



23 February, 2015

Dr. Jim Young Kim
President, World Bank Group
1818 H Street NW
Washington, DC 20433

Dear Dr. Kim,

World Bank Safeguards Consultation

The International Road Assessment Programme (iRAP) welcomes the opportunity to comment on the World Bank Environmental and Social Framework. The work of the World Bank to end poverty and promote shared prosperity is supported by iRAP through our vision for a world free of high-risk roads.

Road crashes are responsible for the death and injury of more than 100,000 people a day and disproportionately affect people who are disadvantaged and vulnerable. Road crashes are the leading cause of death for young people aged 15-29 years (WHO, 2013). Based on these facts our key recommendations for the World Bank Environmental and Social Framework are centred on ensuring the safeguards, adequately and appropriately address this known risk. In summary:

1. The policy statements and *ESS1* should include road safety as a major priority within the Environmental and Social Framework.
2. *ESS4 – Community Health and Safety* be amended to include an Annex on the Safety of Transport Infrastructure that reflects the scale of World Bank investment in this area and the significant number of deaths and injuries that can be sustained on poorly designed road projects.
3. *ESS4 – Community Health and Safety* be amended to require the use of road infrastructure star rating targets to ensure there is a specific, measurable and achievable safety performance measure for all road users as part of all World Bank financed transport infrastructure. The detailed requirements and guidance on setting star rating targets should be explained in the Annex recommended above.

We have provided more detailed recommendations in the following pages.

iRAP has a long and productive partnership with the World Bank and is committed to supporting the development of an improved Environmental and Social Framework that effectively addresses the global road safety challenge. We look forward to working with the World Bank and assisting in the development of the annex, guidelines and associated capacity building materials to support the new World Bank safeguards for road safety.

Yours sincerely

Rob McInerney
Chief Executive Officer

Detailed Recommendations

ESS1 – Assessment and Management of Environmental and Social Risks and Impacts

Clause 54 of ESS1 highlights the need for the borrower to notify the Bank of any incident...including any fatalities or serious injuries. To comply with this requirement Borrowers would need to notify the Bank of any serious road crash on newly funded roads. The frequency of road trauma would most likely require regular reporting, highlighting the scale of the road safety crisis and the negative consequences of poor investment. Detailed crash monitoring and reporting requirements may be required for all road projects to specifically support this requirement in addition to other risk avoidance and mitigation recommendations below.

ESS4 – Community Health and Safety

With the stated objective to “anticipate and avoid adverse impacts on the health and safety of the affected communities” and to “ensure that the safeguarding of personnel....that avoids or minimises risk to the affected communities” the known road safety risks must be addressed.

Clause 25 of ESS1 also states that the Environmental and Social Assessment (ESA) will apply a mitigation hierarchy which favours the avoidance of impacts over minimisation or reduction of impacts to acceptable levels. ESS4 could apply this philosophy in addressing the well-known risk of road trauma by referencing and applying the safe-system¹ and star-rating practices being applied in Bank shareholder countries.

ESS4 - Traffic and Road Safety

The specific inclusion of Traffic and Road Safety in ESS4 clauses 15-17 is commended. We are supportive of the points made in this section. However, the lack of objective and measurable safeguards may result in continued underinvestment in road infrastructure safety, particularly for vulnerable road users. With crash data rarely available in borrowing member countries the community health and safety outcomes and road safety performance of a project can be difficult to measure, and therefore manage.

Given the large scale of World Bank transport sector investment and the long term implications of road infrastructure design it is vital that all transport loans are subject to objective standards for road safety. The use of ‘SMART’ safeguards that are specific, measurable, achievable, realistic and timely will ensure the road safety safeguards can be effectively implemented and monitored. This will ensure alignment with the Bank’s core principles of poverty reduction, shared prosperity and limiting economic burden on future generations.

