Research Article

A Mixed Methods Social Network Analysis of San Diego Law Enforcement Task Forces and Agencies

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Abstract: The San Diego area has a long reputation as a highly networked, cooperative, and task force-oriented law enforcement region. Measuring and understanding how this region achieves its networked state could assist other regions in improving law enforcement functions. This article uses social network analysis to qualitatively and quantitatively map the network of law enforcement agency task forces in the San Diego County region. The analysis first provides an inventory and description of San Diego area law enforcement task forces and participating agencies, then analyzes the structure of the regional network. The analysis identified 33 law enforcement investigative task forces supported by 84 law enforcement and participating agencies in the San Diego area. These comprise a relatively dense network with a well-connected core of primarily federal and local agencies, with the Federal Bureau of Investigation, Drug Enforcement Administration, and Immigration and Customs Enforcement's Homeland Security Investigations being the most central federal agencies, and the San Diego County District Attorney's Office and Sheriff's Department, as well as San Diego, National City, and Chula Vista police departments as the most central local agencies. State agencies were less central but included the California Department of Justice and the California Highway Patrol in the top 10 agencies for centrality, depending on the metric. The network mapping in this article provides a baseline for a highly connected task force region that will allow future comparison with other regions and similarly situated cities along the US-Mexico border and beyond. Policy recommendations based on network theory are provided.

Keywords: social network analysis; task force; police; centrality; counternarcotics; San Diego County, California

Introduction

Since the 11 September 2001 (9/11) terrorist attacks in the United States, much energy has been expended in the law enforcement, intelligence, and homeland security communities in an effort to never fail to "connect the dots" again.[1] One existing tool for collaboration is the law enforcement task force, typically established to address a common problem that crosses geographic and agency jurisdictions.[2] The adage "it takes a network to defeat a network" has become ubiquitous.[3] In a law enforcement setting, task forces bring law enforcement agencies (LEAs) together with investigative capacity and the ability to arrest and prosecute illicit network actors.[4] LEA task forces have been established to address issues including narcotics, street gangs, and prescription drug diversion. But while the network aspect is essential, the actual network structure of these task forces has largely gone unexamined.

While politicians commonly establish "task forces" to consider nonspecific or non-investigative problems, such as public health issues, these "task forces" have no law enforcement investigative capacity and are often simple fact-finding projects. The focus of this article is on law enforcement task forces. This mixed methods social network analysis builds upon existing research and cross jurisdictional task forces to establish a baseline for future research on task forces and their best practices in other locations.

One location where LEA task forces have had an impact is San Diego County, California. San Diego has a culture of cooperation and, as Cynthia Burke of the San Diego Association of Governments (SANDAG) has argued, has low crime rates because the region's law enforcement is so cooperative.[5] Using the San Diego area as a case, this article seeks to answer the following research questions: how dense is a densely connected law enforcement task force region; how does it structure itself overall; what are the most central actors in terms of task forces and law enforcement agencies; and what subgroups emerge and what are the consequences of those subgroups.

This article argues that the San Diego area provides a baseline for a well-connected regional law enforcement task force network. Analyzing the top 10 agencies based on four classic centrality metrics showed that federal and local agencies are the most central, while state agencies appear in the top 10 list fewer times but tend to do so in critical brokerage metrics like betweenness centrality. This article further contributes to the literature by providing a scalable methodology for measuring regional LEA task force networks by assessing agency memoranda of understanding with task forces, which allows future researchers to glean regional networks from archival and publicly available data.

The present analysis identified 33 law enforcement investigative task forces supported by 84 law enforcement and participating entities in the San Diego area. These are arranged in a relatively dense network (given size) with a well-connected core of primarily federal and local agencies, with lesser, though critical, state agency participation. The most central federal agencies included the Federal Bureau of Investigation (FBI), Drug Enforcement Administration (DEA), and Immigration and Customs Enforcement's (ICE) Homeland Security Investigations (HSI). The most central state agencies were the California Department of Justice (DOJ) and the California Highway

Patrol (CHP), while local agencies such as the San Diego County District Attorney's (DA's) Office and Sheriff's Department, as well as San Diego, National City, and Chula Vista police departments were also highly central.

Identifying highly central task forces and agencies provides a map for how poorly connected or completely isolated agencies can most efficiently join a regional task force network when funding and resources become available, e.g., via grants. This takes advantage of Barabási's network concept of "preferential attachment," wherein new network entrants choose to connect to highly connected actors given the advantageous network position provided.[6] These useful policy prescriptions demonstrate the practical nature of task force network research.

This article will (1) review the literature on task forces; (2) provide an inventory and description of all 33 identified task forces; (3) discuss the methods and coding of the networks produced; (4) analyze the most central task forces, agencies, and entities in the network; (5) assess the network topography of the overall task force network to get a sense of density and average degree; and (6) provide conclusions, policy recommendations, and suggestions for future research.

Literature Review

Social network analysis (SNA) is an emerging tool used to examine criminal activity.[7] Network analysis is the study of the relationships between items; as crime often involves relationships (including both offenders and victims), network analysis is useful to consider those relationships and how they may impact criminal activity.[8] SNA has been used effectively in the study of numerous problems, including gun violence, illicit drugs, adolescent initiation into crime, and street gangs.[9] The informal study of relationships within and between gangs existed from the early days of gang-related research. As network analysis became more mature as an analytical technique in the 1990s, it began to be applied more formally to the study of gangs in the late 1990s.[10] An understanding of these offender networks can contribute to specific deterrence and problem-oriented policing. Early efforts to apply network analysis to gang interventions include Boston and Newark.[11] It has since expanded in its application to a number of gang-related questions.[12]

But while network analysis is an increasingly common tool for policing, it is not commonly used on police. SNA is seen as a tool to understand and combat illicit networks, but it is important to recognize that law enforcement is itself a social and therefore networked activity. This is true on many levels—police departments are composed of associated individuals, law enforcement includes numerous local, county, state, and federal actors, and law enforcement exists in a community with numerous stakeholders—and all of the different relationships can impact the success of law enforcement actions. However, formal network analyses of law enforcement organizations have typically only looked at law enforcement when it is corrupt, not when it is acting as intended.[13]

The structure of law enforcement networks themselves may be important to the success of their missions. Following the 11 September 2001 (9/11) attacks in the United States, it became popular to argue "it takes a network to defeat a network," suggesting the US government should network its various agencies to look more like the illicit networks it hoped to combat.[14] This proverb is treated as a truism without much analysis and, as Sullivan and Bunker note, "not enough of this modeling … is taking place to better understand and improve counter-insurgency networks."[15]

Here Sullivan and Bunker discuss counter-insurgency (COIN) networks in the context of global terrorist insurgency post–9/11. Thus, for them, COIN networks include the national security apparatus and law enforcement agencies at all levels. Beyond terrorism, the San Diego area has also had to address transnational gangs and cartels given its proximity to the US-Mexico border.

