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Technical Assistance for establishing an executive body for road safety in North Macedonia

*Road Safety Audit and
Road Safety Inspection
training Course (RSA and RSI TC)
- Programme*

*(Version 1, Date 09.09.2020) Technical Note No.2*

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# Background

Road Safety Audit is stipulated within EC Directive 96/2008 (Amended on November 26, 2019 through Directive 2019/1936) and therefore mandatory for all EU members. During the last decade of Directive usage most of the implemented procedures, led by Road Safety Audit, provided excellent road safety results. This is why further Directive amendments (extension) were introduced in 2019. This clearly indicates that EU Directive was seen as being very successful and that this good practice should be shared with Non-EU members.

One of the most pro-active Directive procedures is Road Safety Audit (RSA). RSA is described as an independent, detailed, systematic and technical safety check relating to the design characteristics of a road infrastructure project and covering all stages from planning to early operation. For new roads, RSA is a pro-active approach with the primary aim to identify potential safety problems as early as possible in the process of planning and design, so that decisions can be made about eliminating or reducing the problems, preferably before a scheme (design) is implemented, or a crash occurs. Road Safety Inspection (RSI) is similar procedure to RSA, aiming at improving of road safety of existing roads preferably by measures that can be implemented via regular maintenance.

RSA requires an efficient organisational structure with clear responsibilities. The general RSA procedure will include three main phases: 1. Ordering, 2. Conducting and 3. Completion.

It is essential that the auditor has extensive experience in road safety issues. The general expectation is that RSA Team Leader (TL) should have completed relevant university education preferably with Master’s degree in a relevant topic such as Traffic Engineering and have significant experience in road safety engineering (design) and/or road traffic crash investigation. Minimum requirements for a RSA Team Leader should be at least five years of working experience in the field of RSA and a minimum of 3 RSA Reports written in the last two years. In addition to this, TL should possess a certificate of competence in road safety audits (i.e. License issued by a recognised institution).

To ensure the quality of the audit, auditors should undergo initial training, resulting in the award of a Certificate of Competence (CoC) and should take part in further training at least once every 5 years.

The content of the proposed training course is adjusted to the recommendations of the Euro-Audit, the European Road Safety Auditor and Training Syllabus and in accordance with requirements of EC Directive 96/2008 and amendment EC Directive 2019/1936, as well as Clients – Ministry of Transport and Communication (MoTC) needs and request.

This document covers Road Safety Audit on the design phases from planning till the early operation and Road Safety Inspection of the existing roads. This means that in the terminology used within Road Safety Audit cover also Road Safety Inspection.

Bearing on mind COVID-19 restrictions, this version of RSA/RST TC is adjusted to the on-line method of TC implementation and as proposed in Technical Proposal (Inception Report) extended number of participants - up to 15.

As on-line platform ZOOM is proposed to be used. This will be discussed and agreed with participants.

# Approach to be used during RSA/RSI training course

The proposed RSA/RSI TC is structured within two parts (in total 11 working days and time for homework), first for training in Road Safety Inspection (RSI) and secondly, for training in Road Safety Audit (RSA). Each part will consist of several modules where the participants will learn from the experience of trainers and teachers. Proposed activities are presented in the Figure 2.1.

1.

RSA/RSI
Training Course

Optional Entry

Test

Failed

2.

Additional education

Passed

Literature for Trainees

**Preparation for RSA TC**

and **Initial Test**

3.

**Conducting of
RSI TC**
(Days: 1-5)

**Daily Tests**

Part I

(**Days 1-5**)

4.

5.

Checking of HMW No. 1

RSI Homework (7-10 days)

6.

**RSI Test**

Part II

(**Days 6-10**)

**Conducting of**
**RSA TC**
(Days: 6-10)

7.

**Daily Tests**

Checking of HMW No. 2

8.

RSA Homework (7-10 days)

9.

**RSA Test**

**day 11**

10.

**Award of Certificates**

Fig. 2.1. RSA/RSI TC algorithm

While implementing the training course, the idea is to start with the RSI because most of people/participants will easily accept the principle of checking the existing road safety condition on the road and their safety knowledge can be extended to cover the key safety design principles needed for the second part of Training course (RSA related).

Training will be organized in the different ways:

1. Joint presentations – presentations will be organized for all participants jointly. Consultants will provide all materials to the participants in electronic form.
2. Smaller group work – video/photo oriented presentations and design review will be organized in smaller group work. Groups will consist of max 5 participants.
3. Individual work – preparation of the field work examples, homework and each test is individual for the participants.

