

GLOBAL | URBAN MOBILITY

Cycling Towards Safety and Inclusivity

The International Road Assessment Programme (iRAP) is a registered charity dedicated to preventing road deaths and serious injuries worldwide. A new CycleRAP tool was launched in 2022 to address increasing cycling and light mobility risks.



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A memorial for Marina Harkot near the crash site.
Image: Debora Ungaretti / Labcidade



The rise in use of light mobility vehicles calls for more proactive design and provision of safer cycling infrastructure.
Image: Monica Olyslagers

Providing safe infrastructure is a critical ingredient for more inclusive mobility and is a vital economic resource.

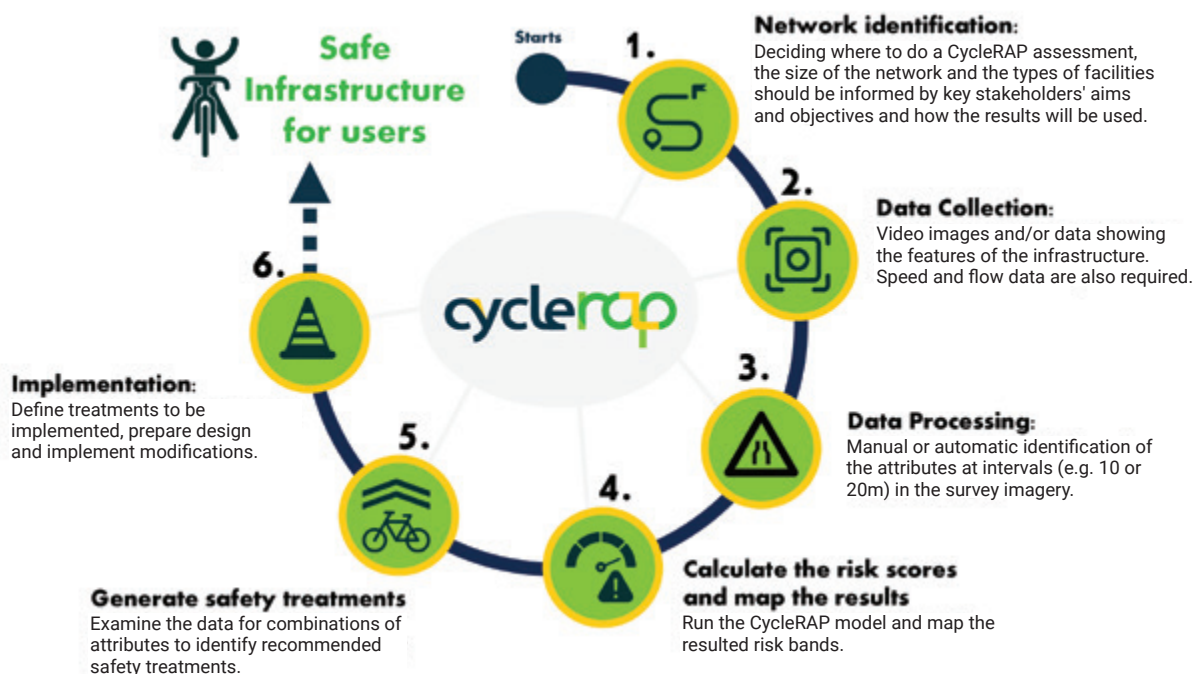
The Challenge

Marina Harkot was a 28-year-old sociologist, cycle activist and researcher on urban mobility. On 8 November 2020, while Marina was riding her bike home in São Paulo, Brazil, she was struck and killed by a 35-year-old man who was driving a sports utility vehicle (SUV). He did not call for medical assistance. Marina's death sparked widespread community response and protests about conditions for bicyclists.

Lack of safe infrastructure for bicyclists is a common issue for cities worldwide. This deficit is becoming ever more critical with the steep increase in the use of bicycles

and other light mobility vehicles. Rapid changes in technologies, the appearance of cycling service providers, the growing sharing economy and food delivery services are some of the contributing factors to the exponential growth of two-wheel vehicles.

Providing safe infrastructure is vital to reducing crashes and saving lives, guaranteeing a positive cycling experience, and encouraging new users to take up cycling. It is also a critical ingredient for more inclusive mobility for women, children, elderly, disabled and disadvantaged, and is a vital economic resource



This reflects the typical CycleRAP assessment. To see the attributes considered in the analysis and test how they affect risk, readers can access the CycleRAP Demonstrator at <http://www.irap.org/cycleraap/demonstrator>.

Image: iRAP

for villages and low-income communities to access markets, employment, education, and other benefits, such as cycling tourism.

