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Request for Information (RFI) on Public and Private Sector Uses of Biometric Technologies: Responses

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Submission by Ann Park on Behalf of The National Center for Missing and Exploited Children, a Nonprofit Organization, in Response to the Office of Science and Technology Policy’s Notice of Request for Information on Public and Private Sector Uses of Biometric Technologies

I. Background on The National Center for Missing and Exploited Children (NCMEC) and Its Use of Biometric Technologies to Help Find Missing Children, Identify Victims of Online Sexual Exploitation, and Recover Victims of Child Sex Trafficking

The National Center for Missing & Exploited Children (NCMEC) is a private, non-profit organization created as a grassroots response to an unthinkable tragedy. In 1981, 6-year-old Adam Walsh was with his mother in a Florida shopping mall when he vanished without a trace. The search for Adam revealed many inadequacies that plagued missing children investigations at the time. There was no coordinated response to search for Adam, no AMBER Alert system to quickly deliver critical information to the public, and no place for families to go for guidance or emotional support. Revé and John Walsh endured 10 excruciating days searching for Adam before he was found murdered 100 miles away. The Walshes channeled their grief and came together with other child advocates to create NCMEC in 1984. Over the past 37 years, NCMEC has grown to become the leading nonprofit organization and the nation’s congressionally designated clearinghouse and resource center on missing and exploited children issues. Today NCMEC’s more than 380 employees manage numerous public-private partnerships and utilize NCMEC’s unique resources to prevent child abduction, recover missing children, and combat child sexual victimization through five main programs of work relating to: (1) missing children; (2) exploited children; (3) community outreach; (4) education and professional resources; and (5) family support.

Over the past decade, crimes against children have evolved and become increasingly technology-based. In response, NCMEC has incorporated the use of biometric information, including DNA, fingerprints and dental records, along with biometric technologies, such as facial recognition, often coupled with artificial intelligence and machine learning tools, throughout its operational programs so it can continue to help identify and recover missing children and child victims of sexual exploitation and sex trafficking. While facial recognition technology is still in the early stages of development, NCMEC has found it to be highly effective in helping to identify and locate child victims of sex trafficking. NCMEC also facilitates collection of biometric information, including DNA, dental records, and fingerprints to help law enforcement and families find missing children and identify unknown deceased children. Most recently, NCMEC has paired artificial intelligence (AI) and machine learning (ML) technologies with biometric data to help identify victims of online sexual exploitation; develop potential locations of children in sexually abusive situations; and prioritize cases involving children in imminent danger.

NCMEC does not use biometric information, including facial recognition technology, or AI or ML tools in any monitoring capacity, does not have access to non-publicly available image content, and uses such technology solely to identify and locate child victims. Additionally, NCMEC's use of such technologies are limited to comparing curated sets of information relating to a missing or exploited child with publicly available images.

A. NCMEC's Programs to Combat Child Sex Trafficking and Use of Facial Recognition to Help Identify, Locate, and Recover Children Victimized by Sex Trafficking

Child sex trafficking is any instance in which a child under the age of 18 is advertised, solicited, or exploited for a sex act in exchange for anything of value (e.g., money, drugs, or food/shelter). NCMEC has received cases of child sex trafficking from every state and territory in the United States and from every community, including urban, rural, suburban, and tribal lands. There is no single pattern to how this crime is perpetrated on children, and NCMEC has worked on cases involving pimp-controlled, familial, gang-controlled, and buyer-perpetrated trafficking involving children as young as 10. To date, NCMEC has worked on more than 113,000 reports of child sex trafficking, including 17,283 reports in 2021.

NCMEC's multi-disciplinary team provides professional education, case management, clearinghouse resources, analytical support, and recovery services assistance on cases of child sex trafficking. One of NCMEC's most recently adopted and impactful tools in fighting child sex trafficking is facial recognition technology. Through a partnership with Thorn, a nonprofit organization that creates technology to combat the exploitation of children, NCMEC has access to an online advertisement aggregator tool called Spotlight, which was developed to improve the effectiveness and efficiency of identifying victims of sex trafficking. NCMEC uses Spotlight to compare images of children reported missing to NCMEC against online advertisements for sex trafficking that are compiled by Thorn. When Spotlight generates a potential match between a missing child's image and an online posting, NCMEC staff review each advertisement and compile information from the advertisement, such as the location or contact information, which can be critical to enabling law enforcement to locate and recover the child.

