



राष्ट्रीय ग्रामीण अवसंरचना विकास एजेंसी
(ग्रामीण विकास मंत्रालय, भारत सरकार)

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To,
The CEO, SRRDA
(All States and UTs)

Subject: Road Safety Audit (RSA) of Roads more than 5 KM in length

Dear Sir,

Road safety is a matter of urgent concern and road design/engineering has a significant bearing on it. Roads have to be designed and constructed in a manner, such that they aid and allow safe use and also absorb/forgive minor mistakes on the part of road user. Keeping this in view, PMGSY-III guidelines specify that safety aspects have to be an integral part of road design during the preparation of Detailed Project Report (DPR). You must also be aware that as per directions issued by the Hon'ble Supreme Court Committee on Road Safety it is mandatory to undertake design stage audit of all roads more than 5 km long. It is therefore requested to get all roads more than 5 KM long, on which the work is to start or is in progress, audited for safety. Existing roads in operation may also be got audited/ inspected for undertaking remedial measures/retrofitting.

2. The audit may be conducted as per IRC: SP 88-2019 by any of the qualified Road Safety Auditors listed on NRIDA website. In case of auditors from within the department, it may be ensured that they are not from same district as the one in which work is to be / being executed or do not have any conflict of interest. Guidelines for RSA are enclosed as **Appendix-I**. Road Safety Audit Handbook for PMGSY based on IRC:SP:88 is attached as **Appendix-II**.

3. The auditors will report in the format provided in the handbook. To facilitate reporting and monitoring of Action Taken Report (ATR), a module for RSA has been created on OMMAS. The findings of the RSA will also be fed on OMMAS by the auditors. The PIU will then furnish the ATR on OMMAS and SQC will evaluate/ accept/ reject the ATR. A flow chart for making inputs has also been provided in the handbook.

4. For Road Safety Auditors from outside the department, honorarium per day, travelling, lodging and daily allowances may be paid on the lines similar to SQMs. However, honorarium will not be more than Rs 5,000/- per day. For auditors from within the department, admissible allowances, as per extant rules may be paid. However, no honorarium is payable to departmental officers. Expenditure on this account shall be booked to the separate sub-head in the state share of admin fund of the PMGSY, created for this purpose.

Yours sincerely,

(Dr. I. K. Pateriya)

Guidelines for Road Safety Audit-PMGSY

1. Introduction: As per PMGSY III Programme Guidelines, safety aspects have to be integral part of road design during the preparation of DPR. In pursuance of directions issued by Committee on Road Safety constituted by Honorable Supreme Court, Road Safety Audit at design stage (RSA) has been made mandatory for all roads more than 5 km in length. It is accordingly envisaged that all DPRs of roads more than 5 km length must include a road safety audit report.

To facilitate reporting and monitoring of Action Taken Report (ATR), a module for RSA has been created on OMMAS. The findings of the RSA will also be input on OMMAS by the Auditors. The PIU will then furnish the ATR and SQC will evaluate/accept the ATR.

2. Organizing the RSA: As soon as work on preparation of DPR for construction/upgradation of a road is commenced, action should be initiated for commissioning the services of a Road Safety Auditor. Audit shall be undertaken by the accredited auditors whose name is listed on the PMGSY website. These auditors have completed two week course on road safety audit conducted by Government recognized institutes such as IAHE, CRRI, AITD etc. In case SRRDA desires to engage an auditor other than those accredited as aforesaid, prior consent of NRIDA shall be obtained.

2.1. Auditors from outside the department should preferably be selected from within the state so that travelling time /issues and expense is minimized. Auditors from within the department should be selected from those posted outside the district and should not in any way be involved with the design of the project, so that objectivity can be ensured. The main auditor should have at least 05 years experience in the design, construction and maintenance of roads. The Audit Assistant/ Apprentice auditor need not have any experience, but should be enlisted on website of NRIDA.

2.2. SQC shall email a request to the shortlisted auditors and finalize the program for audit in consultation with them. The duration of each inspection program will be limited to 5 working days and minimum 05 roads will be audited (including commencement and completion meetings, uploading report on OMMAS) during each inspection program of 5 days. In case all roads are less than 10 km length, at least 07 roads shall be audited, during each inspection program of 5 days. It will be advisable that all roads with a PIU may be audited in one visit. However, if any one or two roads of a PIU are only left at the end of visit, the duration of visit may be extended by one day to complete the assignment.

2.3. The Auditor is expected to make his own arrangements to travel up to the District Headquarters of the district in which audit is to be carried out. The PIU shall make necessary arrangements for transport required for inspection of works within the District and from one District to the next. The PIU may make arrangements of boarding of Auditor in Government Guest Houses/ Inspection Bungalows but in case of non-availability of such an accommodation, the Auditor may stay in private Hotels/ Guest Houses and the reimbursement to Auditor for boarding charges will be done by SQC as for State Quality Monitors'.

3. Conduct of RSA

The auditor will undertake design stage audit of the project as soon as the draft DPR is ready. If for any reason the design stage audit of a road more than 5 km in length could not take place at the draft DPR stage, RSA should be completed before the contract for the execution of the project is concluded. Recommendations of RSA to the extent accepted by PIU/SRRDA should be got included in the contract.

3.1. Before or during the commencement meeting the Auditor shall be provided with the Draft DPR including the following:

- a) project description,
- b) Details of design principles and standards that were used (e.g. design speed, standards of radii on horizontal curves, super elevation and other geometric design parameters),
- c) Details of departures from the standards if any including reasons there for,
- d) traffic data, accident data,
- e) Full set of drawings of the road showing the horizontal and vertical alignment, detailed design and drawings of curves and junctions, signing and marking plans.

3.2. RSA will be conducted and reported as demonstrated in Section 6.1 of IRC:SP:88-2019, Case Study 1: DPR Stage Audit. The following activities shall be undertaken by the Auditor-

- a) Commencement meeting with PIU and Design Consultant, collection and study of designs, drawings and DPR
- b) Field visit during day time and night time.
- c) Preparation of draft report containing observations on designs, drawings and DPR and recommendations for improvements therein
- d) Discussions of RSA with PIU/SRRDA and Design team including consultant engaged for DPR
- e) Completion meeting, Preparation of final report and submission to PIU/SRRDA

4. Reporting requirements

- a. The auditor will submit a signed copy of RSA report in the format specified for PMGSY Roads. The format and guidelines for grading of road safety issues and recommendations in accordance with IRC:SP: 88-2019 are given in the “Road Safety Audit Handbook for PMGSY”.
- b. In addition all safety issues shall be marked on the “Strip Plan” of the road, chainage-wise. In case of issue related to vertical alignment, vertical profile of the concerned section shall also be attached.
- c. The RSA report shall also be uploaded on OMMAS with the help of PIU, along with photographs (one for each issue) and a PDF of the signed RSA report

5. Action on RSA report

The PIU will submit an action taken report on OMMAS to the SQC, who is also the Nodal Officer for road safety. SQC will evaluate/accept the ATR. Guidelines for handling the RSA recommendations in accordance with IRC:SP:88-2019 are given in the “Road Safety Audit Handbook for PMGSY”.



