# 2.0 General Guidelines and Report Conclusions for Footwear/Tire Impression Evidence Analysis

This document is intended as a general outline of procedures to be followed in a footwear or tire track examination. Appropriate references can also be consulted for details of specific techniques.

**Note:** For analysts performing **Footwear/Tire Track Processing-only,** that includes observation, enhancement/lifting, photography, casting, making known impressions and documentation of those activities. It does not include comparisons or reporting any examination opinions/conclusions.

**Terminology**

Examiners should be familiar with the terminology listed and defined in ASB Technical Report 097 - Terminology Used for Forensic Footwear and Tire Evidence, 1st Edition, 2019. This terminology should be used in examiner's notes, worksheets and reports as applicable.

# 2.1 General Examination Guidelines

*NOTE: Prior to conducting a comparison, the questioned impression(s) shall be examined to identify and document characteristics that may be suitable for comparison.*

*NOTE: All evidence submitted should be appropriately labeled and inventoried.*

## 2.1.1 Footwear Examination

The following workflow represents the expected progression through a footwear examination. The steps are considered to be required unless described otherwise or are not applicable.

See further instructions and more detailed procedures below and in other parts of this manual.

### 2.1.1.1 Case evaluation

#### 2.1.1.1.1 Review FSD-007

- Ensure appropriate exam is checked off
- Case details filled out; examination request is clearly documented

#### 2.1.1.1.2 Ensure all relevant evidence is available

- Request original items
- Request digital images
- Request/locate elimination footwear (from agency; CSRT documentation)

#### 2.1.1.1.3 Evaluate if items need to be processed by other units

#### 2.1.1.1.4 Ensure case records/exam types are appropriate

#### 2.1.1.1.5 If digital images are submitted via email, create a disc containing the images, enter it as evidence in FA, and document emailed communication

### 2.1.1.2 Forensic Advantage

#### 2.1.1.2.1 Itemize/breakdown evidence

#### 2.1.1.2.2 Assign evidence to case record

#### 2.1.1.2.3 Add evidence to/create worksheet

### 2.1.1.3 Questioned evidence

#### 2.1.1.3.1 Inventory (FA descriptions and/or worksheet and/or photos), if applicable

- Original packaging
  - Including any inner packaging
- Original packaging/item condition
  - Sealed, damaged, etc.
- Collection information including, but not limited to
  - Recovery location of evidence (as noted on FSD-007 and/or packaging and/or item)
- Inventory contents and assign identifiers to each item of evidence
- Description of contents to distinguish from other similar items
- Evidence discrepancies
  - Between FA/FSD-007 and evidence
  - Between agency markings and evidence within

#### 2.1.1.3.2 Evidence Processing

- Documentation of digital image evidence
  - Create contact sheet/PowerPoint/PDF depicting entire original contents with file names/original image #s for Case Record OR
    - Images in multiple file formats do not need to be depicted in all formats
  - Image numbers
    - File format (*.jpg, *.tif, RAW, etc.)
  - Limitations/interferences of submitted images (scale, alignment, exposure, etc.)
  - Digital processing (e.g. Adobe Photoshop), if needed for visualization
    - Perform on a ***copy*** of the original digital image
  - Impression descriptions

        - Assign letters/#s if applicable
        - Substrate/medium
        - Left/right, partial/full, portion of shoe
        - Tread design
        - Specific features (possible wear, RACs)
        - Limitations/interferences
            - Distortion (saturation, movement, etc.)
            - Overlapping impressions
            - Submitted images (scale, alignment, exposure, resolution, etc.)
            - Substrate
        - Suitability for comparison to known shoes
- Physical evidence
    - Visual assessment
        - Visible impressions
        - Substrate/medium considerations
            - Clean cast, e.g.
        - Additional exam types, if applicable
    - Photography
        - General
        - Examination-quality, if applicable
            - Use TL-approved scale
    - Enhancement methods, if applicable
        - Lighting (oblique, ALS, etc.)
        - Powder processing
        - Chemical methods
        - Lifting
    - Examination-quality photography (after each enhancement method, as applicable)
        - Use TL-approved scale
    - Create relevant evidence in FA (evidence generated in laboratory)
        - E.g., discs of exam-quality images taken in lab, lifts taken of submitted objects, etc.
        - Ensure evidence is generated under the correct submission number
    - Impression descriptions
        - Assign letters/#s if applicable
        - Substrate/medium
        - Left/right, partial/full, portion of shoe
        - Tread design
        - Specific features (possible wear, RACs)
        - Limitations/interferences
            - Distortion (saturation, movement, etc.)
            - Overlapping impressions
            - Substrate
            - Damage to physical item (broken cast, etc.)
        - Suitability for comparison to known shoes