Most notably, Spotlight's facial recognition technology has allowed NCMEC to identify missing children who were not previously identified as potential victims of child sex trafficking by law enforcement or the child's social worker, parent or guardian. In these instances, the facial recognition powered by Spotlight not only provides a lead on locating the missing child, but also is critical to ensure that appropriate services and resources are prepared for the child upon recovery. As such, Spotlight's facial recognition technology has been pivotal in providing critical information to identify, recover, and support victims of child sex trafficking in ways that are not always possible with traditional human analyst review.

From May 12 to December 31, 2021, Spotlight identified 2,681 potential matches between children reported missing to NCMEC and online sex trafficking advertisements. Out of these potential matches, 370 were confirmed by NCMEC analysts to be accurate matches of actively missing children. Additionally, 39 matches arose from online sex trafficking advertisements where the missing children were not initially identified by NCMEC or law enforcement as possible victims of child sex trafficking.

The following examples demonstrate how facial recognition enables NCMEC to recover children from sex trafficking situations:

Case Example #1

A 14-year-old child went missing from a New York foster care facility. After a year, no leads had emerged in the child’s case. NCMEC then used Spotlight to search the child’s image against online escort advertisements, and 87 matches were located advertising the missing child for commercial sex over the past 8 months. Prior to this search there were no indications that the child might be a victim of sex trafficking. Based on active escort advertisements depicting the missing child, law enforcement launched an investigation and recovered the missing child within two days. Upon recovery, the child disclosed that she was forced to take photographs for the ads and was sold for sex in exchange for a place to stay.

Case Example #2

A 15-year-old child went missing from her home in Texas. After four months with no leads, law enforcement recovered the child at a hotel. The child was hospitalized, and law enforcement contacted NCMEC as they prepared to interview the child. Law enforcement suspected the child may have been trafficked for sex. NCMEC searched the child’s social media accounts and phone number but located no information indicating the child had been trafficked. NCMEC then used Spotlight to compare images of the child from her missing child poster against online escort advertisements, and several potential matches were located. With this information, law enforcement conducted a trauma-informed forensic interview with the child, and she disclosed that the online escort ads Spotlight located were her images. As a result of the information provided through facial recognition, the child is now receiving services.

Case Example #3

In July 2020, a child called NCMEC’s Call Center to report that her 15-year-old friend was being exploited, forced to take drugs, and sold for sex. NCMEC analysts conducted online open source searches and located the child’s social media profiles, which indicated that she might be a victim of sex trafficking. Using the publicly accessible image of the child from her social media profile, NCMEC used Spotlight to search the child’s face against aggregated online escort advertisements. Ads posted the prior evening were located depicting the child and another minor being sold for sex. NCMEC reported this information to law enforcement and both children were recovered that night.

Case Example #4

A 17-year-old child went missing from a foster care facility in Ohio. The child had previously gone missing and had always been recovered in Ohio. NCMEC compared the child’s photo against online escort ads and found several matches, one of which appeared to depict the child in an online escort ad in Michigan from the previous day. NCMEC was able to pass this information along to law enforcement in Michigan who recovered the child shortly after receiving the lead information from NCMEC.

NCMEC has tested various facial recognition products over the years, and the accuracy of this technology has improved tremendously in the past few years. NCMEC now has such a high level of confidence in the accuracy and sophistication of facial recognition technology on the market, that it has fully incorporated this technology into its operational programs of work relating to child sex trafficking. Facial recognition has been proven effective to identify child victims of sex trafficking, accelerate law enforcement investigations to recover these child victims, and prevent future victimization.

B. NCMEC's Programs to Help Identify, Locate, and Recover Missing Children Through Use of DNA, Fingerprint, and Dental Biometric Information

NCMEC utilizes biometric technologies in its missing child case management services and forensic services to support resolution of missing and unidentified deceased child cases. NCMEC's case management team supports parents, legal guardians, social services, and law enforcement on missing child cases categorized as: (1) endangered runaways; (2) family abductions; (3) nonfamily abductions; (4) lost, injured or otherwise missing; and (5) critically missing young adults (ages 18-20). NCMEC case managers compile and analyze information relating to the child, including biometric information, depending on the circumstances of a child's disappearance, the length of time a child has been missing, and other relevant lead information. To date, NCMEC has worked on more than 386,570 reports of missing children, including 27,003 reports in 2021, and assisted law enforcement in recovering more than 376,000 missing children.

