NATIONAL CENTER ON SEXUAL EXPLOITATION

1201 F St NW #200,
Washington, DC 20004
www.endsexualexploitation.org
(202) 393 - 7245

An Overview of Technology-Based Demand Reduction Tactics

A Preliminary Summary Based Upon Research from the National Assessments of Prostitution and Sex Trafficking Demand Reduction Efforts

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Prepared for:
The National Institute of Justice
Office of Justice Programs,
U.S. Department of Justice
810 Seventh Street, NW
Washington, D.C. 20531

Prepared by:
National Center on Sexual Exploitation

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Among the most significant developments over the past decade include the emergence of new tactics using information technology (IT) to deter sex buyers and develop evidence to apprehend those actively seeking to purchase sex. This addition has been a response to a shift in the market for illicit commercial sex away from in-person solicitation and toward various advertising websites and social media applications on the internet. In the period beginning approximately around the year 2000, police departments nationwide observed sharp increases in the use of the Internet for soliciting prostitution, and a decline in their yield of arrests made in street-based stings and reverse stings (E.g., Booth, 2007; Hughes, 2004; LaPeter, 2005; Roane, 1998; Ross, 2005; Sanders, 2008; Shaffer, 2008; Shively et al., 2008; Venkatesh, 2011). Aside from the now defunct "Erotic Services" section of Craigslist and the Backpage website, there are many other classified advertising sites that still facilitate the sex trade, as well as other web-based avenues used for the business of commercial sex. The latter includes online gaming systems such as Microsoft Live that allow direct communication and can access Twitter and Facebook accounts.

Importantly, the online commercial sex landscape of the United States has a global footprint with global ramifications. In December 2019, a U.S.-based live "camming" website (streamatemodels.com) was implicated in the successful prosecution of two sex traffickers, both Lesotho nationals, in a South African High Court[i] for the sexual exploitation of a 16-year-old minor. The Pretoria Office of Homeland Security Investigations provided investigative support as the website was hosted in the United States. The investigation revealed that the account used by the victim had more than 6000 unique logins by sex buyers from across the globe to view the victim over the period of two years during which she was exploited.

Demand Forum has tracked information about demand reduction interventions in the United States through daily web searches for over 10 years, supplemented by periodic literature reviews or direct contact with our network of practitioners and other experts. During the period since Demand Forum's launch in 2012, we have found that the sophisticated use of technology used to detect, investigate, apprehend, and deter sex buyers is a distinct and new class intervention requiring modification our original typology. To gather content about this newer tactic requires a rigorous and systematic collection process for the development of content that will fairly represent the range of technologies and where they have been implemented. A grant was awarded to the National Center on Sexual Exploitation (NCOSE) for this purpose, and the work began in January, 2021. The current document contains a preliminary scan and assessment of IT-focused products and their application in demand reduction operations. A preliminary overview of the multiple products in use and the variations of how they were deployed is provided. We will continue to gather information about this tactic and develop resources made available to practitioners. The current grant ends June 30, 2021, and final versions of materials will be posted on the Demand Forum website by that date.

Basic Elements of Technology Driven Tactics

The separate IT products we have identified so far have common elements, but also vary substantially in their capabilities and how they have been deployed. All of these technologies share the capacity to continuously "scrape" data or monitor "signal" from open-source electronic communications, analyze the raw input, and flag messages as probably depicting a commercial sex offer or transaction. Artificial intelligence (AI) and BOTS facilitate those processes, all of which fundamentally seek to identify and diagnose patterns. Large volumes of information are fed into a program that prompts 'the machine' to trace relationships between data points that are too intricate for the human brain to identify.

'Learning' takes place and AI makes informed guesses about the potential outcome of a new question[ii]. The abilities of this technology features quite prominently in what is referred to as 'chatbots'. Simply put, a chatbot is a robot chat that mimics human conversations through voice commands, text chats, or both. It represents a virtual conversation in which one party is an online 'chatting' robot. The chatbot is programmed to interpret the input data into a desired output value[iii]. This predictive capability holds much promise for consumer-level demand reduction and sex trafficking combatting efforts.