Detailed explanation regarding the scope of the work participants will receive on the start of the training course.

Participants are obliged to attend the on-line training course in minimum 70 % of the time. They are required to have daily tests (limited in time), RSI and RSA tests and to provide RSI and RSA Homeworks.

The candidates will have several online tests during course implementation, such as:

* Entry level test,
* Initial test on course commencement ,
* Daily tests on materials/ topics covered each day,
* RSI test and
* RSA test,

In order to achieve the above, the RSI and RSA course will consist of the parts (modules) presented in next Chapter.

The training course is supplemented by an International publication "Practical Guide for Road Safety Auditors and Inspectors" (2018) which has been endorsed by a number of road safety auditor associations. English and Serbian version will be provided to the participants before RSA/RSI TC.

*Note: All of the trainers involved in the training course were amongst the authors of the Practical Guide.*

# RSA/RSI Training Course Programme

PART 1 – day 1 – **INTRODUCTION** (28.09.2020)

**Topic**: Will cover the basics regarding road safety, current situation in the country, global road safety problems, current visions, directives and regulations in the developed countries and basics regarding Road Safety Inspection.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Time (min)** | **No** | **Title** | **Presentation type** | **Note** |
| 10 | 1.0 | Introduction to RSA TC | Joint |  |
| 20 | Initial Test | Individual | All participants will receive online initial test  |
| 40 | 1.1 | Basics about Road Safety  | Joint |  |
| 30 | 1.2 | Traffic Safety Analysis (main causes of accidents). Introduction to the CADaS. | Joint |  |
| 30 | 1.3 | Global Road Safety Developments (WHO, UN decade of Action, Sustainable developments, EU 2008/96) | Joint |  |
| 30 | 1.4 | Safe System Approach and EU 2008/96, EU directive amendment in Road Safety Infrastructure Management | Joint |  |
| 40 | 1.5 | Risk Factors (main and contributing factors with special attention to the road and speed). Basic vehicle dynamic characteristics. | Joint |  |
| 30 | 1.6 | RSA and RSI in Good Performing Countries and role of Road Administrations | Joint |  |
| 30 | 1.7 | Introduction of Road Safety Inspection (RSI) | Joint |  |
| 10 | 1.8 | Daily test 1 | Individual | All participants will receive daily test  |

**Duration**: Approx. 270 min. It will be organized in two, about 2 hours workshop sessions. Participants will have enough time for relax between sessions.

**Type of presentation:** On line work will be based on power point presentations, enriched by as much as possible video/photo examples (case studies). Candidates will receive copies of the presentations before training.

**Expected Achievement:** Candidates will receive an overview of the main road safety issues and developments, knowledge of current conditions in the country (comparing to the best performing road safety countries) plus basic information regarding road safety inspection.

PART 1 – day 2 – **BASICS OF ROAD SAFETY** (29.09.2020)

**Topic:** Human factors and Typical Road Safety Inspection Deficiencies

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Time (min)** | **No** | **Title** | **Presentation type** | **Note** |
| 45 | 2.1 | Human Factors in road operation (including of basic principles of safe road infrastructure design) | Joint |   |
| 40 | 2.2 | Road Hierarchy and Linear settlements | Joint |   |
| 90 | 2.3 | Typical RSI Deficiencies | Joint |   |
| 40 | 2.4 | Roadside Features, passive safety installations, civil engineering structures (with special attention to the VRS) | Joint |   |
| 40 | 2.5 | Traffic signing, marking and lighting | Joint |   |
| 40 | 2.6 | VRU and public/private services  | Joint |   |
| 10 | 2.7 | Daily test 2 | Individual | All participants will receive daily test and limited time for fulfilment |

**Duration**: Approx. 305 min, which will be organized in two sessions.

**Type of presentation**: On-line work will be based on the power point presentations, enriched by as much as possible video/photo examples (case studies). Candidates will receive copies of the presentations before training.

**Expected Achievement**: Candidates will receive information and knowledge regarding the human factors in road operation and their effect on road safety, typical problems of road hierarchy, linear settlements, typical RSI deficiencies, etc.

