very much a part of the ethic of our team, which has expanded since they left in 2015.

Kevin Thomas: Excuse me.

Kevin Thomas: Part of some of those smart policing grants was to grow our analytical capacity. That was something that we learned from our Policing Tactics Experiment when we tried to do problem solving was that we did not have enough analysts to be able to do this. We began training police officers. We have 21 districts, so several of our busy districts got a handful from about two to three years from folks like Jerry Radcliffe and George, we were able to train a portion of 26 officers and 10 detectives using GIS and RGIS and other analytical techniques. We decentralized them, so they still worked for their various captains within their districts. We acted as a central group that ended up providing the training and providing a help desk for them.

Kevin Thomas: I'm going to try to move faster, so I don't take up the time.
Kevin Thomas: Since that time, as of last year, we have really expanded quite a bit. At that point, under commissioner Ross, he decided that he wanted to combine all this into one intelligence bureau. There were a smattering of analysts in other groups, particularly intel analysts, over with the Criminal Intelligence Unit, but he took all those various analysts and he combined them under one chain of command within an intelligence bureau. That really was a big culture change for us. Made us a lot more operational than we were before. On top of that, more interesting to thinking about data, it gave us access to a lot of data that we did not have access to before basically the human source reporting date. The type of data that is more typically qualitative that is George and Matt and Kevin like to hang out on this drug corner or something like that. That would be an example of human source information. Something that we didn't necessarily have access to before.

Kevin Thomas: One of the things that we learned becoming more operational is that we needed to be able to continue that evidence-based practice in the research. We really needed to create a dedicated team and that's what George and Matt are team members of that George runs. That is the Strategy Research and Evaluations section. That way, they can stay focused on doing this type of work, which otherwise, the day to day shootings and the things that occur, and the crime problems and crime patterns would end up taking most of the wind out of the sales. That was something that we learned early on.

Kevin Thomas: A couple of the other things we learned early on were the difference between these intelligence analysts and crime analysts. They have very different backgrounds. We have some people that can do both, but it's very rare. One thing about the intelligence data that we did learn, which I think really feeds in to what we're going to be talking about with social network analysis, is that human source information is just another data set. That's the way that we're trying to think about that information both in terms of trying to take unstructured text or narrative information and structure that better so that those connections between people by intelligence can be visualized and utilized for social network analysis, because those types of human source reporting if it's good information is far more of a direct connection between two individuals. Just the fact that they were co-defendants years ago or that they happened to be stopped together in the car. You get to understand a little bit more about what the criminal dynamic because you might understand also what rules that they play with in that group. That's extremely important when doing social network analysis.

Kevin Thomas: Both in terms of trying to structure that data appropriately and/or use test analytics to be able to structure that data automatically is something that we've been working on.

Kevin Thomas: That gives you a little bit of the history of where we are and where we stand. I will now pass it to George to talk a little bit about the analysis.
George Kikuchi: Thanks, Kevin.

George Kikuchi: As Kevin mentioned, I run a small section on [inaudible 00:12:34] and research. One of the things that my section does is to divide up our prototype application which includes one of our flat shape applications in connecting individuals based upon the data that our unit consolidates and essentially holds.

George Kikuchi: Here's a screen capture of our web-based Link Analysis application. The way it works is if you type in a person's name, let's say Kevin Thomas, it searches our records and tries to identify who has been arrested together. In this case, first the individual will be highlighted in yellow. I know it may be somewhat difficult to see on this screen capture, but in the center is a yellow highlighted individual. He have bunch of dots surrounding him indicating that all other people have been arrested together in the past and by default, the application searches through two degrees of separation. Meaning if I have been arrested together with Kevin and if Kevin has been arrested together with Matt, from me to Kevin is one degree of separation, and from Kevin to Matt from me, essentially, is second degree of separation. By default, the application looks for two degrees of separation.