The dimensions of variation among the separate products and how they are used to reduce commercial sex demand begins with their focus. Some target the identification and deterrence of sex buyers (our focus here), while other programs are used primarily to (a) identify pimps and traffickers posting online ads or infiltrating social media, (b) to identify victims, or (c) to analyze local commercial sex and trafficking markets. Other aspects of variation are how the technology fits within the set of activities that constitute the initiative, and how it interfaces with the people operating the programs.

From our preliminary assessments, we also found that this type of technology used to target sex buyers can be used in several distinct modes of interaction with both the buyers and with law enforcement or others seeking to deter them. First, they can operate in fully automated mode, constantly scanning ad websites, search terms, or social media communications, identifying potential sex buyers, and then responding with deterrence messages. Second, they may continuously scan and then alert law enforcement personnel when cases are identified that meet the criteria that has been set (e.g., individuals seeking to purchase sex with children), at which point police may respond by launching an investigation or a sting operation. Third, the technology may be programmed to scan a set time period during a sting or deterrence operation; the program identifies potential sex buyers, and then program personnel respond by delivering deterrence messages. The technology reviewed in our preliminary scan have been deployed in different ways, and while the programming to identify and respond to online messages contains different algorithms, they all appear to have the same basic capacity to function at different levels of automation, and the flexibility to coordinate with humans in different modes and for different kinds of operations.

To illustrate the kinds of new tactics that have been developed, and the common features and dimensions of variation among them, **Table 1** summarizes the objectives, features, and use of four implemented initiatives featuring digital technologies. All four provide an automated means of scanning online communications and advertising, identifying instances of commercial sex, and then identifying individual sex buyers who have responded to online ads or social media messages. Each also engages buyers in some form of interaction designed to deter individual from attempting to purchase sex, at the present "point of purchase" moment as well as in the future.

Traditional reverse stings are very labor intensive and require substantial planning. Even agencies that are philosophically firmly committed to attacking the demand component of illicit markets cannot field these kinds of operations with great frequency. Most agencies face their wide range of local needs and obligations with scarce resources and prioritize prostitution and sex trafficking operations infrequently (or not at all). The technologies developed for this new type of tactic provide an alternative means of pursuing primary prevention that is far less labor intensive, and therefore can be applied at a vastly expanded scale. All four of the examples **(Table 1)** can operate in fully automated mode and can be deployed at all times. Bots are programmed to identify communications indicative of commercial sex or sex trafficking and obtain contact information based on the accounts used by buyers via voice, text, email, or chat function to initiate a commercial transaction. Through extensive testing, development, and live deployment, artificial intelligence supports the evolution of the

automated messaging that is pushed out to the sex buyers so that the language used, pacing, and local dialects becomes tailored to appear authentic rather than computer generated. These and other capabilities allow the constant deployment of the technology to gather unprecedented levels of data about patterns in the local illicit markets, as well as having the capacity to identify activity consistent with attempting to purchase sex. Automated scanning and identification, coupled with realistic automated responses to buyers, thus provides the only feasible means of constantly (rather than periodically) attempting to undercut markets for sexual exploitation by dissuading sex buyers at points of purchase. In addition to cost effectiveness and scalability in addressing demand, the technologies also have appealed to law enforcement agencies and collaborative efforts by also providing methods for addressing the supply and distribution components of local markets. The constant scanning and analytic capabilities of these products also identify likely cases of child sex trafficking and other exploitation and has successfully aided law enforcement agencies in identifying victims as well as identifying traffickers and trafficking networks.

Overview of selected technologies

Childsafe.ai[iv] is a software startup that deploys machine learning and active collection networks monitoring actors that *"buy and sell human beings from within the surface, deep and dark web marketplaces in which those transactions occur*[v]*"*. Childsafe.ai delivers a Demand Deterrence Platform serving law enforcement human trafficking units around the country to reduce the illicit finances pouring into their local human trafficking economies. The platform has identified tens of thousands of buyers and sellers through its networks over a year of operation, and its team actively monitors, graphs, and models the online ecosystems fueling human trafficking. At its core, ChildSafe.ai amplifies the ability to identify and respond to online abuse by mobilizing chatbots. Prostitution ads are searched to obtain information on sex buyers and providers of illicit services, including details pertaining to price and location of transactions. Voice recognition tools are also used to examine and identify the voices of potential sex buyers and providers of sex. When comprehending the conversations of a potential sex buyer, ChildSafe.ai delivers a customized deterrence message in which it warns the sex buyer of the legal and social ramifications of buying sex. In a 2020 example[vi], several law enforcement agencies have implemented the ChildSafe.ai platform which resulted in the cumulative engagement of 1,477 potential sex buyers with an estimated total of 8,500 customized deterrence messages being sent.

