OSAC RESEARCH NEEDS ASSESSMENT FORM

Title of research need: R1: National Footwear Database

Describe the need:

This is a revision (R1) to the previously listed need "National Footwear Database." The revision considers the outcomes of the following study:

Brian C. McVicker, John F. McGurk, Stephen D. Shaw. "U.S. National Footwear Database System Feasibility Study." NCJRS. Document Number 304048, Award No. 2016-DNR-5470. January 2022. pp. 1-46.

Footwear evidence is currently underutilized in the United States. A national footwear database would support the use and value of footwear evidence in criminal intelligence. This database would allow multiple agencies to share footwear information, including determining the make/model of a shoe from shoe impressions, linking crime scenes by comparing crime-scene impressions, and linking suspects to crimes by comparing arrestee footwear with crime-scene impressions. It should also allow for seamless and automated integration of existing footwear databases created by different agencies.

To support this need, research should address one or more of the following outcomes: (1.) Development of a scan or photo documentation system which could be functionally utilized in law enforcement booking areas and jails (2.) The training, testing, and validation of algorithms to support accuracy and efficiency in the search, retrieval and linkage of impressions within datasets that vary in quality/quantity, (3.) The use of metrics/scores to assess the strength of comparisons between impressions, (4.) Return on investment evaluations based on pilot studies, (5.) Recommendations concerning database architecture, data definition, data modeling and standards, data interchange standards, and interoperability standards for integrating existing agency databases, (6.) A comprehensive review of states' laws and regulations and/or opinions from the various State Attorney Generals/District Attorneys in order to ascertain the legal feasibility of deploying a National Footwear Database in respective States.

Keyword(s): Footwear Intelligence, Database, Linking Crime Scenes, Linking Suspects to Scenes

Submitting subcommittee(s): Footwear & Tire Tread   **Date Approved:** 10/24/2022

Background Information:

1. Does this research need address a gap(s) in a current or planned standard? (ex.: Field identification system for on scene opioid detection and confirmation)

N/A.

2. Are you aware of any ongoing research that may address this research need that has not yet been published (e.g., research presented in conference proceedings, studies that you or a colleague have participated in but have yet to be published)?

NIJ/FTCoE cooperative agreement: Footwear Intelligence Development Group (FIDG).

3. Key bibliographic references relating to this research need: (ex.: Toll, L., Standifer, K. M., Massotte, D., eds. (2019). Current Topics in Opioid Research. Lausanne: Frontiers Media SA. doi: 10.3389/978-2-88963-180-3)

McVicker, B.C., McGurk, J.F., Shaw, S.D.. "U.S. National Footwear Database System Feasibility Study." NCJRS. Document Number 304048, Award No. 2016-DNR-5470. January 2022. pp. 1-46.

Henderson J. & Armitage R., (2018) "If the Shoe Fits: Proposing a Randomised Control Trial on the effect of a digitised in-custody footwear technology compared to a paper-based footwear method.", Crime Security and Society 1(1). doi: https://doi.org/10.5920/css.2018.02

Needham, J. A. and Sharp, J. S. (2016) Watch your step! A frustrated total internal reflection approach to forensic footwear imaging. Sci. Rep. 6, 21290; doi: 10.1038/srep21290

4. Review the annual operational/research needs published by the National Institute of Justice (NIJ) at https://nij.ojp.gov/topics/articles/forensic-science-research-and-development-technology-working-group-operational#latest? Is your research need identified by NIJ?

Yes.

5. In what ways would the research results improve current laboratory capabilities?

This research would result in faster, more extensive and more reliable intelligence gathering for footwear forensics.

6. In what ways would the research results improve understanding of the scientific basis for the subcommittee(s)?

Limited value.

7. In what ways would the research results improve services to the criminal justice system?

The ability to improve the reliability, speed and variety of intelligence gathering could greatly help in identifying potential suspects and solving more cases. It could also result in greater use of footwear evidence overall, including improved training for collecting evidence at crime scenes.

8. Status assessment (I, II, III, or IV): II

	Major gap in current knowledge	Minor gap in current knowledge
No or limited current research is being conducted	I	III
Existing current research is being conducted	II	IV

This research need has been identified by one or more subcommittees of OSAC and is being provided as an informational resource to the community.