



OSAC RESEARCH NEEDS ASSESSMENT FORM

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

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

Submitting subcommittee(s): Footwear & Tire **Date Approved:** 07-Mar-2016

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

Background Information:

1. Description of research need:

Determine the frequency of occurrence of footwear class characteristics in specific and well-defined populations in the United States. Any population of interest must be defined spatially, temporally, demographically, logistically, etc. Class characteristics include brand, make, model, size, wear, pattern, etc.

2. Key bibliographic references relating to this research need:

Petraco, N. et al. (2010). Statistical Discrimination of Footwear: A Method for the Comparison of Accidentals on Shoe Outsoles Inspired by Facial Recognition Techniques. *Journal of Forensic Sciences*, 55(1), pp. 34-41.

Stone, R. (2006). Footwear Examinations: Mathematical Probabilities of Theoretical Individual Characteristics. *Journal of Forensic Identification*. 56(4), pp. 577-599.

Hilderbrand, D. (1999). Four Basic Components of a Successful Footwear Examination. *Journal of Forensic Identification*. 49(1), pp. 37-59.

Wilson, H. (2012). Comparison of the Individual Characteristics in the Outsoles of Thirty-Nine Pairs of Adidas Supernova Classic Shoes. *Journal of Forensic Identification*. 62(3), pp. 194-203.

Parent, S. (2010). The Significance of Class Associations in Footwear Comparisons. Poster. NIJ Impression Evidence Symposium.

Hamburg, C. (2010). Evaluation of the Random Nature of Acquired Marks on Footwear Outsoles. Presentation. NIJ Impression Evidence Symposium.

Bodziak, W. (2000). *Footwear Impression Evidence: Detection, Recovery and Examination*, 2nd Edition. CRC Press.

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

The information gained from this research would build upon frequency studies relating to randomly acquired characteristics. The ability to cite the frequency of certain class characteristics in defined populations will assist in reinforcing the strength of the examiner's conclusions.

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

The results of this research would support the basis of footwear and/or tire examiner's opinions when dealing with class characteristics, such as design, size, and wear. Providing the frequencies of certain class characteristics within known populations would give an objective and quantitative basis to the qualitative model that current rarity estimates are based upon. The results of this research would support footwear and/or tire examiner's opinions that are 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.

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

The results of this research would support footwear and/or tire examiner's opinions that are 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.

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.

Approvals:

Subcommittee

Approval date:

07-Mar-2016

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

SAC

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: 17-Mar-2016

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