



ESTABLISHING iRAP IN YOUR COUNTRY

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ABOUT iRAP

The International Road Assessment Programme (iRAP) is a not-for-profit organisation dedicated to saving lives through safer roads.

iRAP works in partnership with government and non-government organisations to:

- assess high-risk roads and develop Safer Roads Investment Plans
- provide training, technology and support that will build and sustain national, regional and local capability; and
- track road safety performance so that funding agencies can assess the benefits of their investments.

Road Assessment Programmes are now active in more than 50 countries throughout Europe, Asia, the Pacific, North and South America and Africa.

The programme is supported by the FIA Foundation for the Automobile and Society. Its projects receive support from the World Bank Global Road Safety Facility, regional development banks and donors.

National governments leading in road safety, automobile associations, charities, the motor industry and institutions like the European Commission also support the developed Road Assessment Programmes (EuroRAP, AusRAP, usRAP and KiwiRAP) and encourage the transfer of technology to iRAP. Many senior individuals donate their time and expertise to support iRAP.



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Photo: Nicolas Zwarg

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INTRODUCTION

Every day, more than 3,500 people die in road crashes worldwide; 137,000 more are injured or disabled. Road trauma is a serious and rapidly worsening public health crisis. This crisis affects developing countries in particular, where nine out of 10 road deaths and injuries occur.

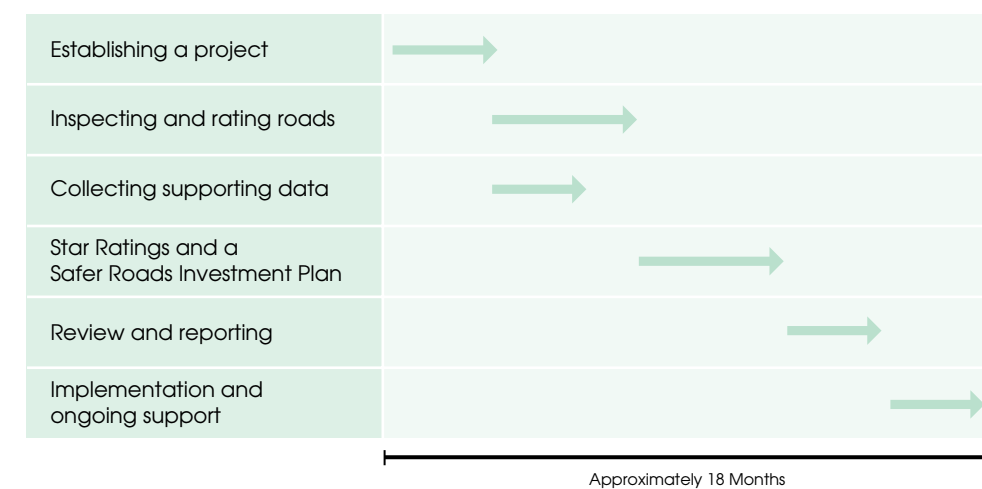
Road death and injury is preventable. iRAP's systematic approach to road safety can help save thousands of lives. It involves simple, affordable improvements to road infrastructure that can dramatically reduce both the risk of crashes occurring and their severity.

iRAP projects in low-income and middle-income countries typically involve:

- inspections of roads that are likely to have the worst levels of death and injury
- identification of affordable, high-return countermeasures that can be implemented rapidly
- building and sustaining the capacity of stakeholder organisations through training and direct experience in using iRAP technology and software.

This booklet is designed to help organisations in low-income and middle-income countries establish an iRAP project. It contains information on the phases of a typical iRAP project, as shown in the chart below. Projects normally take about 18 months to complete, although this can vary depending on local circumstances.

Because iRAP's primary aim is to reduce road trauma, priority is often given to projects in countries where the life-saving recommendations in iRAP's Safer Roads Investment Plans are most likely to be implemented.



ESTABLISHING A PROJECT

The establishment of a successful iRAP project depends on two key elements: strong partnerships and solid planning. At the outset, it is crucial that a partnership is forged between the iRAP team and a range of stakeholders who will cooperate to reduce road deaths and serious injuries in a country or region. Stakeholders often include governments, funding agencies, automobile associations, research institutes and other non-government organisations.

During the project establishment phase, a project plan will be developed by the iRAP team and updated on a regular basis in consultation with the key stakeholders.