George Kikuchi: Application also allows a user to change the parameters and so forth. A few other things that the application does is highlights those individuals with active warrants, so all those individuals highlighted in red square in this screen are those individuals that currently have active warrants. We developed this application about a year and a half ago and we showed this to our bosses and they got excited. Our bosses always get excited with a new toy. Immediately, some of the feedback that we got was that they wanted to take it to the next level. As soon as we get them a new toy, they want more. In this context specifically, they wanted to search multiple individuals all at once, so rather than typing Kevin Thomas’s name and Matt's name separately, the wanted to type in multiple individuals. That was relatively easy to accomplish. Then, the got crazier.

George Kikuchi: They wanted to see how all shooting victims in Philadelphia are connected. Unfortunately, we have a lot of shooting victims. Each year we have approximately 1500 to 1600 shooting victims. They wanted to see how those shooting victims may be connected. That's doable, but they also wanted to do something else. They wanted to see link analysis of results on the map. We were able to respond to that request. I'm framing this as boss getting a new toy and they got excited and they wanted more in a joking way, but my background, Kevin's background, and Matt's background is GIS Enhance. Visualizing it on the map personally excited me and I was interested in looking up how that shooting victim pattern on link analysis looks like in Philadelphia.

George Kikuchi: This is what we came up with.
George Kikuchi: What you are seeing on the screen is our web-based mapping application. This is being used for ComStat and other purposes. Specific in this screen, I’m showing shooting victims in the past 60 days and color coding them based upon whether or not they belong to the same network. Any gray dots which are symbolized in small circles, each of those is a shooting victim in the past 60 days, but they didn’t have any other shooting victims within their known associates. While those individuals with the same colors belong to the same network or they have common known associates.

George Kikuchi: Here’s an example of how this application works. If you click a dot for shooting [inaudible 00:17:28], there’s a pop-up showing some context of the shooting including date of [inaudible 00:17:34], victim’s name, and so forth. But that pop-up is hyperlinked to a link analysis application that shows how those shooting victims may be connected to each other. In this case, or in this example, I click a green circle that also has another shooting victim within their network and hence we have two individuals highlighted in yellow. What that is showing is that in the past, they have been arrested together.

George Kikuchi: John skipped to slide 17, but what I wanted to type in- yeah. Thirteen. Here we go. Yeah.

George Kikuchi: Immediately what we started seeing based upon this spatial visualization of link analysis is that connections exist across divisional boundaries. As Kevin mentioned, Philadelphia Police Department is broken down into 21 districts. Those 21 districts are grouped into six divisions. I’m just showing on this screen the regional boundary with a blue line. I’m highlighting two light blue dots indicating that two separate shooting victims in the past 60 days, they been shot on separate days, on separate locations, but they have a common known associate and they belong to the same network. It just so happens that detective bureaus in Philadelphia Police Department are organized by division.

George Kikuchi: I have no law enforcement background. My background is in research and the only thing I have been learning is from Law and Order. My impression of detectives are that they don’t talk to each other. They do not want to share information, right? If shootings are happening across divisions, they may not even be looking at these two separate things. Our analysis can easily show that there’s something common going on between those two separate instances. I got curious more and more about how these cross-division shootings have some commonalities.

George Kikuchi: Hence, I get my research question and some hypothesis to drive my analysis. Besides social connection-based meaning a previous co-offending, are there anything else that are common or that look similar that may be connecting these shooting victims, specifically my interest would be those in instance that occur across divisions. My gut instinct was that connected instances may be more similar than some random instance. They may have similar backgrounds, they may have been killed with the similar weapons, and instance may have
occurred on a similar day of the week, similar time, and so forth. Maybe because victims have similar lifestyles and they have some commonalities or common backgrounds in the beginning.