सत्यमेव जयते

**Ministry of Rural Development
Government of India
National Rural Infrastructure Development Agency**

Road Safety Audit Handbook for PMGSY



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Foreword

We have completed two phases of PMGSY and are now in the process of taking up works under PMGSY-III. You would agree that road safety is a matter of serious concern and road engineering has a significant bearing on it. Roads have to be designed and constructed in a manner such that they aid and enable safe use and also absorb/forgive minor mistakes on the part of road user. Keeping this in view, PMGSY-III guidelines specify that safety aspects have to be an integral part of road design during the preparation of Detailed Project Report (DPR).

2. In this context, you must also be aware that as per directions issued by the Hon'ble Supreme Court Committee on Road Safety, it is mandatory to undertake design stage audit of all roads more than 5 km long. It is therefore envisaged to get all rural roads more than 5 km long, audited at the design (DPR) stage. Audit at this stage is most effective as recommendations of Road Safety Auditor can be easily incorporated in the DPR and implemented; prevention is better than cure. You may also like to get some of the important existing rural roads in operation audited/ inspected for identifying and undertaking remedial measures/retrofitting. A brief outline of the recommended process, extracted from IRC:SP:88-2019, is contained in this booklet.

3. To facilitate reporting of the audit findings and action on recommendations as well as monitoring of Action Taken Report (ATR), a module for Road Safety Audit (RSA) has been created on OMMAS. RSA findings will be input by the auditor and the Project Implementation Unit (PIU) will take action and input the ATR. The SQC will evaluate/accept the ATR. A flow chart for the entire process has been prepared and is available in this booklet.

4. The RSA will be conducted as per IRC: SP: 88-2019, Manual on Road Safety Audit, as applicable to rural roads. Audit will be done by qualified auditors listed on the PMGSY website. While selecting auditors, preference will be given to engineers working/have worked on rural road projects. Instructions on related financial issues are being issued separately.

5. I am sanguine that proactive engineering interventions on rural roads by way of RSA will help in increasing our understanding of the safety issues on the rural roads and to construct roads that assure safe connectivity and mobility. It will go a long way in promoting a culture of safety not only on the rural roads but on roads in general, and will contribute to a reduction in road crash fatalities.

Alka Upadhyaya
Addl. Secy. (MoRD) and DG, NRIDA

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1. What is Road Safety Audit?

- ⦿ Road safety audit is "a formal, systematic and detailed examination of a road project by an independent and qualified team of auditors that leads to a report of the potential safety concerns in the project."
- ⦿ It is a formal examination because the audit follows a set process that leads to a formal report which then becomes a part of the record of the whole road project. It is a detailed examination that requires time, knowledge, skill, judgement, depth and detail.
- ⦿ It requires a team of independent auditors, each of whom is detached from the design team and who are qualified and experienced in road safety engineering practices. Other professionals could also add inputs to an audit, but the main auditors shall invariably have engineering background. Having a team of auditors (rather than a sole auditor) provides a variety of experiences that increases the likelihood of a potential safety concern being detected. Two heads are better than one!
- ⦿ The outcome of a road safety audit is a road safety audit report that identifies road safety issues and makes recommendations to remove or reduce the impact of these. Responsibility to implement these recommendations remains with SRRDA.
- ⦿ Road safety audit is a proactive measure to identify and mitigate crash risk. It assesses the safety of all road users including car drivers and passengers, pedestrians, bicyclists and motorcyclists, trucks, bus passengers, 3-wheelers and users of animal drawn vehicles. An auditor is to put himself into the shoes of the future users of the road.
- ⦿ Road safety audit is:
 - A formal process (not just an informal check).
 - Conducted by persons who are independent of the design team.
 - Conducted by persons with appropriate qualification, training and experience.
 - An assessment of road safety issues in a road design or it can be the identification of safety concerns on any existing road.

2. Objectives of Road Safety Audit

- ⦿ The main objective of road safety audit is to minimize the risk of crashes occurring on an existing road/a new road project and to minimize the severity of any crashes that do occur or are likely to occur.
- ⦿ There are other objectives too, including:
 - To minimize the risk of crashes occurring on adjacent roads (especially at intersections).

- To recognize the importance of safety in road design so that the needs and perceptions of all road users are met, and to achieve a balance between needs where they may be in conflict.
- To reduce the long term costs of a new road project, bearing in mind that unsafe designs may be expensive (or at times even impossible) to correct at a later stage.
- To enhance the awareness of road safety engineering principles by all involved in the process of planning, designing, constructing, operating, managing and maintaining roads.
- To advance the awareness of providing safe road schemes for non-motorized as well as motorized road users.

3. How can Engineers help to Reduce Road Trauma?

- ⦿ The road safety problem involves three components - the human, the vehicle and the road. International research shows that the road plays a crucial role in road crashes. Roads have to be designed and constructed in a manner such that they aid and enable safe use and also absorb/forgive minor mistakes on the part of road user. Engineers are an important part of the solution to the road safety problem.
- ⦿ The roads are often in need of safety improvements and across the country, there are instances of geometric deficiencies, inconsistent pavement markings, missing (or wrong) road signs, traffic signals not operational, inadequate attention to needs of the vulnerable road users.
- ⦿ Pedestrians and cyclists are often left to cross high speed roads without assistance, especially in case of highway passing through urban settlements and villages.
- ⦿ If crashes occur due to design deficiencies, the community will pay a much higher price than the initial capital cost. The serious injury and fatal crashes can end up costing much more over the life of a road project than the initial capital cost.
- ⦿ The engineers are not expected to "wash their hands" of the safety problems on the roads and highways. Examining how road projects cleared through the traditional system of engineering design and hence checking yields a clear answer to the question of why the road safety audit process is needed in all road authorities.
 - Sometimes a new design may include standards inappropriate for the type of road.
 - In some cases, outdated standards may be used in a design.
 - Sometimes, the combination of various elements of the design may yield a result that is not the best in terms of safety.

