OSAC 2025-N-0004
Standard Criteria for Crime Scene Reconstruction

Crime Scene Investigation & Reconstruction Subcommittee
Scene Examination Scientific Area Committee
Organization of Scientific Area Committees (OSAC) for Forensic Science

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Draft OSAC Proposed Standard

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This OSAC Proposed Standard was written by the Organization of Scientific Area Committees (OSAC) for Forensic Science following a process that includes an open comment period. This Proposed Standard will be submitted to a standard developing organization and is subject to change.

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Forward

This standard is meant for investigators who are responsible for performing crime scene reconstruction (CSR). Crime scene reconstruction is a discipline rooted in the scientific method that collects and analyzes the evidence left during an incident to build an understanding of the distinct events that occurred. To do so, a reconstructionist will conduct an evaluation of the available evidence and its context within the scene.

The term reconstruction is often confused or improperly used to describe activities such as crime scene investigation, reenactments, and criminal profiling. This standard is presented to define the basic characteristics of CSR, provide guidance on CSR processes, and distinguish CSR from other investigative disciplines.

This document should be utilized in conjunction with local regulations and any requirements set forth by entities examining collected evidence to inform or augment policies relating to collecting and preserving physical evidence.

This document has been drafted by the Forensic Science Crime Scene Investigation and Reconstruction Subcommittee of the Organization of Scientific Area Committees (OSAC) for Forensic Science through a consensus process.

This standard cannot replace knowledge, skills, or abilities acquired through appropriate education, training, empirical testing, and experience and should be used in conjunction with sound professional judgment. It is the responsibility of the appropriate agency to develop a full health and safety plan.

All hyperlinks and web addresses shown in this document are current as the publication date of this standard.

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Keywords: *crime scene reconstruction, investigative question, reenactment, scientific method, chronology*

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Standard Criteria for Crime Scene Reconstruction

1 Scope

This document defines the basic characteristics of Crime Scene Reconstruction (CSR). It is intended to distinguish CSR from other forensic and investigative efforts. This document is not meant to provide complete protocols for conducting a reconstruction.

2 Normative References

ANSI/ASB Standard 159 Standard for Scene Investigation and Reconstruction Foundational Principles, 2024, 1st Ed.

See Annex A (bibliography) for informative references.

3 Terms and Definitions

For purposes of this document, the following definitions and acronyms apply.

NOTE: In a situation that involves a potentially criminal act, definitions 3.19 through 3.22 would be preceded by "crime" (e.g., crime scene investigator).

3.1
analyst
A qualified individual who conducts and/or directs the analysis of forensic casework samples, interprets data, reaches conclusions, and/or issues reports concerning conclusions. (OSAC Lexicon)

3.2
assumption
The belief that something is true without direct physical proof.

3.3
chronology
A series of events arranged in the order of their occurrence.

3.3.1
absolute chronology
A series of events arranged using specific, verifiable times.

3.3.2
relative chronology

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A series of events arranged with respect to each other's occurrence, but not necessarily to a specific time. Also known as sequencing.

3.4

cognitive bias

The class of effects by which an individual's preexisting beliefs, expectations, motives, and situational context may influence their collection, perception, or interpretation of information, or their resulting judgments, decisions, or confidence.

3.5

conclusion

A position reached after consideration of a set of facts or examination results. (OSAC Lexicon)

3.6

critical thinking

the process of using rational, and unbiased analysis to evaluate facts, evidence, and arguments.

3.7

empirical data

Factual data that is based on actual measurement, observation, or direct sensory experience rather than on theory. (NFPA 921)

3.8

event

A distinct component of an incident supported by physical evidence.

3.9

incident

The matter under investigation.

3.10

interpretation

Explanations for the observations, data, and calculations. (OSAC Lexicon)

3.11

observation

Recognizing and noting an occurrence. (OSAC Lexicon)

3.12

opinion

View, judgment, belief - takes into consideration other information in addition to observations, data, calculations, and interpretations. (OSAC Lexicon)

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3.13

physical evidence

Any material, object, or substance that can be collected or documented to inform the understanding of a scene. (OSAC 2021-N-0018)

3.14

recreation

See reenactment.