George Kikuchi: I have two approaches, one that I’m going to focus on [inaudible 00:21:31] to see what patters that I can dissect, but in future I will also be looking at assimilation models to see if I can assess studies to go [inaudible 00:21:42] similarities and so for. My unit analysis is Group Shooting and the time period for the purpose of this research was between 2005 and 2016, which included about 18000 shooting victims or approximately 1600 victims per year. Out of those 18000 shooting victims, approximately five percent of the victims belonged to the same network or is equated to 900 victims that have some connection to another victim.

George Kikuchi: One of the first things that I wanted to look at, as I mentioned, was how often those common network shooting victims cross jurisdictional or divisional boundaries. It turned out a pretty significant proportion of shooting victims network crossed divisional boundaries. More specifically, 40% of network cross the original boundaries.

George Kikuchi: Looking at some background of the shooting victims, 90% of connected incidents involved single race, and most specifically 83% were African American and approximately 8% were Caucasians, and so forth.

George Kikuchi: African American victims are more likely to be connected than Caucasian victim. I will just be going through quickly some of the characteristics that I examined separately, but in the end, I will be summarizing some of the punch lines and how this analysis may or may not be useful for both research and investigation.

George Kikuchi: Looking at Sex, the vast majority of our shooting victims are male to begin with, but connected shooting are far more likely to be male than female.

George Kikuchi: Looking at the Criminal Circumstance of the shooting, 10% of the connected incidents were part of robberies, and to me that looked pretty low compared to how often robberies may lead to shooting instance. In fact, comparing connected shooting to non-connected shooting, robbery were actually less likely to be connected than non connected shooting interest.

George Kikuchi: Looking at the victim's past, victims are far more likely to have gun crimes and also narcotics prior arrest.

George Kikuchi: Looking at the gang, gang it was approximately 40% of connected instance involved or occurred within the gang boundaries.

George Kikuchi: What was interesting to me what that in many cases we actually are making arrests. So let's say hypothetically there are two victims belonging to a single network. Chances are in 50% of the cases, we have made an arrest on that case.
We may not have those two cases, but data-wise, the likelihood is that we have arrested one of the shooting victims in that case.

George Kikuchi: Summarizing some of the findings that I found, approximately five percent of the shooting victims has social connections and 40% of shooting victims or connected shooting incidents cross divisional boundaries indicating that detectives definitely need to talk to each other. More importantly, the implications of this analysis is that we may actually be able to find out what is going on about the victim and their network if not already.

George Kikuchi: First of all, 70% of shooting victims in general have prior arrests and slightly higher percentages of connected shooting victims have gun crimes and/or narcotics priors. We should already be knowing a little bit about those shooting victims. What was more startling to me was that in half of the connected shooting victim network, at least one arrest has been made, so they've already solved one of the cases, so why not go after the other cases by looking at the connections and soliciting information perhaps from the arrested offender?

George Kikuchi: What we also saw, I didn't run any statistics, but carefully visual inspection indicated that active warrants are pretty common around shooting victim networks. Perhaps investigators may able to utilize the presence of active warrants as a leverage to solicit information.

George Kikuchi: The direction that I want to go in future is that I was interested in developing automatic notification system, so that especially when shooting victims across divisions but those shooting victims belong to the same network, I could easily create a notification system so that detectives get that information automatically. I had that idea, but I sort of paused because sometimes detectives may not really be interested in getting information on other cases, especially if they think that that would lead to more work for them. There could be some cultural challenges among detectives and simply may not want to change their current work flow. I worked with both investigative analysts and detectives and I can easily tell that they want an ability to be able to search information but sometimes they may not be so receptive or they may not fully understand what analytical application do and that's where I sort of pause on this project.

George Kikuchi: Again, to summarize some of my key findings, they have already solved one of the cases. I feel like that's convincing argument to take this to the next level and detectives take advantage of that. With that, I will pass on to Matt, who also has been looking at social network analysis within the context of GIS.

Mr. Lattanzio: Thanks, George.

Mr. Lattanzio: Hello, everyone, my name is Matthew Lattanzio, I work for the Philadelphia Police Department as an analysis under George Kikuchi. The research focus for
this project is its relationship between geography and gangs, specifically, the changes in local crime around those gangs.