Freedom Signal[vii] is an online platform built by the technology team at Seattle Against Slavery[viii] and serves advocates in developing ongoing relationships through texting those entangled in the sex trade. Direct service organizations are enabled to send targeted text-based outreach to potential trafficking victims identified through web scraping. When a potential victim replies, advocates are able to build trust with vulnerable populations in crisis situations. The outreach technology was designed by software engineers and survivors of online sex trafficking in response to the specific needs of this population. It ensures a safe, direct channel of communication. Since 2017, more than 37,000 potential victims across North America received proactive outreach from services providers using Freedom Signal. Moreover, compared to in-person or street outreach, victims who were sent direct text outreach were significantly more likely to engage with services. Technology has also been used effectively by Seattle Against Slavery to post fake online adverts that connected people with chatbots thought to be persons in prostitution, followed by the delivery of a deterrence message. Between 2014 and 2016, 2.1 million ads were placed by Seattle Against Slavery that had simple deterrence messages: "You could be arrested for buying sex online" or "By buying sex online you could be causing

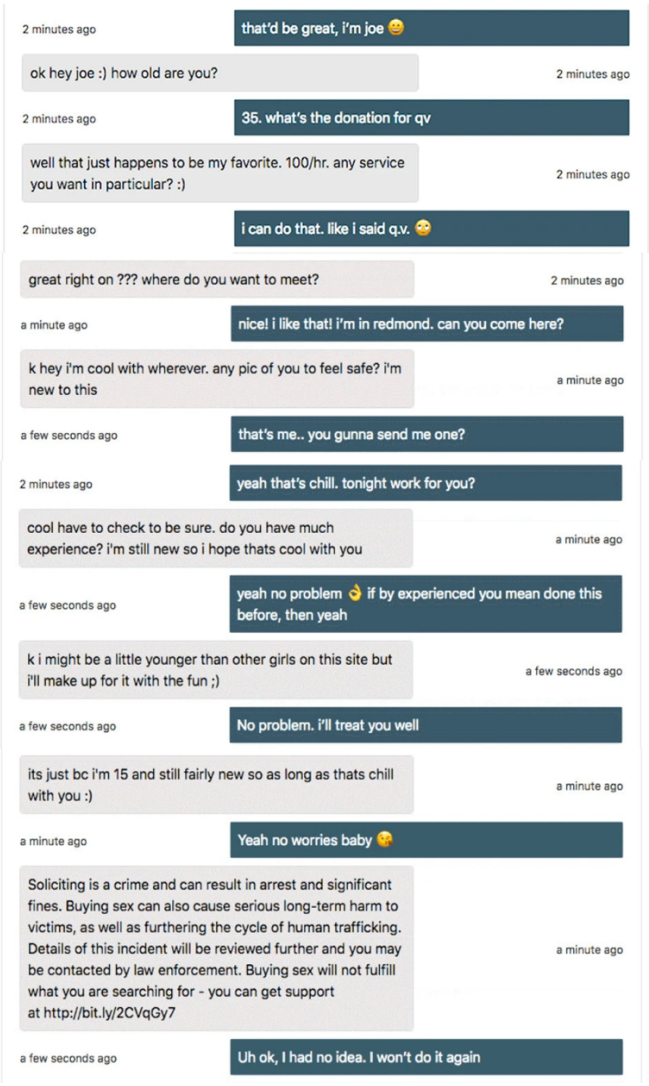
harm to a victim". These messages had links to counselling services and other support groups. Seattle Against Slavery reported that there was a 40-60% decline in keyword searches during this period and was a statistically significant decline when Seattle was compared with other US cities where the campaign had not taken place.[ix] This was followed by the organization posting fake ads between 2016 and 2018 offering sex that was prompted by specific keyword searches. A chatbot, designed to pose as a prostituted person, was triggered and resulted in about 19,000 conversations with 15,000 people. The impact of deterrence messages was tested by the bot's disappearance after a short chat. In other cases, the chatbot would post a message stating the risks of buying sex online. It was found that those who received such a message were 30% less likely to click on one of the ads in the future[x].

