Unit 7: Casts and Impressions Notes

Casts and Impressions

By the end of this unit you will be able to:

- Provide examples of how impression evidence gives clues about:

  o The _____

  o _____ at the scene

  o _____ that occurred at the scene

- Distinguish among _____, _____, and _____ impressions

- Outline procedures for collecting impression evidence from _____

- Describe features of _____ and _____ to help identify:

  o Tire(s) or a vehicle's wheelbase

  o Track width

  o Turning diameter

- Compare and contrast skid marks for _____ events leading to a _____

- Summarize the methods used to produce an impression or cast

- Analyze impression evidence to determine if it is consistent with evidence from a crime scene

Types of Impressions

- _____ impressions: _____ when object picks up material and transfers it elsewhere

  o Paint, dust, soil, blood

- _____ impressions: _____ impressions but can be made visible using different techniques

  o Can be dusted or chemically treated to lift print

- _____ impressions: _____ and left in _____ materials and often preserved by making _____

  o Made in mud, snow, soil, congealing blood

Figure 16-1 *Examples of latent (left), patent (center), and plastic (right) impressions. The latent shoe impression (left) was made visible by dusting with orange powder and viewing with an orange filter and an alternate light source.*
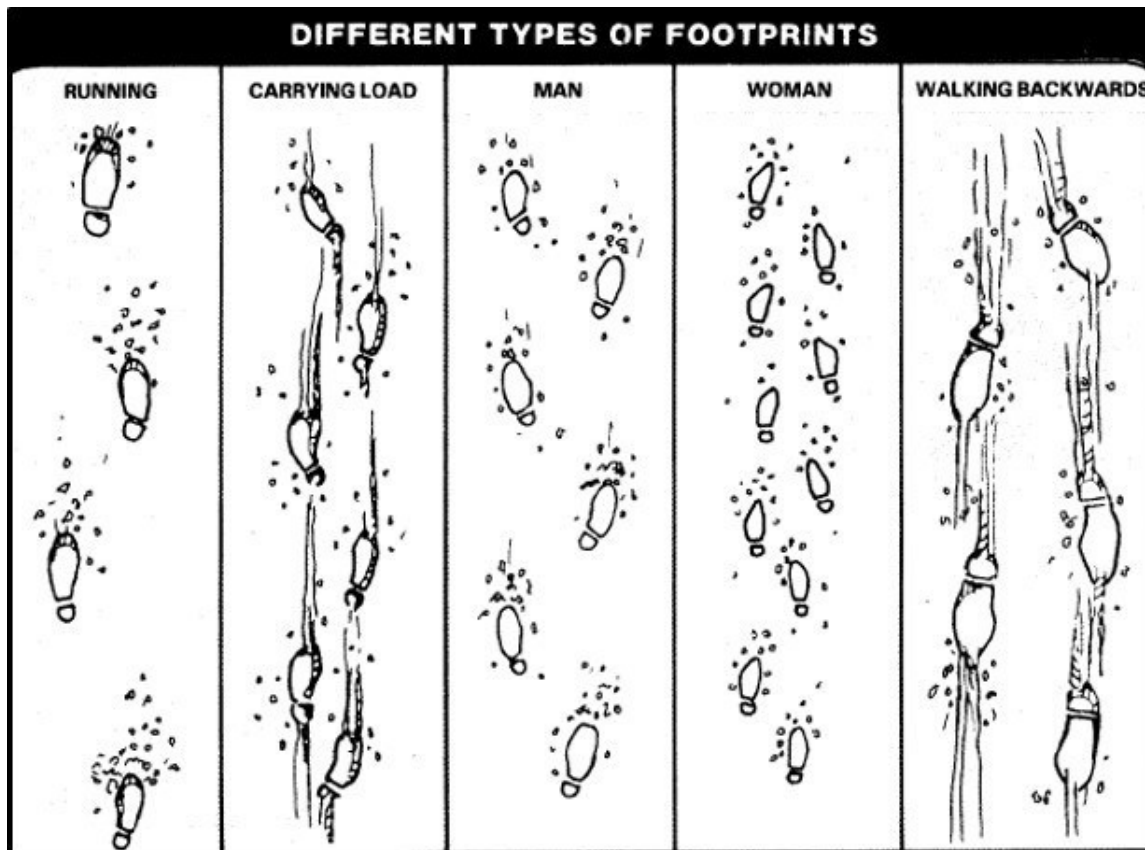
Photo of a Bloody Shoe Print