One mechanism in place to address gangs long known to law enforcement is the investigative multijurisdictional task force. Task force models had already been gaining traction in the late 1980s, with federal funding for High Intensity Drug Trafficking Areas (HIDTAs) and the use of task forces expanded in the post–9/11 environment.[16] Evaluations of gang task forces have been conducted more often in recent years, but these have only included examinations of task force organization to a limited extent.[17] Jefferis et al. considered organizational structures generally (but not through SNA) and found evidence that different structures were associated with perceived effectiveness but not actual effectiveness.[18] Bright and Whelan used SNA to assess fusion center networks in Australia.[19]

In the post–9/11 reorganization of the security apparatus, the US federal government built fusion centers as a means of better sharing information and networking intelligence with state and local agencies. In many ways, Southern California served as a precursor to that effort.[20] The present analysis is not the first to assess task force networks in San Diego County. Cynthia Burke of SANDAG has evaluated individual task force officer networks within the San Diego area.[21] The present study builds upon Burke's work by looking not at the individual level of analysis (task force officer to task force officer), but by assessing the relationships of agencies to task forces. In short, this article provides a different level of analysis for the San Diego area law enforcement task force network (organization not individual). The question remains: What is the overall structure of the network in areas known to be well connected in task forces such as San Diego County?

Methods

This article's analysis of San Diego area task forces is a mixed methods (quantitative and qualitative) SNA.[22] SNA focuses on the structure of relationships between actors in a network.[23] Theoretically, SNA analyzes the structure of networks with the assumption that actor behavior is impacted by "their ties to other actors and the networks in which they are embedded."[24] Thus, law enforcement institutions can also be viewed as embedded within networks. This could help to explain the behavior of these agencies and their relations with each other, as well as the criminal justice outcomes that may stem from their cooperation.

With social network data, a significant number of questions can be answered about the structure of law enforcement task force operations in the San Diego area. Who are the central actors in terms of agencies and task forces? Are they local, state, or federal? What is the overall density of the task force network in San Diego, and could San Diego be an exemplar or benchmark for other similarly situated cities? If more densely networked task forces and agencies lead to better outcomes, can one identify agencies and task forces to connect to improve the overall network flow of information and cooperation?

The first step in performing the network analysis involved gathering data on the elements of the network and their relationships to each other. This was done through an analysis of task force memoranda of understanding and a qualitative mapping of San Diego area task forces, in addition

to gathering a list of agencies operating in the San Diego area in 2018. These were then coded into a two-mode matrix. The universe of cases comprises San Diego LEA task forces, LEAs and investigative agencies that connected to those task forces, and LEAs operating in the San Diego area that may not be task force participants.

When data were available, strength of tie was included based on the number of agents, analysts, or support staff that were included on the task force. Many coding decisions were made. First, investigators and support staff were coded together for an overall employee total that became the "strength of tie" between the agency and the task force measure. This was done because it helped measure the commitment of the agency to the task force. While investigators are important, the significant financial commitment of analysts and support staff demonstrate strong ties as well. Unfortunately, the data set did not include the rank of each task force officer, which would be a fertile area of future research. This data could be used as a metric for strength of tie or as actor attribute data that would allow for correlations between task force officer rank and the position of their agencies and task forces.

Second, part-time employees were coded as .5 or one-half an employee. Third, numerous agencies have sub-agencies and most of the time they were combined with their parent agency. However, in a few places the sub-agencies were assessed as too important to simply combine under the primary agency. This is particularly important in the context of the US Department of Homeland Security (DHS), which as an overall department has many sub-agencies that are critical LEA task force actors, e.g., combining 22 agencies under one actor would seriously weaken the data and artificially inflate DHS as a unitary actor. On the other hand, investigative units of a single LEA were typically put together and not treated as separate actors. In short, the level of analysis is the agency level not the larger department level except in the case of separating ICE HSI from ICE as a whole, as they investigate independently.[25]

The matrix was primarily analyzed in UCINET, a social network analysis program, allowing visualizations and quantitative analysis.[26] UCINET allowed for the creation from the two-mode network of an agency to agency network and task force to task force network based on inferred connections of agency to task forces. Secondary analysis was conducted in Gephi, an open-source SNA visualization program.

The analysis conducted was exploratory, identifying the structure of the network and the central actors, focusing on aspects of centrality, including degree, betweenness, closeness, and eigenvector centrality.[27] Degree centrality is the most common centrality measure and is calculated based on the number of ties an actor has in relation to other network actors. Betweenness centrality is based on how often an actor lies on the shortest path between other nodes in the network and is commonly considered a brokerage metric. Closeness centrality is a measure of how close an actor is to other actors in the network based on the number of actors they would have to go through to get to other actors. Finally, eigenvector centrality is a centrality metric that considers the centrality of the other actors tied to the actor in question.[28]

In addition to node or actor level centrality, each of the networks generated were analyzed with descriptive network topography statistics with an emphasis on cohesion measures and community detection algorithms to identify subgroups.[29]

Results

Network Boundaries

The network was defined by the task forces in the San Diego region and the agencies that participate in them. The identified two-mode matrix included columns with 33 San Diego Task forces and rows with 84 LEA and participating non-LEAs. Agencies that participate in those task forces sometimes include non-LEAs, such as the California State Board of Pharmacy, which provides crucial expertise and knowledge to prescription drug diversion task forces. Table 1 below provides a brief description of the San Diego investigative task forces.

Case Study: Qualitative Assessment of the San Diego Task Force Network

The County of San Diego has a long tradition of interagency cooperation at the federal, state, county, and local levels. The region achieves cooperation in multiple ways:
- a regional police academy where recruits train together
- a regional leadership institute where police leaders discuss current issues
- regional monthly meetings of the chiefs, seconds in command, and training managers
- collaboration in radio communications
- numerous regional policies addressing issues such as pursuits, use of force and body worn cameras
- de-confliction centers
- memoranda of understanding, such as the Automated Regional Justice Information System (ARJIS) and the San Diego Association of Governments (SANDAG)

Thus, based on these various coordination and information sharing mechanisms, San Diego can be viewed as an exceptional case of coordination. The region's law enforcement leaders have collectively recognized the limitations of going it alone and have embraced the concept of a multidisciplinary and multijurisdictional response to combating crime. Task forces are resource multipliers that focus participating agencies' resources on an agreed-upon problem and employ an agreed-upon strategy. This agreement is typically articulated in a memorandum of understanding that defines the mission, terms, responsibilities, relationships, strategies, and commitments of each participating agency.

The task force environment encourages communication and the sharing of intelligence information. For example, the DEA has recognized the need for cooperation and coordination of drug enforcement efforts. This allows the DEA to share information with task force partners, but also to draw on the expertise of state and local law enforcement, thereby increasing the collective investigative ability. In the task force environment, state and local officers can be deputized as federal drug agents, thus extending their jurisdiction. Further, state and local participating agencies can receive an equitable share of forfeited drug proceeds. Finally, the DEA pays overtime and investigative expenses for the state and local agencies. All of these structural factors increase the flow of information sharing and efficiency.

The San Diego County area has more than 30 task forces with contributions of over 7,500 sworn law enforcement officers and 850 staffers. Memoranda of understanding cover a variety of issues to share expenses, e.g., Organized Crime Drug Enforcement Task Forces (OCDETFs) and HIDTAs fund cooperation agreements between local and federal prosecutors and entities such as

SANDAG, ARJIS, the San Diego Law Enforcement Coordination Center, etc. The units and teams listed in Table 1 are considered task forces.