## 2.1.1.4 Known footwear evidence

### 2.1.1.4.1 Inventory (FA descriptions and/or worksheet and/or photos), if applicable

- Original packaging
  - Including any inner packaging
- Original packaging/item condition
  - Sealed, damaged, etc.
- Collection information including, but not limited to
  - Recovery/source information of evidence
- Inventory contents and assign identifiers to each item of evidence
- Evidence discrepancies

### 2.1.1.4.2 Observations and Documentation

- Make, model, size, color
  - Can perform search (Internet, FPX, etc.) to determine model name
- Photograph tag information
- Condition/special circumstances
  - Worn, dirty, clean, etc.
  - Items inside footwear
- Outsole wear
- Randomly acquired characteristics
- Search for biological and/or trace materials for possible collection, if applicable
  - Collect and generate evidence as needed
- General photographs
  - Uppers, outsoles, tags
- Tread design (photograph is sufficient)

### 2.1.1.4.3 Test Impressions (if applicable)

- Clean outsole if needed
  - Retain removed material for potential comparisons, as applicable to the case
- Questioned evidence-dependent
  - Two-dimensional, three-dimensional, etc.
- If laboratory-generated materials (e.g. Bio-Foam, casts, etc.) are too large to be retained in a case jacket, create evidence in FA for return to agency

## 2.1.1.5 Prepare questioned and known evidence for comparison

### 2.1.1.5.1 Digital processing/printing

- Select impressions/images for further processing (per impression)
  - For cases with multiple impressions of the same tread design, selection based on probative value assessments and examiner discretion
- Digitally process in Adobe Photoshop
  - Perform on a ***copy*** of the original digital image

  - Ensure history log is enabled (detailed)
  - Calibrate image using scale
  - Techniques to improve contrast/visibility/etc.
- Print
- Save image
  - Copy of original
  - Lossless file type (*.tif, *.psd, etc.)
- Verify calibration on printed image using TL-approved scale

#### 2.1.1.5.2 Make transparent overlays (if applicable)

- Photocopied or hand-traced
- Verify size reproduction (for photocopies)

### 2.1.1.6 Comparisons

#### 2.1.1.6.1 Conduct visual comparison

- Side-by-side, overlay, digital superimposition, etc.

#### 2.1.1.6.2 Examine and document correspondence or disagreement of the following:

- Tread design
- Physical size
- Wear characteristics
  - General, specific
- Randomly acquired characteristics

#### 2.1.1.6.3 Document/reiterate interferences and limiting factors

- Effect on examination
- Effect on conclusion/opinion

#### 2.1.1.6.4 Select appropriate conclusion level

### 2.1.1.7 Compile supporting documentation

#### 2.1.1.7.1 Object Repository

- Email communication (put in Case OR; note in Case Record comments)
- General documentation images
  - Contact sheets of any submitted digital evidence
  - Physical items of questioned evidence
  - Known footwear
- Supporting documentation for the conclusion(s) reached
  - Digitally processed images (TIFF file format)

- Test impression (*.jpg, *.pdf, etc.), if produced
- Marked areas of interest or comparison, as applicable (PowerPoint, scanned notes, etc.)