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Shoe and Foot Impressions

- Databases contain the names of specific manufacturers and _____ used to identify different types of shoes

- Crime-scene investigators can search the databases to find:

  o The _____ that produced the sole pattern

  o The company that _____ the sole for the shoes

- If a large number of manufacturers use the same _____ patterns, it complicates sole identification

Gait and Tracks

- Examining tracks can reveal:

  o If a person was _____ or walking

  o If someone is _____

  o The likelihood that somebody is _____

DIFFERENT TYPES OF FOOTPRINTS

| RUNNING | CARRYING LOAD | MAN | WOMAN | WALKING BACKWARDS |

Collection of Shoe Impression Evidence

- Due to the _____ nature of these impressions, it is important to get pictures first!

- This way, there is evidence that the print was at the _____

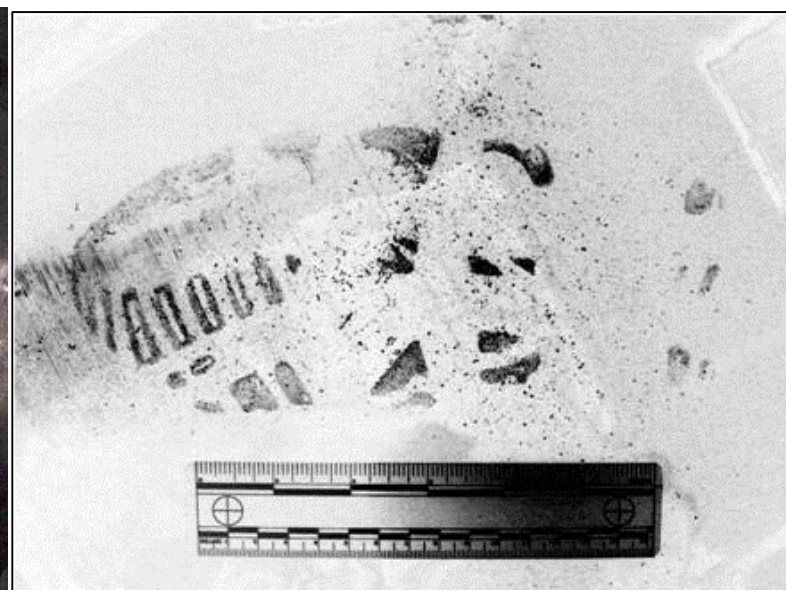**Figure 16-4** *Impression evidence is documented before any attempt is made at casting.*
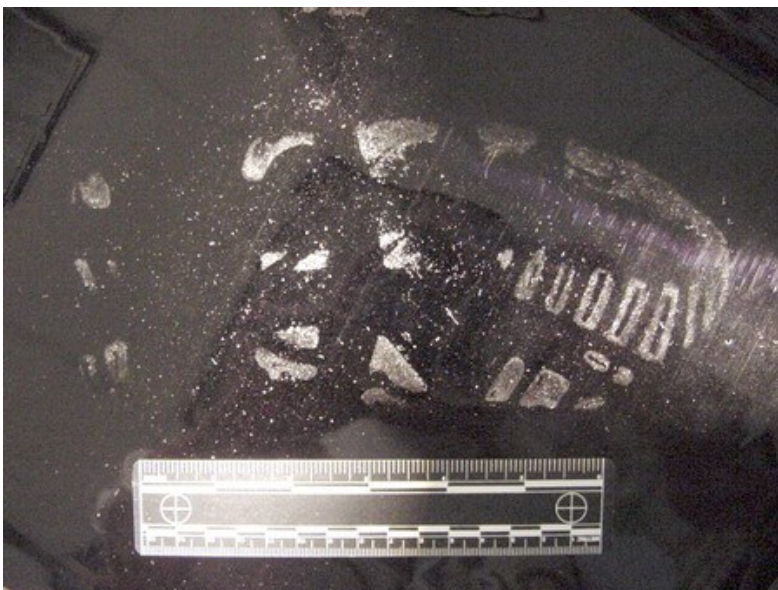
Latent Impressions