- Compromises may be made between traffic carrying capacity and safety which lead to a lessening of safety in the finished road project.
- Sometimes changes are made during construction which does not fully consider operational safety factors.

4. Safety Aspects in Rural Roads

- ◎ The road agencies responsible for rural roads need to ensure that safety engineering measures are embedded into the design during preparation of DPRs and estimates. The following aspects for improving safety on these roads may be given due attention:
 - Road signs and pavement markings should be integral part of road construction and upgradation works. The signs should be retro-reflective and markings done with thermoplastic reflective paints. They will also require regular maintenance to serve the intended purpose. There should be no compromise whatsoever on this requirement in all rural road projects and programmes.
 - Where the existing geometrics of the road alignment are poor, efforts should be made to undertake spot improvements identifying such locations. In the meanwhile, appropriate cautionary and speed limit signs should be posted at such locations. Where there is history of or potential for accidents, proper traffic calming measures should be provided with proper advance warning signs.
 - Intersections and junctions of rural roads with main roads need special emphasis. The layout design may be finalized in consultation with traffic specialists. Provision of traffic calming measures on rural roads just ahead of their meeting point with the main highway would be of help. There is also need to ensure availability of safe sight distance.
 - Provision of bus bays at suitable location close to villages en-route and ramps for providing access to agricultural fields may also be considered. At the end of the road, adequate space needs to be ensured so as to enable turning of buses and other commercial vehicles.
 - Provision of proper crash barriers, hazard markers and parapets on bridges and embankments on curves, especially in hill areas with valley and gorges posing safety hazards.
 - Special attention may be paid to fixing of alignment of Rural Road in hilly areas after comprehensive study with the help of Geotechnical expert, to assess the vulnerability to landslide hazard and slope failure.

5. Road Safety Audit on Rural Roads

- ⦿ As per directions issued by the Hon'ble Supreme Court Committee on Road Safety, it is mandatory to undertake design stage audit of all roads more than 5 km long. It is therefore envisaged to get all rural roads more than 5 km long, audited at the design (DPR) stage. Audit at this stage is most effective as recommendations of RSA can be easily incorporated in the DPR and implemented; prevention is better than cure.
- ⦿ Some of the important existing rural roads in operation audited/ inspected for identifying and undertaking remedial measures/retrofitting.
- ⦿ Rural roads are generally single lane with low design speeds and low volumes of traffic (both motorized and non-motorized). At some places, these roads have intermediate lane (5.5 m) or two-lane (7.0 m) wide carriageway. With development of rural economy, these roads are experiencing accelerated growth of traffic. One negative externality associated with this is increased potential for accidents.
- ⦿ As with other categories of roads, crashes on rural roads may be caused by one or a combination of several factors such as:
 - Road design: compromise on geometric design due to land constraints, lack of proper road signs, pavement markings and other traffic control devices, poor intersection layout, inadequate sight distance, unmanned railway level crossings.
 - Road condition: Uneven and slippery road surface, pot holes, sunken shoulders and edge break, rut formation.
 - Bridge condition: Gap in expansion joints, worn out bearings, broken parapets.
 - Road Users: Dangerous driving (excessive speed, excessive alcohol), fatigue, not wearing seat belt/helmets. Sections passing through habitations and schools pose safety risk to pedestrians, cyclists and even cattle and non-motorized vehicles.
 - Vehicles: Failure of brakes and steering systems, tyre burst, lighting system, night time conspicuity.
 - Environment factors: Heavy rainfall, fog, snow, storm, etc. creating unsafe driving environment.
- ⦿ Commonly encountered safety issues on rural roads are listed in Annexure-I.

6. Key Players involved in Road Safety Audit - their Roles and Responsibilities

Key Player	Main Functions
SRRDA	<ul style="list-style-type: none"> • Expresses a commitment to road safety • Provides funding and resources for safer roads • Considers safety audits as essential • Commissions audits at appropriate times • Selects road safety audit team • Facilitates the response to the recommendations of audits and arranges implementation of recommendations that are accepted and agreed • Attends commencement and completion meetings
Design Team	<ul style="list-style-type: none"> • Attends commencement and completion meetings • Provides relevant information to safety team • Acts upon and supports the client to provide response to recommendations of audit
Safety Audit Team	<ul style="list-style-type: none"> • Identifies safety issues in the proposed design • Inspects the site during day as well as night • Makes constructive recommendations to reduce risk of crashes and their severity • Documents safety concerns and recommendations • Holds commencement and completion meetings with the client and design team

7. Road Safety Audit Process

- ⦿ Road safety audits are undertaken to identify safety concerns in a road design so that those who are responsible for delivering the road project can take these safety concerns into account and make the necessary amendments at an early time.
- ⦿ The RSA is to be conducted as per IRC: SP: 88-2019, Manual on Road Safety Audit. Audit will be done by qualified auditors listed on the PMGSY website. While selecting auditors, preference will be given to engineers working/have worked on rural road projects.
- ⦿ The road safety audit process has ten steps. For some small road projects, some of these ten steps may be brief, but the sequence of steps still applies. The 10-step process is illustrated in Table 3.1 of IRC:SP:88-2019 (reproduced below).

Table 3.1 Road Safety Audit Process

S. No.	Road Safety Audit Steps	Responsibility
1	Determine that an audit is needed	SRRDA
2	Select a Team Leader, who then selects the audit team	SRRDA/PIU
3	Provide information (the drawings and design reports) about the project to the Team Leader	PIU
4	Hold a commencement meeting – outline the project and discuss the audit ahead	PIU (plus Designer) and the Road Safety Audit Team Leader
5	Assess the drawings and design reports for safety issues (the “desktop” audit)	The Audit Team
6	Inspect the site – day time and night time	The Audit Team
7	Write the audit report, submit to the PIU	The Team Leader with assistance from the audit team
8	Hold a completion meeting – to discuss the key safety issues and to clarify outstanding matters	PIU (plus Designer) and Road Safety Audit Team Leader
9	Provides response on the Audit report, referring to each and every audit recommendation	PIU/SRRDA
10	Follow-up and implement all agreed recommendations and changes	SRRDA/PIU (Designer)

8. Checklist for RSA

IRC:SP:88-2019 provides checklists for assistance during the audit process; checklist 7.6 is applicable to the audit of rural roads at design (DPR) stage and is reproduced at Annexure-II.

9. Reporting and format for RSA Report

The auditor will prepare report as per format placed at Annexure-III. To facilitate reporting of the audit findings and action on recommendations as well as monitoring of ATR, a

module for RSA has been created on OMMAS. Road safety audit findings will be input by the auditor on OMMAS. The PIU will take action and input the ATR. The SQC will evaluate/accept the ATR. A flow chart for the entire process has been prepared and is placed at Annexure-IV.