Table 1: San Diego Task Forces and Descriptions

1. The **Auto Insurance Fraud Task Force (Urban Grant)** investigates organized auto theft rings and staged collisions. There are 10 members, with the California Dept. of Insurance as the lead agency. Participating agencies include the San Diego County DA's Office, CHP, and the National Insurance Crime Bureau.
2. The **Border Corruption Task Force** investigates corrupt government officials. There are 10 members, with the FBI as the lead agency. Other participating agencies include the US Customs and Border Protection (CBP) Office of Professional Responsibility and the CBP Office of Field Operations.
3. The **California Border Alliance Group (CBAG)** is part of the Southwest Border HIDTA California Partnership, which seeks to reduce drug trafficking in the San Diego region. The task force has 30 member agencies. Participating agencies include the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF), DEA, FBI, CBP, Internal Revenue Service (IRS), US Attorney's Office, US Border Patrol, US Bureau of Land Management (BLM), US Coast Guard, US Forest Service, US Marshals Service, US Postal Inspectors, US DOJ Office of Inspector General, US Dept. of Defense (DOD), California Attorney General's Office, California DOJ, California Dept. of Corrections and Rehabilitation (CDCR), CHP, California National Guard, Carlsbad Police Dept. (PD), Chula Vista PD, Coronado PD, Escondido PD, National City PD, Oceanside PD, San Diego PD, San Diego County DA's Office, San Diego County Sheriff's Dept., San Diego County Probation Dept., and Harbor PD.
4. The **Cartel Enforcement Task Force** investigates drug cartels operating in their region. There are 10 members, and the lead agency is ICE HSI. Other participating agencies include DHS and CBP.
5. The **Combined Border Prosecutions Initiative** includes collocated prosecutors that use a cross-designated US Attorney–District Attorney approach, which provides for felony drug prosecutions of small volume federal border drug cases in state court, thus allowing federal prosecutors to concentrate on major violators and OCDETF-level cases. The US Attorney's Office and the San Diego County DA's Office are the 2 member agencies that collaborate on these prosecutions.
6. The **Computer & Technology Crime High-Tech Response Team (CATCH)** investigates computer crimes. The lead agency is the San Diego County DA's Office, and the task force has 13 members. Participating agencies include the San Diego County Sheriff's Dept., San Diego County Probation Dept., San Diego PD, and the US Attorney's Office.
7. The **Cross Border Violence Task Force (CBVTF)** investigates narcotics cases involving members of drug cartels and organized crime. The lead agency is the FBI, and the task force has 13 members. Participating agencies include the San Diego County DA's Office, Chula Vista PD, and the US Attorney's Office.
8. The **East County Regional Gang Task Force (ECRGTF)** investigates gangs in the east county areas. The ECRGTF is a unit of the Sheriff's Special Investigations Division and is a multijurisdictional unit comprising nine local, state, and federal agencies combined to be reactive and proactive in gang investigations. The lead agency is the San Diego County Sheriff's Dept., and the task force has 37 members. Participating agencies also include the FBI, San Diego County DA's Office, El Cajon PD, CHP, IRS, La Mesa PD, and US Marshals Service.

9. The **Fugitive Task Force** investigates cases involving fugitives from justice. The lead agency is the US Marshals Service, and the task force has <u>78 members</u>. Their primary mission is to locate and apprehend known wanted felony fugitives with active warrants. Additional agencies include the ATF, DEA, San Diego County Sheriff's Dept., FBI, US Border Patrol, Carlsbad PD, Chula Vista PD, San Diego County DA's Office, El Cajon PD, Escondido PD, ICE, La Mesa PD, Naval Criminal Investigative Service (NCIS), CHP, San Diego County Probation Dept., and the CDCR Fugitive Apprehension Team.

10. The **Hazardous Waste Task Force** comprises <u>40 members</u> including the San Diego County Department of Environmental Health (DEH), San Diego County Air Pollution Control District (APCD), US Attorney's Office, FBI, US Environmental Protection Agency (EPA), California Attorney General's Office (CAG), California Department of Toxic Substance Control (DTSC), California Department of Fish and Wildlife (DFW), CHP, Harbor PD, California Regional Water Quality Control Board (RWQCB), San Diego City Attorney's Office (SDCA), and various other local regulatory agencies.

11. The **Human Trafficking Task Force** investigates human trafficking cases in the county. The lead agency is the California DOJ, and the task force has <u>22 members</u>. Additional agencies include the San Diego County Sheriff's Dept., San Diego County DA's Office, CDCR Parole Division, CHP, Escondido PD, National City PD, San Diego County Probation Dept., San Diego City Attorney's Office, and US Attorney's Office.

12. The **Internet Crimes Against Children Task Force (ICAC)** investigates cases involving crime against children committed via the Internet. The lead agency is the San Diego PD, and the task force has <u>11 members</u>. Additional agencies include the Chula Vista PD, FBI, San Diego County DA's Office, NCIS, San Diego State University PD, San Diego County Sheriff's Dept., and ICE HSI.

13. The **Joint Task Force—West CA Corridor San Diego Area Team** investigates drug interdiction and transportation cases. The lead agency is the US Border Patrol, and the task force has <u>7 members.</u>

14. The **Joint Terrorism Task Force (JTTF)** investigates cases involving terrorism. The lead agency is the FBI, and the task force has <u>76 members</u>. Additional agencies include the El Cajon PD, Harbor PD, Coronado PD, San Diego PD, Chula Vista PD, San Diego County DA's Office, NCIS, Sheriff's Dept., CHP, IRS, ATF, US Border Patrol, DHS, US Marshals Service, and Federal Air Marshal Service.

15. The **Jurisdictions Unified Drug and Gang Enforcement (JUDGE)** task force investigates cases involving gangs and narcotics. The lead agency is the San Diego County Probation Dept., and the task force has <u>7 members</u>. Additional agencies include the San Diego County Sheriff's Dept., San Diego County DA's Office, CDCR Parole Division, US Border Patrol, ATF, Child Protective Services (Drug Endangered Children), Chula Vista PD, Oceanside PD, and Escondido PD.

16. The **Law Enforcement Coordination Center (LECC)** serves as the Regional Threat Assessment Center (RTAC) for San Diego and Imperial counties and is part of the California State Threat Assessment System (STAS). The San Diego LECC is a collaborative partnership among federal, state, and local law enforcement and public safety agencies focused on enhancing coordination, information sharing, regional preparedness, training, and investigative support and analysis. It is funded by the HIDTA and has <u>90 members</u>. Participating agencies include the San Diego County Sheriff's Dept., San Diego PD, US Border Patrol, CHP, FBI, California DOJ, DEA, and analysts from the Chula Vista PD, San Diego County Fire, American Medical Response (AMR), Community Alliance for Drug Free Youth (CADFY), and CBP.

17. The **Marine Task Force (MTF)** investigates and targets drug smuggling organizations using the Pacific Ocean as a transportation route for cocaine, marijuana, and methamphetamine destined for the United States via Pacific beaches, waterways, and maritime facilities. The MTF is the only joint maritime task force composed of federal, state, and local law enforcement on the US West Coast. The lead agency is ICE HSI, and the task force has 15 members. Additional agencies include the DHS, FBI, Harbor PD, US Border Patrol, and the US Attorney's Office.