PRELIMINARY ASSESSMENT

As part of the initial development of an iRAP project, stakeholders often complete a feasibility assessment. The assessment addresses issues such as the country or region's road network, the road safety situation and the availability of data including traffic volumes and road safety countermeasure costs. The assessment helps the iRAP team customise projects to specific circumstances and needs in each country or region.

WORKSHOP

Held early in the planning process, a workshop helps stakeholders understand the iRAP initiative and identify factors that will be critical for a successful project in their country or region. Workshops typically include the iRAP team and high-level representation from stakeholder organisations.

The workshop aims to:

- develop a common understanding of the purpose of the iRAP project
- define clearly the relationship of iRAP to other aspects of road safety strategy in the country or region
- create strong support for the iRAP project at a political level and across all key government and non-government stakeholders.

STEERING COMMITTEE

Following the initial workshop, a steering committee is normally established.

The purpose of the committee is to:

- provide leadership and support for the iRAP project and its focus on safer roads
- oversee each phase of the project and facilitate actions required for the project's success
- review the project outcomes and directions for the future of iRAP in the country
- provide leadership and commitment for the longer-term implementation of the iRAP recommendations.

The steering committee typically includes representatives of governments, funding agencies, automobile associations, research institutes and other non-government organisations that are independent of government.

ROAD NETWORK

One of the early tasks of the steering committee is to establish the iRAP road network, which becomes the focus of iRAP road inspections. Normally, the road network includes roads where large numbers of people are killed and seriously injured. The road network can also include corridors identified for future upgrade and investment. Typically, initial iRAP projects look at approximately 3,000km of road.

FINANCIAL ARRANGEMENTS

iRAP will typically establish a Memorandum of Understanding (MOU) with the lead stakeholder organisation in a country. The MOU sets out a clear definition of the project goals and any financial and resourcing arrangements.

Generally, iRAP will:

- manage the initial planning stage
- provide its technology and methodology through a licensing agreement
- help stakeholder organisations obtain any funding required from international bodies and other sources.

As part of a project's budget, the iRAP team will:

- provide overall management direction of the project, reporting to the steering committee
- secure the services of experts with experience in undertaking similar iRAP projects
- enable training for personnel seconded to the project.

Best outcomes in an iRAP project are achieved when there is local ownership and the contribution of local experts. Therefore, stakeholder organisations facilitate the project by providing practical help and support for visiting iRAP team members and experts, arranging any necessary permits and authorisation, and seconding staff to participate in the assessment project.

PROJECT PROMOTION

In a typical project, there are several opportunities for promotion, including through the media.

These opportunities include the:

- official 'launch' of the project
- start of the road inspections
- finalisation of the Star Ratings and Safer Roads Investment Plan.

These milestones present opportunities to:

- raise awareness of road safety generally
- highlight the importance of safer road infrastructure
- promote the role of stakeholders in the iRAP project.

The iRAP team works with local stakeholders to develop communications plans for the project, drawing on resources and experience from iRAP projects globally.

INSPECTING & RATING ROADS

After a project has been established, detailed road inspection and rating is able to begin. Using specially equipped vehicles, software and trained analysts, iRAP inspections focus on more than 30 different design features that are known to influence the likelihood of a crash and its severity. These features include intersection design, road cross-section and markings, roadside hazards, footpaths and bicycle lanes.

iRAP currently uses two types of road inspections: drive-through and video-based. The type of inspection conducted depends on the availability of technology, the complexity of the road network and the degree to which a project is focused on building the capacity of road safety stakeholder organisations.

DRIVE-THROUGH INSPECTIONS

Drive-through inspections require inspectors to record road design data as they drive along the road using a specialised data-tablet. The process is technical and requires accredited iRAP inspectors. Drive-through inspections are typically used where the length of road being surveyed is short or relatively simple (such as rural roads with no adjacent development). Local staff can be trained as accredited inspectors during the course of the project if required.

The drive-through inspection equipment includes a video camera, touch-sensitive laptop and Global Positioning System (GPS) antenna.

The drive-through inspections are followed by a period of data analysis and quality checking.



VIDEO-BASED INSPECTIONS

Video-based inspections are undertaken in two stages:

1. A specially equipped survey vehicle records images of the road as it travels the iRAP network.
2. The video is later viewed by analysts, or raters, and assessed according to iRAP protocols.