- Can also be seen by using several techniques

    o Luminol

    o _____ and lifting

    o _____ lifting

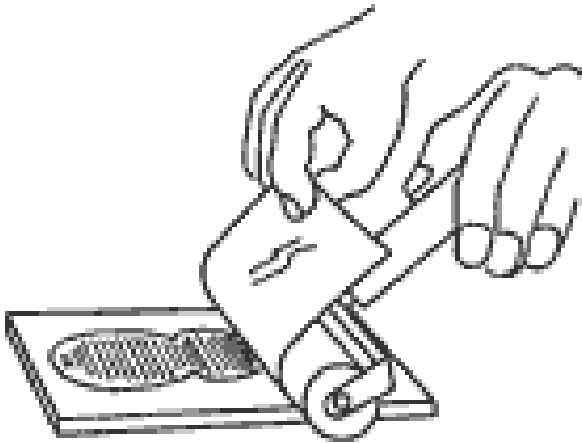   o _____-lifting

    o Combinations of lifting

Latent Impressions: Electrostatic Dusting and Lifting

- Can reveal _____ left by a dry shoe

1. Place film on print

2. _____ a piece of plastic film

3. _____ is attracted to charged plastic

4. Use special light source

- Forms a mirror image of the print

Latent Impressions: Gel Lifting

- A layer of gel sandwiched between _____ and a _____ cover sheet

- It is thick and _____ to conform to _____

- Best used on _____ or prints that have been developed with fingerprint powder

- Can be used where can't use tape such as _____

Latent Impressions: Casting Plastic Impressions

- Impressions made in soft materials can be _____

- Dental stone often used, but we will use _____

- Ex: Snow

  - Use low temp materials

  - Can use hairspray to hold

  - Often dental stone used

    - _____ water used

    - Hardens faster

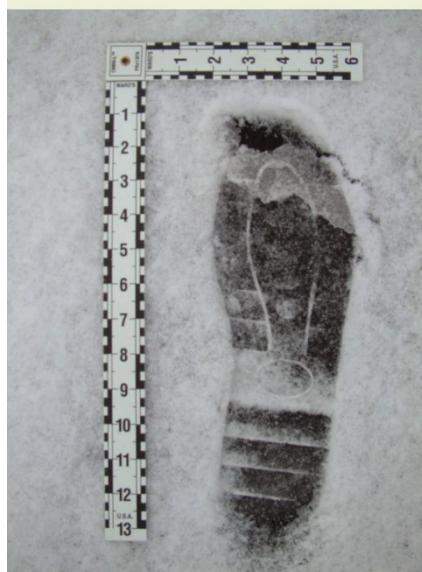Figure 16-7 *Prints in snow must be photographed before casting.*

Figure 16-6 *Plaster cast of a plastic impression of a shoe.*
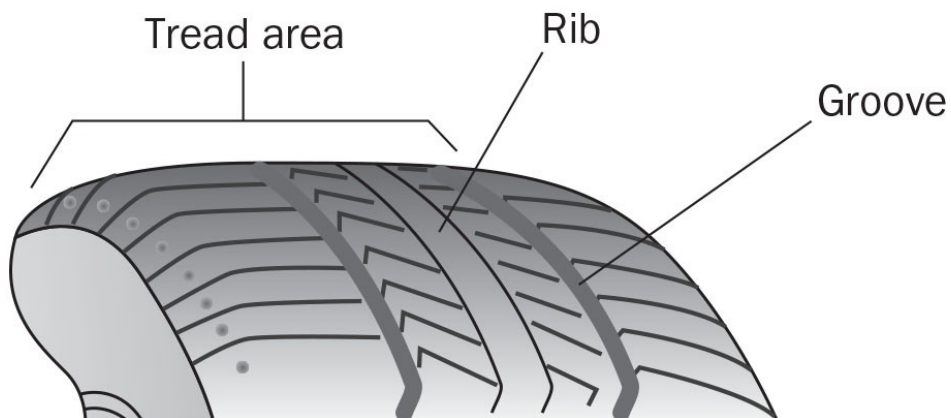
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Tire Treads and Impressions