Mr. Lattanzio: The police department, especially the larger departments, something that we're very good at is generating paperwork and collecting basic data on incidents and they get filed away and normally, nothing happens to it. It's very reactive. What you're looking at is an example of how the data is basically structured in a very simple format of taking the information that we already naturally collect in the policing field and then put into a structured format, commonly this would be known as an Edge List. Simply put, it's just a list of connections. In this case, sorted by type which would be arrest, stop, and victimization.

Mr. Lattanzio: We keep this on a personal level so that let's say one gang member would be arrested with another. We have that data stored on a server and we can easily access that. When you take those relationships where two people are stopped together in the same car or two people are arrested together or one person victimizes another, we structure that out and then we bring it up one level. Instead of saying Kevin victimized George, we say that Kevin's gang victimized George's gang. We take this personal one-to-one person relationship and bring it up to an organizational level.

Mr. Lattanzio: We can take that data in using the Pivot Table function in, in this case, Excel, we can summarize the relationships between groups. What you're looking at here is the number of relationships between groups color coded, in this case, green being low amount of relationships, red being the highest. This data structure is perfect for the software that we use called Aura, where you can take this data and then map it out later on in terms of a social network chart.

Mr. Lattanzio: By positive connection, we mean those connections that are friendly in nature. If two people are stopped together in the same car or they're stopped on the street or they're arrested together, in this case they're not killing each other so we're counting that as a good thing.

Mr. Lattanzio: Conversely, if one is victimizing another we're considering that a negative connection. Now, in many cases in Philadelphia, that means a shooting. It may also mean a burglary, a robbery, but in most incidents, one gang member shot another gang member. Similar to the other pivot table, you're looking at a color coded chart where the red indicates many victimization between those two groups.

Mr. Lattanzio: That pivot table, both positive and negative, then gets charted out and examined using social network software. The chart you're looking at is every gang in Philadelphia as they are connected to every other gang in Philadelphia. The size of the squares is a measure called the between-this. As simply as I can explain it, it's how that group sits on the network between the other groups. The idea being that a group with a high between-this is at least in the
Integration of Social Network Analysis (SNA) and Spatial Analysis (GIS)
July 17, 2018

explanation, easiest to pass information through if you wanted to pass information from one end of the network to the other.

Mr. Lattanzio: Now, what that doesn't take into account is the more qualitative relationship between gang members or how often they communicate. What we’re doing is taking our reports, our police reports, and aggregating the data, mapping out the connections. Looking at the potential for information sharing. The potential for who in that network, in this case the organizational network, which organizations may be most important to the overall gang structure in the city of Philadelphia.

Mr. Lattanzio: This chart shows the negative connections. Remember, this is victimization and it's directional. It may be hard to see in these examples, but there are actually small arrows indicating from which gang victimized another gang. The arrow pointing to the group on the receiving end would be the victim. You may notice that Gang 30 has many arrows pointing into its symbol, meaning it's being victimized by multiple other gangs. This becomes more of a concern where you have one gang who's being victimized by multiple groups and then you have these other groups that as far as we can tell don't actually know each other, but they share a common enemy. That's when it becomes dangerous, where you have a large gang conflict. Otherwise, had we not mapped out these relationships, we would not have known that it's structured in this manner.

Mr. Lattanzio: Now the focus becomes in these gang conflicts, how far across the city do they extend because a gang with a high organization where they have the resources and the wherewithal to maintain large connections to other groups across vast distances, to us that indicates a level of sophistication and that's something that makes them more dangerous than say a group of friends that just so happened to commit a crime every now and then.