The survey vehicle can record digital images of a road (generally at intervals of 5–10 metres) using an array of cameras aligned to pick up panoramic views of the road (forward, side-left and side-right). The main forward view is calibrated to allow measurements such as lane width, shoulder width and distance to roadside hazards. The vehicles can drive along the road at almost normal speed while collecting this information.

Video rating

Following the completion of the video-based inspection, each relevant design features is measured and rated according to iRAP protocols. The process involves ‘streaming’ the video-images together to form a ‘video’ of the road network. Raters then undertake desktop inspections by conducting a virtual drive-through of the road network, at highway speed or on a frame-by-frame basis, depending on the complexity of the road. The software used by the analysts enables accurate measurements of elements such as lane widths, shoulder widths and distance between the road edge and fixed hazards, such as a trees or poles. Ideally, the people who undertake these inspections will be junior engineers and technical staff seconded to the project from stakeholder organisations.

At the completion of the rating, it is possible to produce a detailed condition report on the iRAP network. The report contains information such as the proportion of the network that has paved shoulders and number of locations that have adequate pedestrian crossings. This data forms the basis for Star Ratings and the Safer Roads Investment Plan.

To support the rating process, iRAP has developed a detailed road inspection manual that provides protocols and guidance on assessing various road design features. Because road design can vary significantly from country to country, iRAP regularly tailors the standard iRAP inspection manual for local conditions.

Training

Prior to the video-rating process, the iRAP team can train raters who have been seconded to the project. It is preferable, although not essential, that raters have some engineering background or experience.

The iRAP video-rating training programme includes:

- introduction to iRAP’s background and an explanation of the programme’s purpose
- outline of specific road safety data that highlights the scale of road trauma in the region
- detailed explanation of and training in the survey data collection process, and quality and efficiency requirements for the rating
- detailed presentation and explanation of road design attributes to be rated, with many local case studies and examples
- detailed training in the use of the video-rating software
- practice road rating sessions to ensure that trainees understand and can repeat the process.

At the completion of the training, trainees graduate as accredited iRAP raters.

COLLECTING DATA

To ensure the project outcomes reflect local conditions, practice and experience, a range of local data is sought. This part of the project often occurs immediately before and during the road inspections.

TRAFFIC VOLUME AND SPEED

Data on traffic volumes, vehicle mix and vehicle speed on the designated iRAP road network will be collated if it is available.

MAPPING AND ASSET MANAGEMENT

If possible, road mapping data (such as centreline locations) that is used by the local road authority will be sourced before road inspections begin. This is used to verify the boundaries of the iRAP road network and map the locations of road improvements subsequently recommended in the Safer Roads Investment Plan.

ROAD SAFETY COUNTERMEASURE COST

To enable cost estimates for proposed Safer Roads Investment Plans to be developed, a series of cost estimates for typical projects in the country will be required. This might include a review of information on the expected life of projects, if it is available.

CRASH

Many countries do not maintain readily accessible records on road crashes. Therefore, iRAP projects are designed so that they can be completed without reference to detailed crash data. Nonetheless, if crash data is readily available, it can provide a very useful source of information for model calibration, countermeasure review and performance tracking in the future.



Photo: Michael Martin

STAR RATINGS & SAFER ROADS INVESTMENT PLAN

When the road inspection and rating process is completed, the data is loaded into iRAP's customised online software.

The software was developed with the expertise of leading road safety research agencies worldwide, including ARRB Group (Australia), TRL (United Kingdom) and the Midwest Research Institute (United States). As part of the project, stakeholder organisations will receive training in the use of the iRAP software and will gain ongoing access to the software, enabling further detailed analysis of their road network.

STAR RATINGS

Star Ratings are based on road inspection data and road design risk factors. They provide a simple and objective measure of the level of safety that is 'built in' to the road for car occupants, motorcyclists, bicyclists and pedestrians. Five-star roads (green) are the safest, whereas one-star roads (black) are the least safe.

Importantly, Star Ratings can be completed without reference to detailed crash data, which is often unavailable in low-income and middle-income countries.



SAFER ROADS INVESTMENT PLAN

iRAP considers more than 70 proven road improvement options to generate affordable and economically sound Safer Roads Investment Plans that will save lives. These road improvement options range from low-cost road markings and pedestrian refuges to higher-cost intersection upgrades and full highway duplication.

