





AI&ME: EMPOWERING YOUTH FOR SAFER ROADS

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ABBREVIATIONS

The following table describes the definition of the abbreviations or acronyms presented in this report.

Abbreviation	Definition
irap	International Road Assessment Programme
SR4S	Star Rating for Schools
YEA	Youth Engagement App

ABOUT THIS PROJECT

The *AI&Me: Empowering Youth for Safer Roads* project is funded by the Fondation Botnar and co-funded by the FIA Foundation.

The project partners are the AIP Foundation (Lead), the International Road Assessment Programme (iRAP), and Anditi.

AIP Foundation and the International Road Assessment Programme (iRAP) collaborated to produce this Public Facing Report and acknowledge, with thanks, the donors and other partners who have contributed to its preparation, particularly Fondation Botnar and FIA Foundation. The views and opinions expressed in this Scalability Report are solely those of AIP Foundation and iRAP and do not necessarily reflect the official policy, position or views of Fondation Botnar and FIA Foundation. Further enquiries can be made to the following point of contacts:

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Project Funders

Lead funder



Fondation Botnar https://www.fondationbotnar.org Co-funder



FIA Foundation https://www.fiafoundation.org

Project Partners



AIP Foundation (Lead partner) https://www.aip-foundation.org



International Road Assessment Programme (iRAP)

https://irap.org



Anditi https://www.anditi.com

About Fondation Botnar

Fondation Botnar is a Swiss-based foundation which champions the use of artificial intelligence and digital technology to improve the health and well-being of children and young people in growing urban environments. To achieve this, Fondation Botnar supports research, catalyzes diverse partners, and invests in scalable solutions around the world:

More information is available at: <u>www.fondationbotnar.org</u>.

About FIA Foundation

The FIA Foundation is an independent UK registered charity which supports an international programme of activities promoting safe roads, clean air and climate action.

More information is available at: www.fiafoundation.org.

About AIP Foundation

AIP Foundation is a non-profit organization dedicated to preventing road injuries and fatalities in low and middle-income countries. Since 1999, AIP Foundation has been delivering effective road safety programs in locations across Asia and Africa.

More information is available at: <u>www.aip-foundation.org</u>.

About iRAP

The International Road Assessment Programme (iRAP) is a registered charity dedicated to saving lives by eliminating high risk roads throughout the world. iRAP works in partnership with governments, road authorities, mobility clubs, development banks, NGOs, and research organizations around the world. We provide the tools and training to assess and measure the safety of roads, create the business case for investment in safer roads, and track performance against road safety targets in over 100 countries. iRAP is financially supported by the FIA Foundation.

More information is available at: <u>www.irap.org</u> and at the <u>SR4S Website</u>.

About Anditi

Founded in 2014, Anditi is a data analytics company specialized in spatial data transformation to provide a better understanding of how data can improve our lives. Anditi provides LiDAR, data analytic and visualization services for people in government, roads and infrastructure, urban planning, mining, and energy industries. Its powerful 3D data portal enables decision-makers to access and view spatial data in a flexible and user-friendly way.

Anditi is working to create more sustainable global communities by helping clients better manage, visualize, and understand data insights. Through our projects and partnerships, Anditi is working to reduce waste and unnecessary use of resources, create safer roads and working environments and improve collaboration between industry and community.

More information is available at: <u>www.anditi.com</u>.

PILOT IN VIETNAM: BEST PRACTICES FOR THE AI&ME: EMPOWERING YOUTH FOR SAFER ROADS

1. EXECUTIVE SUMMARY

Road crashes are the leading cause of death for children and young adults aged 5-29 years globally, and the tragedy of death and injury impacts every community on earth. In Vietnam, young people (10-24 years) are especially vulnerable, accounting for 17.2% of road crash-related fatalities. Despite increased awareness of the road safety crisis, inadequate data hinders policymakers' ability to target interventions effectively. Current mobility data in Vietnam is fragmented and lacks youth input, impeding efforts to localize and fix high-risk areas. A platform that combines open data with community inputs, especially around schools, is crucial for improving road safety and protecting vulnerable users with youth and community participation.

AIP Foundation, in partnership with the International Road Assessment Programme (iRAP) and Anditi, piloted a three-year project, *AI&Me: Empowering Youth for Safer Roads*, in three Vietnamese cities (Ho Chi Minh City, Pleiku City - Gia Lai Province, and Yen Bai City - Yen Bai Province), with funding from Fondation Botnar and the FIA Foundation. The project effectively utilized technologies to engage young people in sharing their safety perceptions and assisting decision-makers in identifying high-risk areas near schools and prioritizing resource allocation for school safety improvement. The project consists of the following elements: Big data and digital technologies, youth empowerment, government engagement, and public-private collaboration and partnerships. This report is one of the project's most vital deliverables, aiming to share best practices, outcomes, lessons learnt and recommendations for scaling the project.

The Big data Screening Methodology, the Youth Engagement App (YEA), and the Citizen Portal were three technology tools and approaches that the project championed. The Big data Screening method collected road, infrastructural, and sociodemographic data from 1,063 schools in Ho Chi Minh City, Pleiku, and Yen Bai and ranked them from greatest to lowest risk using Big data sources, mainly telematics and satellite data. The method was validated by the results of iRAP's school star rating, which confirmed the capabilities of the Big data screening methodology to identify high-risk schools from a broad population of schools. The YEA was created as an "easy-to-use" tool for young people to identify sites where they feel "safe" or "unsafe" on their way to school, with the goal of informing the locations for iRAP's Star Rating for Schools Assessments. The combined Big data, YEA, and SR4S results were placed on a Citizen Portal, and the local government partners successfully advocated for its inclusion in provincial government websites to support dialogues with communities and decision-makers in order to spark change toward a healthy and safe environment for young people to thrive.