10. Providing Response to the Audit Report

- ⦿ The PIU is required to provide response in writing to each audit recommendation in the report.

He/she can either:

- Accept it completely (and develop solutions to overcome or reduce the safety concern); or
 - Accept the safety concern but not agree to the recommendation. In these cases, he/she will seek alternative ways to resolve the safety concern; or
 - Not accept the recommendation (explaining clearly why this decision has been taken).
- ⦿ To provide useful feedback, the PIU should send a copy of the response to the audit Team Leader for information. The audit team should note the responses and where possible learn from them. The team should be aware that they should not create an on-going dispute over which recommendations have or have not been accepted.
 - ⦿ As mentioned earlier, the audit team “guides” but it is the responsibility of the PIU and the designers (not the audit team) to make the final decision about the solution and to arrange for any redesign.

11. Deciding the way forward

- ⦿ The audit team has quite a straight forward task – to identify all the safety concerns that might exist in a road design for a new road project. If there is any doubt about whether or not an issue is likely to become a safety concern, the usual routine is to include that issue – just in case!
- ⦿ A part of the audit process that is often more challenging and demanding rests with the PIU and the SRRDA. How does the client decide whether or not to accept an audit recommendation? It is neither always possible nor practical to agree with all recommendations as some of these may involve large additional expenses that will affect progress with the project. In practice, this challenge facing the decision makers usually only arises with the 'very expensive' recommendations and occasionally with 'complex' recommendation; it rarely happens with simple and/or low cost recommendations.

- ⦿ As a guiding principle, when faced with an audit recommendation that is difficult to resolve, the PIU needs to consider and weigh up the following aspects:
 - How often might crashes occur? (weekly, monthly, yearly)
 - How serious might such crashes be? (fatal, injury, property damage only),
 - What will it cost to remedy (or at least reduce) the problem? With most safety concerns, there are usually several alternative remedies.
 - How effective can each alternative be expected to be?

12. Following up and implementing Agreed Recommendations and Changes

- ⦿ A road safety audit achieves nothing for the road users until its recommendations are discussed, decided and implemented.
- ⦿ As mentioned earlier, in many audits, particularly while the project is still in the design stage, the changes can be made at low cost. At times, however, an audit may reveal safety concerns that cause difficult decisions to be made by the PIU, usually because the cost of remedial action is so high. In these cases, the usual options available to the PIU include:
 - staging the improvement work over an increased period of time, possibly into the next financial year when more funding may be available.
 - seeking an increase in the project budget to allow the desired countermeasures.
- ⦿ These are all valid decisions, provided they are committed in writing in the response report with clear reasons given. The audit process can direct PIUs towards a safer alternative but the onus lies on the PIU to ultimately decide on the course of action and its implementation. As long as all competing issues are clearly and fully considered for each identified safety concern, the audit team should be satisfied that its contribution has been of value to the project.

13. Putting Road Safety Audit to Work in the SRRDA

- ⦿ For those road authorities yet to introduce the road safety audit process into their road planning/design/construction process, the following points provide guidance about the way forward:
 - Whether there is a formal commitment to improving road safety and this kind of support and empowerment is critical to creating a “safety culture” within a road authority.
 - Include road safety in the Action Plan of organization, and commit to developing a Road Safety Action Plan.

- Develop a Road Safety Action Plan. Base it on relevant road safety strategies (such as existing national and state road safety strategies). There is need to include a programme for the treatment of hazardous road locations (a blackspot programme) as well as the road safety audit process.
- Hold an open meeting of senior technical staff to discuss and address the important road safety audit issues that will arise in the organization. In so doing, develop an audit policy and a set basic audit practices which meet the needs of organization. Points that may arise in the meeting include:
 - How will the organization get adequate road safety audit skills and resource?
 - What needs to be done for the audit process to be understood by senior executives, managers, designers and potential auditors?
 - Designers may initially express reluctance at having their work audited. How can this be addressed?
 - How much training is required and for whom (departmental manager, engineers, designers, potential auditors)?
 - What road projects are to be audited in the organization? Only the largest projects, or only those on the busiest roads, or maybe urban only, or perhaps all projects above a certain cost or length.
 - How will road safety audit requirement be incorporated into design and construction contracts?
 - What proportion/number of projects will be audited? At what design stages will audits be conducted?
 - Who will be conducting audits? Will it be outsourced? If so, how to find and decide on auditors –best value for money, skills or experience? Who manages the panel of certified road safety auditors? Who can give advice on these issues?
 - How will audit recommendations be dealt with? Who will decide to accept or reject the more difficult recommendations? A formal process is required.
 - How will audit findings be fed back into the design process to improve future designs?
- Get started. Consider calling in a team of qualified and experienced road safety auditors to undertake some pilot projects or road designs. Use their findings in a training workshop that includes managers, designers and

potential future auditors as participants. Practical examples are very convincing. Designers and PIU of the road authorities quickly become audit supporters when they see for themselves some of the safety issues that arise in some road designs.

- Adhere to the agreed road safety audit policy to improve designs before they are built. Get feedback from auditors, designers and managers and then modify the audit policy and the audit process to best suit the road authority as experience grows.
- Be prepared for some mistakes but take time to learn from those mistakes so that the road safety audit process can develop and grow in the organization. After gaining experience with design stage audits, consider undertaking safety audits of the existing road network (possibly in conjunction with a program of treating hazardous road locations).
- Let the senior executives know how the audit process is progressing in the organization. Give them examples of where road users have benefited because of the road safety improvements generated through the audit process, and let them know how staff members are learning new skills as a result of the process.
- Keep it going! Once road safety audit becomes established in the organization there can be a temptation to believe that it will not happen automatically. This may or may not be so. Monitor the quality and the quantity of audit reports. Maintain a training and awareness program. Ensure that road safety audit is promoted with continued energy and passion.