3.15

reenactment

The demonstration of presumed events that can be based, in part, on either physical or testimonial evidence.

3.16 3.16

result

The product of the forensic service provider. This term is broad and includes observations, data, calculations, interpretations, and opinions. (OSAC Lexicon)

3.17 3.17

scene

A place, an object, a person, or an animal that is subject to and/or requires forensic examination. (ANSI/ASB Standard 159)

3.18 3.18

scene context

The relationship of physical evidence to other items and the scene where it was found.

3.19 3.19

scene investigation

An examination of a scene to locate, document, process, collect, and preserve items of potential

evidentiary value. (ANSI/ASB Standard 159)

3.20 3.20

scene investigator

An individual, however named, who is responsible for performing elements of scene investigation. (ANSI/ASB Standard 159)

3.21 3.21

scene reconstruction

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The process to gain explicit knowledge of the series of events that surround a scene using deductive and inductive reasoning, physical evidence, scientific processes, and their interrelationships. (ANSI/ASB Standard 159)

3.22

scene reconstructionist

An individual, however named, who is responsible for performing elements of a scene reconstruction. (ANSI/ASB Standard 159)

3.23

scientific method

The systematic pursuit of knowledge involving the recognition and definition of a problem; the collection of data through observation and experimentation; analysis of the data; the formulation, evaluation and testing of a hypothesis; and, when possible, the selection of a final hypothesis. (OSAC Lexicon, NFPA 921)

3.24

sequence

see chronology

3.25

testimonial evidence

Information that originates from a statement(s) of an individual.

4 Overview

The phrase Crime Scene Reconstruction (CSR) has historically been incorporated into text books, articles, and the names of international associations. As reconstructions are most commonly undertaken when a situation involves a criminal act, the phrase Crime Scene Reconstruction and acronym CSR is used in this document. The word “crime” may be dropped in cases determined to be non-criminal in nature.

Crime Scene Investigation (CSI) focuses on the recognition, documentation, and collection of physical evidence as well as the documentation of factual observations that provide scene context. CSR generally occurs after the crime scene investigation and focuses on analysis of evidence, scene context, and integration of other examination results. Reconstruction often depends on the scientific and technical opinions of other analysts.

A CSR work product may be used as a mechanism to test statements made by subjects or witnesses and to test theories of the incident. CSR has historically guided public safety decisions and additional investigation and laboratory analysis requests.

ANSI/ASB Standard 159 Standard for Scene Investigation and Reconstruction - Foundational Principles shall be used in conjunction with this document because ANSI/ASB Standard 159

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provides the foundational principles upon which additional specific requirements, such as this document, will be based.

4.1 Crime scene investigation versus crime scene reconstruction

CSI and CSR often use common techniques and documentation. However, though some overlap may exist, the distinction between the two is found in their respective goals.

4.1.1 Scene Investigation

a) Includes one or more actions associated with the concept of processing a scene with the goal of data collection and preservation. Those actions may include:

i) Documentation of observations including items of evidence and those providing scene context.

ii) Identification, preservation, and collection of physical evidence.

b) Actions and concepts typically involved with reconstruction may be employed to locate additional evidence.

c) Issuance of a report of the scene processing.

i) Conclusions regarding reconstructive aspects of the scene are generally outside the scope of a scene investigation report.

4.1.2 Scene Reconstruction

a) Includes one or more actions associated with the holistic concept of reconstructing an incident with the goal of resolving investigative questions. Those actions may include:

i) The compilation and review of incident-related data

ii) Further analysis of physical evidence

iii) Further analysis of the scene

1. Further analysis for CSR may be performed using photographs, notes, diagrams, and other forms of documentation.

2. Although reconstruction efforts may be employed during initial scene processing, it is not uncommon for additional analysis of the scene to be conducted months or years after the occurrence of the incident.

i). Experimentation when necessary to resolve investigative questions.

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ii). Determination and presentation of the sequence of events.

iii). Issuance of a report when expert testimony is requested.

iv). Providing testimony.