Mr. Lattanzio: Now, this leads to a couple gaps investigationally where does an area experience more crime if the gangs in the area are friendly towards each other. The idea being if my gang is not focused on fighting some other gang, does the focus then turn to members of the public? How many gang on gang conflicts are personal business where it's truly between two people who happen to be in a gang and not related to the business of running that gang, the finances, the narcotics, and things like that. Finally, the structure of the gang, how does that affect the local crime? In some gangs we have across the city, like I said, are just friends who happen to identify under a common banner, so to say. They commit crimes together or they have more sophisticated gangs that are run almost like a business or an organization. Would those gangs that are structured differently, would their contacts be more on a professional level between the other gangs or does that not matter to the cause of the conflict?

Mr. Lattanzio: What we've done is we've taken these charts and we've developed an online application currently in Beta where you can pick a gang, any gang in the city from a dropdown and then have the other gang territories across the city color
code to show the relationship. Not only the relationship in a positive and negative way, but also the geography between gang boundaries. This example was done in desktop because the gang app has a lot of personal identifiable information, but we still wanted to show you the concept.

Mr. Lattanzio: What you're seeing in blue would be a selected gang. The green boxes would be the territories that are on good terms, on positive terms with the gang in blue. The red territories are those gangs that have a negative relationship with the gang in blue. While the names and locations are randomized, these connections are real connections between these gangs. What we're seeing in this case is that you have the blue gang and essentially three potential partners. The blue gang is having a conflict with the gangs in red and then you'll notice that one of the gangs in red has enough resources to hold two different territories and that also makes them dangerous because they have an increased resource then that makes them more effective in combating the gang they're in conflict with.

Mr. Lattanzio: Similarly, we have a small gang in blue who are on good terms with gangs in green and on bad terms with gangs in red. These other gangs, as they're related to have enough resource at the whole much greater area of territory. This is where the geography comes into play, where these gangs, not only in this case, it crosses different districts, but that's actually a divisional cross right down the center of the map. This one small gang is fighting a much larger gang, but they also have partners that are almost as equally as big in terms of territory held to the gang in red.

Mr. Lattanzio: Now, like I mentioned, we have this in an app form that was made with Ezrie WebAp Builder. With very little programming experience, this is completely within reach to smaller departments. There was a challenge incorporating an auditing and security aspect to it, but we've met that and we can set the requirements and the accessibility as needed. We're working on integrating it with other online content and where we hope to go is a standardization of gang names, which in our case is almost cultural because certain gangs were formed-there's this one gang in the city that goes back decades. They may reinvent themselves, but they're known to people in the department under one name, but they've reinvented under another name. Over time, the same group may have multiple names so we have to come up with a way to standardize, at least for the digital form of it, one gang name.

Mr. Lattanzio: Daily updates, because as of now the app is statics. Most importantly, and as Kevin mentioned earlier, we want to incorporate the human intelligence side of this. As of now, all of these connections are coming out of police reports. The good part about police reports is that for a fact, these people were spotted together in some fashion. If they were stopped together it was because an officer made contact, had a reason to investigate, and recorded on that day and time that they were stopped together for some reason.
Integration of Social Network Analysis (SNA) and Spatial Analysis (GIS)
July 17, 2018

Mr. Lattanzio: The same thing with an arrest. It's recorded for sure that they were arrested for this crime and that that's recorded in our records. What we don't know as far as the data recorded is the more institutionalized knowledge of our intel unit in that we start to look at other connections, such as family connections. Who are brothers? Who are cousins? Any romantic connections? Shared addresses. Connections similar to that nature where it goes beyond traditional police reporting. Once we have those connections, we can then start to build out a much more comprehensive and massive network of who knows who and how they know each other.

Mr. Lattanzio: Then once we have that network, we can start to run metrics on who was most important to that network? Who would be the quickest to pass information to? Who may not have a lot of connections but knows somebody who does have a lot of connections? There's a lot of different investigative ways we could go with this information and that's the biggest directions we could go with this and one of most important.

Mr. Lattanzio: With that, I'd like to pass it back to George Kikuchi.

