

OSAC RESEARCH NEEDS ASSESSMENT FORM



Title of research need:

Describe the need:

Investigate the discriminating power of shoe outsole wear characteristics based upon the position, size, shape and degree of wear on outsoles. Results should include data discussing the persistence (over time) of wear features, the rarity of the features, and the potential for random agreement of wear in unrelated outsoles.

Keyword(s):

Submitting subcommittee(s): **Date Approved:**

(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)?

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)

- Davis, R.J. & DeHaan, J.D. (1977), A Survey of Men’s Footwear, Journal of the Forensic Science Society, 17(4): pp. 271-285.
- Davis, R.J. & Keeley, A. (2000), Feathering of Footwear, Science and Justice, 40(4): pp. 273-276.
- Fruchtenicht, T.L., Herzig, W.P., & Blackledge, R.D. (2002), The Discrimination of Two-Dimensional Military Boot Impressions Based on Wear Patterns, Science and Justice, 42(2): pp. 97-104.
- Bodziak, W.J., Hammer, L., Johnson, G.M., & Schenck, R. (2012), Determining the Significance of Outsole Wear Characteristics During the Forensic Examination of Footwear Impression Evidence, Journal of Forensic Identification, 62(3): pp. 254-278.

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?

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. The research findings pertaining to rarity and chance of random agreement could be combined with frequency studies of class and randomly acquired characteristics when applied to these capabilities, but this is considered a down-stream impact and is outside the scope of this research need.

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

Wear patterns aid in greatly narrowing the population of potential source shoes that could have made an evidence impression, even in the absence of randomly acquired characteristics (RACs). Therefore, the results of this research would provide an objective, quantitative, and empirically-obtained basis for assessing the persistence and associated discrimination potential (given the amount of time between the commission of a crime and the collection of suspect shoes) of these features within known populations.

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

Having persistence and rarity data on outsole wear patterns will directly impact the degree of confidence of the footwear examiner’s opinion that is presented in court, specifically regarding source attributions which require assessments of the expected appearance/degree of wear if time elapses between crime and collection. This would be beneficial to the trier of fact in giving weight to expert testimony and could potentially be used as a statistical basis for opinions.

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.