iRAP Safer Road Infrastructure Bonds Discussion Paper

Saving lives and transforming road infrastructure safety through Social Impact Bonds

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The Cause of Road Death

- Road death and injury cost $2,200 billion+ globally each and every year
- The solutions are in one sector – The benefits in the other
- Gross underfunding of proven, cost effective and high-return interventions

Who has Solutions

The Road
50% of the world's roads are only 1 or 2 star standard where 5 star is the safest.

The Vehicle
New vehicles are now reaching 5 star safety levels. Global availability and affordability is the issue.

The Road User
Speed, Alcohol, Distraction, Fatigue, Helmet use & non-use of seat belts remain major contributors to death

Who Benefits

The Health Sector
Crashes can consume 75% of hospital capacity for treating head injuries.

Insurance
Insurance premiums and payouts can account for >1% of GDP

Business & Families
Congestion from road crashes
Death or Injury of a worker and work-based insurance premiums
Death or Injury of a family member

A World Free of High Risk Roads

The Solution to Save Lives

iRAP Safer Road Infrastructure Bonds

Social impact bonds (SIBs) are designed to help reform public service delivery. SIBs improve the social outcomes of publicly funded services by making funding conditional on improvements. Investors pay for the project at the start, and then receive a payment based on the results achieved by the project.

THE BENEFITS

- Health Sector Saving
- Business Sector Saving
- Insurance Sector Saving
- Legal Sector Saving

THE SOLUTIONS

- Accelerated Road Upgrades
- Deaths & injuries saved
- 30 year dividends to funder
- Before & After Star Ratings

A World Free of High Risk Roads
iRAP Safer Road Infrastructure Bonds

This paper has been prepared to generate discussion and explore the potential for the concept of Social Impact Bonds or Social Benefit Bonds to be applied to road safety investment during the United Nations Decade of Action for Road Safety and beyond. The broad concept is summarised as:

- Private Sector/Investment Fund accelerated financing of safety upgrades (Social Benefit Bond)
- Investments and economic benefits guided by iRAP Safer Road Investment Plans
- Benefits measured by iRAP Risk Maps, Star Ratings and estimated Fatality Reductions
- Calibrated against actual crash data, insurance and hospital records
- 20-30 year dividend streams that capture and share road safety performance benefits

The Need

Road crashes kill 1.24 million people a year. An estimated 30-50 million people are injured every year. Road crashes impact the young and economically productive and impose a significant burden on health, insurance and legal systems.

The cost of road crashes globally is estimated at more than US$2,000 billion a year. Investment does not match the scale of the problem. Road infrastructure has unacceptable risk of head-on, run-off road, intersection and pedestrian deaths and injuries built in to current designs. Proven and cost effective solutions exist for most crash outcomes and all that is missing is the appropriate scale of response to the problem.

The Cause

The gross underfunding of road infrastructure safety relates to the disconnection and incorrect apportionment of funds between prevention and funding of consequences.

That is the US$2,000 billion in annual road crash costs are primarily borne by the health and welfare system, the legal system, the insurance sector, the commercial and business sector and the families of those impacted.

Without a whole of government / whole of system response to solving the $2,000 billion problem the scourge of road death and injury will remain for future generations. We can either pay now or pay forever.

The Solution

The preventative solutions for road death and injury are primarily in:

- road infrastructure (e.g. significant lengths of our road network are 1- or 2-star where 5-star is the safest and research shows that crash costs halve for each one star improvement in a road network),
- policing and behaviour change (e.g. enforcement, education, technology improvements such as alcohol interlocks)
- vehicles (e.g. rapid modernisation of fleets to 5-star safety levels)

iRAP Safer Road Infrastructure Bonds provide the mechanism for the whole of government / system benefits to be captured and the rightful, accelerated investment in safer road infrastructure delivered.
iRAP Safer Road Infrastructure Bonds.