World Bank Environmental and Social Policy

- All road projects should be deemed high or substantial risk due to the direct negative impacts of road death and injury.
- Clause 54 highlights that the Bank will develop and maintain directives, procedures and appropriate guidance and information tools to assist in implementing the Policy. The long-term partnership between World Bank and iRAP in this area has led to the development of the star rating, fatality estimation and economic valuation of road safety engineering improvements worldwide. The established iRAP experience across more than 30 low and middle-income countries can be expanded into appropriate guidelines to meet the specific needs of the safeguards (refer ESS1 and ESS4).

¹ The safe system principles are currently the subject of a major OECD / International Transport Forum working group <http://www.internationaltransportforum.org/jtrc/safety/safe-system/index.html>

For example the recent World Bank Global Road Safety Facility work funded by Bloomberg Philanthropies in India has undertaken iRAP assessments on 10,444km of road with an estimated 75,893 fatalities and serious injuries each year costing the Indian community \$2.8 billion annually. The engineering treatments recommended as part of those projects will significantly improve the star rating of the roads for all road users resulting in an estimated 58% reduction in death and injury with a benefit-cost ratio of 2.7. More than 31 billion vehicle kilometres of travel will be made safer supporting the 58 million people who live within 3km of the roads.²

ESS1 Assessment and Management of Environmental and Social Risks and Impacts

- Clause 2: traffic and road safety risk is high for all transport sector projects and therefore requires a commensurate level of assessment and monitoring.
- Clause 19 says that the Borrower will undertake...”measures and actions to address any capacity development issues pertaining to the Borrower”. A mandatory training module on road safety (capturing management, infrastructure, road user, vehicle and post-crash care needs) is recommended for all government, consultant and Bank project staff.
- Clause 26a should also specifically state “traffic and road safety” given the known-scale of the negative impacts.

ESS4 Community Health and Safety

Building on the Multi-lateral Development Bank (MDB) Road Safety Guidelines³ the following recommendations are suggested:

- Given the large scale of road trauma, it is recommended that road traffic safety is specifically included in clause 1 of the Introduction. For example “*ESS4 recognizes that project activities, equipment and infrastructure can increase community exposure to risks and impacts. Road related death and injury is a specific risk to be managed. In addition....*”.
- Clause A.15 suggests that the Borrower will identify traffic and road safety risks and where appropriate address them. Addressing these risks is always appropriate and therefore the words “*where appropriate*” should be deleted from this clause.
- With World Bank partnerships and supplier networks already in place to competitively deliver iRAP assessments, it is recommended that Clause A.16 is updated as follows:
 - *The Borrower will make use of tools such as the Road Safety Management Capacity Review and iRAP assessments to identify road safety measures and incorporate technically and financially feasible road safety components into the project design to avoid and/or mitigate potential road safety impacts on the local affected communities.*

² India Fact Sheet prepared in consultation with GRSF for Bloomberg Philanthropy reporting purposes

³ http://publicaciones.caf.com/media/40517/1._road_safety_guidelines.pdf

- It is recommended that Clause 16 is expanded and updated to capture the well-established use of road infrastructure star rating targets and investment plans, as follows:
 - *Where road and transport infrastructure forms part of the project, the Borrower will set appropriate infrastructure safety star rating targets⁴ for all applicable road users at the expected operating speed of the road.*
 - *The Borrower will incorporate the estimated economic costs of road trauma in the financial business case for the project based on the before and after fatality and serious injury estimations from the iRAP assessment or equivalent analysis.*
 - *In conjunction with meeting the agreed star rating target the Borrower will undertake a road safety audit for each phase of the project and routinely monitor incident and accident reports to identify and resolve problems or negative safety trends.*
 - *For Borrowers with vehicles or fleets of vehicles (owned or leased), the Borrower will provide adequate training to workers on driver and vehicle safety. The Borrower will include safety standards (e.g. Global NCAP ratings) in vehicle purchasing policies and ensure regular maintenance of all project vehicles.*
- Clause 17 can specifically highlight the importance of worksite safety (traffic management in addition to movement of construction traffic) as follows:
 - *For projects that involve construction on public roads, the Borrower will prepare and monitor appropriate worksite traffic management plans that avoid or mitigate the risks as required for the safety of workers, road users and affected communities.*
- An additional clause can be added as follows:
 - *The Borrower will document the road safety actions and star rating targets agreed for a particular project, and the rationale behind the setting of those targets, as part of the Environment and Social Commitment Plan (ESCP).*

For example based on the ADB Guidelines⁵ “roads with more than 50,000 vehicles per day should have a minimum of 4-stars for all users and roads or sections of roads passing through linear settlements should have a minimum four-star standard for pedestrians and cyclists.