#### 2.1.1.7.2 Case Jacket

- Test impressions/overlays, disc of images, 1:1 printed images
- Document that it will be retained

### 2.1.1.8 Generate Report

#### 2.1.1.8.1 Evidence received list – ensure appropriate evidence is listed

- Specify items generated in laboratory
- Any listed items that were received, but not examined must be addressed
  - Examples: within Evidence Received/Generated list as "(not examined)", within Results section of report, within Disposition of Evidence section

#### 2.1.1.8.2 Introduction (description of evidence received and/or examination requested)

#### 2.1.1.8.3 Methods (e.g. visual comparison)

#### 2.1.1.8.4 Results (also ensure consistency between Report and Main Form page of Worksheet):

- Observations
  - Correspondences/non-correspondences
  - Limitations
- Conclusion/association level
- Opinion
- Population statement

#### 2.1.1.8.5 Images or charts/tables, as applicable

- If included, a description referencing the images should be present
- Consider including qualification as to image scaling/size in image caption

#### 2.1.1.8.6 Association Scale

#### 2.1.1.8.7 Evidence disposition

### 2.1.1.9 Review process

#### 2.1.1.9.1 Self-review of case record contents prior to tech/admin reviews

#### 2.1.1.9.2 Assign tech reviewer and send case jacket, as needed

#### 2.1.1.9.3 Assign admin reviewer after completion of tech review

### 2.1.1.10 Case completion:

#### 2.1.1.10.1 Package and seal evidence post-tech review

#### 2.1.1.10.2 Store evidence (physically and in FA)

#### 2.1.1.10.3 Store case jacket

## 2.1.2 Tire Examination

The following workflow represents the expected progression through a tire examination. The steps are considered to be required unless described otherwise or are not applicable.

See further instructions and more detailed procedures below and in other parts of this manual.

### 2.1.2.1 Case evaluation

#### 2.1.2.1.1 Triage, as needed

- Cursory evaluation of evidence
  - Maintain chain of custody
  - Document evaluation/suitability in OR file
- Communication with agency
  - Submission of vehicle/known tires/known tire impressions (partial versus full-rotation) based on quality of submitted evidence
  - Retention of known tires based on quality of submitted evidence

#### 2.1.2.1.2 Review FSD-007

- Ensure appropriate exam is checked off
- Case details filled out; examination request is clearly documented

#### 2.1.2.1.3 Ensure all relevant evidence is available

- Request all available forms of the questioned evidence (e.g. casts, physical items, digital images)
- Determine if elimination tires (from agency; CSRT documentation) have been documented; request as needed

#### 2.1.2.1.4 Evaluate if items need to be processed by other units

#### 2.1.2.1.5 Ensure case records/exam types are appropriate

#### 2.1.2.1.6 If digital images are submitted via email: create a disc containing the images, enter it as evidence in FA, and document emailed communication

### 2.1.2.2 Forensic Advantage

#### 2.1.2.2.3 Itemize/breakdown evidence

#### 2.1.2.2.4 Assign evidence to case record

#### 2.1.2.2.5 Add evidence to/create worksheet

### 2.1.2.3 Questioned evidence

#### 2.1.2.3.1 Inventory (FA descriptions and/or worksheet and/or photos), if applicable

- Original packaging
  - Including any inner packaging
- Original packaging/item condition
  - Sealed, damaged, etc.
- Collection information including, but not limited to
  - Recovery location of evidence (as noted on FSD-007 and/or packaging and/or item)
- Inventory contents and assign identifiers to each item of evidence
- Description of contents to distinguish from other similar items
- Evidence discrepancies
  - Between FA/FSD-007 and evidence
  - Between agency markings and evidence within