Recurrent Type of Road Safety Issues on PMGSY Roads

S. No.	Issue	Description of Road Issue	Severity	Recommendation to Address the Issue
1.	Design of start point/ junction	Possible collision with through traffic on major road.	Very High	Provide speed breaker before intersection to alert drivers. Provide advance informatory and warning sign about the road/Junction ahead
2.	Sharp horizontal Curve	Thick vegetation right at edge of road. Poor sight distance causing risk of head-on collision.	High	Clear vegetation on shoulder and ensure it is maintained clear in future. Provide curve warning signs.
3.	Trees/pole/ other hazards close to the carriageway	Risk of vehicles hitting the object.	Medium	Hazardous objects to be painted/ marked.
4.	Edge Line not provided	Edge Line on both sides of single lane carriageway not provided	High	Provide Edge Line as per IRC : 35-2015.
5.	Edge Line and center line not provided	Edge Line and centre line on intermediate/ two lane carriageway not provided	High	Provide Edge Line and centre line as per IRC:35-2015.
6.	Cautionary Signboards missing	Cautionary signboards are absent at hazardous locations.	High	Required cautionary signboards are to be provided as per IRC:67-2012 recommendations.
7.	Object Markers not provided	Object markers which are used to indicate hazards and obstructions within the vehicle flow path are missing.	Very High	Object markers to be provided as per IRC: 79 recommendations.

8.	Speed breaker not provided	Speed breaker not provided at location requiring speed reduction	Very High	Speed breaker/ hump to be provided as per IRC:99-2018.
9.	Speed breaker	Speed breaker not visible	High	Speed breaker needs to be painted in black and white as per IRC:99-2018 and caution sign needs to be provided.
10.	Sign board	Sign board is not clearly visible.	Medium	Sign board has been provided but it is damaged, needs to be provided with proper sign board.
11.	Wheel guard not painted	Wheel guard is not conspicuous, especially at night.	Medium	Wheel guard on both sides needs to be painted black and white.
12.	Guard stone not provided	In case of roads along canal/ water bodies, errant vehicles may fall into the canal.	High	Guard stones to be provided along the road.
13.	Personal Protection Equipments	Laborers not wearing protective gear during construction activities. Risk of injury.	High	Work is in progress. Personal Protection Equipments need to be provided and laborers need to be encouraged to use personal protection equipments for their safety.
14.	Unsafe merging with higher category road	Road merges with a higher category road with restricted visibility. But no safety measure has been considered at the junction.	Very High	Provide speed breaker before intersection to alert drivers. Provide advance Informatory and Warning signs before approaching to the junction.
15.	School and habitation without any safety measures	No safety measures notice in these sensitive locations.	Very High	Provide speed breaker and cautionary signage for road safety.

16.	CD structure without hazard marking and guard posts	No safety measure found on CD structure to prevent errant vehicle from falling off road	Very High	Parapet w all of CD structure should be painted with hazard markings. Provide conspicuous guard posts and wheel guard to prevent errant vehicle from falling off road.
17.	Under construction Culvert without any cautionary signage and diversion road	Culvert construction is going on but no cautionary or diversion signage has been provided for safety.	Very High	Provide signage with retro-reflective stickers for safe moving. Provide temporary traffic diversion road for safe moving of vehicle.
18.	Blind Curve	Risk of possible head-on collision with opposing vehicles.	Very High	Blind curve on RHS needs to be provided with speed breaker and sign boards for road safety point of view.
19.	Habitation with restricted RoW	Speed regulation is required at these sensitive locations to have safe journey on road and safety of the residents	High	Provide speed breakers with caution signs following proper guideline laid out in IRC: 99-2018 for up and down traffic at these locations.

Table 7.6 Checklist for Safety Audit of Rural Roads

Issue	Yes	No	NA	Comments
1. Alignment				
(i) Are operating speeds likely to be commensurate with the design speed?				
(ii) Are there any abrupt sharp curves on the roads? If so, are warning signs provided on the approaches? Especially when radii of curves are less than the standards.				
(iii) Is there sufficient forward visibility available along the road?				
(iv) Whether appropriate traffic calming measures and cautionary signs boards are provided where there is compromise on geometrics due to land and other site constraints?				
(v) Is the interface between the new and existing road well away from any hazard (such as a crest, a bend, a roadside hazard or where there may be poor visibility) ?				
(vi) Are sight and stopping distances adequate throughout the road section?				
(vii) Will horizontal and vertical alignment be consistent with safe visibility requirement?				
2. Cross Section				
(i) Is the road wide enough for the traffic?				
(ii) Does the cross section include the needs of all road users including pedestrians, cyclists when the road passes through habitation/villages				
(iii) Does the cross section avoid unsafe compromises at bridges and other narrowing?				

(iv) Is there smooth transition in case of narrow bridges, CD structures and other narrowing?	
(v) Whether the cross fall/camber provided correctly in the design?	
(vi) Whether super elevation and extra width provided at the curves where required?	
(vii) When rural roads are constructed in stages, does the Stage-1 ensure proper safety until Stage-2 is taken up.	
(viii) Is there provision for bus stop/safe waiting space for villagers?	
(ix) Are they well positioned?	
3. Road Signs and Pavement Markings	
(i) Is the road (design) provided with reflective edge line markings and centre line markings (where applicable) as per IRC:35?	
(ii) Are the edge markings clearly visible at day and night conditions	
(iii) Are all required road signs provided as per IRC:67?	
(iv) Do the road signs and pavement markings have adequate retro reflectivity as required in IRC:67 and IRC:35?	
(v) Are there no-overtaking sign envisaged at curves at locations of restricted sight distance?	
4. Lighting	
(i) Are lighting facilities sufficient in built-up areas?	
(ii) Has street lighting been provided on sections where pedestrians or other vulnerable users are expected during night conditions?	
(iii) Is street lighting provided at junctions of rural road with high speed roads?	

5. Road-side Hazards	
(i) Are all delineations and hazard markers in accordance with IRC:79?	
(ii) Is the right of way free from hazardous road side objects? If not, are the hazardous road side objects delineated well with hazard markers or other treatments?	
(iii) Are all hazardous locations/ objects protected by safety barriers?	
(iv) Are there any roadside hazards which appear to have been left out in the design?	
(v) Is the type of barrier proposed suitable for the location?	
(vi) Whether retaining walls and breast walls provided where needed on roads in hilly area??	
(vii) Will the barrier terminals be a suitably safe type?	
(viii) Is the connection of safety barrier to bridge/culvert parapet safe?	
6. Schools/Built up areas	
(i) Are traffic calming measures provided near schools and built up area as per IRC:99?	
(ii) Has the approaching traffic been warned (through signs and markings) of the presence of the school and children?	
7. Drainage	
(i) Has drainage been provided? Is there any road section which is susceptible for water logging?	
(ii) Is the pedestrian walking space affected by provision of drainage?	
8. Junctions	
(i) Is sufficient visibility available for the main road users to spot the traffic approaching from the side road?	