- Road safety training and monitoring needs for the project must also be defined in the ESCP. This should include actions to ensure capacity building and compliance (as per clause 50 ESS1), incident reporting (as per Clause 54 ESS1) and steps to measure progress.
- Given the critical nature of road death and injury in low and middle-income countries, it is recommended that a specific Annex in ESS4 that addresses fully the Safety of Transport Infrastructure (as is the case for Dam Safety) is added. This can capture action across all 5 pillars of road safety action as defined in the UN Decade of Action for Road Safety⁶, and include the detailed guidance on the appropriate use of star rating targets being currently developed in consultation with Bank staff.

⁴ The iRAP star rating assessments were developed in partnership with the World Bank Global Road Safety Facility (GRSF) and guidance on the setting of star rating policy and project targets is under development in consultation with World Bank staff and other global iRAP partners.

⁵ <http://www.adb.org/publications/toward-sustainability-appraisal-framework-transport>

⁶ http://www.who.int/entity/roadsafety/decade_of_action/en/

Detailed Discussion and Background to Recommendations

The World Bank safeguards provide the framework for the Bank's "efforts to protect people and the environment" and to "be mindful of the economic burdens development can place on future generations"⁷. By lifting the prominence of road safety in the safeguards, the Bank can promote awareness of what is a global crisis and ensure best practice in managing it.

The scale of global road crashes

- Road crashes are the biggest killer of young people aged 5-24 in the world. Road crashes kill and injure an estimated 30-50 million people every year or more than 100,000 a day.⁸
- 92% of all road traffic deaths occur in low and middle-income countries⁶.
- Road death and serious injury in low and middle-income countries has an estimated economic cost of \$1 trillion a year or 5% of GDP⁹.
- 265,000,000 people will be killed and seriously injured in road crashes worldwide over the next 15 years. That is equivalent to the combined populations of Argentina, Ethiopia, Ukraine, Nepal and Thailand or 85% of the entire US population (iRAP estimate based on WHO projections).

Global action

- In recognition of the global road safety crisis the United Nations established the Decade of Action for Road Safety¹⁰.
- The United Nations post-2015 Sustainable Development Goals¹¹ currently include the following:
 - **Goal 3.6** "halve global deaths and injuries from road traffic accidents".
 - **Goal 9.1** "Develop quality, reliable, sustainable and resilient infrastructure, including regional and trans-border infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all".
 - **Goal 11.2** "by 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons.

The road safety imperative in World Bank lending

Transportation infrastructure has been, and will continue to be, one of the most significant areas of lending by the World Bank (typically 20-25% of the total loan portfolio). In pursuing other development objectives, Bank funded projects often focus on access, reduced travel times through faster speeds and higher volumes. Each of these are associated with an increase in road trauma risk that must be offset with appropriate mitigation measures and broader objectives to reduce road trauma levels. There are examples of roads where the evidence suggests deaths have increased following completion of a project. The scale of this tragedy must be reflected in the focus placed on road safety safeguards in the new Environmental and Social Framework.