### 2.1.2.3.2 Evidence processing

- Documentation of digital image evidence
  - Create contact sheet/PowerPoint/PDF depicting entire original contents with file names/original image #s for Case Record OR
    - Images in multiple file formats do not need to be depicted in all formats
  - Image numbers
    - File format (*.jpg, *.tif, RAW, etc.)
  - Limitations/interferences of submitted images (scale, alignment, exposure, etc.)
  - Digital processing (e.g. Adobe Photoshop), if needed for visualization
    - Perform on a ***copy*** of the original digital image
  - Impression descriptions
    - Assign letters/#s if applicable
    - Substrate/medium
    - Tread design (# ribs/grooves, sidewall features, etc.)
    - Specific features (possible wear, RACs)
    - Limitations/interferences
      - Distortion (saturation, movement, etc.)
      - Overlapping impressions
      - Submitted images (scale, alignment, exposure, resolution, etc.)
      - Substrate
    - Suitability for comparison to known tires
- Physical evidence
  - Visual assessment
    - Visible impressions
    - Substrate/medium considerations
      - Clean cast, e.g.
      - Examine interior side of clothing items
    - Additional exam types, if applicable
  - Photography
    - General
    - Examination-quality, if applicable
      - Use TL-approved scale
  - Enhancement methods, if applicable
    - Lighting (oblique, ALS, etc.)
    - Powder processing
    - Chemical methods
    - Lifting
  - Examination-quality photography (after each enhancement method, as applicable)
    - Use TL-approved scale
  - Create relevant evidence in FA (evidence generated in laboratory)
    - E.g., discs of exam-quality images taken in lab, lifts taken of submitted objects, etc.
    - Ensure evidence is generated under the correct submission number
  - Impression descriptions
    - Assign letters/#s if applicable
    - Substrate/medium
    - Tread design (# ribs/grooves, sidewall features, etc.)
    - Specific features (possible wear, RACs)

- Limitations/interferences
  - Distortion (saturation, movement, etc.)
  - Overlapping impressions
  - Substrate
  - Damage to physical item (broken cast, etc.)
- Suitability for comparison to known tires

## 2.1.2.4 Known tire evidence

### 2.1.2.4.1 Inventory (FA descriptions and/or worksheet and/or photos), if applicable

- Original packaging
  - Including any inner packaging
- Original packaging/item condition
  - Sealed, damaged, etc.
- Collection information including, but not limited to
  - Make, model, size, type, DOT information
  - Position on vehicle
  - Condition/special circumstances
  - Test impression collection method (inked, Vaseline/powdered, etc.)
  - Tread wear
  - General photographs of tires
- Inventory contents and assign identifiers to each item of evidence
- Evidence discrepancies

### 2.1.2.4.2 Submitted test impressions

- Observations and Documentation
  - Type of impression (full-rotation vs. partial)
  - Tread design (image/file in OR may suffice)
  - Tread wear, if discernible
  - Possible randomly acquired characteristics (must obtain tires to confirm)
  - Limitations/interferences
    - Quality of test impression
    - Markings indicating location of wear bar indicators, direction of travel, etc.

### 2.1.2.4.3 Submitted digital images

- Create contact sheet/PowerPoint/PDF depicting entire original contents with file names/original image #s for Case Record OR
  - Images in multiple file formats do not need to be depicted in all formats
- Observations and documentation
  - Document image numbers
    - File format (*.jpg, *.tif, RAW, etc.)
  - Tread design (image/file in OR may suffice)
  - Tread wear, if discernible
  - Possible randomly acquired characteristics (must obtain tires to confirm)

- Limitations/interferences of submitted images (scale, alignment, exposure, etc.)

#### 2.1.2.4.4 Submitted known tires

- Observations and Documentation
  - General photographs
  - Make, model, size, type, DOT information
  - Position on vehicle
  - Condition/special circumstances
  - Tread design (image/file in OR may suffice)
  - Tread wear
  - Randomly acquired characteristics
- Test Impressions (if applicable)
  - Test impressions should be obtained under load
  - Clean tread if needed
    - Retain removed material for potential comparisons, as applicable to the case
  - Questioned evidence-dependent
    - Two-dimensional, three-dimensional, etc.

### 2.1.2.5 Prepare questioned and known evidence for comparison

#### 2.1.2.5.1 Digital processing/printing

- Select impressions/images for further processing (per impression)
  - Selection based on tread design correspondence, probative value assessments, and examiner discretion
- Digitally process in Adobe Photoshop
  - Perform on a ***copy*** of the original image
  - Ensure history log is enabled (detailed)
  - Calibrate image using scale
  - Techniques to improve contrast/visibility/etc.
- Print (full length of impression/full tire rotation, as applicable)
- Save image
  - Copy of original
  - Lossless file type (*.tif, *.psd, etc.)
- Verify calibration on printed image using TL-approved scale

#### 2.1.2.5.2 Make transparent overlays (if applicable)

- Photocopied or hand-traced
- Verify size reproduction (for photocopies)

## 2.1.2.6 Comparisons

### 2.1.2.6.1 Conduct visual comparison

- Side-by-side, overlay, digital superimposition, etc.