(ii) Is sufficient visibility (check the visibility splay) available for the minor road user to see the traffic approaching from the side road?	
(iii) Has the junction control (priority) been established through markings	
(iv) Is the approach to junction provided with warning signs of the major road ahead?	
(v) Is the road approaching the junction on a gradient?	
(vi) Is there a need for speed reduction measure at the mouth of the junction?	
(vii) Is the design free of all Y junctions?	
(viii) Is the priority established in cross roads through pavement marking and traffic signs?	
(ix) Is the junction easily identified and understood from all approaches?	
(x) Are sight lines within each junction adequate and free of obstruction by fixed objects such as buildings, overpass structures, traffic signs or vegetation?	
(xi) Is there sufficient visibility (safe braking distance) available for all approaching vehicles?	
9. Railway Level Crossing	
(i) Whether road crosses a railway line and if so, whether a manned crossing or subway or over bridge has been envisaged?	
(ii) In case of level crossing, are all traffic calming measures provided with adequate signs and markings as per IRC Codes (IRC:67 and IRC:35)	
10. Other Safety Considerations	
(i) Whether the height of electrical transmission line over the road would have proper vertical clearance.	

(ii) Is the new road, as safe as practical given the local weather (sunrise, sunset, rain, snow, fog, storm, wind)	
(iii) Will the new road surface be free of gravel and sand and with good skid resistance	

Yes = likely to be satisfactory for safety

No = there are possible safety issues

NA = not applicable

Road Safety Audit Formats

(PART 1: ROAD INFORMATION)

State:			
District:			
Block:			
Road Number (Core Network)			
Construction Package Number			
Road Name:			
RSA Stage:	After construction/ maintenance	During construction	During Design Review
			●
Date:			
PIU:			

(PART 2: AUDIT INFORMATION)

Lead Agency:		
Inspection Team and Participants		
Name:	Role:	Organization:
Background to Inspection		
Road Safety Audit (RSA) Process		

(PART 3: Community Discussion)

Discuss with Community About Accident , Accident Place , & Description

(PART 4: ROAD SAFETY AUDIT FINDINGS)

Safety Issue No			
Photograph of issues		Description of Road Issue	
Road Safety Risk Assessment			
As per IRC:SP:88-2019			
Recommendation to Address the Issue			
Assigning Priority Level for Suggested Recommendation			
As per table below: (Slight adaptation of IRC:SP:88-2019 to take probability of occurrence into account)			
Severity Risk*	Likelihood (Frequency) of Occurrence		
	High	Medium	Low
Very High	Essential	Essential	Highly Desirable
High	Essential	Highly Desirable	Desirable
Medium	Highly Desirable	Desirable	Desirable

Note:

*Severity of Risk (based on possible consequences)

- **Very High:** Death single or multiple likely viz. bus falls in deep gorge in hill area, high speed collisions, vulnerable users get fatally hit.
- **High:** Death or hospitalization likely, high speed collisions, vulnerable users get injured requiring hospitalization.
- **Medium:** Only minor injury likely, medium speed collisions.

FORM A: Employers Response to RSA Findings

State:

District:

Block:

Construction Package Number

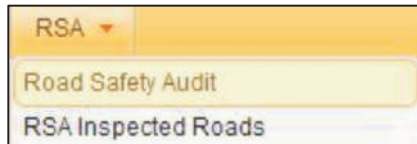
Road Name:

1	2	3	4	5	6	7
Road Safety Issue No	PIU Agree? Yes/No	PIU If disagree, explain why	RSA suggestion(s)	PIU To be implemented? yes, no, partial (elaborate)	PIU If yes or partial: arrangements for implementation and timeline	PIU If no, describe an alternative action to be taken and arrangements for implementation
	{To be filled by PIU}	{To be filled by PIU}		{To be filled by PIU}	{To be filled by PIU}	{To be filled by PIU}
	{To be filled by PIU}	{To be filled by PIU}		{To be filled by PIU}	{To be filled by PIU}	{To be filled by PIU}

RSA Module

Auditor

1. Login with RSAuditor role.
2. Go to “RSA Road Safety Audit”



3. Select the required parameters to list down the roads

4. The list of roads are displayed. Click on “Audit Details” against the respective road to update the RSA details.

Sl. No.	State	District	Block	Year	Batch	Package No.	Road Name	Road Length (in Km)	Maintenance Cost (in Lacs)	Audit Details
1	Odisha	Balasore	Barnaka	2009-2009	Batch-1	0.0103	RefadaSarangpurBarnakaApadipal - Hebatpur	124.7000	2.100	3.2100
2	Odisha	Balasore	Barnaka	2009-2009	Batch-1	0.0104	ArulaparaParyaparaChakradar - BarnakaNalaka	40.8400	2.750	2.8000
3	Odisha	Angul	Deopali	2009-2009	Batch-1	0.0101	ManikabaraChakradar - Chakradar	47.1600	2.900	2.1500
4	Odisha	Angul	Deopali	2009-2009	Batch-1	0.0101	KanakaPurChakradar - MNS	53.8800	3.900	3.9000
5	Odisha	Angul	Deopali	2009-2009	Batch-1	0.0101	SPB - Sahasrabudhi	50.7500	4.100	4.4700
6	Odisha	Angul	Deopali	2009-2009	Batch-1	0.0101	UNKAR - Narsipur	81.8000	2.200	2.2000
7	Odisha	Angul	Chandkhola	2009-2009	Batch-1	0.0104	ChandkholaChakradar - Karampur	213.8300	10.100	10.9100
8	Odisha	Angul	Chandkhola	2009-2009	Batch-1	0.0102	ArmedalaChandkholaChakradar - Saran	46.8000	3.000	3.5200
9	Odisha	Angul	Chandkhola	2009-2009	Batch-1	0.0102	ChandkholaChakradar - Rajgadh	64.6700	4.200	4.2100
10	Odisha	Balaspur	Mangur	2009-2009	Batch-1	0.0103	MangurKhanamalhuachhacharya - Taulanda	100.6400	6.100	6.5000

5. Select the “Road Status”, enter the “Inspection Date” and click on “Save” button

6. Enter the “Start Chainage, End Chainage, Safety Issue, RSA Recommendation, Severity and Likelihood of Occurrence” and click on “Save” button. Probability of occurrence is automatically populated.