⁷ <https://consultations.worldbank.org/consultation/review-and-update-world-bank-safeguard-policies>

⁸ WHO (2013) [Global Status Report on Road Safety](#)

⁹ iRAP (2014) <http://www.irap.org/en/about-irap-2/a-business-case-for-safer-roads>

¹⁰ http://www.who.int/roadsafety/decade_of_action/en/

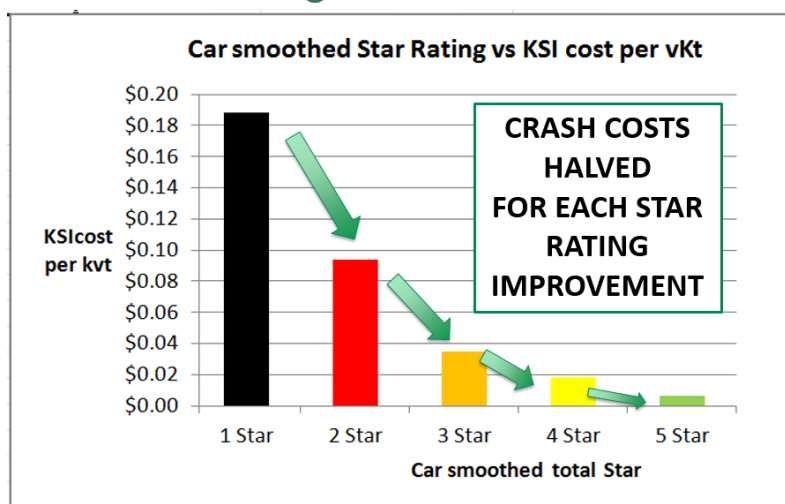
¹¹ <https://sustainabledevelopment.un.org/focussdgs.html> viewed 18 Feb 2015

The reporting requirements of Clause 54 of ESS1 highlights the need for the borrower to notify the Bank of any incident...including any fatalities or serious injuries. The frequency of road fatalities and serious injuries on many new road projects will require regular reporting over many years highlighting the tragic consequences of road trauma. This likely scenario highlights the need for more stringent and specific safeguards for road safety that avoid or mitigate the risk of road crashes as part of all projects.

The World Bank Policy statement (Clause 4a and 4b) highlights the need to address social risk and impacts that 'fall disproportionately on disadvantaged or vulnerable groups'. The Global Status Report on Road Safety⁶ (WHO, 2013) highlights the impact of road death on injury on those "entering their most productive years" and that "economically disadvantaged families are hardest hit by both direct medical costs and indirect costs such as lost wages that result from these injuries."

Prevention is the key. iRAP research¹² worldwide has shown that the fatal and serious injury crash cost per kilometre travelled is approximately halved with each incremental improvement in star rating. With death and serious injury rates on many low and middle-income country roads as high as 10-20 per kilometre per year, the potential for safer roads to save lives is significant.

Star Ratings and Crash Data



While local agencies may define the final designs in accordance with local standards the safety performance of those standards may be poor. In many cases the infrastructure failings are clear. No footpaths, safe crossings or safe speeds for pedestrians and vulnerable road users, no separation of oncoming high-speed traffic, dangerous intersections and hazardous roadsides are just some of the avoidable issues. The process based monitoring of the past (e.g. has a road safety audit been completed) is often insufficient to avoid and mitigate risks. The paucity or lack of accurate crash data may also make crash based performance measures unmeasurable and ineffective, or where crash data is good, poor performance will only become visible many years after the project has been completed.

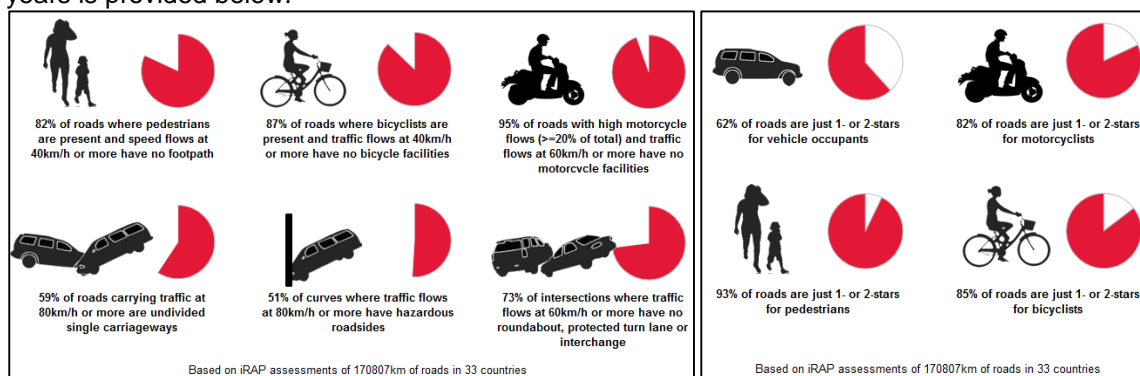
The World Bank has the opportunity to use the safeguards to "anticipate and avoid adverse impacts on the health and safety of affected communities" by eliminating, minimizing or mitigating the risks and impacts of transport projects in relation to road trauma. Outcome measures such as infrastructure star ratings can be applied during the project specification, design and monitoring stage providing a proven, measurable and effective means of managing risk.