### 2.1.2.6.2 Examine and document correspondence or disagreement of the following:

- Tread design
- Physical size
- Noise treatment
- Wear characteristics
    - General, specific
- Randomly acquired characteristics

### 2.1.2.6.3 Document/reiterate interferences and limiting factors

- Effect on examination
- Effect on conclusion/opinion

### 2.1.2.6.4 Select appropriate conclusion level

## 2.1.2.7 Compile supporting documentation

### 2.1.2.7.1 Object Repository

- Email communication (put in Case OR; note in Case Record comments)
- General documentation images
    - Contact sheets of any submitted digital evidence
    - Physical items of questioned evidence
    - Known tire(s)
- Supporting documentation for the conclusion(s) reached
    - Digitally processed images (TIFF file format)
    - Test impression (*.jpg, *.pdf, etc.), if produced (depicting tread design or representative of area compared)
    - Marked areas of interest or comparison, as applicable (PowerPoint, scanned notes, etc.)

### 2.1.2.7.2 Case Jacket

- Laboratory-generated materials (test impressions, overlays, tracings, etc.)
    - If materials are too large to be retained in a case jacket, create evidence in FA for return to agency
- Disc of images, 1:1 printed images

- Document that it will be retained

## 2.1.2.8 Generate Report

### 2.1.2.8.1 Evidence received list – ensure appropriate evidence is listed

- Specify items generated in laboratory
- Any listed items that were received, but not examined must be addressed
    - Examples: within Evidence Received/Generated list as “(not examined)”, within Results section of report, within Disposition of Evidence section

### 2.1.2.8.2 Introduction (description of evidence received and/or examination requested)

### 2.1.2.8.3 Methods (e.g. visual comparison)

### 2.1.2.8.4 Results (also ensure consistency between Report and Main Form page of Worksheet):

- Observations
    - Correspondences/non-correspondences
    - Limitations
- Conclusion/association level
- Opinion
- Population statement

### 2.1.2.8.5 Images or charts/tables, as applicable

- If included, a description referencing the images should be present
- Consider including qualification as to image scaling/size in image caption

#### 2.1.2.8.6 Association Scale

#### 2.1.2.8.7 Evidence disposition

### 2.1.2.9 Review process

#### 2.1.2.9.1 Self-review of case record contents prior to tech/admin reviews

#### 2.1.2.9.2 Assign tech reviewer and send case jacket, as needed

#### 2.1.2.9.3 Assign admin reviewer after completion of tech review

### 2.1.2.10 Case completion

#### 2.1.2.10.1 Package and seal evidence post-tech review

#### 2.1.2.10.2 Store evidence (physically and in FA)

#### 2.1.2.10.3 Store case jacket

## 2.2 Enhancement/Lifting

- All visible footwear impressions or tire tracks on submitted items should be photographed and their locations noted before any enhancement or lifting is attempted. Impressions should be re-photographed after any significant enhancement.
- The development of latent impressions or the enhancement/lifting of visible impressions should proceed according to a sequential processing scheme which takes into account the nature of the substrate and the impressions, as well as the effect of each enhancement technique on subsequent processing.
- Before attempting any enhancement technique on casework samples, an analyst should become familiar with it by practicing on test impressions and should have verified its effectiveness on the type of impression and substrate being processed.
- Some enhancement techniques which are not used on a routine basis by footwear examiners may be addressed in the latent print unit procedure manual (examples include ninhydrin and physical developer enhancement).

## 2.3 Photography

**Examination Quality Photography Rulers**

- Any ruler put into use as a scale for examination quality photography in the laboratory will be labeled on both sides (if applicable) with a unique identifier (example: NV#1a and NV#1b).
- In addition, before being put into use, both sides will be checked with a metal ruler that has a certificate of calibration (no expiration date), and that check will be recorded (certificate of calibration available onsite or in Qualtrax).
- The record of this check will include the laboratory ruler's unique identifier, date, serial number of the metal ruler checked against, and initials of examiner making the check. This record can be made directly on the laboratory ruler itself or documented elsewhere.
- A ruler not fitting a +/- .5mm tolerance over the entire length shall be discarded or clearly marked as not intended for examination quality photography.
- Checking the ruler once should be sufficient to meet the needs for the intended use, unless it becomes damaged or is exposed to extreme conditions such as very high or very low temperatures for an extended period of time. Discretion should be used in determining if further checking is warranted.
- Rulers checked, approved and labeled for use by the FSD Crime Scene Response Teams for examination quality photography are also acceptable for laboratory use.