George Kikuchi: Here's our contact information in case you guys want more detailed information, specifically with law enforcement agency. We're more than happy to do a demo of actual applications and so forth, but for the purpose of public presentation, we needed to anonymize this content for obvious reasons.

George Kikuchi: With that, I will pass it back to Erin and we're here to answer any questions that you guys may have.

Erin Farley: Okay. Thank you very much. Yeah, if anybody has any questions just type it up in the chat box at the bottom right hand corner. In the meantime, first, now that I'm not on mute, there's a thunderstorm happening right now, so if you hear any weird noises, it's just the thunder.

Erin Farley: I was curious just as a side question, when you look the maps and you see the territories and some of them are weird shaped and things of that, how do you gather that information? I'm assuming part of that is human intelligence, but is that in terms of really standardizing or verifying the boundaries? What sort of process do you go through to do that?

Mr. Lattanzio: The gang territories as shown are based on human intelligence of where that gang, the core of that gang, operates. Now, obviously as people have free will and they can just move in and out of the box as they please, so I'm not relegated to staying in that one box.

Erin Farley: Mm-hmm (affirmative).

Mr. Lattanzio: That representation is meant to be at the core of where that gang is found. In Philadelphia, many of our gangs are neighborhood based. That territory
represents the neighborhood that that gang represents. Many gangs will actually call themselves after a certain neighborhood or if they’re from a certain apartment building or if they’re from a certain school even. It's really the core of where those members can be found.

Erin Farley: Okay. Okay.

George Kikuchi: To follow up on that, we are actually undertaking a research project to objectively define where their area of influence is by spotting where these gang members have been arrested, where they have been stabbed, and so forth. So then we can cross-reference what human intel is saying where there area of influence or area of operation is as opposed to where exactly they're committing crimes.

Erin Farley: Mm-hmm (affirmative)

George Kikuchi: I think we have just completed defining those objective areas are and we have a bunch of research questions to pursue based upon that data. Off the top of my head, some of things that will be interested in is how area of operation changes based on, again, size or primarily type of criminal activity that they engage in. If they are strictly focusing on narcotics, their area may be pretty small. When they commit violent crimes, they may go beyond their typical area of operation and so forth. There will be so many analysis that we're interested in pursuing with this.

Erin Farley: Mm-hmm (affirmative). Okay. Thank you.

Erin Farley: We do have a couple questions. Okay. Hold on. Let me go up a little bit more. I think I... I don't know people. Okay. I can hear that thunder. Hopefully my power doesn't go out. Forgive me if I disappear. Okay. Here we go. First question.

Erin Farley: Have you considered NIBIN leads for the social network? I think you'd find higher rates of connection between incidents.

Erin Farley: I don't know if it's initials or if it's called NIBIN.

Kevin Thomas: Yeah. Hello, this is Kevin. It's, yeah, NIBIN.

Kevin Thomas: We don't receive the NIBIN information directly from the ATF in a structured form right now. We are receiving individual reports. When we receive those individual NIBIN reports, they go through a process of being vetted about whether or not we have the resources to do more robust analytical analysis of that NIBIN job. That gives you an idea of how many we receive. It's quite a few. We're working right now with the ATF to find a way to be able to get this data in a more structured form, because this is something that we talk about very frequently, and yes, this is definitely a direction that we want to go. As of this
point, we are not receiving that information in a form where we can do that easily.

Erin Farley: Okay.

George Kikuchi: Suburban issues of NIBIN leads or the frequency of NIBIN leads that gets generated in Philadelphia. Something like multiple reports per day?

Kevin Thomas: Yeah. Just for the gang related ones, which is maybe 30% of the total we're doing, maybe six or so per week. So if we multiplied that out, that gets to be a fairly decent number if you include even the non-gang related NIBIN leads.

George Kikuchi: The NIBIN leads come in a PDF document enhanced. We're looking for a structured spreadsheet type of things.

Kevin Thomas: Or like a- yeah.