¹² <http://www.irap.org/en/about-irap-3/research-and-technical-papers?download=91:relationship-between-star-ratings-and-crash-costs-the-bruce-highway-australia> and <http://www.irap.org/en/about-irap-3/research-and-technical-papers?download=40:crash-rate-star-rating-comparison-paper>

The opportunity for improvement

The World Bank and iRAP have worked in partnership since 2004 when the Global Burden of Disease report highlighted the scale of road trauma in low and middle-income countries. The partnership involved the development and piloting of star ratings for pedestrians, cyclists, motorcyclists and vehicle occupants that can be applied in rural and urban areas and the associated investment plans that identify all of the proven and cost effective interventions on the roads assessed.

The iRAP protocols have now been used in over 70 countries worldwide and an estimated 400,000km + of roads have been star rated. An example of road assessment data from the last 2 years is provided below.



iRAP road condition data (170,807km)

iRAP star rating data (170,807km)

Many countries and development agencies are now applying star rating targets as part of their operations. For example:

- The MDB Road Safety Guidelines¹³ have identified road safety rating as one of the issues to be considered in all stages of a road project.
- The World Bank and relevant state governments have applied minimum star rating standards as part of road projects in Karnataka, Assam, Gujarat and Kerala in India. The Gujarat Results Report¹⁴ includes the monitoring of the length of the corridor meeting the star rating target.
- The ADB has also applied a similar approach in Shaanxi¹⁵ and Anhui in China.
- The SloCaT Results Framework¹⁶ (p23) developed to support achieving the proposed SDG target to halve road deaths includes an implementation measure to eliminate one or two star roads by 2030.
- The World Bank SSATP programme has developed the Managing Road Safety in Africa¹⁷ publication that provides a framework for national lead agencies describes iRAP as international best practice that “can develop a prioritised program of works towards achieving at least 3 star safety ratings for all road users” (p46).

¹³ http://publicaciones.caf.com/media/40517/1.road_safety_guidelines.pdf

¹⁴ http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/SAR/2014/08/06/090224b0825ec462/3_0/Rendered/PDF/India000Second0Report000Sequence002.pdf

¹⁵ <http://www.irap.org/en/about-irap-3/presentations/category/15-innovation-workshop-2014?download=230:iws14-07-star-rating-designs-in-shaanxi-tiejun-zhang-greg-smith>

¹⁶ <http://www.slocat.net/resultsframework>

¹⁷ <https://www.ssatp.org/en/publication/managing-road-safety-africa-framework-national-lead-agencies>

- The ADB Sustainable Transport Appraisal Rating¹⁸ integrates the star rating performance targets into their Sustainable Transport Appraisal Rating (see below).

SOC-4 Safety

To what extent will the project improve transport safety and security?