**Photography**

Footwear and tire impressions should be photographed using the following examination quality photographic techniques:

- A professional SLR digital camera (manual focus, detachable flash with 6-foot cable or flash with remote capability, sufficient resolution, timer or shutter cable cord or other remote control) should be used. A copy stand or tripod should be used.
- Examination quality photographs should be taken as raw images. Set an appropriate ISO setting.
- All photographs should include a flat scale of a size comparable to the impression. If available, an L shaped scale which will allow size distortion in the photo to be judged is recommended. Photos should also include identifying information such as the case #, initials of the examiner, # of the impression (if applicable) and any other information deemed necessary.
- Impressions should be photographed with the camera parallel to the impression. Check this with a level (For impressions on angled surfaces, the best possible estimate should be made when orienting the camera, using an angle finder may be useful). Footwear impressions (with scale) should fill the frame of the camera's viewfinder. Tire tracks should be photographed so that the field of view encompasses no more than 15" to 18" of the impression at one time.
- Locate an area with crisp fine detail and use manual focus (focus on the bottom of the impression if it is 3-dimensional).
- In order to adequately highlight details of the impression appropriate side lighting, using a flash or other light source held at varying angles, should be employed. Recommend taking multiple photographs of each impression with lighting at different angles.
- Consider other lighting sources such as an alternate light source (ALS).
- Printed images of impressions to be compared should be made 1:1 whenever possible. If this is not possible (due to lack of a scale in the photograph or distortions in size from one part of the photograph to another) the image size can be approximated for purposes of pattern comparison. An exact comparison of size may be impossible in such cases.

## 2.4 Environmental Conditions

Photography of dust impressions whether on an object, or having been lifted onto a black background (electrostatic lift or black gel lifter) should be performed in a room that is darkened.

The use of enhancement techniques such as luminol and alternate light source should be utilized in a darkened room.

## 2.5 Casting

- Three dimensional impressions should normally be cast with dental stone. Alternate casting materials (e.g. sulfur, paraffin, silicone rubber) may be acceptable in some cases, but should only be used by examiners with experience in these specific techniques.
- Loose material in an impression should be removed prior to casting. Material imbedded in an impression should not be disturbed.
- Casting material should be poured in such a way as not to disturb the impression.
- When appropriate, a release agent or firming material (e.g. Sno-Print Wax, hair spray, clear lacquer) should be applied to the impression prior to casting. When casting impressions in snow, cold water and a thicker dental stone mix is recommended.
- Casts should be cleaned with water and a soft brush or other tool which will not scratch the cast.

## 2.6 Known Impressions

- Also see IMP-PM 8.0 Known Impressions
- Prior to production of test impressions, footwear/tires should be examined for any relevant trace evidence (e.g. fibers, soil, glass). Such evidence should only be collected after an evaluation of the possible effect on the subsequent exam
- Known impressions may be produced in any of a number of ways. An examiner should have validated and practiced a technique before using it on evidence footwear or tires.
- Known impressions should be produced for all shoes or tires used for comparison. Known impressions are normally a dark impression on a light background, although in cases of obvious dissimilarity, it may not be necessary to create test impressions.
- In cases where the evidence impression is 3-dimensional, production of a 3-dimensonal test impression may also be useful.
- If known impressions on clear plastic are produced by photocopying, a comparison to the original test impression, or verification of 1:1 reproducing by the photocopier by including a scale, must be made to verify accurate size reproduction.
- Various actions used in making evidence impressions (e.g. kicking, stomping, skidding) should be kept in mind when producing and using known impressions.
- Known impressions of tires must be made with the tires on a vehicle, if possible.

## 2.7 Examination

- In every case, detailed notes should be prepared, listing the evidence received and documenting all processing, photography and comparisons.