18. The **Medical and Legal Insurance Fraud Task Force** is a joint federal, county, and state law enforcement provider fraud task force dedicated to uncovering and prosecuting provider fraud. The task force has 15 members. Participants include the San Diego County DA's Office, California Dept. of Insurance, FBI, US DOJ, US Food and Drug Administration (FDA), California State Bar, California Employment Development Dept. (EDD), California Franchise Tax Board (FTB), US Dept. of Veterans Affairs, US Dept. of Defense, Railroad Retirement Board, California Dept. of Consumer Affairs, US Health and Human Services, California Health Care Services, California DOJ, California Inspector General, Amtrak Office of Inspector General, and California state medical, dental, and pharmacy boards.

19. The **Metro Arson Strike Team (MAST)** is called if an incident involves a suspicious fire or explosive device. The task force has 21 members. The lead agencies are the San Diego Fire-Rescue Dept., San Diego PD, ATF, and FBI. MAST investigators are cross-trained to achieve expertise in both fire and explosive investigations and police procedure. Fire investigators on MAST are peace officers, have powers of arrest, and are armed.

20. The **Narcotics Task Force (NTF)** investigates narcotics cases in the county. The lead agency is the DEA, and the task force has 102 members. The task force is divided into eight teams with separate enforcement responsibilities relating to general narcotics enforcement, marijuana eradication, commercial interdiction, and airport enforcement. Participating agencies include the San Diego County Sheriff's Dept., San Diego PD, US Border Patrol, Carlsbad PD, Chula Vista PD, Coronado PD, FBI, El Cajon PD, Escondido PD, IRS, Harbor PD, La Mesa PD, US Bureau of Land Management, National City PD, US Postal Inspectors, and National Guard.

21. The **North County Regional Gang Task Force (NCRGTF)** investigates gangs in the north county areas. The lead agency is the San Diego County Sheriff's Dept. The task force has 28 members and focuses its investigative efforts on the leadership of documented gang members and associates, including criminal aliens, who participate in any ongoing criminal enterprises or patterns of violent criminal activity. Additional agencies include the ATF, FBI, DEA, NCIS, CDCR, CHP, Carlsbad PD, San Diego County DA's Office, Escondido PD, Oceanside PD, San Diego County Sheriff's Dept., US Attorney's Office, and US Marshals Service.

22. The **Operation Alliance Task Force** investigates narcotics smuggling, transportation, and distribution groups along the California-Mexico border based on post seizure analysis. This task force is also responsible for the investigation of all drug seizures affected by the US Border Patrol and CBP at and between the ports of entry. The lead agency is ICE HSI, and the task force has 90 members. Participating agencies include the DHS, DEA, Sheriff Dept., US Border Patrol, San Diego PD, National City PD, and the US Attorney's Office.

23. The **Organized Crime Drug Enforcement Task Forces (OCDETF)** program operates nationwide and combines the resources and unique expertise of federal agencies in a coordinated attack against major drug trafficking and money laundering organizations. The participants include the 94 US Attorney's Offices, ATF, DEA, FBI, IRS, US Coast Guard, CBP, US Marshals Service, and the Criminal and Tax Divisions of the US DOJ. OCDETF was originally formed as a part of a true "task force" approach against sophisticated criminal organizations, with prosecutors and law enforcement personnel working side-by-side in the same location.

24. The **Pharmaceutical Narcotics Enforcement Team** investigates pharmaceutical cases in the San Diego region. The lead agencies are DEA and California DOJ. The team is funded by the HIDTA.

25. The **Regional Auto Theft Task Force (RATT)** investigates cases involving auto theft in the county. The lead agency is CHP, and the task force has <u>23 members</u>. Additional agencies include the Chula Vista PD, San Diego County Sheriff's Dept., San Diego County DA's Office, La Mesa PD, National City PD, National Insurance Crime Bureau, CBP, California Dept. of Insurance, San Diego County Probation Dept., California Dept. of Motor Vehicles, San Diego PD, and Oceanside PD.

26. The **San Diego Regional Computer Forensics Laboratory (RCFL)** investigates crimes involving computers and assists agencies with forensic examinations of seized computers. The lead agency is the FBI, and the task force has <u>13 members</u>. Additional agencies include the San Diego County Sheriff's Dept., San Diego County DA's Office, CHP, and DEA.

27. The **San Diego Major Mexican Drug Traffickers Strike Force (MDTSF)** is funded by HIDTA and OCDETF grants. The task force lead agencies include DEA, ICE HSI, and FBI. This multi-agency initiative has five groups that address the major multi-drug trafficking organizations operating in the Southern California and Northern Baja California, Mexico areas. The task force has <u>42 members</u> and includes the IRS, US Attorney's Office, US Marshals Service, US Border Patrol, Chula Vista PD, El Cajon PD, Coronado PD, San Diego County Sheriff's Dept., and Escondido PD.

28. The **San Diego Regional Fraud Task Force (FTF)** investigates and targets money laundering cells of domestic and international drug trafficking organizations for dismantlement, using long-term investigative strategies. The lead agency is the United States Secret Service, and the task force has <u>9 members</u>. Additional agencies include the San Diego PD, San Diego County DA's Office, and ICE HSI.

29. The **San Diego and Imperial County Financial Crimes Task Force** investigates complex financial crimes in the San Diego region. The lead agency is the IRS, and the task force has <u>8 members</u>. Additional agencies include the DEA, San Diego County Probation Dept., San Diego PD, and Chula Vista PD.

30. The **Sexual Assault Felony Enforcement (SAFE)** investigates crimes involving sex registrants and offenders. The lead agency is the San Diego County Sheriff's Dept., and the task force has <u>8 members</u>. Additional agencies include the San Diego PD, San Diego County DA's Office, CDCR Parole Division, and San Diego County Probation Dept.

31. The **Tunnel Task Force** investigates cases involving tunnels at the US-Mexico border. The lead agency is ICE HSI, and the task force has <u>10 members</u>. Additional agencies include DHS and DEA.

32. The **Violent Crimes Task Force (VCTF)** proactively investigates, apprehends, and prosecutes gangs, major offenders, and fugitives—including illegal aliens—involved in narcotics trafficking and associated violent crime. The lead agency is the FBI, and the task force has <u>25 members</u>. Additional agencies include the San Diego PD, California Dept. of Corrections, Federal Bureau of Prisons, San Diego County Sheriff's Dept., San Diego County Probation Dept., National City PD, and San Diego County DA's Office.

33. The **Workers Compensation Premium Fraud** investigates crimes involving insurance fraud. The lead agencies are the San Diego County DA's Office and the California Dept. of Insurance, and the task force has <u>8 members</u>. Additional members include the California Labor Commissioner's Office, California Employment Development Department Criminal Investigations and Tax Enforcement, California Franchise Tax Board, California Public Utilities Commission, and California Contractors State Licensing Board (CSLB).