- Tire tread patterns and measurements _____ help

  o Link a suspect to victim or location

  o _____ of vehicle

- Nature of impression can determine:

  o _____ vehicle was driven

  o Tire _____

  o Level of tire _____

Recording Tread Impressions

- Usually _____ pattern

- _____ (ridges around tire)

- _____ (gaps for gripping road)

- _____ (indentations along whole tire)

- To obtain impression of tire for comparison to crime scene:

  o Ink tire and drive over at least _____ of paper on smooth pavement (1 rotation)

  o Note imperfections:

    ▪ Cuts   - Bulges
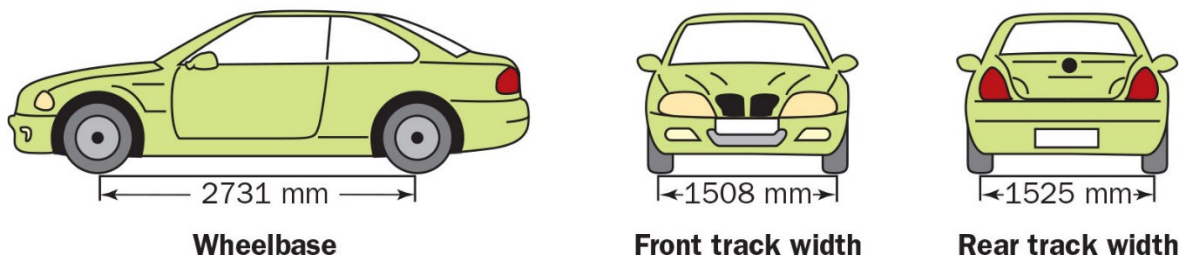
    ▪ _____   - _____ items

Figure 16-10 *A tire tread.*

Tread area   Rib   Groove
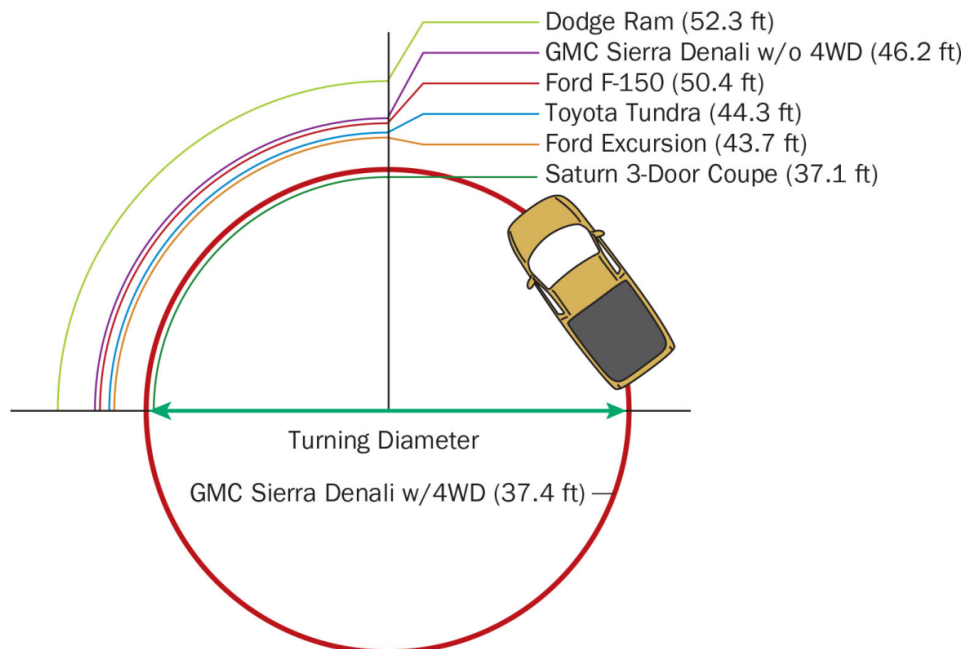
Identifying a Vehicle

- Tire impression not enough!

