



Footwear and Tire Track Impression Submission Guidelines

General Submission Guidelines

The Colorado Bureau of Investigation Forensic Services (CBI-FS) recognizes that each case is distinct. These submission guidelines will address typical situations encountered by your agency but cannot speak to all of the unique circumstances that are often exclusive to a particular case. With this understanding, the CBI-FS provides the following information to assist you in the submission of your evidence.

Contact Information

Please feel free to contact us at any time regarding your evidence submission.

cdps_cbi_laboratory_foot_tire_analysts@state.co.us

Types of Crimes/Case Types

Except when a crime is committed within the suspect's own home, the suspect generally has to travel to the crime scene either on foot or by vehicle. This means there is a potential for footwear or tire track impressions, whether visible or not, to be left behind. For this reason, all crime scenes of any crime type should be searched for such impressions.

Types of Exams and Evidence

Comparative Exam

- Requires a questioned impression and a known source for comparison.
 - If the questioned impression is a footwear impression, known footwear should be submitted for comparison.
 - If the questioned impression is a tire track, known impressions of the known tires should be made while the tires are still on the suspect vehicle. The tires should then be removed from the vehicle and submitted as well.
- Photos of the known footwear or tire are not sufficient for a complete examination.

Make/Model Search

- If known footwear or tires have not yet been identified for a comparative exam, the questioned impressions can be submitted for a make/model search in order to attempt to provide an investigative lead in the case.
- Submit all questioned impression evidence for analysis.
- The analyst will use available databases or resources to attempt to identify a make and model of the questioned footwear or tire.
 - In some cases the questioned impression may not have enough detail to be suitable for such a search. In those cases the questioned impression may still be suitable for a comparative exam if a known is identified in the future.

- In some cases, the questioned footwear or tire may not be included in the available databases preventing a possible make/model lead. In those cases the questioned impression may still be suitable for a comparative exam if a known is identified in the future.

Sample Collection Recommendations

Questioned impressions can exist in multiple forms including:

- Latent (invisible to the naked eye)
 - These typically require oblique lighting, powder application, or chemical enhancement to view.
- Patent (visible to the naked eye)
 - 2-D impressions – an impression in dust, blood, mud or another substance transferred onto a flat or semi-flat surface. These impressions generally do not have an element of depth to the impression.
 - Dry-Origin – deposits of loose dirt or dust off of the tread of the footwear or tire which is not physically adhering to the surface it is deposited on. These can be easily disturbed, but can also generally be easily lifted using a gel lift, large adhesive lift, or electrostatic dust lifter (ESDL).
 - Wet-Origin – deposits of mud, dirty water, blood, or another substance which have since dried and are adhering to the surface the impression was deposited on. These are more fixed but the impression can still be scraped or scuffed away if not careful. Collection may require cutting out the impression from the deposited surface.
 - Inverse or Negative Impressions – these typically take place when a surface is covered in a thin layer of dust or dirt and walking or driving across that surface results in removing that thin layer in the areas where the outsole of the footwear or tread of the tire came in contact with the surface.
 - 3-D impressions – an impression in a moldable surface such as but not limited to: dirt, mud, sand, or snow. These impressions have an element of depth to the impression.

Requirements of Questioned Impressions:

- Always take **comparison quality photographs** of any questioned impressions prior to attempting any additional manipulation, and after each step if processing is used.
 - Failure to submit comparison quality photographs will severely limit the conclusions that can be made in a comparative examination.
 - For best photography practices, please refer to [ANSI/ASB 050 Best Practice Recommendation for Photographic Documentation of Footwear and Tire Impression Evidence](#)
 - All images should be submitted on a disc or thumb drive for review and examination.
 - Minimum resolution requirements: 300ppi; 600ppi in RAW or TIFF format preferred.
 - Photos taken on phones are not comparison quality.
- For tire impressions, also take multiple overall photographs of the labeled impressions in the scene which may help to identify certain impressions to certain locations on a vehicle (i.e. this track could only be made by the front driver side tire).
- If some sort of processing is performed such as dusting with fingerprint powder or using a chemical enhancer such as luminol, photographically document the impressions before and after each process and inform the footwear/tire impression analyst of the steps taken.
- For guidance on collection of impressions at scenes, please refer to:
 - [ANSI/ASB 052: Best Practice Recommendation for the Detection and Collection of Footwear and Tire Impression Evidence](#)

- ANSI/ASB 126: Best Practice Recommendation for Casting Footwear and Tire Impression Evidence at the Crime Scene
- ANSI/ASB 049: Best Practice Recommendation for Lifting of Footwear and Tire Impressions
- Ensure the images taken prior to collection and the physical lift(s) and/or cast(s) are both submitted.

Requirements of Known Footwear

- Submit known footwear for comparison to questioned impressions.
 - Do not attempt to clean footwear or remove adhering or embedded debris.

Requirements of Known Tires

- Known impressions should be created from each tire from the suspect vehicle prior to removing the tires from the vehicle.
 - It is important that the tires are mounted on the suspect vehicle for this process in order to produce a comparable known impression under a similar weight load.
 - For large trucks and commercial vehicles with dual tire mounts, ensure the tires are not taken off the rim prior to creating the known impression, as the way they are mounted in relation to one another is critical in the examination step.
 - If the tires have already been removed from the vehicle prior to apprehension, they should be placed back on the vehicle for collection (if available) or another vehicle of similar size if the suspect vehicle is damaged or unavailable. If the location they were originally in is unknown, make note of this and the location each tire was mounted in on the vehicle for the known impression collection.
 - Do not forget the spare tire. Many larger vehicles have full size spare tires which may have the same tread pattern as the mounted tires. Once known impressions have been made from all mounted tires, locate the spare tire(s), mount them, and create a known impression of each as well.
 - If the spare tire is of a smaller donut design and does not resemble any of the questioned impressions, photograph the tire sidewall and tread design with a scale for exclusionary purposes and submit these photos to the lab on a disc or thumb drive.
- Create full circumference known impressions of each tire
 - For guidance, refer to the tire exemplar collection procedure and video on the CBI Forensics website. <https://cbi.colorado.gov/sections/forensic-services>
- Once known impression collection is complete, it is best practice to remove the tires from the vehicle and also submit the tires for comparison. An identification (the highest level of association) of a known tire to a questioned impression rarely can be made without submitting the physical known tire.
 - Clearly mark each tire with the location it was removed from on the vehicle. (Including the spare if applicable)
 - Contact the CBI evidence staff prior to submission to coordinate drop-off of large items such as tires.

Additional Considerations

- Use appropriate scales. The scale should be a minimum of 300mm in length (approximately 1 foot) and completely flat.
 - 150x300mm L-scales are preferred.
 - Never use hinged or curved scales
- Do not make any attempts to clean any adhering dirt or debris from a lifted cast prior to submission. The cast will be cleaned by the analyst in the laboratory.

Summary

These guidelines are recommendations of what should be included in the initial evidence submission to the CBI-FS. In support of your agency and upon request, the CBI-FS will provide training on the proper collection and submission of evidence. Please see our General Submission Guidelines for an overview of the submission process.

Links

- <https://www.nist.gov/osac/subcommittees/footwear-tire>
- <https://forensiccoe.org/trace-evidence-collection-mobile-app/>