

OSAC RESEARCH NEEDS ASSESSMENT FORM



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

Describe the need:

Investigate the frequencies associated with class characteristics of footwear [outsole design and size (could be physical and/or retail size; the physical size is the more important)] 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. This task involves generating not only the frequencies of the overall outsole designs and sizes of shoes, but also the frequencies of specific design elements and combinations of such elements. These elements would be basic geometric shapes and patterns (and possibly also text/logos) that are combined to form the overall outsole design.

Keyword(s): Footwear, Class, Population, Frequency, Pattern, Size

Submitting subcommittee(s): Footwear & Tire **Date Approved:** February 23, 2021

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

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)

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)?

<https://forensicstats.org/news-posts/csaf-explores-unique-footwear-examination-methods-with-new-nij-grant/>

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)

- 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

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?

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, as well as wear characteristics, when applied to these capabilities.

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

The majority of footwear comparison interpretations involve class associations (i.e. correspondence in outsole 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.

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

Having population frequency data on outsole design and size (physical and/or retail) 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 design?

8. 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.