The obstacles to safer infrastructure for bicyclists and other forms of light mobility are not simply political or community reluctance. There is a lack of knowledge—about both the problems and how to address them. The lack of data on bicycle trips, travel patterns and crashes is a significant challenge to understanding how the design of streets and cycling facilities impact safety and risk.

This is exacerbated by high levels of crash underreporting, particularly for those that do not involve motor vehicles. This is because traffic police rarely attend the site of a bicycle crash where no vehicle is directly involved, and so no crash

reports are made. As a result, many more injured bicyclists are hospitalised than are recorded in official crash reports. A study led by Paul Schepers of hospital data in 12 countries found that between 60% and 95% of hospitalisations and 17% of fatalities from bicycle crashes did not involve conflict with a vehicle.

The World Health Organisation reports that on average, 41,000 cyclists are killed each year on roads around the world. Many more suffer severe, life-long injuries. More effort is needed to improve safety for bicyclists and light mobility users in cities to support new and greener mobility choices. With so many urban challenges ahead, cities need to ensure the proper allocation of resources in light mobility infrastructure, to maximise road safety.

The Solution

Addressing road safety typically uses a "reactive" approach. That is, road managers fix known crash sites and then propose remedies. Road safety assessments, on the other hand, employ a "proactive" approach. Rather than waiting for crashes to happen, this method objectively identifies risks and proposes safety treatments. This is done before any crash happens, based on well-known high-risk road and facility-related attributes.

iRAP launched its new CycleRAP tool in 2022 to meet increased demand for tools to help road managers understand and address cycling and light mobility risk. CycleRAP is an evidence-based infrastructure risk evaluation model which aims to reduce crashes and improve safety specifically for bicyclists and other light mobility users. The model identifies high-risk



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locations without the need for crash data, and pinpoints and maps where crashes are likely to occur. It also offers suggestions for treatments to reduce this risk. Its efforts relate directly to the UN Sustainable Development Goals, specifically Goal 3.6 to halve road deaths by 2030, and Goal 11.2 for access to safe, affordable, accessible and sustainable transport.

The CycleRAP model classifies the cycling infrastructure into four levels of risk (low, medium, high or extreme) for four crash types (vehicle-bicycle, bicycle-bicycle, bicycle-pedestrians and single-bicycle), based on the combination of 50 data points.

As part of the CycleRAP safety treatment plan, the model results are analysed and mapped to inform



CycleRAP results mapped for the city of Deutschfeistritz, Austria, using data from the SABRINA project.
Image: EIRA over Google Earth Background

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CycleRAP was also used to assess trails, paths and shared-use spaces that were beyond the scope of traditional road inspection.

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local authorities about the risky areas and propose solutions. The model is designed to be easy, affordable, and fast to perform.

CycleRAP has now been used in several cities internationally. This includes the European Interreg SABRINA project where Eurovelo routes across eight countries in the Danube region—covering central and eastern Europe—were assessed using CycleRAP, alongside other assessment methods. CycleRAP was also used to assess trails, paths and shared-use spaces that were not connected to the road network, hence beyond the scope of traditional road inspection.

More recently, CycleRAP pilots were launched in Barcelona, Bogotá, Fayetteville, Madrid and São Paulo, as part of a project funded by Foundation Mapfre, UCI and PTV. This project aims to present to the cities the infrastructure risks and recommended treatments to increase safety. It showcases what a safe facility for cyclists and other light mobility vehicles is and how they can implement CycleRAP projects in other cities. CycleRAP has also been used in Addis Ababa, Ethiopia, as part of a masters thesis study at the University of Berkeley.

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This is the equipment used to collect CycleRAP data.
Image: iRAP





Examples of different low-risk infrastructure in Fayetteville, Ljubljana, Madrid, São Paulo and Vienna where CycleRAP was piloted.
Image: iRAP

The Outcome

Where data is often severely lacking, CycleRAP helps cities identify, understand, prioritise and address high-risk locations for cyclists and light mobility users. CycleRAP does this by ranking the risk levels—from extreme to low risk—of sections in the assessed network. This can also be done for specific crash types, such as bicycle-pedestrian conflicts. CycleRAP then provides recommendations for treatments to reduce risk. The mapping results can help cities to prioritise spending resources, based on the risk hierarchy and recommended interventions at each section.

CycleRAP can also be used to guide the definition and design of safer infrastructure. Low-risk facilities can be showcased to inspire other cities to deliver safe infrastructure.

To prevent more riding fatalities, every city in the world must create safe infrastructure for users. Tools such as CycleRAP, can support city planners to improve the efficiency and impact of investments, to ensure safer streets and paths for bicycles and light mobility users. These tools support evidence-based decision-making and can be used to communicate success in promoting sustainable transportation and safe mobility. 🗨️