Social Network Analysis of the San Diego Area Task Force Network

The first analysis (Figure 1) shows the San Diego area task force network based on a circle layout with the actor nodes sized by degree centrality (i.e., number of ties they have). The nodes with the highest centrality were pulled to the center of the circle for easy visual recognition. The task forces (depicted with squares) tend to have some of the highest degree of centrality given the

many agencies that connect to them. However, it is also apparent that certain agencies tend to have very high task force participation. These agencies include the FBI, DEA, San Diego County Sheriff's Department, San Diego County Probation Department, San Diego County DA's Office, San Diego PD, CHP, California DOJ, and Chula Vista PD. These high participation agencies include agencies from all levels of government, from federal to state to local. The often high federal participation is consistent with the important resources federal agencies bring to task forces. Local agencies are also highly central, having a primary role in pursuing most criminal activity and also contributing knowledgeable local investigators. While state agencies do not appear as central in all metrics, two (California DOJ and CHP) appear high in the top 10 on betweenness centrality (a metric of how often a node lies in between paths to other nodes).[30] This suggests they play a critical brokerage role bridging different portions of the network.

Figure 1: San Diego Area Task Force to Agency Network
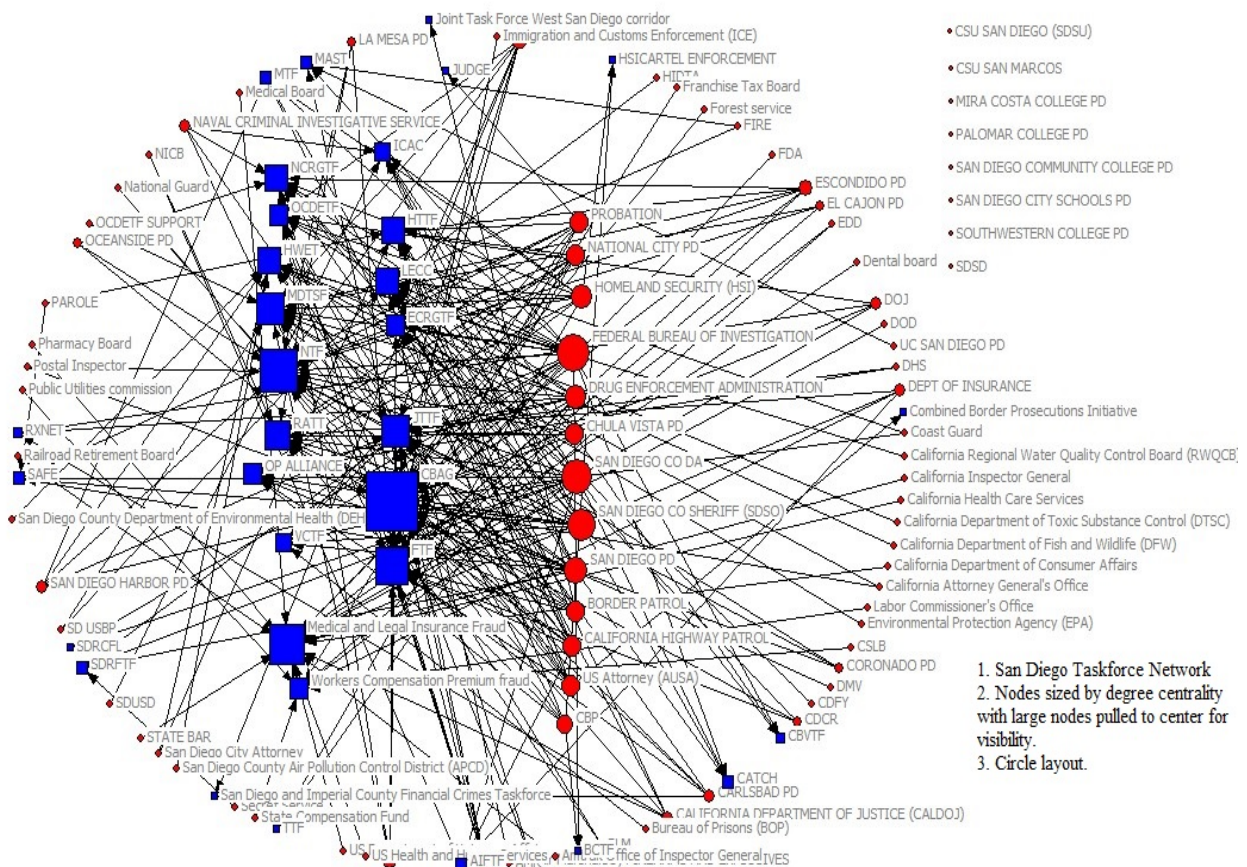
There are also eight "isolate" (defined as actors with no ties) agencies disconnected from the network because they have no connections to task forces. These are university police departments that may not have the resources to commit investigative officers or support staff to task forces. Additionally, many of the task forces in the San Diego region are counternarcotics-based. Participation in such task forces might put a university in the position of prosecuting its own students. University officials may be reluctant to have their affiliated police departments increase their involvement in activities which criminalize their own students.

Figure 2 is a task force to task force network built by taking inferred connections from the original two-mode network or "folding" the network. In other words, task forces that have agency members in common are considered "tied" in this network. The Figure 2 layout is based on Gower scaling in UCINET, which means that nodes with more similar connections are depicted closer together. Nodes were also sized by degree centrality, meaning larger nodes have more connections. One can see, for example, that the East County Regional Gangs Task Force and the North County Regional Gangs Task Force are placed closely together, suggesting a high degree of similarity in terms of membership. This is consistent with the focus of the unit and agencies involved.