- Prior to conducting a comparison, the questioned impression(s) shall be examined to identify and document characteristics that may be suitable for comparison.
- Whenever possible, examinations/comparisons should employ the actual shoes or tires and the original impressions, as well as known impressions and photographs.
- The comparison process should include the following steps in sequence (or until exclusion is shown):
    - Direct visual comparison of tread pattern. Care should be taken to examine for and recognize possible negative impressions (impressions that result from the removal of a substance from a substrate by a shoe outsole or tire tread).
    - Use of measurements and/or overlays of known impressions for more detailed comparison of tread pattern, size of pattern area, areas of general wear and any other class characteristics.
    - Identification of specific randomly acquired (RACs) characteristics in common between the evidence impression and the shoe or tire.

# 2.8 Conclusions and Opinions - Report Content

## 2.8.1 Range of Conclusions

The SWGTREAD Range of Conclusions Standard for Footwear and Tire Impression Examinations (03/2013) from the Scientific Working Group for Shoeprint and Tire Tread Evidence will be used as a guideline for defining the types of, and the range of, conclusions applicable to footwear and tire impression examinations. Also see www.TreadForensics.com

The following is an excerpt from that standard and includes the range of conclusions descriptions along with opinion level descriptions (**see 2.8.2 for scale format to place into reports**):

**Lacks sufficient detail**

No comparison was conducted: the examiner determined there were no discernible questioned footwear/tire impressions or features present.

- This opinion applies when there is insufficient detail to conduct any comparison. In the opinion of the examiner, an impression was either not present or the impression lacked sufficient detail for any comparison.

A comparison was conducted: the examiner determined that there was insufficient detail in the questioned impression for a meaningful conclusion. This opinion only applies to the known footwear or tire that was examined and does not necessarily preclude future examinations with other known footwear or tires.

- In the opinion of the examiner, the impression lacked sufficient detail for a meaningful conclusion regarding the particular known footwear outsole or tire tread.

**Exclusion** – This is the highest degree of non-association expressed in footwear and tire impression examinations. Sufficient differences were noted in the comparison of class and/or randomly acquired characteristics between the questioned impression and the known footwear or tire.

- In the opinion of the examiner, the particular known footwear or tire was not the source of, and did not make, the impression.

**Indications of non-association** – The questioned impression exhibits dissimilarities when compared to the known footwear or tire; however, the details or features were not sufficiently clear to permit an exclusion.

- In the opinion of the examiner, dissimilarities between the questioned impression and the known footwear or tire indicated non-association; however, the details or features were not sufficient to permit an exclusion.

**Limited association of class characteristics** – Some similar class characteristics were present; however, there were significant limiting factors in the questioned impression that did not permit a stronger association between the questioned impression and the known footwear or tire. These factors may include but were not limited to: insufficient detail, lack of scale, improper position of scale, improper photographic techniques, distortion or significant lengths of time between the date of the occurrence and when the footwear or tires were recovered that could account for a different degree of general wear. No confirmable differences were observed that could exclude the footwear or tire.

- In the opinion of the examiner, factors (such as those listed above) have limited the conclusion to a general association of some class characteristics. Other footwear or tires with the same class characteristics observed in the impression are included in the population of possible sources.

**Association of class characteristics** – The class characteristics of both design and physical size must correspond between the questioned impression and the known footwear or tire. Correspondence of general wear may also be present.

- In the opinion of the examiner, the known footwear or tire is a possible source of the questioned impression and therefore could have produced the impression. Other footwear or tires with the same class characteristics observed in the impression are included in the population of possible sources.

**High degree of association** – The questioned impression and known footwear or tire must correspond in the class characteristics of design, physical size, and general wear. For this degree of association there must also exist: (1) wear that, by virtue of its specific location, degree and orientation make it unusual and/or (2) one or more randomly acquired characteristics.

- In the opinion of the examiner, the characteristics observed exhibit strong associations between the questioned impression and known footwear or tire; however, the quality and/or quantity were insufficient for an identification. Other footwear or tires with the same class characteristics observed in the impression are included in the population of possible sources only if they display the same wear and/or randomly acquired characteristics observed in the questioned impression.

