

CLAC360 PROFESSIONAL COURSE SERIES

CLAC360 Advance Course on

ROAD SAFETY AUDIT FUNDAMENTALS WITH AI

From Road-User Perspective to
Structured Safety Findings

***Conduct and document a structured road safety audit/assessment
under an appropriate professional framework.***

Course Code:	CLAC-RSAI-01
Course Type:	Professional Applied Learning
Delivery:	PDF + field exercises + case studies + assignments + quizzes + live sessions
Level:	Intermediate / Professional
Core Outcome:	Conduct and document a structured road safety audit/assessment under an appropriate professional framework.

PART I — COURSE IDENTITY

1. COURSE PREMISE

A Road Safety Audit is not a conventional design check.

An RSA is a formal, independent, multidisciplinary safety examination of an existing or future road or intersection. FHWA guidance emphasizes independence, multidisciplinary review, consideration of all road users and field review under relevant conditions.

This course therefore teaches the learner to look at a road through the eyes of different road users, identify potential safety concerns, evaluate the circumstances in which they may arise, and communicate them without pretending that the audit itself is a detailed redesign.

2. PRACTICAL OUTCOME

The learner produces an RSA-style professional audit package containing:

- audit scope;
- project information review;
- team structure;
- field-review plan;
- safety observation register;
- photographs/annotations;
- road-user analysis;
- risk/context assessment;
- findings;
- suggested mitigation opportunities;
- limitations;
- formal audit report;
- AI verification record.

3. WHAT AN RSA IS NOT

The course explicitly distinguishes an RSA from:

- design compliance checking;
- routine design review;
- crash investigation;
- crash-data analysis alone;
- road-condition inspection;
- construction inspection;
- traffic-impact analysis;
- redesign;
- project ranking.

FHWA's guidance makes these distinctions explicit.

MODULE 00 — SAFETY THINKING

From "Is the Design Correct?" to "How Could a Road User Experience It?"

- proactive safety;
- human factors;
- road-user behavior;
- road-user expectations;
- conflict;
- visibility;
- decision points;
- recovery;
- consequences;
- vulnerable road users.

Core principle

«An RSA asks how the road may perform from a safety perspective—not merely whether it satisfies a drawing or checklist.»

MODULE 01 — RSA PROCESS & INDEPENDENCE

The course follows a structured audit process:

1. Identify project/road.
2. Select qualified team.
3. Conduct pre-audit review.
4. Conduct field review.
5. Analyze findings.
6. Prepare report.
7. Present findings.
8. Respond/incorporate where applicable.

Critical concept

Independence is a substantive part of the process, not a ceremonial statement.

This corresponds to the established FHWA eight-step framework.

MODULE 02 — AUDIT TEAM

- team leader;
- road design;
- traffic operations;
- construction;
- maintenance;
- human factors;
- pedestrians;
- cycling;
- transit;
- enforcement/emergency response;
- local context.

Practical Exercise

Construct an audit-team matrix based on: Project type → safety issues → required expertise

MODULE 03 — PRE-AUDIT INFORMATION REVIEW

Review:

- plans;
- profiles;
- cross-sections;
- intersections;
- traffic information;
- speed;
- crash history where applicable;
- land use;
- pedestrian generators;
- cycling;
- transit;
- lighting;
- roadside;
- drainage;
- barriers;
- signing;
- pavement marking.

Deliverable

Pre-Audit Information Register

MODULE 04 — ROAD-USER PERSPECTIVE

Evaluate the facility from:

- driver;
- pedestrian;
- cyclist;
- motorcyclist;
- heavy-vehicle driver;
- public-transit user;
- older road user;
- child;
- person with disability;
- emergency responder.

Critical Question

«What does the road communicate to the user—and is that expectation consistent with what actually occurs?»

MODULE 05 — FIELD REVIEW

Field review should consider relevant conditions, potentially including:

- daytime;
- nighttime;
- peak;
- off-peak;
- wet/dry where relevant;

- school activity;
- pedestrian activity;
- special events.

FHWA guidance specifically emphasizes field reviews under different conditions and consideration of day/night and peak/non-peak conditions.

MODULE 06 — ROADWAY & GEOMETRY

Review:

- alignment;
- sight distance;
- cross-section;
- lane width;
- shoulders;
- medians;
- curves;
- grades;
- superelevation;
- transitions;
- intersections;
- access points;
- roadside environment.

The audit question is not merely "Does this comply?" but: "Could this configuration create a safety concern for a particular road user under a particular circumstance?"

MODULE 07 — INTERSECTIONS & CONFLICT AREAS

- approach visibility;
- turning movements;
- crossing;
- channelization;
- signal visibility;
- stop/yield control;
- lane assignment;
- conflict points;
- queue interaction;
- access interference.

MODULE 08 — VULNERABLE ROAD USERS

Dedicated analysis for:

- pedestrians;
- cyclists;
- motorcyclists;
- children;
- older people;
- persons with disabilities.