PART 1 – day 3 – **ROAD SAFETY INSPECTION (RSI)** (30.09.2020)

**Topic:** The third day is preparation for the field visit through introduction of the road safety manual, main chapters in the checklists, reporting requirements and necessary equipment for the undertaking the RSI.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Time (min)** | **No** | **Title** | **Presentation type** | **Note** |
| 30 | 3.1 | RSI Reporting requirements | Joint |   |
| 45 | 3.2 | RSI Manual - TRACECA and Practical Guide | Joint |   |
| 45 | 3.3 | RSI Function and Cross Section Checklist | Joint |   |
| 45 | 3.4 | RSI Alignment and Intersection Checklist | Joint |   |
| 45 | 3.5 | RSI Public/private services and VRU Checklist | Joint |   |
| 45 | 3.6 | RSI Traffic signing, marking, lighting and Roadside features Checklist | Joint |   |
| 60 | 3.7 | Proposed Equipment for undertaking of RSI  | In groups | Participants will work in 3 smaller groups due to the need of software explanation and individual work.  |
| 10 | 3.8 | Daily test 3 | Individual | All participants will receive daily test and limited time for fulfilment |

**Duration:** Approx. 325 min, which will be organized in two sessions.

**Type of presentation**: On-line work will be based on power point presentations, enriched by as much as possible video/photo examples (case studies). Candidates will receive copies of the presentations before training.

**Expected Achievement:** Trainees will become familiar with latest SEETO RSI Manual (prepared for SEETO by TL & KE2) and accompanying checklists. Major road safety topics such as Road Function, Cross Section, Alignment, Intersections, Public Services, VRU, Signing/Marking and Passive safety devices will be discussed.

PART 1 – day 4 – **PREPARATION FOR THE RSI AND VIRTUAL FIELD VISIT** (01.10.2020)

**Topic:** The fourth day presentations and virtual field visit will be used in order to prepare candidates for their future individual implementation of RSI activities.

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| --- | --- | --- | --- | --- |
| **Time (min)** | **No** | **Title** | **Presentation type** | **Note** |
| 45 | 4.1 | Examples of different RSI's | Joint |   |
| 15 | 4.2 | Preparation for the Field Visit  | In groups | Participants will work in 3 smaller groups due to the need of software explanation and individual work. |
| 120 | 4.3 | Virtual Field Visit will be substituted with quality movies and pictures from North Macedonia. Participants will exercise identification and specification of major road safety deficiencies (preparatory work for RSI Report)  | In groups | Participants will work in 3 smaller groups due to the need of explanation of different road sections (type of roads) and identified problems. |

Duration: Approx. 180 min, which will be organized through two sessions.

**Type of presentation**: On-line work will be based on the power point presentations, enriched by as much as possible video/photo examples (case studies). During the simulation of field work, based on videos and pictures, candidates will receive oral instructions and practical demonstrations by trainers in use of instruments to carry out RSI in the field.

**Expected Achievement:** All candidates will be capable for the first individual RSI via a field visit and to be able to report on the safety deficiencies identified in the road infrastructure examined.

PART 1 – day 5 – **RSI REPORTING** (02.10.2020)

**Topic:** Candidates will have possibility to work in small teams (groups) for their first RSI report. First, they will receive explanations regarding the RSI report template and they will then prepare their RSI reports, after which they will present their Report to the all on-line participants. At the end of the day Candidates will receive the RSI assignment for their individual homework.

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| **Time (min)** | **No** | **Title** | **Presentation type** | **Note** |
| 30 | 5.1 | RSI Report Template explanation | Joint |   |
| 300 | 5.2 | RSI Report Preparation (Group work) | In groups | Participants will work in 3 smaller groups due to the need of work on different types of roads. Participants will work individual, while the RSI report will be presented in group. |
| 60 | 5.3 | RSI Report Presentation to Audience | Joint | Group presentation of partially prepared RSI Reports with discussion and questions from other groups. |
| 30 | 5.4 | Homework No. 1 (RSI) explanation | In groups | Group work, where each trainees will receive individual RSI homework. Trainees will have task to fulfil first RSI report.  |

**Duration:** Approx. 420 min.

**Type of presentation**: On-line work will be based on the power point presentations, enriched by as much as possible video/photo examples (case studies).

**Expected Achievement:** At the end of the 5th day, candidates will be prepared and able to carry out a RSI individually and to write RSI reports identifying most dangerous road safety deficiencies.

**Note:**

Trainees will receive individual RSI Homework.

They will have about 7 days for preparation of individual RSI Reports, where the participants will work together with the trainers.

Trainers will have 3 days to review (evaluate RSI Reports)

PART 2 – day 6 – **RSI REPORT PRESENTATIONS & FINAL RSI TEST** (14.10.2020)

*(about three weeks after day 5 or as agreed)*

**Topic:** Trainees will present their homework on-line in 3 groups, each one will present one part of Report and will take a written final RSI exam.