The Safer Roads Investment Plan is produced in three key steps:

1. Drawing on data underpinning the Star Ratings and traffic volume data, estimates of deaths and injuries throughout the network are generated.
2. For each section of road, options for improvement are tested for their potential to reduce deaths and injuries. For example, a section of road that has a high level of risk for pedestrians might be a candidate for a pedestrian refuge, pedestrian crossing or signalised pedestrian crossing.
3. Each improvement is assessed against affordability and economic effectiveness criteria by making use of the road safety countermeasure cost data collected earlier in the project. A benefit-cost ratio of five is often set as a minimum requirement as a starting point for the analysis. This ensures that the proposed programme is affordable and represents a good investment return and responsible use of public money.

The Safer Roads Investment Plan produces information on:

- where the most affordable and cost-effective road improvements can be made to the network
- the number of deaths and serious injuries that would be avoided when the plan is implemented
- the economic benefit of the plan
- the cost of the plan, including capital and maintenance costs
- the estimated cost per death and serious injury avoided.

The results of the Plan can be categorised by the entire network or by road, road segment and road safety countermeasure type.

REVIEW AND REPORTING

Following the generation Star Ratings and Safer Roads Investment Plan, the results are reviewed with the stakeholder organisations and the steering committee.

At the completion of the review, the iRAP team will produce a range of materials to assist in promoting and disseminating the results. In addition to the results being available for stakeholders on the web-based software, summary results will also be presented in printed report. Example reports are available on the iRAP website, www.irap.net/library.asp



IMPLEMENTATION & ONGOING SUPPORT

iRAP encourages and supports several continuing post-project activities to ensure that genuine road safety gains are made and the capability of stakeholder organisations continues to grow.

iRAP SOFTWARE TRAINING

To ensure that stakeholder organisations are in a position to draw maximum benefit from the detailed road condition report, Star Ratings and Safer Roads Investment Plan, iRAP offers ongoing support and training on the use of the customised iRAP software.

ROAD SAFETY TOOLKIT

Typically, the planning and engineering steps involved in implementing a Safer Roads Investment Plan include:

- local examination of proposed iRAP countermeasures
- preliminary scheme investigation studies
- detailed design and costing, final evaluation and construction.

iRAP supports this process with best practice advice through the iRAP Road Safety Toolkit - www.irap.net/toolkit.

Building on decades of research into causes and prevention of serious injury on roads, the iRAP Road Safety Toolkit offers engineers and planners a free resource on the cost and life-saving potential of more than 35 safety countermeasures.

In addition to advice on countermeasures, which range from basic linemarking to complete highway duplication, the Toolkit helps engineers and planners customise safety plans for all road users, including cars, cyclists, pedestrians, heavy vehicles, motorcyclists and public transport vehicles, and for various road crash types, such as head-ons, intersections, lane-changes, manoeuvring, rear-end and run-off road.

REGIONAL WORKSHOPS

iRAP seeks to build a community of knowledge and a strong network of friendships between neighbouring iRAP projects. This allows ideas and experiences to be shared, and facilitates continuous improvement of iRAP activities globally. Regional workshops are an important forum for this interaction: countries discuss their progress and results, and report back on implementation plans, research and evaluation exercises.

RISK MAPPING AND PERFORMANCE TRACKING

Risk Mapping and Performance Tracking are iRAP protocols that can provide simple, objective information to guide future policy development and measure the effectiveness of implemented projects.

Risk Mapping

In regions where detailed crash data is available, iRAP produces Risk Maps that represent the actual number of deaths and injuries on a road network. Risk Maps capture the combined risk arising from the interaction of road users, vehicles and the road environment. The maps provide an objective view of where people are dying and where their crash risk is greatest.

Performance Tracking

Governments and funding agencies can benefit from measuring and reporting on the road safety outcomes of their investments. Star Ratings and Risk Maps provide objective measures that can be used to track road safety performance and establish policy positions. In the United Kingdom for example, EuroRAP used Risk Maps to demonstrate that the government had achieved a significant reduction in high-risk primary route roads between 1997 and 2006. In the Netherlands, the government has committed to eliminating one-star and two-star national roads.



FOR MORE INFORMATION

If you are interested in commencing an iRAP project in your country, please contact your local representative by visiting www.irap.net/contacts.

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To find out more about the programme, visit www.irap.net

To watch the iRAP video, go to www.irap.net/pilotproject.asp

You can also subscribe to 'WrapUp', the iRAP e-newsletter, by sending a message to icanhelp@irap.net