Consider:

- crossing distance;

- accessibility;
- continuity;
- visibility;
- speed environment;
- refuge;
- interaction with turning vehicles;
- desire lines.

MODULE 09 — TRAFFIC CONTROL & ROAD USER INFORMATION

Review:

- signs;
- markings;
- signals;
- delineation;
- lighting;
- visibility;
- consistency;
- placement;
- obstruction;
- legibility.

Human-Factors Question

«Can the road user understand what is expected quickly enough to respond safely?»

MODULE 10 — ROADSIDE & FORGIVING ENVIRONMENT

- roadside hazards;
- clear zones;
- fixed objects;
- barriers;
- slopes;
- drainage;
- utilities;
- trees;
- poles;
- walls;
- pedestrian hazards.

MODULE 11 — WORK ZONES & CONSTRUCTION SAFETY

- temporary traffic control;
- worker exposure;
- temporary alignment;
- pedestrian detours;
- temporary signs;
- night visibility;
- access;
- construction vehicles;
- changing conditions.

FHWA's RSA framework specifically recognizes construction-phase audits, including work-zone traffic-control plans and pre-opening audits.

MODULE 12 — SAFETY ISSUE IDENTIFICATION

Each finding should establish:

WHAT?

What is the safety concern?

WHO?

Which road user may be affected?

WHERE?

Where does it occur?

WHEN?

Under what conditions?

WHY?

What mechanism may create the concern?

CONSEQUENCE?

What type of outcome could occur?

RESPONSE?

What opportunities may reduce the concern?

MODULE 13 — SAFETY RISK THINKING

The course avoids false precision. Instead of pretending that every safety issue can be assigned a scientifically exact numerical risk score, evaluate:

- exposure;
- likelihood/context;
- severity potential;
- vulnerable users;
- operating conditions;
- existing controls;
- uncertainty.

Deliverable

Safety Issue & Risk Context Register

MODULE 14 — AI FOR ROAD SAFETY AUDIT

AI can assist with:

- drawing review;
- checklist generation;
- issue categorization;
- road-user scenario generation;
- photograph description;
- report structure;
- consistency checking;
- finding cross-references.

AI must not:

- certify safety;
- replace field inspection;
- invent site conditions;
- declare compliance;
- fabricate crash history;
- replace an independent audit team.

MODULE 15 — AI AS A "DEVIL'S ADVOCATE"

This becomes a signature CLAC360 exercise. After the audit team identifies a safety issue, AI is asked:

Critical Question

«Challenge this finding. What evidence might contradict it? What information is missing? Under what circumstances might this concern not occur?»

The auditor then decides whether the challenge is valid. This deliberately prevents confirmation bias.

MODULE 16 — AI IMAGE/PLAN REVIEW

Where appropriate and authorized, AI may assist with:

- identifying visible features;
- organizing photographs;
- generating image descriptions;
- identifying possible objects;
- comparing design elements.

Core principle

«AI image interpretation is treated as an observation aid, not definitive site evidence.»

MODULE 17 — RSA REPORT

Recommended structure:

1. Executive Summary
2. Project Background
3. Audit Scope
4. Audit Stage
5. Audit Team
6. Information Reviewed
7. Field Review
8. Existing Conditions
9. Safety Findings
10. Road-User Considerations
11. Risk Context
12. Suggested Mitigation Opportunities
13. Limitations
14. Conclusion
15. Appendices

FHWA's RSA guidance similarly describes a concise report with numbered safety issues, relevant photographs/diagrams and project context.

MODULE 18 — FINAL RSA PROJECT

Complete Road Safety Audit

Learner receives:

- plan set;
- site photographs;
- traffic information;
- road-user observations;
- selected crash information;
- design information;
- deliberate safety traps.

The learner must:

1. define scope;
2. identify team needs;
3. review documents;
4. plan field observations;
5. identify safety concerns;
6. analyze road-user perspectives;
7. challenge findings;
8. document evidence;
9. propose mitigation opportunities;
10. produce final RSA report.

AI GOVERNANCE

CLAC360 RSA Rules

1. AI does not conduct the field review.
2. AI does not certify safety.
3. AI does not establish site facts from missing evidence.
4. AI does not replace independence.
5. AI findings require verification.
6. AI-generated references require source verification.
7. Safety recommendations require professional review.
8. Sensitive project information requires appropriate authorization.
9. AI use should be documented.
10. The audit team remains responsible for the final report.

ASSESSMENT

- RSA concepts quiz
- pre-audit review
- road-user perspective exercise
- field-observation exercise
- safety issue register
- AI devil's-advocate exercise
- RSA report
- final practical project
- live audit discussion

PROFESSIONAL OUTCOME

The learner progresses from:

Road → Road User → Potential Hazard → Circumstance → Safety Mechanism → Evidence → Mitigation Opportunity → Formal Finding

CLAC360 Principle

«Do not ask only whether the road was designed correctly. Ask how the road may actually be experienced by the people who use it.»