Transaction Intercept[xi] seeks to identify the buyers of sex with minors and chips away at their notion of anonymity. Reducing the demand for commercial sexual exploitation in the marketplace is considered *"quite possibly the single greatest weapon"*. When potential sex buyers are identified, Street Grace communicates with these individuals through Gracie – an artificial intelligence chatbot – who communicates the risks and consequences of the potential buyer's actions when the intent to purchase a minor is confirmed by Gracie. Transaction Intercept provides trauma and therapy resources to individual sex buyers to assist them[xii] in taking the first step towards receiving help.

The EPIK Project[xiii] was founded in 2012 in response to the heinous reality of sex trafficking in the United States and use technology to disrupt the buying of sex at the point of sale. Functioning as a "highly trained and sophisticated neighborhood watch program", EPIK provide law enforcement with specific information related to the illegal activity of prostitution and sex trafficking. EPIK seeks to mobilize male allies to disrupt the commercial sex market by equipping them to confront the roots of exploitation and encouraging them to effectively collaborate within the broader anti-trafficking movement. Sex buyers are connected with one of more than 200 male volunteers who seek to educate them about the realities of the commercial sex trade. EPIK's volunteers spend approximately one to three minutes following a myth-busting call script that has been refined through numerous iterations over a number of years. Calls last between a couple of minutes to approximately 40 minutes. To date the EPIK Project has disrupted over 178,000 attempts by an estimated 90,000 men intent on buying sex. More than 250 men have been trained in 14 US cities. EPIK enjoys support from law enforcement, survivors, advocates, and city officials and are recognized as leaders in demand reduction efforts. A contributing factor to the EPIK Project's success is its collaboration with law enforcement agencies. One such example is found in California's Alameda County's H.E.A.T Watch[xiv], a five-point program designed to combat human trafficking. Law enforcement officials use a decoy website advertising for-purchase sex which result in the site getting between 15,000 and 40,000 views a month. This translates into 3,000 to 5,000 clicks a month. The site collects potential sex buyers' IP addresses, and alerts them of both the illegality of their actions and the fact that the DA's office prosecutes sex buyers. In some instances, the decoy site connects the potential sex buyer to an EPIK Project volunteer.

Among the ways the different products vary is how they interface with humans. What has been referred to as 'Augmented Intelligence[xv]'—where humans and machines exploit each other's strengths—is a tenet of some technologies that alert law enforcement when certain criteria are met. Law enforcement, in turn, may then choose to launch an investigation or stage a sting operation. The EPIK approach features the most consistent use of human labor: the technology identifies people actively seeking to purchase sex, and then trained volunteers step in to provide deterrence messages.

Below is an example of a conversation between a sex buyer and a chatbot, and the computerized text message in response to sex buyers after their sex solicitation engagements with artificial intelligence chatbots[xvi]:



A conversation between a sex buyer and a chatbot – Seattle Against Slavery

A New York City Police Department computerized text message in response to sex buyers after their sex solicitation engagements with artificial intelligence chatbots

The potential of technology-based tactics to disrupt sexual predators and sex buyers are also gaining traction further afield. The C3-Sex[xvii] smart chatbot similarly uses Natural Language Processing (NLP) and are deployed on websites or scenarios where it profiles the interests of suspects regarding online child sexual abuse. A 50-day experiment revealed that, on average, the C3-Sex smart chatbot can interact with 900 suspects weekly. In the seventh week of the experiment the chatbot engaged with more than 500 users, and in weeks 2, 3, and 5, it surpassed 1,500 suspects. In the second week C3-Sex was able to maintain contact with nearly 2,500 network users and was able to stay online throughout the eight weeks of the experiment, with a total of 7,199 users contacted. Developers expect to deploy this technology to other types of sexual crimes, including sexual exploitation, sexting, sextortion, sex scam, or sex trafficking. A Canadian example can be found in Wilber.ai, an AI-powered chatbot developed by Buyer Resist[xviii] and promoted by The BreakFree Collective[xix], that has engaged with

nearly 500 sex buyers and has shown potential for reducing demand for commercial sex. The strategy involves posting online ads targeting sex buyers with a phone number linked to the chatbot. When sex buyers contact the chatbot, it takes them on a journey of understanding the legal consequences of purchasing sex, the associated health consequences, and the cruel realities of the sex trafficking industry. By the end of this educational experience, many sex buyers recognize the harms of sex buying and are provided with supplementary resources like information on counselling or local sex addict anonymous groups so they can receive the help they need to overcome their addictions and regain a hold on their lives.