NCMEC also employs various forensic services to support missing child cases and cases of unidentified deceased children. Biometric technologies and information are especially crucial to the following NCMEC forensic services utilized to help resolve missing cases and to help identify the deceased remains of a child:

- **Forensic Imaging Services**: NCMEC's forensic artists age progress missing children's faces to show what they might look like today and also create facial reconstructions when an unidentified deceased child is located to increase the likelihood that someone will recognize them. To date, NCMEC has created more than 7,100 age progressions and created more than 600 facial reconstructions.
- **Help ID Me**: NCMEC enlists the public's help in identifying unknown deceased children by sharing facial reconstructions and case related information through this public Facebook page www.facebook.com/helpidme, which has more than 167,000 followers.
- **Biometric data collection**: In 2004, NCMEC began facilitating the collection of biometric data, including DNA, fingerprints, and dental records¹ relating to missing and unidentified deceased child cases. NCMEC also facilitates partnerships between law enforcement and NCMEC's forensic lab and genealogist partners specializing in DNA case work.

¹ Although dental records are not identified as part of the Office of Science and Technology Policy's definition of biometric information, NCMEC considers dental records to be a crucial biometric resource. Dental impressions can be a key identifier for a missing child, and NCMEC emphasizes that parents should know where their child's dental records are stored and how to obtain them in case of an emergency situation. NCMEC facilitates the collection of dental records and works with forensic odontologists to code and upload dental information into the national missing and unidentified person databases.

NCMEC is not currently using facial recognition technology for its missing children programs but is evaluating how this technology could benefit NCMEC's missing children programs. NCMEC staff spend significant time manually comparing images of missing children against potential images of these children on open web sources. For long-term missing children cases, where current photos of the missing child are unavailable, staff use age progressions created by NCMEC forensic artists to try to make facial comparisons. Facial recognition technology would improve the efficiency and accuracy of facial analysis and comparisons and also save staff time on manual reviews. These improved efficiencies would improve NCMEC's ability to provide actionable leads to law enforcement, resulting in faster intervention by law enforcement, and more expedient and successful recoveries of missing children.

i. NCMEC's Facilitation of DNA Comparisons and Related Biometric Processes to Help Identify Missing Children and Unidentified Deceased Children

DNA testing is a critical tool for NCMEC's work to identify missing children and unidentified deceased children. There are still many families whose child has been missing for years and who struggle for new leads and resolution regarding their loved one. When available leads have been exhausted, DNA collection and testing may be one of the few options to provide answers for these families. Since 2004, NCMEC has proactively facilitated law enforcement's collection of DNA samples from family members of missing children. These collected DNA samples are uploaded into CODIS, a national DNA database maintained by the FBI. When law enforcement locates an individual who is unable to identify themselves, or locates unidentified bodily remains, they will take a DNA sample and enter it into CODIS to search for a match against the missing person samples maintained in CODIS.

Over the past 10 years, NCMEC has used DNA to help resolve around 380 cases of missing or unidentified deceased children. Currently, NCMEC is actively using DNA information to help resolve more than 660 cases of unidentified deceased children, and NCMEC has facilitated the collection of DNA samples from around 2,430 family members related to long-term missing child cases.

The following are case examples that demonstrate the critical role DNA testing has played in NCMEC's mission to help identify long-term missing children and unidentified, deceased children:

Case Example #1

In September 1988, a 17-year-old female left her home in South Carolina and was never seen again. The child had gone missing previously and was suspected to be a victim of child sex trafficking. Law enforcement in South Carolina requested NCMEC's assistance in 2011. Originally it was thought that all known family members of the missing child were deceased, but in 2019, NCMEC tracked down a sibling and facilitated DNA collection to be uploaded into CODIS. The sibling's DNA matched to DNA in CODIS from an unidentified deceased child found in Florida in 1993. The CODIS hit confirmed that the body found in Florida was the missing child from South Carolina. The collection of DNA and the CODIS entry led to resolution of this long-term missing child case.