- Can have _____ kind of tire on _____ cars

- Measure:

    o _____

    o _____

    o Rear track width

Figure 16-11 *Every make and model of vehicle has its own track width and wheelbase measurements.*

← 2731 mm →	←1508 mm→	←1525 mm→
Wheelbase	**Front track width**	**Rear track width**

- _____ (also can use turning radius)
    o Smallest circle a car can drive
- Longer wheelbase = larger turning diameter
- Investigators use a database of these measurements to compare markings

Figure 16-12 *Tread marks revealing turning diameter can help identify a vehicle. Which of these vehicles has the smallest turning diameter?*
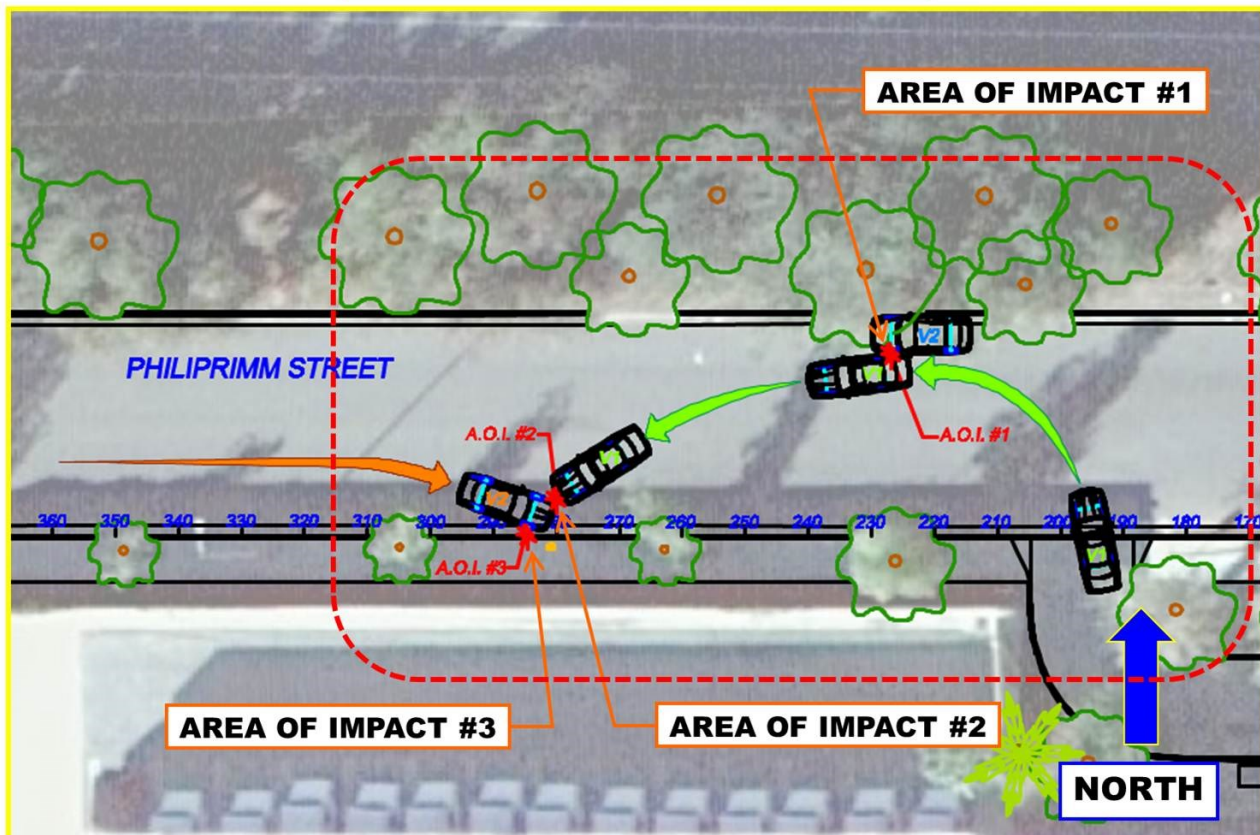