Despite the significant opportunities and potential of chatbots and AI supplements, the foreseeable future will in all likelihood see the continuation of humans and machines exploiting each other's strengths (augmented intelligence). As noted recently in the area of mental healthcare, AI chatbots is yet to fully replace human interactions. Albeit having the capacity to improve ef!ciency, affordability, convenience, and patient-driven access, AI interfaces and chatbots *"cannot be expected to provide the feelings of respect and subtle constellations of interpersonal supports necessary for a sense of social agency, inclusion and equity."*[xx]

Table 1: Examples of Information Technology and Social Media Platforms Used to Deter and Investigate Sex Buyers

Technology/ Program Name	Objectives	Description	Implementation
Childsafe.AI	Combat online facilitation of child sexual exploitation; deter sex buyers; provide investigative intelligence to law enforcement agencies.	Automated scans of online ads detects CSE and trafficking, alerts law enforcement agencies (LEAs); LEAS may plan stings, or allow automated deterrence engagements by AI chatbots.	Tools, training, technical assistance provided to LEAs in dozens of US cities and counties; over 17,000 sex buyers engaged by Childsafe bots in five National Johns Suppression Initiative operations 2018-2020.
Freedom Signal (Seattle Against Slavery)	Identify instances of online facilitation of CSE & trafficking; deter sex buyers; disrupt markets; aid LEAs in prevention and investigation; victim identification and outreach.	AI software interrupts buyers during search and purchase processes; uses buyer search keywords to target deterrence messaging; bots build profiles of buyers then use them to reinforce deterrence messaging; bot poses as provider and engage in online conversations with	Launched in 2018. Developed in partnership with Microsoft. Tools and training provided to LEAs in dozens of US cities and counties; over 15,000 sex purchases disrupted by bots within first year.

		buyers and/or redirects them to deterrence websites	
Transaction Intercept (Streetgrace.org)	Disrupt commercial sex transactions before they occur, at point of purchase. Particular focus on disrupting purchase of minors.	Posts decoy advertisements, identify potential sex buyers. AI chatbots deployed to engage buyers. When intention to purchase a minor is confirmed, bot communicates risks & consequences, provides trauma & therapy resources.	Launched in 2018; developed in partnership with the Centers for Disease Control, Georgia Bureau of Investigation, Kennesaw State University, advertising agency BBDO.
EPIK (The Epik Project)	Uses technology to assist disrupting online purchase of sex at point of sale. Functions as cyber "neighborhood watch" program, providing LEAs with actionable information for deterring CSE & sex trafficking.	Do not provide details about their online tactics, but disclose that technology includes combination of SMS, voicebots, chatbots, & AI. Once identified by IT, human volunteers engage sex buyers in deterrence conversations.	Founded in 2012. Through early 2020, documented disruption of over 178,000 attempts by roughly 90,000 men intent on purchasing sex via the internet. Trained over 250 volunteers in 14 US cities.

Table 2: Number of Sex Buyers Arrested or Engaged by Bots in National Johns Suppression Initiative Operations, 2017-2020[xxi]

NJSI Operations	# Agencies Participating in NJSI	# Jurisdictions Deploying Bots	# Sex Buyers Arrested	# Potential Buyers Engaged by Bots
August, 2017	37	3	1,020	454
February, 2018	30	5	638	9,114
August, 2018	24	5	473	1,576
February, 2019	24	7	390	1,477

July, 2019	26	6	503	3,097
February, 2020	22	9	451	1,627
Total			**3,475**	**17,345**

A preliminary list of jurisdictions known to have used Bots and other IT to Intercept and Deter Sex Buyers:

- Alameda County, CA
- Boston, MA
- Brown County, WI
- Colorado Springs, CO
- Cook County, IL
- Des Moines, WA
- Foster City, CA
- Glendale, AZ
- Houston, TX
- Las Vegas
- Los Angeles, CA
- Mesa, AZ
- McHenry County, IL
- Minneapolis, MN
- New York, NY
- Peoria, AZ
- Oakland, CA
- Phoenix, AZ
- Portland, OR
- Seattle, WA
- Tarrant County, TX
- Upper Marion Township, PA