While Prime Ministers and Presidents can directly recognise the whole of government benefits of investment in safer road infrastructure, initial capital funding constraints can and have restricted the scale of investment needed for the long term benefits to be realised. With road crashes costing US$2,000 billion each and every year the annual benefits to be unlocked are significant.

A mechanism is needed that adequately informs the funding of road improvements and distributes the potential benefits of this road safety investment to the agencies and actions that have the potential to stop the death and injury occurring. The use of the global iRAP Star Ratings and Safer Road Investment Plans provides this mechanism.

Where insurers, such as TAC in Victoria, have the responsibility for managing the majority of the impacts of road trauma the benefits of investment in roads has been recognised. TAC is currently funding a $1 billion (AUD) ten year investment in safer roads across Victoria. Recently the Road Safety Foundation in the UK published Saving Lives, Saving Money capturing the true cost and burden of road crashes in the UK and the OECD recently held a roundtable on Insurance Costs and Accident Risks in Paris.

Social Benefit Bonds or Social Impact Bonds are becoming well established and the model is particularly applicable to investment in road infrastructure safety. The bonds are currently applied in the UK and US and are now being encouraged now in Australia. The Social Benefit Bonds provide the vehicle where long term social and government benefits can be captured and converted into long-term performance based income streams that can support innovative financing or capital market up-front investment in road safety.

Financial, community and political benefits

There is no greater reward than saving lives. Despite the death and injury of an estimated 30-50 million people each year globally the scale of action globally is still lacking. The United Nations has declared 2011-2020 the Decade of Action for Road Safety. The iRAP Safer Road Infrastructure Bonds have the potential to provide a win, win, win, win and win!

Community Win: High return road infrastructure improvements can typically save at least 1 in every 3 fatalities and injuries on high-risk roads. The reduction in personal suffering will be enormous.

Technical Win: Road authorities will benefit from an increased safety level across their road networks driven by a robust, internationally recognised methodology with backing of the world’s leading research agencies. Road funding levels will be at appropriate increased levels.

Political Win: Use of the iRAP star rating protocol will provide the ability to immediately measure the before and after star rating of any upgraded section. The new upgrade, small or large, can be celebrated as the auto-club and government stand together to ribbon cut the road going from one star to three star – or two star to four star immediately upon completion. This will drive community knowledge, interest and demand for further improvements.
**Health and Legal Sector Win:** The direct costs associated with the long term treatment of head, spinal, limb and internal injuries sustained in road crashes will be immediately reduced. Hospital beds and medical resources will be freed up. Third party insurance costs will be reduced and the legal costs associated with coronial inquiries and crash investigation will be reduced.

**Financial Win:** The iRAP Safer Road Investment Plan provides the objective data to guide the road investment priorities, the returns on investment and the immediate dividend payment stream associated with any accelerated road investment. An international model now applied in 80+ countries worldwide, the iRAP plan will provide confidence to investors and government involved in the initiative. Benefits will accrue over 20+ years providing guaranteed income streams and returns to support the upfront capital investment.

**Measurement of the benefits**

A major barrier to investment in road safety in the past is that the impacts are not immediately measurable unless large scale upgrades have been undertaken. The highly effective interventions such as roadside barriers, widening, delineation and intersection improvements need to be monitored over time to measure improvements.

The iRAP approach provides the mechanism to ensure “outcomes are predefined and measurable” as recommended by the [UK Government](#).
The iRAP Safer Road Infrastructure Bond

iRAP is a UK registered charity and has active projects and programmes in over 80 countries. The programme provides the global benchmark and international standard for road safety performance through the use of risk maps and star ratings for roads. iRAP is a sister programme to the globally successful New Car Assessment Programme (NCAP) that is applied globally and provides the star ratings for cars.

