OSAC Research Needs Assessment Form

Title of research need: Population Frequency of Class Characteristics: Footwear in the United States

Keywords: Footwear, Class, Population, Frequency, Pattern, Size

Submitting subcommittee(s): Footwear & Tire   **Date Approved:** 6/24/19

(If SAC review identifies additional subcommittees, add them to the box above.)

Background information:

1. Description of research need:

Investigate the frequencies associated with class characteristics of footwear (outsole pattern design and physical size) in well-defined United States populations (geographically, temporally, demographically, etc.) Factors such as manufacturer sales data, counterfeit shoes and offender footwear being worn at time of arrest/booking may be taken into account in generating the frequency data.

2. Key bibliographic references relating to this research need:

Benedict, I. et. al. (2014), Geographical Variation of Shoeprint Comparison Class Correspondence, Science and Justice, 54(5): P. 335-337.

Davis, R. et. al. (1977), A Survey of Men's Footwear, Journal of the Forensic Society, 17(4): P. 271-285.

Gross, S. et al. (2013), The Variability and Significance of Class Characteristics in Footwear Impressions, Journal of Forensic Identification, 63(3): P. 332-351.

Hancock, S. et. al. (2012), The Interpretation of Shoeprint Comparison Class Correspondence, Science and Justice, 52(4): P. 243-248.

Parent, S. (2010), The Significance of Class Associations of Footwear Evidence, Unpublished, Presented at the 2010 Impression and Pattern Evidence Symposium, Clearwater Beach, Florida

3a. In what ways would the research results improve current laboratory capabilities?

The day-to-day operations of the laboratory are not expected to change as a function of this research. However, the reporting structure, strength of conclusions and examiner training may change over time to incorporate the research findings. Note that the research findings pertaining to frequency of class characteristics could be combined with frequency studies of randomly acquired characteristics when applied to these capabilities.

3b. In what ways would the research results improve understanding of the scientific basis for the subcommittee(s)?

> The majority of footwear comparison conclusions involve class associations (i.e. correspondence in outsole pattern design and physical size between a known shoe and a crime scene impression). Therefore, the results of this research would provide an objective, quantitative, empirically-obtained basis for the frequencies of class characteristics within known populations rather than the subjective methods upon which current rarity estimates are based.

3c. In what ways would the research results improve services to the criminal justice system?

> Having population frequency data on outsole pattern design and physical size may directly impact the degree of confidence of the footwear examiner's opinion that is presented in court. This would be beneficial to the jury in giving weight to expert testimony and could potentially be used as a statistical basis for opinions. For example, given a shoe of interest, what is the probability that a shoe randomly selected from a given geographic location would have the same outsole pattern design?

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

	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.

Subcommittee	Approval date:	05/22/2019

(Approval is by majority vote of subcommittee. Once approved, forward to SAC.)

SA

1. Does the SAC agree with the research need?   Yes ⊗   No ◯

2. Does the SAC agree with the status assessment?   Yes ⊗   No ◯

   If no, what is the status assessment of the SAC: [　　]

Approval date: 6/24/2019

(Approval is by majority vote of SAC. Once approved, forward to NIST for posting.)