[i] Westonaria Police CAS 150/10/2017 and Johannesburg High Court Case no 41/2017. doi.org/10.1016/j.clsr.2015.12.015
[ii] Aubrey Calaway, "Artificial intelligence and the fight against human trafficking", *Business & Human Rights Resource Centre*, (2021), https://www.business-humanrights.org/en/blog/artificial-intelligence-and-the-fight-against-human-trafficking/
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[iv] https://childsafe.ai
[v] Rob Spectre, "Beyond Backpage: Buying And Selling Sex In The United States One Year Later", ChildSafeAI, 2018.
[vi] CIO Review, "ChildSafe.AI: World's First AI Platform Combatting Online Child Abuse", (2020), https://law-enforcement.cioreview.com/vendor/2020/childsafe.ai
[vii] https://freedomsignal.org/
[viii] https://www.seattleagainstslavery.org/
[ix] Hannah Devlin, "Trafficking industry hit as 'sex worker' chatbots fool thousands", *The Guardian*, (2020), February 13, https://www.theguardian.com/society/2020/feb/13/sex-worker-chatbots-fool-thousands-to-hit-trafficking-industry
[x] Hannah Devlin, "Trafficking industry hit as 'sex worker' chatbots fool thousands", The Guardian, (2020), February 13, https://www.theguardian.com/society/2020/feb/13/sex-worker-chatbots-fool-thousands-to-hit-trafficking-industry
[xi] https://www.streetgrace.org/transaction-intercept/
[xii] https://epikproject.org/
[xiii] https://epikproject.org
[xiv] http://www.heatwatch.org/
[xv] Lynn Heidmann, "What Is Augmented Intelligence?", *Data Iku*, (2021), https://blog.dataiku.com/augmented-intelligence
[xvi] Tina Rosenberg, "A.I Joins Campaign Against Sex Trafficking," *New York Times*, April 9, (2019), https://www.nytimes.com/2019/04/09/opinion/ai-joins-the-campaign-against-sex-trafficking.html; *see also* https://news.sky.com/story/ten-tech-predictions-for-the-decade-ahead-what-will-happen-by-2030-11884641

[xvii] John Ibañez Rodríguez, Santiago Rocha Durán, Daniel Díaz-López , Javier Pastor-Galindo and Félix Gómez Mármol, "*C*3-Sex: A Conversational Agent to Detect Online Sex Offenders," *Electronics* 9, no. 11, (2020), **doi.org/10.3390/electronics9111779**

[xviii] https://www.buyerresist.ca

[xix] https://www.breakfreecollective.org

[xx] Julia E.H. Brown and Jodi Halpern, "AI chatbots cannot replace human interactions in the pursuit of more inclusive mental healthcare", *SSM - Mental Health* 1, (2021), doi.org/10.1016/j.ssmmh.2021.100017

[xxi] February 5, 2020, National Sex Buyer Stings Reach 10,000 Arrests (https://www.cookcountysheriff.org/national-sex-buyer-stings-reach-10000-arrests/); July 31, 2019, National Sex Buyer Sting Nets More Than 500 Arrests (https://www.cookcountysheriff.org/national-sex-buyer-sting-nets-more-than-500-arrests/); February 6, 2019, National Sex Buyer Sting Nets More Than 390 Arrests (https://www.cookcountysheriff.org/national-sex-buyer-sting-nets-more-than-390-arrests/); August 29, 2018, National Sex Buyer Sting Nets More Than 450 Arrests (https://www.cookcountysheriff.org/national-sex-buyer-sting-nets-more-than-450-arrests/); February 6, 2018, National Sex Trafficking Sting Nets over 630 Sex Buyers and Pimps/Traffickers (https://www.cookcountysheriff.org/national-sex-trafficking-sting-nets-630-sex-buyers-pimps-traffickers/); August 2, 2017, National Sex Trafficking Sting Nets Over 1,000 Sex Buyers and Pimps/Traffickers (https://www.cookcountysheriff.org/national-sex-trafficking-sting-nets-1000-sex-buyers-pimpstraffickers/).