The iRAP Safer Road Infrastructure Bond concept is summarised as:

- Government sets a performance target (e.g. 4 star standard) for a section of road or network
- The iRAP Safer Road Investment Plan provides a measure of the expected lives and serious injuries saved, the crash cost saving and the benefit cost ratio and internal rate of return from the potential application of over 90 proven countermeasures every 100 metres along the road
- Accelerated financing of safety upgrades is undertaken and supported by Treasury direct (through recognition of whole of government benefits) or through a Social Impact Bond where the private sector invest in the initial capital investment and/or maintenance programs
- The individual investments are measured in terms of before and after star ratings, risk maps and the predicted fatality reductions and economic benefits as derived from the iRAP Safer Road Investment Plans
- The models are calibrated against actual crash data, insurance and hospital records if available, or the base international research and iRAP fatality predictions can be used.
- The government agencies or private sector financiers are delivered 20-30 year dividend streams or availability payments that capture road safety performance benefits as measured objectively by the iRAP model
- Government, auto-club and other stakeholders celebrate each upgraded section through the promotion of the before and after star ratings and/or the predicted level of crash risk reduction. This creates demand and recognition of the benefits of investment.
**Next Steps**

The iRAP Safer Road Infrastructure Bonds are well suited to a road that is highly deficient in terms of road engineering safety or are subject to a public private partnership on an existing or new piece of road. Current feasibility activities include:

- Analysis by Australian Government Treasury officials as part of a potential multi-billion dollar road upgrade of 1,700km of road that currently experiences crash rates 3-5 times greater than other strategically important roads. The road has an estimated 5,000 deaths and serious injuries predicted over the next ten years. The current road is primarily 1,2 or 3 star standard where 4- or 5-star is the preferred target.
- Early discussions related to the reprivatisation of up to 5,000km of road in Mexico currently managed by Banobras that has the potential to include upgrades to minimum 3- or 4-star standard as part of any term sheet.
- Independent review by Deloitte Access Economics and ongoing discussions with a range of government, development bank and investors.

**Expressions of Interest**

For further information or an expression of interest please contact:

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The iRAP Solution – Australian Case Study

Risk Mapping
Crashes per kilometre travelled maps and performance tracking provide the international benchmark for actual lives saved.

Star Rating
The star rating provides the objective international measure of the safety of the road infrastructure provided.

Minimum star ratings set for new upgrades and before and after star ratings used to promote and provide immediate feedback on safety investment.

Safer Road Investment Plans (SRIP)
Developed in conjunction with the world’s leading road safety institutions and World Bank the SRIP provides the IRR, BCR and NPV of all possible road safety treatments, optimised to maximise the deaths and serious injuries saved and economic return on investment.

For more details visit www.irap.org
Background Research

Social Impact Bonds Globally

https://www.gov.uk/social-impact-bonds

Social impact bonds (SIBs) are designed to help reform public service delivery. SIBs improve the social outcomes of publicly funded services by making funding conditional on improvements. Investors pay for the project at the start, and then receive a payment based on the results achieved by the project.

Rather than focusing on inputs (e.g. number of doctors) or outputs (e.g. number of operations), SIBs are based on achieving social ‘outcomes’ (eg improved health). The outcomes are predefined and measurable.


The “social impact bond,” also known as a “pay for success” bond, is the latest — and most discussed — tool in a broader playbook philanthropists are using to blend business and charity to make a bigger difference.

In 2010 the first Social Investment Bond was signed with the UK Ministry of Justice to provide a program to work with inmates of the Peterborough Prison who were soon to be released. The social program worked with them to reduce the likelihood that they would reoffend and end up back in jail.

The NSW Treasury has initiated a trial of social benefit bonds in the areas of out-of-home care and recidivism http://www.treasury.nsw.gov.au/site_plan/social_benefit_bonds


“The Centre for Social Impact’s inaugural Social Finance Forum has been told that Social Investment Bonds (SIBS) could be a ‘game changer’ in funding, benchmarking transparency and driving innovation in the Australian Not for Profit sector.