This question seeks to measure the contribution of the project to the following agendas:

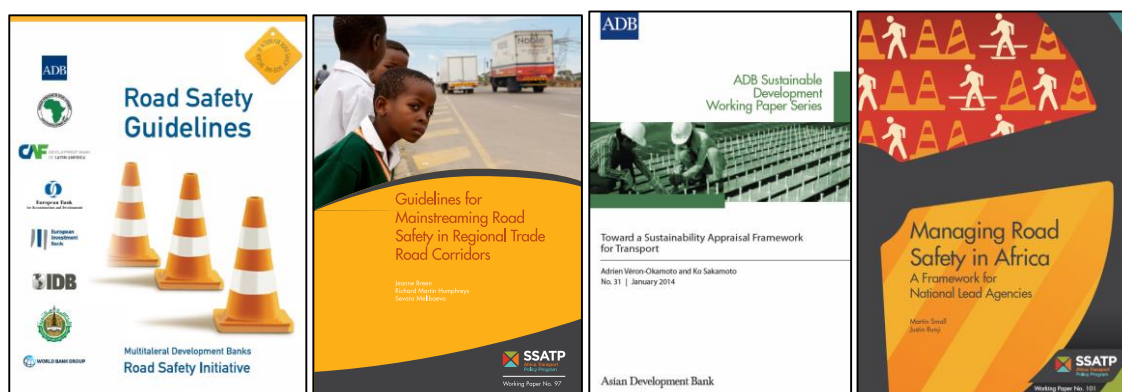
- **Transport**, particularly **road safety**. Road crashes cause around 1.3 million deaths and injure or disable as many as 50 million people each year.
- **Security**. The intervention may affect personal safety ranging from crime to harassment.

Road safety considerations will need to be taken for most road-based projects. The attached safety scoring tool can be used on a pilot basis to derive the rating for safety issues. Alternatively, when an International Road Assessment Programme (iRAP) rating is available, the difference between before and after cases is a prime indicator. Preferably, (i) all new or rehabilitation road designs should always have a higher safety rating than the existing road and have at least a three-star rating standard for all road users, (ii) roads with more than 50,000 vehicles per day should have a minimum of four stars for all users, and (iii) roads or sections of roads passing through linear settlements should have a minimum four-star standards for pedestrians and cyclists.

Recommended quantitative indicators are

- predicted number of road death fatalities, serious road injuries, and non-motorized transport users deaths; and
- length of roads with an iRAP rating of two stars or less/three stars or more.

- The Dutch Government was the first to adopt a no one or two star road by 2020 policy. The Swedish Government measure the percentage of vehicle mileage on roads that meet EuroRAP four-star standard¹⁹.
- The New Zealand Government recently adopted a review of design standards that ensure Roads of National Significance will be implemented with a minimum 4-star rating²⁰.
- The UK Government²¹ (p13) and Australian state governments²² (p3) are now actively pursuing star rating targets.



Example LMIC Policy Documents recommending safety ratings and iRAP metrics

¹⁸18 <http://www.adb.org/publications/toward-sustainability-appraisal-framework-transport>

¹⁹19 http://ec.europa.eu/transport/road_safety/specialist/knowledge/dacota/pdf/safety_issues/policy_issues/08-safety_ratings_en.pdf

²⁰20 <http://www.saferjourneys.govt.nz/action-plans/safe-roads-and-roadsides/>

²¹21

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/396487/141209_Strategic_Business_Plan_Final.pdf

²²22

http://www.transportinfrastructurecouncil.gov.au/publications/files/National_Road_Safety_Action_Plan_2015-2017.pdf

Safer roads will also pay for themselves. The economic benefit of road trauma reduction is not typically included in the economic valuation of Bank funded projects. The valuation of this benefit is now possible as part of all iRAP assessments being applied around the world. The inclusion of the economic costs of road trauma, and the associated crash cost savings associated with a well-built and safe new piece of road infrastructure will ensure safety benefits are quantified and form part of the financial business case for a project. Internal rates of return of 30% plus are common for road safety infrastructure investments.

The key opportunity is to target high risk roads where large numbers of people are being killed and injured, and apply economically viable treatments to improve the star rating of those roads. Ensuring the safety of new roads being built is also critical to avoid creating a new burden for local families, communities and health services.