Figure 2: San Diego Area Task Force to Task Force Network
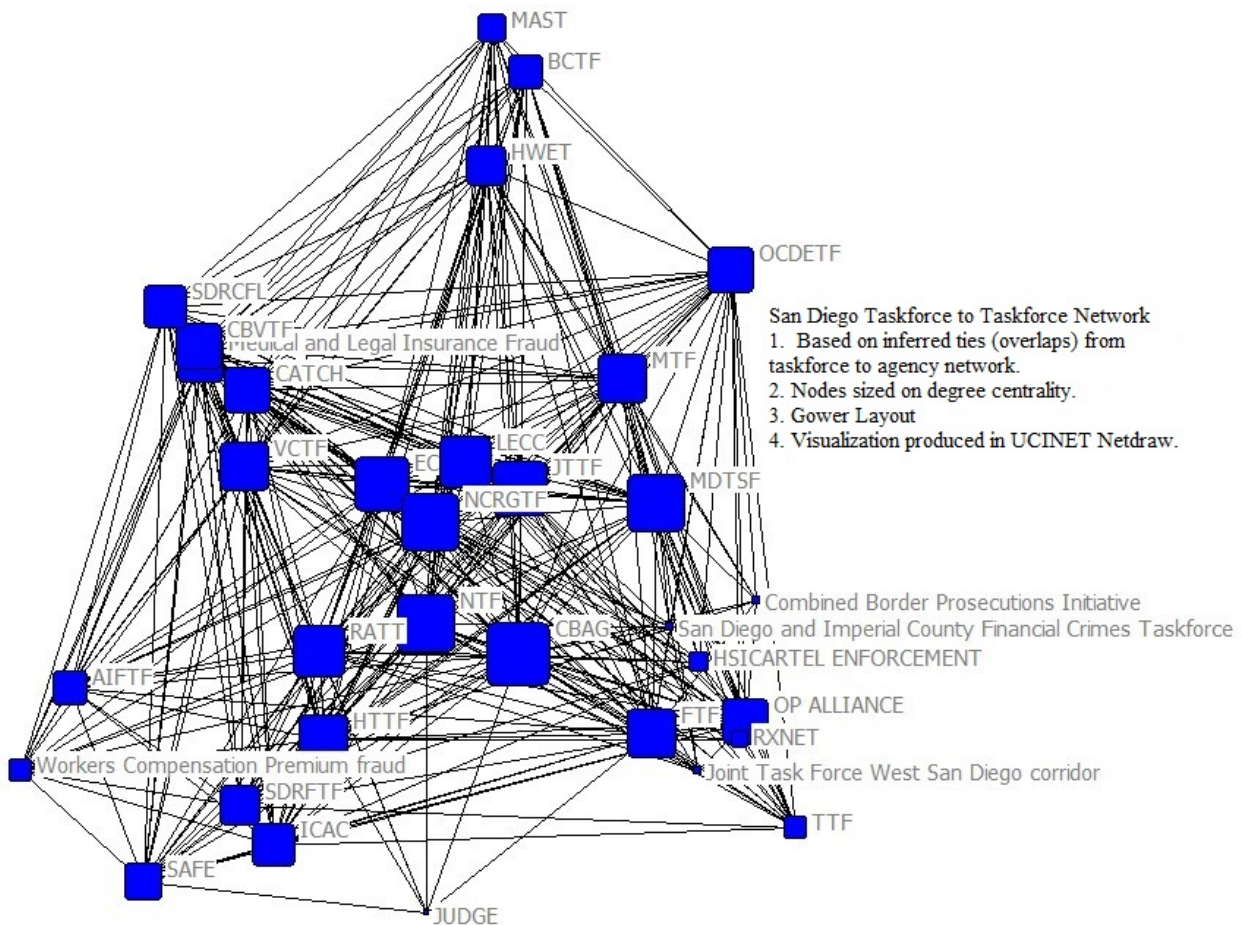
In Figure 3, the same network is depicted in Gephi with nodes sized on betweenness centrality in the Yifan Hu layout. Here one can see that the CBAG task force has the highest betweenness centrality in addition to high degree centrality depicted in Figure 2. Thus, isolated agencies might benefit from attaching to this task force under the principle of "preferential attachment," which will be discussed more later.[31] The Louvain community detection algorithm was used to detect two subgroups within the network.[32] It found a core subgroup depicted in yellow with CBAG, NTF, FTF, and another community depicted in green with the JTTF task force and the NCRGTF as important actors based on their degree centrality. With only two communities detected, it is clear

the task force to task force network is far more connected than the agency to agency network (see Figures 4 and 5).

Figure 3: Task Force to Task Force Network (Gephi)

Larger task force circles have higher betweenness centrality (Task forces in Brokerage Positions) and thicker lines represent more connections with the same agencies.

In Figure 4, the nodes were sized based on degree centrality and a graph theoretic layout was used, which, like the Gower layout, brings similar nodes together. Here one can see a "core" of densely connected agencies in the center that includes the FBI, California DOJ, San Diego County DA's Office, DEA, Coronado PD, etc. A faction analysis that divided the network into four subgroups based on density of connections generally found the same results, with agencies in the center depicted in red grouped together and the more peripheral agencies, such as the California State Board of Pharmacy, in another faction depicted in black. This is logical in so far as specialized task forces such as those focusing on prescription drug diversion will pull actors, such as a pharmacy board, into their task force that would not make sense on other task forces. This has the effect of making the network seem significantly less dense quantitatively than it is by increasing the number of agencies with a small number of connections.

Figure 4: San Diego Area Law Enforcement Agency to Agency Network

Agency to Agency Network
1. Based on inferred ties (overlaps) with Taskforces.
2. Graph Theoretic Layout with slight author adjustements for node visibility.
3. Nodes sized on degree centrality.
4. Node colors depict 4 faction analysis.
5. Visualization produced in UCINET Netdraw.
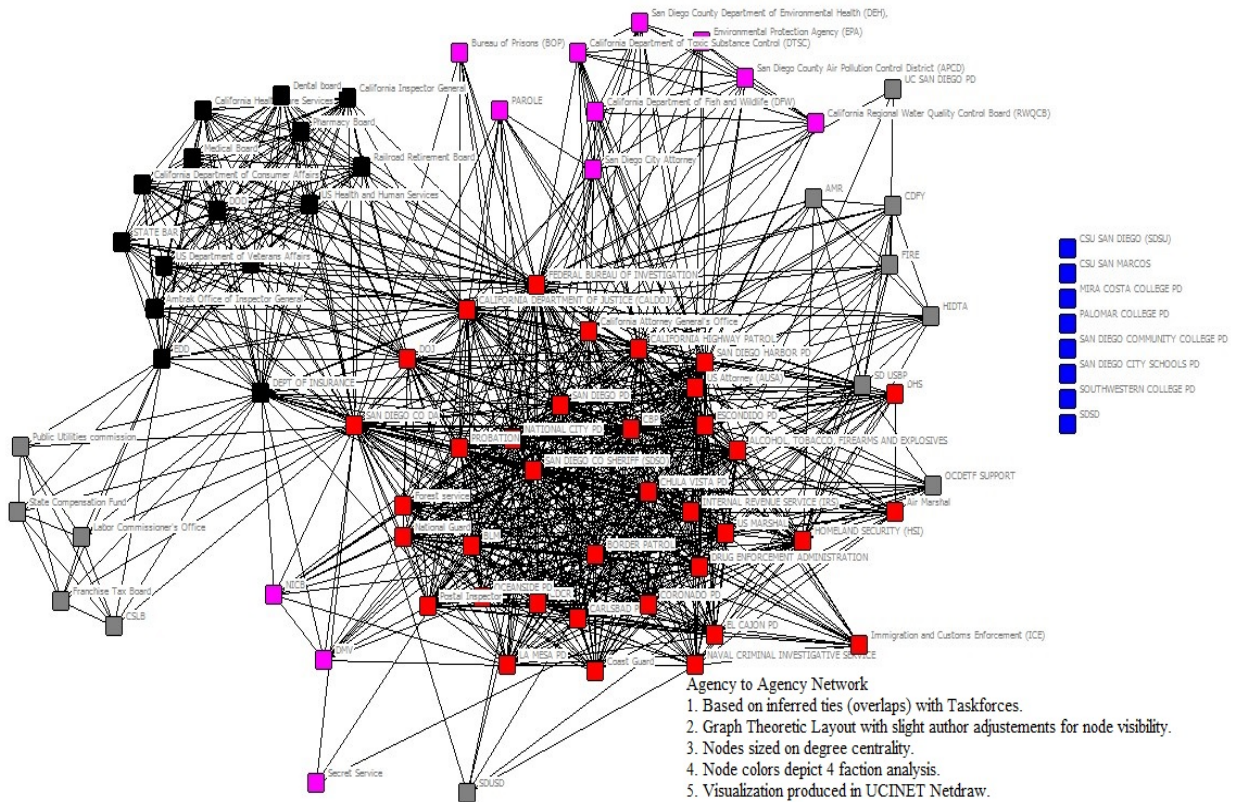
Table 2: San Diego Area Task Forces Ranked by Centrality (Top 10 by Metric) Unweighted