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| **Time (min)** | **No** | **Title** | **Presentation type** | **Note** |
| 45 | 6.1 | Repetition of main RSI TC parts and conclusions (including evaluation survey) | Joint |   |
| 135 | 6.2 | RSI Homework No. 1 - Reports Presentations (3 groups: 30 min for presentation and 15 for discussions) | In Groups | Group presentation of finalised RSI Reports from part I with discussion and questions for each team member and from other groups |
| 120 | 6.3 | RSI Written Exam | Individual | All participants will receive RSI final exam and limited time for fulfilment |

**Duration:** Approx. 300 min.

**Type of presentation**: Power point presentations, Word based presentations, etc.

**Expected Achievement:** Candidates should be able to pass the test/exam, to successfully present RSI reports in front of an audience (on-line) and to explain road safety deficiencies identified and their proposals for improvement.

PART 2 – day 7 – **ROAD SAFETY AUDIT AND TYPICAL ROAD SAFETY GAPS/DEFICIENCES IN DESIGN** (15.10.2020)

**Topic:** Candidates will have opportunity to learn about basics of Road Safety Audit (RSA), typical gaps and deficiencies in designs, and best practices in design, construction and maintenance to reduce risks of unsafe roads.

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| --- | --- | --- | --- | --- |
| **Time (min)** | **No** | **Title** | **Presentation type** | **Note** |
| 15 | 7.1 | Introduction to RSA TC - Part 2 | Joint |   |
| 30 | 7.2 | RSA origins - How RSA started and evolved over time | Joint |   |
| 45 | 7.3 | Basics of RSA and proposed National RSA Policy | Joint |   |
| 45 | 7.4 | Best Practice of Safe Road Design | Joint |  |
| 90 | 7.5 | Typical RSA gaps/deficiency in preliminary and detail design (experience and findings form different RSA Reports) | Joint |   |
| 30 | 7.6 | Road Safety Audit of Working Zones | Joint |   |
| 10 | 7.7 | Daily test 4 | Individual | All participants will receive daily test and limited time for fulfilment |

**Duration:** Approx. 265 min.

**Type of presentation**: On-line work will be based on the power point presentations, enriched by as much as possible video/photo examples (case studies). Candidates will receive copies of the presentations before training.

**Expected Achievement:** By the end of the day, candidates will be able to understand the background of RSA and how it evolved over time and to understand the ideas behind RSA and RSA Policy. They will be able to recognize different types of road safety gaps and deficiencies in design, as well as in construction stages (Working Zones).

PART 2 – day 8 – **ROAD SAFETY AUDIT MANUAL, CHECKLISTS & SAFE ROAD DESIGN PRINCIPLES I** (16.10.2020)

**Topic:** Candidates will have an opportunity to learn about the Regional (SEETO) road safety audit manual, checklists and the main road safety topics that will be discussed within 8 PIARC chapters (Road Function, Cross Section, Alignment, Intersections, Road Services, VRU, Signing/Marking and Passive devices).

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| --- | --- | --- | --- | --- |
| **Time (min)** | **No** | **Title** | **Presentation type** | **Note** |
| 30 | 8.1 | Road Safety Audit Manual | Joint |   |
| 50 | 8.2 | Road Safety Audit Checklists | Joint |   |
| 45 | 8.3 | Function & Cross Section: Background/ Deficiencies/ Proposals  | Joint |   |
| 45 | 8.4 | Alignment & Intersections: Background/ Deficiencies/ Proposals | Joint |   |
| 45 | 8.5 | PP Services & VRU: Background/ Deficiencies/ Proposals | Joint |   |
| 45 | 8.6 | Traffic signing, marking, lighting & Passive safety installations: Background/ Deficiencies/ Proposals | Joint |   |
| 10 | 8.7 | Daily test 5 | Individual | All participants will receive daily test and limited time for fulfilment |

**Duration**: Approx. 270 min.

**Type of presentation**: On-line work will be based on the power point presentations, enriched by as much as possible video/photo examples (case studies). Candidates will receive copies of the presentations before training.

 **Expected Achievement:** Trainees will become familiar with the SEETO RSA Manual and accompanying checklists. Major road safety topics will be discussed under 8 PIARC chapters.