The mechanism for improvement

Applied at the institutional level and building on the successful long-term partnership between the World Bank, Global Road Safety Facility and iRAP the introduction of star rating metrics to World Bank lending is immediately possible. There is established World Bank (40,000km+) and iRAP (400,000km+) of star rating experience worldwide. The World Bank specific process and guidelines can build on the extensive training and support materials already developed by iRAP to support the global programme active across more than 70 countries worldwide.

The application of objective measurement tools will remove many of the subjective challenges faced by World Bank country managers and project teams and provide certainty in decision making, monitoring and evaluation. With appropriate support this approach should deliver efficiency savings in addition to improved road safety outcomes and confidence in the positive impact of investments.

The established national programmes²³ and iRAP supplier networks²⁴ will provide immediate capacity and allow for competitive tendering of assessments. The star rating of a design at a project level can be easily incorporated into, or form the basis of a road safety audit and be undertaken by the road safety auditor with associated training and accreditation. The cost of any assessments will be marginal to the cost of the audit and likely to be less than 0.1% of the project cost.

The most important aspect of a new project is to ensure the new road is built to a minimum safety standard / star rating target. At a minimum this will only require a star rating of the design drawings at various stages during a project. If measuring success is required then the assessment of the existing road is required and the completion of before assessments can also be streamlined with low-cost, fit for purpose assessment tools that can allow before and after conditions to be measured, monitored and celebrated. These tools (e.g. low-cost video, smart phone / tablet applications) are already being developed by commercial suppliers to support star rating of schools and pedestrian star rating of public transport hubs.

iRAP is a charity and is willing to work closely with the World Bank Safeguards team to ensure the institutional, procurement, capacity and other requirements associated with application of star rating targets can be managed within the Banks operating procedures. This will also provide a framework for the Monitoring and Implementation Support phases of transport related projects.

²³ <http://www.irap.org/en/about-irap/about-us>

²⁴ <http://www.irap.org/en/resources/accredited-suppliers>

Concluding Statement

The road infrastructure provided at a location provides the foundation for potential conflicts that can kill or injure:

- a high-speed road with no footpaths, safe crossings and vulnerable user separation has the risk of pedestrian, cyclist, animal-drawn cart and motorcyclist fatalities and serious injuries built into the design.
- an undivided road has the risk of poor overtaking behaviour and head-on fatalities and serious injuries built in to the design;
- a road with steep drains or trees has the risk of run-off road fatalities and serious injuries build into the design;
- an intersection with no time or physical separation of turning movements has the risk of side impact fatalities and serious injuries built into the design and

If new roads are built with these deficiencies then the risk of death and injury exists on day 1 and will continue for the 20-30 year life of that piece of infrastructure. Avoiding or mitigating this risk is simple, proven and cost effective and the World Bank has an opportunity to prevent this tragedy in the years ahead with appropriate attention in the Safeguards.

Introducing star rating targets will provide the specific, measurable, achievable, reliable and timely safeguard to address the significant risk of road death and injury World Bank loans can create for a community.

World Bank leadership in setting objective targets will have benefits beyond the World Bank lending portfolio and make a significant contribution to the proposed UN Sustainable Development Goal to halve road traffic deaths. The development of the new safeguards and appropriate attention on road safety targets and actions will save lives, reduce injuries, reduce poverty and lift the burden of road trauma from future generations.

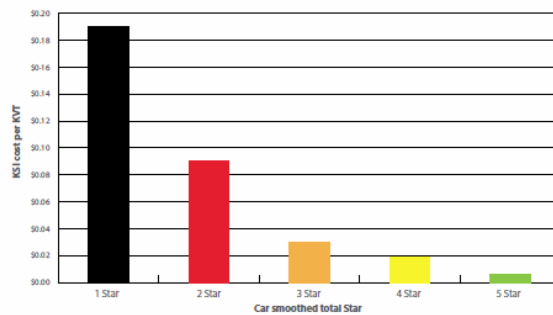
Further details

Contact: iRAP Chief Executive Officer
Rob McInerney
rob.mcinerney@irap.org
+61 405 49 3030

Appendix A: Established World Bank success with star rating targets – Safe Roads for All²⁵, Commission for Global Road Safety (2013)

BOX 10

Targeting high risk roads



Source: AusRAP 2013. Relationship between star ratings and crash cost per kilometre travelled

More than half of the world's road deaths happen on less than 10% of roads. The targeting of high risk roads with the implementation of proven safe system interventions is consequently an efficient way to save many lives. One example of how this can be achieved is through safety star rating of roads, an approach that is beginning to be adopted by many countries.