Case Example #2

In July 1971, the body of an unidentified male between the ages of 14 or 15 was located in Oregon. The cause and manner of death was undetermined. In April 2020, law enforcement requested

NCMEC's assistance in identifying the deceased child. NCMEC assisted in securing biometric information from the remains of the deceased child and law enforcement submitted the bone samples to a lab for DNA testing and evaluation with genetic genealogy resources. The child's remains were tentatively identified soon after DNA testing was completed. The deceased was confirmed to be a boy who left his home at the age of 15 shortly after fathering a daughter. The daughter, now an adult, was curious about her parents and had submitted her DNA to an ancestry company, which provided the lead that helped the lab confirm the child's identity.

Case Example #3

A 12-year-old girl went missing in CA in 1995. Twenty years later, NCMEC received a phone call from a woman in Mexico who had seen NCMEC's missing child poster and believed she was the missing child from 20 years ago. The caller told NCMEC that she had been abducted by a stranger in California and taken to Mexico and had just run away from the house where she was being confined with her children. In order to verify her identity, NCMEC obtained DNA samples from the missing child's mother and had them loaded into CODIS. A State Department liaison coordinated DNA comparisons, which confirmed that the caller was the missing child. Given the trauma the child had endured while missing and the insufficient similarities between the women's images and the child's age progressed images, the DNA information was key to identifying the missing child.

ii. Fingerprints

NCMEC also facilitates the collection of fingerprint records and works with fingerprint examiners at the U.S. Secret Service to code and upload fingerprints into the national missing and unidentified person databases. Fingerprints have been especially useful in helping to recover runaway children or children who have been victimized by sex trafficking and are using aliases to hide their identity.

Case Example #1

In 2006, a 15-year-old boy went missing from Pennsylvania. It was later discovered that a few days prior to the boy's disappearance, he had been taken into custody by law enforcement who had collected his fingerprints. In 2012, NCMEC facilitated getting the boy's fingerprints coded and uploaded into the national database. In 2017, NCMEC was notified that there had been a fingerprint hit in the national database to a man who had recently been arrested in Maryland. The man matched the missing boy's description but went by a different name. Law enforcement was able to confirm that the man who had been arrested was in fact the missing boy who was using an alias name.

Case Example #2

In 1985, an unidentified man between the ages of 17 and 25 was found deceased in Georgia. The man had been shot two times in the back of the head. In March 2020, NCMEC facilitated the uploading of the deceased man's fingerprints into the national database. Shortly after, NCMEC was notified that a fingerprint hit in the national database revealed that the deceased man had been identified as a 21-year-old who had gone missing from Georgia and whose prints were on file from a misdemeanor arrest four months prior to his death.

C. NCMEC's Use of Artificial Intelligence and Machine Learning Technologies to Identify and Expedite Leads Relating to Children Exploited Through the Online Distribution of Sexually Abusive Imagery

NCMEC works to combat the online distribution of child sexual abuse material (CSAM) through two core programs: (1) the CyberTipline; and (2) the Child Victim Identification Program (CVIP). Given the pervasive nature of child sexual exploitation crimes, the tremendous volume of CSAM content being shared online, and the image-intensive nature of this abuse, artificial intelligence (AI) and machine learning (ML) technologies are crucial tools that NCMEC uses to facilitate the work of both the CyberTipline and CVIP.

NCMEC does not currently use facial recognition technology for its exploited children programs but continues to evaluate use of such technology to help identify victims of online sexual exploitation. NCMEC anticipates incorporating facial recognition technology in the future to help compare facial images of unidentified children to images that may be publicly available on the internet. This use of facial recognition technology would enable NCMEC to provide a higher volume of relevant leads to law enforcement relating to an unidentified child victim's identity and potential location. Currently, NCMEC analysts manually conduct open source searches on victims as needed, but facial recognition technology would preserve staff resources and increase efficiency and accuracy in identifying victims.