PART 2 – day 9 – **SAFE ROAD DESIGN PRINCIPLES II AND CASE STUDY (Preparation of RSA Report)** (19.10.2020)

**Topic:** Through one Case Study trainees will have an opportunity to learn about preparation of a RSA Report

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| --- | --- | --- | --- | --- |
| **Time (min)** | **No** | **Title** | **Presentation type** | **Note** |
| 45 | 9.1 | Specific items (Bridges, Working Zones, Motorcyclists, …) | Joint |   |
| 30 | 9.2 | RSA Template presentation | Joint |  |
| 200 | 9.3 | Case study/exercise I: Preparation of joint RSA Report for selected road section with high interactivity between presenter and trainees | Joint |  |

**Duration**: Approx. 275 min.

**Type of presentation**: On-line work will be based on the power point presentations and real road design examples.

Candidates will receive copies of the presentations before training.

**Expected Achievement:** Trainees will be involved in preparation of a real RSA Report through a Case Study. This will increase their knowledge about RSA Report preparation and prepare them for future work.

PART 2 – day 10 – **PRESENTATION OF RSA REPORT FINDINGS AND PREPARATION OF GROUP RSA REPORTS** (20.10.2020)

**Topic:** Candidates will have an opportunity to learn how to prepare RSA reports and to participate in discussions regarding homework and what is expecting from their side to fulfil.

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| --- | --- | --- | --- | --- |
| **Time (min)** | **No** | **Title** | **Presentation type** | **Note** |
| 30 | 10.1 | Case study/exercise II: Presentation of RSA Report to Client (simulation) and Preparation of follow-up table | Joint |  |
| 240 | 10.2 | RSA Report Preparation (Group work on provided design and template) | In groups | Participants will work in 3 smaller groups due to the need of work on different types of roads. |
| 30 | 10.3 | Homework No. 2 (RSA) explanation | In groups | Group work, where each trainees will receive individual RSA homework. |
| 10 | 10.4 | Evaluation of RSA TC - Part 2 | Joint |  |
| 15 | 10.5 | Closing of RSA TC | Joint |  |

**Duration:** Approx. 325 min.

**Type of presentation** On-line work will be based on the power point presentations, enriched by as much as possible video/photo examples (case studies).

**Expected Achievement:** Candidates will gain a good understanding about preparation and content of a RSA report. Since they will be mentored by experienced road safety auditors during preparation of the RSA reports, they also will get good practical experience in such work.

**Note:**

Trainees will receive individual RSA Homework.

They will have about 7 days (or as agreed) for preparation of individual RSA Reports.

Trainers will have 3 days to review (evaluate RSA Reports)

PART 2 – day 11 – **RSA REPORTS PRESENTATIONS, FINAL RSA WRITTEN TEST AND DELIVERY OF CERTIFICATES** (30.10.2020)

**Topic:** Candidates will have opportunity to present their RSA homework and will have opportunity to give answers on the questions raised by the participants and lecturers. Candidates will have opportunity to pass written exam on the end of the day. The written exam will be based on the practical questions and legal aspects of the RSA procedures.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Time (min)** | **No** | **Title** | **Presentation type** | **Note** |
| 180 | 11.1 | RSA Homework presentation including discussions about identified problems and proposals)(3 groups: 30 min for presentation and 30 for discussions) | In groups |   |
| 60 | 11.2 | RSA Written Exam | Individual | If COVID-19 restrictions are removed, this can be done in Skopje. If not, all participants will receive online RSA final exam and limited time for fulfilment. |
|  |  | Certificates delivery will be done through MoTC |  |   |

**Duration**: Approx. 240 min.

**Type of presentation**: Presentations will be based on the power point presentations.

**Expected Achievement:** It is expected that candidates will pass the test and be able to participate in the Road Safety Audit process as team members.

# Engaged Staff (trainers) and logistics

|  |
| --- |
| **Experts used for implementation of TC (SARSA members)** |
| 1 | Dejan Jovanov - KE/TL | Full time |
| 2 | Rajko Branković - KE | Full time |
| 3 | K. Lipovac - KE | Part time (0.5+0.5 days) |
|  | + NKE |  |
| 4 | Filip Trajković - NKE | Part time (4 days), to cover Beneficiary request for smaller groups during practice work.He is experienced, certified Auditor in Ireland and will provide support to TL & KE2 during practice work (field work) as well as mentor of one group of trainees. He was involved in previous RSA/RSI in Macedonia. |
| 5 | On-line platform (ZOOM) licences for 2 KE trainers and on-line tests | All participants will be invited by 2 KE trainers so there will be no restrictions in ZOOM usage. Support from on-line test/database specialist will be provided. |