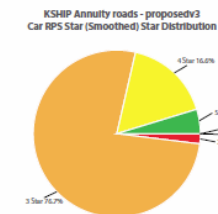
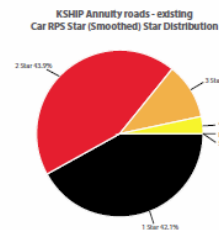
Star rating is a design and measurement tool used to assess the safety protection provided to all road users on a given road. The relationship between star ratings and the speed limit is crucial. To achieve the safety performance required for a desired star rating a road can either be engineered to enable a higher speed limit (e.g. separation of oncoming traffic, separate provision for pedestrians and cyclists or effective prevention of access, treatment of roadside hazards), or can have a lower speed limit (which needs to be effectively enforced).

The relationship between star ratings and actual crash outcomes is becoming well understood. In simple terms, improving a road from one star to two star will halve crash costs per kilometre or mile travelled. Improving from two star to three star will halve crash costs again.

Taking in to account the economics of road upgrades and traffic volume, the complete elimination of one and two star roads is a viable high return initiative and policy position. Upgrading high volume roads and motorways to four or five star standard is also viable. For example the New Zealand Government has set the target for their Roads of National Significance to be minimum four-star standard.

At the road design level it is important to ensure that new high-risk roads are not built. In this respect, the World Bank is beginning to lead the way with Global Road Safety Facility-funded work in India through the support of

	Car RPS star (smoothed) star ratings										Total		
	0 km	0.0%	★	★★	★★★	★★★★	★★★★★	★★★★★	★★★★★	★★★★★			
KSHIP Annully Roads - existing	0 km	0.0%	231 km	42.1%	241 km	43.9%	59 km	10.7%	18 km	3.3%	0 km	0.0%	549 km
KSHIP Annully Roads - proposedv3	0 km	0.0%	0 km	0.0%	2.0%	2.0%	421 km	76.7%	91 km	16.6%	25 km	4.6%	549 km



Bloomberg Philanthropies. The Karnataka State Highway Improvement Project (KSHIP) in India provides an award winning example of how Star Ratings are being used to design safer roads:

1. The World Bank initially set a target of 3-stars for road safety demonstration corridors. The Government then extended this target to include a further 500km of new roads.
2. Road safety inspections were carried out and baseline Star Ratings calculated for the existing roads.
3. Consulting engineers and road authority engineers used Design Star Ratings to test the safety impact of various design options, such as 'raised pedestrian crossings', and were motivated to achieve the minimum 3-star target.
4. Final designs were based on optimised Star Ratings that met local design standards and budget and environmental requirements.

This process resulted in designs with significantly better Star Ratings than the existing roads through the inclusion of proven improvements such as footpaths, raised crossings, signage and delineation, roadside hazard reduction and paved shoulders. For example, the percentage of road rated 1- or 2-stars for vehicle occupants reduced from 86% to 2% (see above). It was estimated that the new designs would result in 55% fewer deaths and serious injuries than currently occur, equivalent to over 1,400 deaths and serious injuries saved every year on just 550km of road.

A project in the Republic of Moldova produced similarly impressive results. With the support of the Millennium Challenge Corporation, the Global Road Safety Facility and engineers from URS Corporation and Univerisnj, designs that focused on pedestrian safety in villages increased the percentage of road rated 4-stars from 8% to 84%. Final designs were estimated to reduce risk of severe injuries by 40%.

²⁵ http://www.makeroadssafe.org/Documents/mrs_safe_roads_for_all.pdf