		Degree		Closeness		Eigenvector		Betweenness
1	CBAG	32	CBAG	32	CBAG	0.23	CBAG	22.70
2	NTF	30	NTF	34	NTF	0.22	NTF	15.80
3	NCRGTF	29	NCRGTF	35	NCRGTF	0.22	MDTSF	13.75
4	MDTSF	29	MDTSF	35	ECRGTF	0.21	FTF	13.48
5	ECRGTF	28	ECRGTF	36	MDTSF	0.21	NCRGTF	10.06
6	JTTF	28	JTTF	36	JTTF	0.21	RATT	9.75
7	LECC	27	LECC	37	LECC	0.21	JTTF	9.74
8	RATT	27	RATT	37	RATT	0.20	HTTF	9.09
9	FTF	26	FTF	38	VCTF	0.20	OCDETF	8.26
10	HTTF	26	HTTF	38	CATCH	0.20	ECRGTF	8.20

*Unweighted; from multiple measures output unnormalized; from two-mode data
*All outputs produced in UCINET

A Mixed Methods Social Network Analysis of San Diego Law Enforcement Task Forces and Agencies

Moving beyond imagery, the next section provides a top 10 list of task forces based on their centrality scores across four centrality metrics. These findings are collected in Table 2, presenting the top 10 rated task forces according to each centrality metric. Here one can see several things. First, the CBAG task force was the most central task force across all centrality metrics. The DEA also plays a significant role on the task force and has a high task force participation rate in the overall network (see Table 3). Additionally, the analysis presented some unexpected findings, one of which was the mid-range betweenness centrality of the Medical and Legal Insurance Fraud Task Force (not shown in the top 10 but ranked at 15 of 33 task forces) in the overall network. This may identify the task force's role as a broker, incorporating into the network actors, such as the California State Board of Pharmacy, that have few other connections to task forces.

Table 3: Agency to Agency Four Centrality Metrics Unweighted Data from Two-Mode Network

		Degree		Eigen-vector		Closeness		Between-ness
1	FBI	0.52	San Diego County Sheriff	0.34	FBI	0.84	FBI	0.19
2	San Diego County DA	0.48	FBI	0.30	San Diego County DA	0.80	San Diego County DA	0.17
3	San Diego County Sheriff	0.42	San Diego County DA	0.27	CHP	0.71	CHP	0.04
4	San Diego PD	0.36	San Diego PD	0.26	San Diego PD	0.71	US Attorney's Office	0.04
5	DEA	0.30	DEA	0.24	San Diego County Sheriff	0.70	San Diego PD	0.04
6	HSI	0.30	Chula Vista PD	0.24	California DOJ	0.69	San Diego County Sheriff	0.03
7	Border Patrol	0.27	Border Patrol	0.23	Chula Vista PD	0.68	California DOJ	0.03
8	CHP	0.27	National City PD	0.22	US Attorney's Office	0.68	HSI	0.03
9	Chula Vista PD	0.27	CHP	0.20	Border Patrol	0.66	Border Patrol	0.03
10	US Attorney's Office	0.27	San Diego County Probation	0.19	National City PD	0.66	DEA	0.03

*Unweighted data
*Black cells=Federal, Gray cells=State, White cells=Local
*All outputs produced in UCINET

Next, the analysis moves from the most central task forces to the top 10 most central agencies in the network. Table 3 provides the top 10 ranking for task force agencies and entities across four centrality metrics, which provides a sense of the most central actors in the overall law enforcement task force network in the San Diego area. In Table 3, one can see that the FBI plays the most central role across all centrality metrics except that of eigenvector centrality (representing the centrality of nodes the FBI is connected to), where the FBI is the second-most central of 84 entities in the network. The San Diego County DA's Office is the second-most connected actor for most metrics and third most central based on eigenvalue. This is likely due to the unique nature of the San Diego County DA's Office, which prosecutes many cases and thus necessarily works with many agencies and task forces. The San Diego County Sheriff's Department varies across measures, ranking as high as the top spot for eigenvector centrality but as low as sixth for betweenness. Local and federal agencies tend to dominate the task force top 10 centrality rankings, while state agencies are few (10%–20% of the top 10 agencies depending on the metric). In addition to the FBI, the federal agencies of the DEA and US Border Patrol are both in the top 10 in multiple centrality metrics of the network, not surprisingly given the proximity of San Diego to the US-Mexico border. Local agencies are as prominent as federal agencies, with the San Diego County DA's Office at the top with local police departments, such as San Diego PD, Chula Vista PD, National City PD, and San Diego County Sheriff's Department all regularly appearing on the list. State-level agencies, including the California DOJ and CHP are the only state agencies present in the top 10 lists.

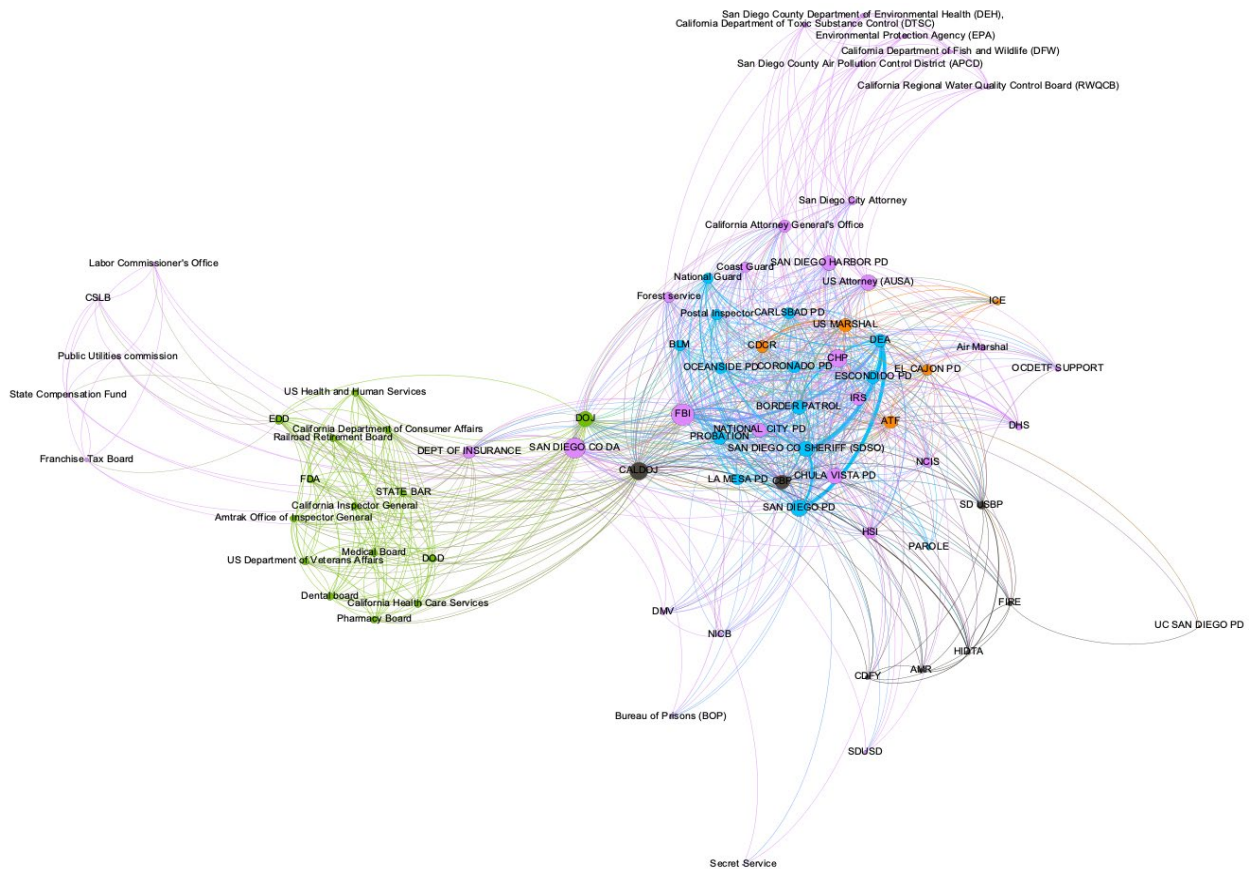**Figure 5: Agency to Agency Task Force Network for the San Diego Area (Gephi)**