4.2 Characteristics of Crime Scene Reconstruction

In CSR, an incident refers to the matter under investigation (e.g., homicide, officer-involved shooting, break-in, sexual assault). The incident is broken down into individual components that are referred to as events (e.g., a bloodstain pattern produced by an impact, a bullet path created by a fired projectile, a shoe impression left on a broken door). The reconstructionist defines these events using the available physical evidence.

4.2.1 CSR includes the following concepts:

a) The application of critical thinking throughout the reconstruction process.

b) The methodology shall be rooted in the scientific method.

c) CSR shall identify events that have reconstructive value.

d) An event shall be defined by documented physical evidence, scene context, and/or physical laws.

e) Context within the crime scene shall be considered in the interpretation of the physical evidence (e.g., physical dimensions of a scene, the variety of weapons available, number of individuals involved, environmental conditions).

f) Events shall be sequenced, when possible. Absolute and relative chronology of events shall be defined by physical evidence, scene context, and/or physical laws.

g) A reconstruction requires contextual information to guide the analysis. Reconstructionists shall take steps to mitigate impacts of cognitive biases on their work.

4.2.2 The following shall not be relied upon for CSR:

a) The use of testimonial evidence as fact.

b) The use of apparent logical flow, "common sense" expectations, personal beliefs, or expected human behavior to define or sequence events.

c) Speculation regarding evidence (or lack of evidence) to explain inconsistencies in a desired result.

d) The omission of data so that the conclusion matches a desired result.

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4.3 Crime scene reconstruction versus reenactments

CSR is an examination based on scientific methodology and physical laws. A reenactment (also known as re-creations, demonstrations, role-playing, or any activity/process of a similar nature, or however named), often includes conjecture regarding presumed events. Although these two terms are often incorrectly interchanged, reenactments are not the same as reconstructions.

4.3.1 Scene Reconstruction

Scene reconstruction is a process where hypotheses are tested against physical evidence. It involves the examination of events using the scientific method supported by physical evidence to test a statement or observation. A reconstruction illustrates static captures in time and is supported by specific data which has been documented or can be cited.

4.3.2 Scene Reenactment

Scene reenactment is primarily a process whereby participants or animations attempt to demonstrate what may have happened based on statements, evidence, or data. Reenactment is a technique often used to present an incident to others using elements revealed during reconstruction. Reenactments can be based, in whole or in part, on the conclusions of a CSR report. When a reenactment is used to fill in gaps between defined events, it often requires a presumption of activity, or actions based on expectations and/or personal influence.

4.3.3 Reconstructing with figures of human and other animals

a) Humans and other animals have a wide range of motion inherent with anatomical properties. Care must be taken when attempting to reconstruct an event by placing figures in the scene. Placing a complete figure in a scene without supporting data is an element of reenactment unless the specific reconstructive data is identified.

b) To limit bias in the use of realistic models, generic figures without facial expressions should be used. When positional data does not exist, the reconstructionist shall clearly identify which body parts are included to aid and assist the viewer. When parts of the body lacking supporting positional data are included for purposes of context, the use of a qualifying statement, a legend, labels, or color indicators shall be used to identify the contextual information.

5 Limitations

a) As CSR can only define events supported by available data, it is unlikely that CSR can completely explain the totality of an incident.

b) CSR cannot identify intent or motive in an incident.

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c) The reconstructionist shall only be held responsible for the data provided to them. Data that has been omitted, withheld, or newly discovered may cause conclusions and interpretations to be reevaluated by the reconstructionist when discovered.

d) Data in scientific and technical reports may be relied on as accurate until proven otherwise.

e) Certain assumptions regarding scene evidence and observations are often necessary to work through the logic of a reconstructive scenario, especially when evidence limitations exist (e.g. apparent bloodstains observed in photographs were not collected or confirmed to be blood). All assumptions made shall be clearly defined and supported when the data cannot be directly validated.

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ANNEX
(informative)

Bibliography

The following bibliography is not intended to be an all-inclusive list, review, or endorsement of literature on this topic. The bibliography aims to provide examples of publications addressed in the standard.

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