NCMEC's CyberTipline serves as the global online mechanism for members of the public and online technology companies to report incidents of child sexual exploitation, including child sex trafficking, child sexual abuse material, child sexual molestation, the online enticement of children for sexual acts, and several other categories of sexual crimes against children. NCMEC's two primary goals in operating the CyberTipline are: (1) to prioritize reports indicating imminent danger to a child; and (2) to determine where the incident occurred so the report can be made available to the appropriate law enforcement agency. To date, NCMEC has received over 113 million CyberTipline reports, and the volume of content reported to the CyberTipline continues to increase. In 2020, NCMEC received more than 21.7 million reports containing 65.4 million images, videos and related contents and in 2021, NCMEC received more than 29.3 million reports containing 85 million images, videos and related content.

NCMEC's Child Victim Identification Program (CVIP) has a three-part mission to help locate unidentified child victims depicted in sexually abusive images so they can be identified and recovered; to provide information relating to previously identified child victims; and to provide survivor services to child victims who have been identified and recovered. To date, NCMEC CVIP analysts have analyzed more than 350 million images and videos and have helped law enforcement identify more than 20,000 children depicted in online CSAM.

Artificial intelligence (AI) and machine learning (ML) technologies have proven to be highly effective in helping NCMEC quickly process CyberTipline reports and compile lead information that can help law enforcement locate and recover victims of online child sexual exploitation. NCMEC uses a location prediction tool that automatically determines a potential location for incidents reported to the CyberTipline. This tool employs automated searches to process potential location information within

CyberTipline reports, thereby reducing the need for NCMEC analysts to manually look up information relating to the potential locations of reported offenders and/or child victims.

NCMEC also uses an automated machine learning tool to make connections among individuals referenced in CyberTipline reports based on an individual's name, user ID, email address, phone number, and other reported information. This ML tool enables NCMEC to group reports relating to a single offender and/or victim, thereby streamlining work needed to recover and safeguard a child victim. NCMEC also has developed an alert system based on natural language processing technology that alerts NCMEC analysts based on certain key words or phrases that indicate a child is potentially in imminent danger. This automated technology enables NCMEC to prioritize more urgent cases.

Automated image matching tools, such as PhotoDNA and Google's Child Safety Hash Matching API, are among the most powerful technology that NCMEC employs to combat online child sexual exploitation. These hash-matching tools are built into automated processes in NCMEC's CyberTipline to match hashes of newly submitted images to hashes of images previously reported to the CyberTipline and viewed and categorized by NCMEC. These tools provide multiple significant benefits. First, they greatly reduce the need for NCMEC staff to review identical images of CSAM, thereby decreasing NCMEC staff's exposure to this imagery and preventing further revictimization of the children depicted in the sexually explicit content. Second, these tools have improved overall efficiency and speed of reviewing and categorizing CSAM reported to NCMEC's CyberTipline. In 2021, NCMEC used these image matching tools to review and categorize more than 21 million images and videos and has reviewed and categorized more than 28.5 million images and videos to date.

II. Conclusion

Throughout NCMEC's nearly four decades of helping to locate missing children and combat child exploitation and child sex trafficking, it has continuously adapted to new trends of how children are victimized and implemented new technologies to combat crimes against children. As the science of various biometric technologies, including facial recognition, DNA, genealogy, forensic odontology, and fingerprint analysis, has developed in recent years, NCMEC has incorporated these new technologies to identify and locate child victims of sex trafficking and help resolve especially challenging cases involving missing children and cases of unidentified deceased children. Facial recognition greatly increased the efficiency and effectiveness of NCMEC's work to provide actionable leads to law enforcement to locate and recover child victims of sex trafficking. Previously complex missing children cases which had remained open after existing leads were exhausted, leaving many searching families without resolution, were resolved through DNA, fingerprint analysis, genealogy and forensic odontology. Similarly, as child sexual exploitation has proliferated online in recent years and technology has facilitated an explosion in the volume of child sexual abuse material being shared online, NCMEC's incorporation of AI and ML solutions, including image hashing technology, to facilitate automated processes has helped determine the exigency of child exploitation reports and the potential identity and location of children in sexually abusive situations.

As biometric technologies continue to develop in the future, it is essential to evaluate the role of these technologies in terms of how they can benefit the most vulnerable members of our communities.

NCMEC looks forward to serving as a resource to the Office of Science and Technology Policy regarding how NCMEC uses biometric technologies to help find missing children, reduce child sexual exploitation and prevent child victimization.