RSA Module

7. The details are saved and option to upload photograph will be available.

Start Change	End Change	Safety Issue	Risk Recommendation	Probability of Occurrence	Severity	Image Upload	Delete
0.00	1.00	Cautionary Signboards are absent of hazardous locations.	Required Cautionary Signboards are to be provided as per RC, Essential 47-2012 recommendations	Essential	Very High		

8. Click on “Add Files” to select the photograph.

Image	Start Change	End Change	Safety Issue	Risk Recommendation	Risk Grade	Description of Image	Delete
Image_00000000	0.00	2.00	Safety Issue	Recommendation	Deficient		

9. Select the photograph, enter the “Description” and click on “Upload” button.

Image	Start Change	End Change	Safety Issue	Risk Recommendation	Risk Grade	Description of Image	Delete
Image_00000000	0.00	2.00	Safety Issue	Recommendation	Deficient		

10. Click on “Upload / View PDF file” to upload the PDF

File	Description of File	Delete

11. Click on “Add files”, select the PDF file, enter the description and click on “Upload” button to upload the file.

File	Description of File	Delete

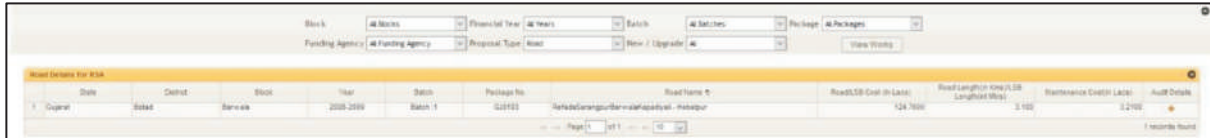
12. Once all the Issues are entered and photographs uploaded, click on “Finalize Audit” to finalize the RSA details and forward to PIU for updating the ATR.

Start Change	End Change	Safety Issue	Risk Recommendation	Probability of Occurrence	Severity	Image Upload	Delete
0.00	1.00	Cautionary Signboards are absent of hazardous locations.	Required Cautionary Signboards are to be provided as per RC, Essential 47-2012 recommendations	Essential	Very High		

RSA Module

PIU

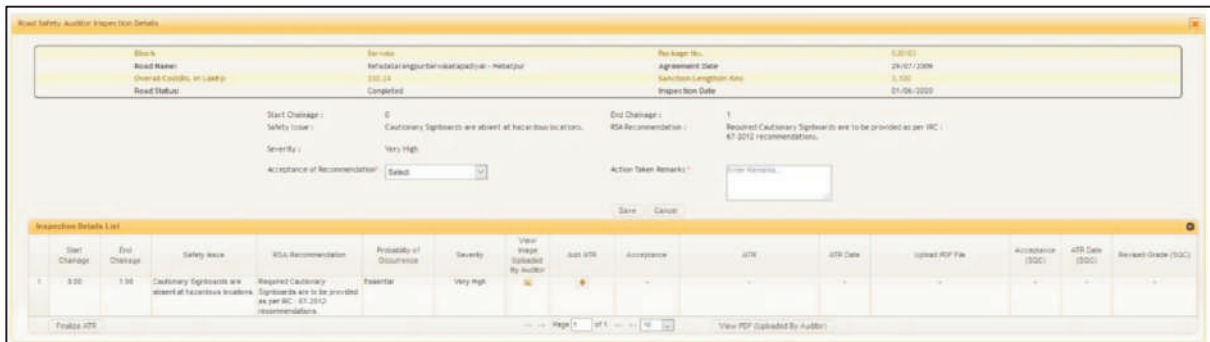
1. Login with PIU role.
2. Go to “RSA Road Safety Audit”
3. Select the parameters and click on “View Works” to list of works where RSA is performed.



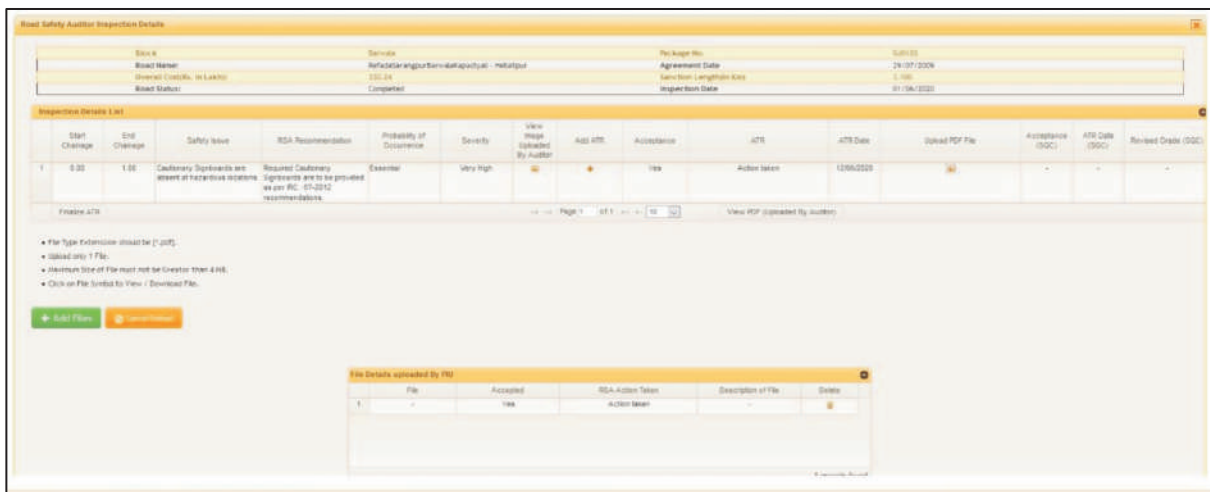
4. Click on “Audit Details” against the work to view the RSA details.



5. View the RSA details and click on “Add ATR” to update the ATR details.

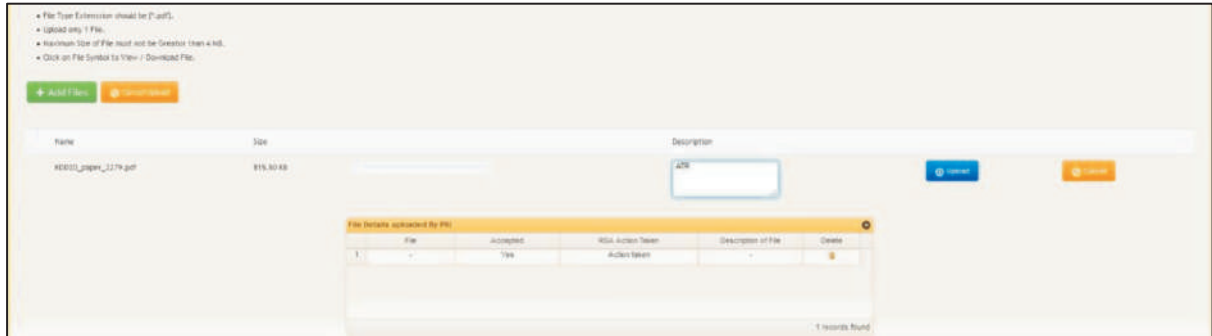


6. Select the “Acceptance of Recommendation”, enter the “Action Taken Remarks” and click on “Save” button. Option to upload ATR file will appear.