Figure 5 is a visualization of the overall agency to agency network with nodes sized on degree centrality (number of ties). It is colored in Gephi based on the Louvain method of community detection, which detects and visualizes subgroups and communities within large networks.[33] The FBI and San Diego County DA's Office are found in the core community (purple). This may be related to both of their relevant functional positions. Many prosecutions will be pursued with the San Diego County DA's Office, and the FBI brings significant leadership to various task forces in addition to organization and resources. There is a second core network depicted in blue, which has strong ties to the DEA and numerous local police departments, such as Mesa PD, San Diego PD, Escondido PD, Ocean Side PD, National City PD, and the San Diego County Sheriff's Department. The Yifan Hu layout pushes less connected actors to the periphery of the network where there are lesser connected actors with limited connections to some of the core network communities.

Network Topography Analysis

Table 4: Cohesion Outputs for the Three Networks (UCINET)

	Two-Mode	Agency to Agency	Task Force to Task Force
Avg Degree		22.10	21.45
Deg Centralization		0.52	0.35
Density	.0959	0.27	0.67
Components		9.00	1.00
Connectedness		0.82	1.00
Fragmentation	.13	0.18	0.00
Avg Distance	3.2	1.71	1.33
SD Distance		0.53	0.47
Diameter	6	3.00	2.00

The discussion now pivots to a descriptive statistical analysis of the network topography, which includes measures of how well connected the network is. Table 4 provides network topography descriptive statistics for the San Diego law enforcement task force network. The output is organized along three networks. The first network is the original two-mode network of task forces to agencies. From this first network a task force to task force and an agency to agency network were created in UCINET based on inferred connections. For example, if the DEA and FBI both connected to a task force, there is an inferred connection between them. This is logical; e.g., if an FBI agent in San Diego needs to speak with a DEA agent, they are likely to know there are agents from both agencies on one of the task forces and can thus share information. Indeed, there are likely many mutual task force connections happening informally among task force officers behind the scenes. For example, Senator Jon Kyl of Arizona described the following in a 2003 US Senate hearing:

> Indeed, as Chairman Hatch has mentioned, the narco-terrorism connection was underscored by a November 2002 arrest in San Diego of two Pakistanis and one U.S. citizen for attempting to exchange 600 kilograms of heroin and 5 metric tons of hashish for cash and 4 Stinger anti-aircraft missiles to supply Al-Qaeda associates.[34]

While the role of task forces is not specified in the example above, it is an example of the type of operation wherein counternarcotic task force officers would share information with counterterror task forces.

The two-mode network has a density score of .0959 and a diameter of six. The task force to task force network has a high-density score of .67, while the agency to agency network has a lower score of .27. It should be noted that density scores tend to go down mathematically with greater size. Thus, it is not that surprising that the agency to agency network with 84 participants has a lower density than the task force to task force network of 33. That low density score may be deceiving, however, given the diameter of the network is only three, which means that to get from any point in the network to another an actor need only go through two other actors. The lower density may also be the result of about eight isolate agencies with no connections to task forces, as indicated by the components score of nine. The average degree (average number of ties) of the task force to task force network is 21, while the average degree of the agency to agency network is 22, suggesting each actor in both networks has an average of 21 to 22 ties. All of the cohesion indicators in the one-mode networks suggest a dense, well-connected network with a small number of agencies that do not participate in task forces.

Eliminating the remaining fragmentation by connecting some of these agencies into task forces would be a way to better integrate the San Diego area task force network. These isolated agencies tend to be small police forces with limited resources. Thus, connecting these isolated agencies to task forces with high centrality, and task forces with agencies of high centrality, might be the most resource efficient mechanism to integrate them into the network. This is an example of what Barabási calls "preferential attachment," wherein actors choose to connect to nodes or actors with high centrality because of the advantages that entail.[35] This leads to nodes or actors with vastly more connections than others and results in what Barabási calls "scale free networks."[36] Following this logic, isolated small agencies should connect to agencies like the DEA and FBI and their associated large task forces. The top 10 list of agencies or task forces in Table 2 and Table 3 respectively can provide a menu of options for agencies based on their needs and network integration goals.

Discussion

Through a social network analysis, this article has demonstrated a densely connected San Diego regional law enforcement task force network. It has contributed to the literature by empirically mapping that network as a baseline of a densely integrated task force network. The conversion of the two-mode network to two separate one-mode networks enabled an analysis of the network with more metrics and in more detail across two software platforms (UCINET and Gephi).

The analysis provided highly central agency and task force tables and network topography metrics with policy implications. For example, isolated law enforcement agencies unconnected to task forces due to size and resources could efficiently and cheaply enter the task force network by joining the most central task forces, such as CBAG, which are likely to have centralized agencies, such as the DEA and FBI.[37] This provides the greatest bang for the buck for small agencies that might benefit from connections the overall task force can provide. These small agencies may have limited funding, which keeps them out of these networks. Thus, it may be necessary for these agencies to seek grant funding for task force officers. When funding is secured, smaller or mid-

sized agencies should remember the principle of preferential attachment and seek out studies like this, which map regional task force networks based on centrality. This will allow them to efficiently integrate into task force networks and leverage the myriad advantages they provide, like information sharing.

Limitations and Recommendations for Future Research

This research presented an initial approach to describe a law enforcement task force network through more rigorous network analysis tools. This is only an initial approach, serving as proof of concept and presenting a description of the network. Additional research can build on this foundation, identifying other networks in a purposeful fashion to test specific hypotheses. In this way, it is hoped that this will serve as a first study to better understand how network properties affect law enforcement network effectiveness.

Still, aspects of this network do present useful recommendations based on network topology. The analysis provided highly central agency and task force tables and network topography metrics with policy implications.

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Disclosures

None

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