George Kikuchi: Yeah. But on a case by case basis, we are adding those NIBIN-based connections to our in-depth social network analysis so that if individuals shared a gun in the past, that may be a connection that we maybe building and adding on a case by case basis.

Kevin Thomas: Yes.

Erin Farley: Great. Thank you.

Erin Farley: The next question is do your prosecutors find this useful? Can they use these analysis during prosecution?

Mr. Lattanzio: Jersey.

Kevin Thomas: Yeah, this is Kevin again.

Kevin Thomas: We've gone through quite a few changes here in the city of Philadelphia in terms of a new DEA, a new mayor. A lot of the new DEA right now has come to sit with us and see what we're able to provide. We've had some very promising conversations them so far. There's a whole new rash of assistant district attorneys now here in the city, so again, I think there have been a few individual cases that we worked on specifically where we've used some of these techniques, but they just haven't reached a point where they would have to be used in court yet.

Kevin Thomas: Again, a lot of the stuff that you're seeing right now is stuff that's only about a year old. Probably less than a year old. I think it's really amazing what could happen when we take this intersection of technologists or GIS people or people who can create apps, overlap them with researchers like these guys that I'm sitting in here looking at data in a different way, and then our intelligence side.
That's a new area for us right now, so I think it's pretty big. We've got about 6500 officers or something like that in a fairly decent-sized DA's office, so we're getting there. I think I'll have a better answer to that question in probably the next year.

Erin Farley: Great. Thank you.

Erin Farley: We have it looks like one more question. Before I read that, I just want to let people know we do have a poll we're about to open up and so while we're talking please take a moment to answer the few questions. That will help us out.

Erin Farley: The next question is is the web-map app accessible to road deputies and how do they access it, if so?

Mr. Lattanzio: Yeah, so we've deliberately designed our data environment so that it's accessible to anyone that is sitting on the network. Of course, setting them by who they're logged in as. We do have access control at the user level, but it's been designed so that even our mobile data computers or MDCs as we call them, which is basically like Panasonic Tuck Book. You've seen those. That's what's actually in the cars. Yes. They can access any of these applications straight from the road. I'd love to actually look at some of the logs and see how often that's actually done, so you gave me an idea to give to the app development team.

Mr. Lattanzio: I would say more often than not, this is used internally on desktop computers, but yes. Short answer is yes, it is available to them.

Erin Farley: Great. Great. I think that was the last question. I do have one.

Erin Farley: I came across the work that you guys do through ASC and I was wondering are you guys any of you planning to attend the upcoming ASC conference? I think it's in Atlanta this year.

George Kikuchi: Maybe, but I think we will also be interested in ASC that would be closer to us. I think the next on in Baltimore?

Erin Farley: Mm-hmm (affirmative). Oh, that's right. Yeah it's in Baltimore. Okay. So people can find you there. Awesome. I think that we have reached the end of our webinar and if anybody has any follow up questions, obviously the contact information is there. I would like to thank you all, the presenters for taking a time out to speak to us and present to the audience.

Erin Farley: Before I forget, we do have another webinar that is tentatively scheduled for August, so we're just working out and finalizing the day. Keep your eyes open for that announcement. Should be coming soon. Thank you again for joining us. I hope everybody has a great afternoon.
Integration of Social Network Analysis (SNA) and Spatial Analysis (GIS)
July 17, 2018

Speaker 5: ...recommend this webinar to your co-workers, but I'd like to recommend-

Kevin Thomas: Thank you.

George Kikuchi: Thank you.

Mr. Lattanzio: Thank you.


Speaker 6: Is it pouring out there now?

Mr. Lattanzio: Yeah.

Speaker 5: I'm excited. I love this kind of weather.

Mr. Lattanzio: Get struck by lightning. Yeah.

Mr. Lattanzio: That'll just attract more lightning.

Speaker 5: It's a good story though. See you on Thursday.

Mr. Lattanzio: Yup. See you then.