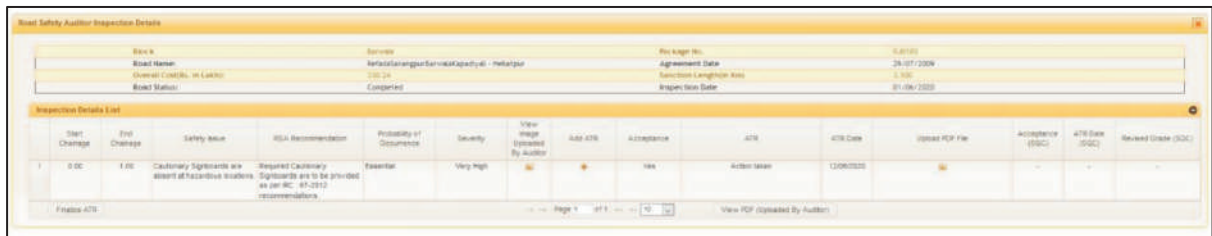


RSA Module

- Click on “Add Files” to select the ATR file.



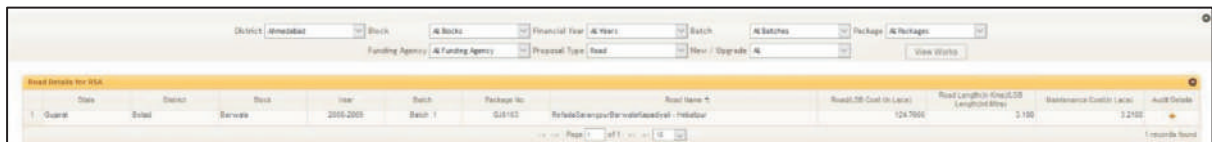
- Enter the “Description” and click on “Upload” to upload the ATR file against each issue.



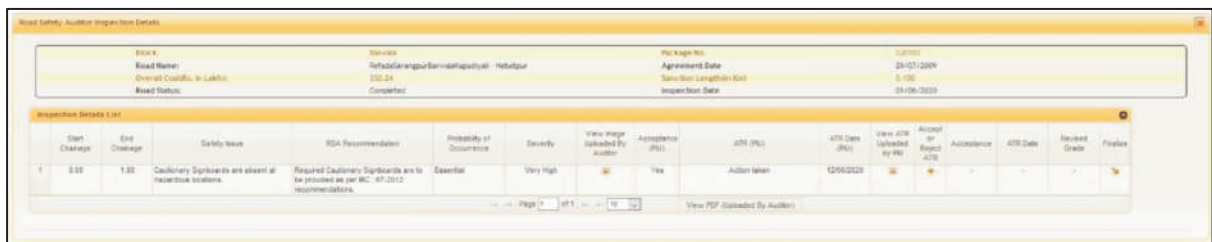
- Once all the ATR’s are submitted against each issue, click on “Finalize ATR” to forward the ATR to SQC.

SQC

- Login with SQC role.
- Go to “RSA Road Safety Audit”
- Select the parameters to list the roads where ATR is submitted by PIU.

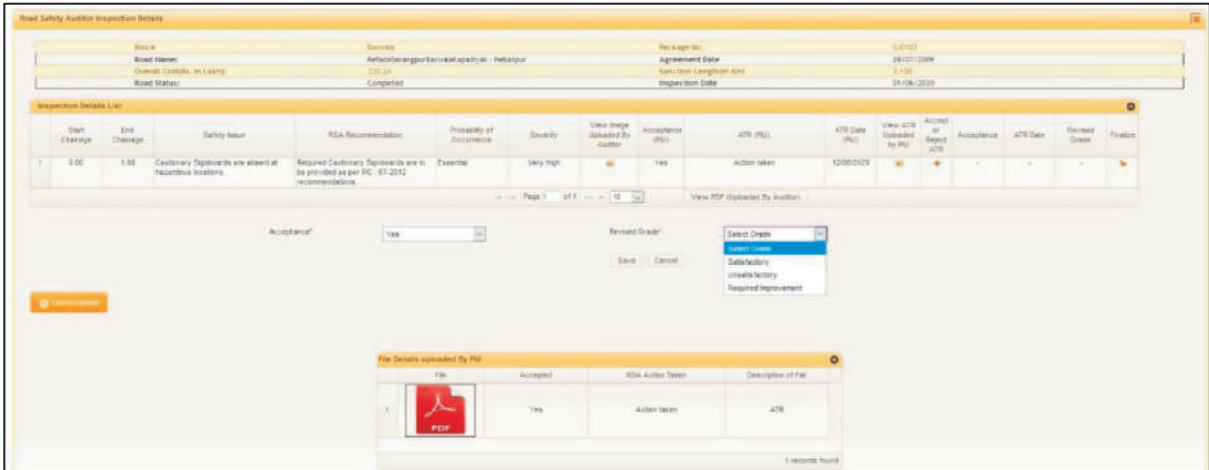


- Click on “Audit Details” to view the RSA Details.

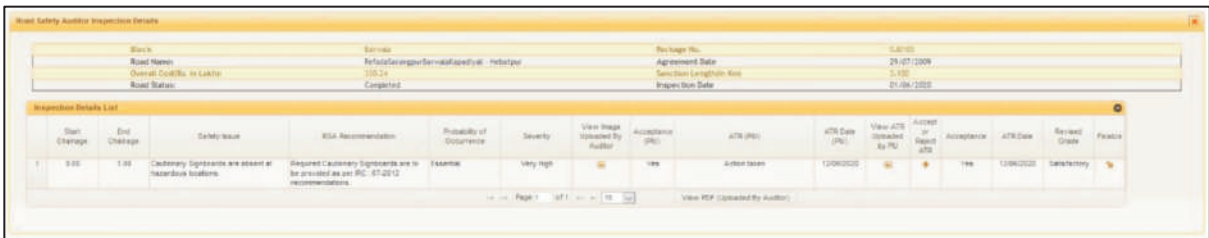


RSA Module

- To Accept or Reject the ATR, click on “Accept or Reject ATR”



- Select the “Acceptance”, “Revised Grade” and click on “Save” button.



- Once all the RSA details for the work are accepted or rejected, click on “Finalize” to close the RSA.