Dodge Ram (52.3 ft)
GMC Sierra Denali w/o 4WD (46.2 ft)
Ford F-150 (50.4 ft)
Toyota Tundra (44.3 ft)
Ford Excursion (43.7 ft)
Saturn 3-Door Coupe (37.1 ft)

Turning Diameter
GMC Sierra Denali w/4WD (37.4 ft)

Accident Reconstruction

- The goal of accident reconstruction is to determine:

    o _____ happened

    o _____ it happened

    o _____ it happened

    o Why it happened

    o Who was involved

    o Who was at _____

Figure 16-14 *In a multiple-car collision, skid marks can help to determine the path and speed of each vehicle.*

David Frazier/PhotoEdit

ACCIDENT SCENE DIAGRAM

AREA OF IMPACT #1

PHILIPRIMM STREET

A.O.I. #2

A.O.I. #1

360 350 340 330 320 310 300 290 280 270 260 250 240 230 220 210 200 190 180 170

A.O.I. #3

AREA OF IMPACT #3

AREA OF IMPACT #2

NORTH

Accident Reconstruction – Tire Marks

- If one or more wheels _____, one of three basic types of tire marks are made:

    1. _____ marks (braking tires lock up)

    2. _____ marks (tires slide sideways)

    3. Tire scrubs (tires marks during or immediately after impact)

Tire Marks – Skid Marks

- Braking suddenly and wheels lock

- Provides evidence of _____ brakes applied

- Enables a calculation of _____ (velocity)

Figure 16-15 *Skid marks.*

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Tire Marks – Yaw Marks

- Car travels in curved path faster than able to handle – _____

- Occurs when tire and road surfaces melt from high temps

- Often has _____ and _____ tires

- Always _____

Tire Marks – Tire Scrubs

- _____ or overloaded tires right when they hit pavement or just after

- Usually curved and irregular in _____ and may have stripes

- Determined _____

Dental Impressions

- Generally _____ considered to be _____ evidence

  - Alone, not enough to convict but helpful

- Often used for:

  - _____

    - Using impressions

    - Using DNA

  - _____

    - As many as 76 points of comparison may be used such as:

      - Number of teeth (or missing teeth)

      - _____ of teeth

- Chipped or surface indentations

- Angle of mouth _____

- Distances _____ teeth

Figure 16-16 *The difference in tooth placement is used to individualize an impression.*

Collecting and Analyzing Dental Evidence

- Bite marks should be photographed as soon as possible.

- Photographs should include a ruler to establish a reference for size.

- If possible, swab the bite mark with a sterile cotton swab to obtain DNA evidence.

Summary

- There are three types of impressions

  - Patent impressions
  - Latent impressions
  - Plastic impressions

- Generally, any impression evidence made by an object will be considered class evidence unless it has individualizing features

- Tire impressions may provide:

  - Information to help identify a vehicle

- o Evidence about events that occurred before an accident
- Tire impressions such as skid marks, yaw marks, or scrubs can give evidence of:
  - o Car's turning diameter
  - o Track width
  - o Wheelbase
  - o Speed
  - o Direction
  - o When brakes are used
- Dental impressions are considered class evidence
  - o Reliability depends on:
    - Number of points of comparison
    - Clarity of the impression
- Photographs of original impression always accompany cast/impression or record used in court
- Impressions may be used several ways:
  - o Help identify a person or object
  - o Determine actions that occurred in committing the crime
  - o Verify accounts given by eyewitnesses
- https://quizlet.com/11539696/forensic-tire-impressions-flash-cards/
- https://quizlet.com/111102654/forensics-impression-ch4-flash-cards/
- https://quizlet.com/75013672/impressions-forensics-flash-cards/
- https://quizlet.com/83650990/casting-and-impressions-forensics-flash-cards/