**Identification** – This is the highest degree of association expressed by a footwear and tire impression examiner. The questioned impression and the known footwear or tire share agreement of class and randomly acquired characteristics of sufficient quality and quantity.

- In the opinion of the examiner, the particular known footwear or tire was the source of, and made, the questioned impression. Another item of footwear or tire being the source of the impression is considered a practical impossibility.

## 2.8.2 Report Content Requirements Regarding Conclusions/Opinions

The scale below is intended to outline the range of conclusions that may be reached in a footwear/ tire track examination and general criteria underlying them. It is directly drawn from the Scientific Working Group for Shoeprint and Tire Tread Evidence (SWGTREAD) Range of Conclusions Standard for Footwear and Tire Impression Examinations (03/2013) – See above

**Report Conclusion Requirements:**

- If a comparison is made, the association scale below shall be placed into the body of the laboratory report sent to the submitting agency.
- Inclusion of reasoning, specific to each comparison made, as to why a conclusion was drawn.
- When an association is made, proper qualifying statements shall be included.

Examples of qualifying statements are listed in the SWGTREAD standard excerpt above, beginning with "In the opinion of the examiner…"

**Scale to be placed into the report:**

**<u>Association Scale for Footwear and Tire Impressions</u>**

*The following descriptions are meant to provide context to the levels of opinions reached in footwear and tire impression comparisons. Each level may not include every variable in every case.*

**Lacks sufficient detail** – No comparison was conducted: the examiner determined there were no discernible questioned footwear/tire impressions or features present.

Or – A comparison was conducted: the examiner determined that there was insufficient detail in the questioned impression for a meaningful conclusion. This opinion only applies to the known footwear or tire that was examined and does not necessarily preclude future examinations with other known footwear or tires.

**Exclusion** – This is the highest degree of non-association expressed in footwear and tire impression examinations. Sufficient differences were noted in the comparison of class and/or randomly acquired characteristics between the questioned impression and the known footwear or tire.

**Indications of non-association** – The questioned impression exhibits dissimilarities when compared to the known footwear or tire; however, the details or features were not sufficiently clear to permit an exclusion.

**Limited association of class characteristics** – Some similar class characteristics were present; however, there were significant limiting factors in the questioned impression that did not permit a stronger association between the questioned impression and the known footwear or tire. These factors may include but were not limited to: insufficient detail, lack of scale, improper position of scale, improper photographic techniques, distortion or significant lengths of time between the date of the occurrence and when the footwear or tires were recovered that could account for a different degree of general wear. No confirmable differences were observed that could exclude the footwear or tire.

**Association of class characteristics** – The class characteristics of both design and physical size must correspond between the questioned impression and the known footwear or tire. Correspondence of general wear may also be present.

**High degree of association** – The questioned impression and known footwear or tire must correspond in the class characteristics of design, physical size, and general wear. For this degree of association there must also exist: (1) wear that, by virtue of its specific location, degree and orientation make it unusual and/or (2) one or more randomly acquired characteristics.

**Identification** – This is the highest degree of association expressed by a footwear and tire impression examiner. The questioned impression and the known footwear or tire share agreement of class and randomly acquired characteristics of sufficient quality and quantity.

## 2.9 Technical and Administrative Review

The technical review shall include but is not limited to the review of all examination documentation within the case record and the test report to ensure:

- Conformance with proper technical procedures (test methods) and applicable laboratory policies and procedures.
- Accuracy of test reports and that the data supports the results and/or conclusions in the test report.
- Associations are properly qualified in the test report.
- The test report contains all required information.

At a minimum, an administrative review shall include:

- A review of the test report for spelling and grammatical accuracy;
- A review of all administrative and examination records to ensure that the records are uniquely identified according to laboratory policy and/or procedure;
- A review of the test report to ensure that all key information is included.

## 2.10 Verifications of Identifications

All positive identifications shall be confirmed by the technical reviewer (i.e. the technical reviewer, by passing the technical review is verifying all conclusions, including any identifications).

## 2.11 References

Useful references materials can be found at www.TreadForensics.com

ASB Technical Report 097 - Terminology Used for Forensic Footwear and Tire Evidence, 1st Edition, 2019