The project successfully promoted young people's commitment, comprehension, and action by empowering them about road safety, while securing buy-in and better targeting the resources of the local government through involving them in trainings and events. As a result, young people expressed their opinions by creating nearly 20,000 pins for places near their schools, along with remarks about the road safety risks they witnessed at every point. Out of the 106 schools identified through the Big data screening, 98 were rated with 1-2 stars and shared with local government. While seven schools were improved by the project and other donor-funded projects, the local government developed and implemented 87 modification items at 13 other schools as a result of collaboration and partnership between the public and private sectors and diverse stakeholders working together to improve safety.

The project was assessed and analyzed for feasibility, efficiency, and scalability in the <u>Scalability Impact</u> <u>Report</u>, which confirmed the viability of the approach and the potential to replicate the successful and cost-efficient intervention in other countries around the world.

2. BACKGROUND

Xuan is 15 years old and living in one of the major cities in Vietnam. She usually walks to school. It is not a long walk. She takes no more than 15 minutes to the school gate from her house where she lives with her parents, siblings, and grandmother, Anh. She enjoys walking since the weather is usually pleasant, although sometimes it is a bit too hot on her way back home, and she has company from her friends on most of her route. On the way to school, Xuan and her friends must cross eight roads. One of them is particularly difficult to cross since it is a wide road. There are no signals for the cars and motorcycles to stop, and drivers pass by quickly.

Xuan is a happy girl who loves K-pop music. She considers herself lucky since she has a lovely family and friends with whom she gets along very well, and the whole future is waiting for her. She loves to tell others stories, so she wants to study journalism and be a reporter.

Xuan's profile is not different from the 6,200 children and youth killed in road crashes in 2019 in Vietnam. Road crashes are the leading cause of death for children and young adults aged 5-29 years globally, and the tragedy of death and injury impacts every community on earth. A staggering 500 million people are projected to suffer life-changing injuries or be killed in road crashes over the next decade, which translates to an estimated economic cost of over 25 trillion USD. Low and middle-income countries are most affected, bearing the burden of 79% of global road fatalities in accordance with the latest Global Status Report, 2023.

By 2050, almost 70% of the world's population will live in urban areas, and more young people will be growing up in cities than ever. Poor road infrastructure standards and the essential use of sustainable forms of transport, like walking and cycling, mean young people like Xuan are particularly at risk for road trauma.

SOMETHING NEEDS TO BE DONE AND NEEDS TO BE DONE QUICKLY

Digital transformation is reshaping nearly every aspect of young people's lives, from communicating and socializing to accessing information and engaging with the world around them. With the rapid advancement of technology, today's youth are growing up in an era where smartphones, social media, and other digital platforms are integral parts of their daily routines.

There is a generational gap in technological literacy and adoption between young people and decisionmakers, which can affect decision-makers' ability to fully understand and address the needs and perspectives of young people, especially regarding road safety. To bridge this gap, it's essential to establish effective channels of communication and engagement that leverage technology to facilitate dialogue.

Moreover, incorporating youth perspectives into the design of road safety policies and urban interventions ensures these initiatives resonate with their needs and preferences. By placing youths' voices at the center of decision-making processes related to road safety, policymakers can better understand the realities and priorities of the younger generation and develop more inclusive and effective strategies to improve road safety in communities. This approach not only empowers young people to take ownership of their own well-being but also fosters a sense of responsibility and civic engagement among future leaders.

It's certainly true that engaging youth in road safety discussions can be challenging, given the competing interests for their attention. Leveraging technology as a tool to capture their interest and facilitate engagement is a smart approach. By using platforms and mediums already popular among young people, such as social media or interactive apps, you can create content that resonates with them and encourages participation.

Through technology-based road safety education, youth gain the knowledge and skills to effectively communicate their concerns and advocate for safer roads. Equipped with the understanding of road safety concepts, they can articulate their observations and propose solutions to decision-makers, ultimately shaping safer infrastructure and regulations.

For example, Xuan, with a solid grasp of road safety language and concepts, can identify hazardous areas and propose specific measures or improvements to address them. This ability to communicate effectively with local authorities enhances the power of the governmental agency by receiving realistic and constructive inputs which facilitates dialogue between the community and policymakers and other stakeholders.

Ultimately, by harnessing technology to promote road safety education and advocacy among youth, we can foster a generation of informed and proactive citizens who actively contribute to creating safer road environments for themselves and their communities.

However, demands can come from all over the place. For Xuan, the focus might be on improving pedestrian crossings, while for her friend, Khoa, the concern lies with narrow sidewalks obstructed by vendors and parked motorcycles. For others, safe pedestrian crossings or traffic calming can be crucial.

To address these varied concerns effectively, decision-makers need access to comprehensive data and tools that enable them to prioritize investments in areas with the greatest need for road safety improvements. This data-driven approach allows for the rational distribution of public investments, maximizing the benefits of resource allocation.

By combining community input with data-driven analysis, decision-makers can make informed decisions about where to allocate resources that address the most pressing road safety issues. This approach ensures that public investments are directed toward initiatives that will have the greatest impact on improving safety and accessibility for all road users, including pedestrians like Xuan and Khoa. These initiatives will not only be designed by youth but will also have community support, facilitating communication and approval of changes.

This was the foundation for the success of the *AI&Me: Empowering Youth for Safer Roads* (*AI&Me*) project. Overall, the project serves as a framework for how innovative technology-based approaches, youth engagement, government engagement, partnerships, collaboration among various stakeholders, and datadriven decision-making can be combined to address pressing social issues and create positive change in communities. Through partnerships with government agencies and access to Big data, the project was able to gather comprehensive information about road safety issues, providing not only a list of priority schools for interventions through a flexible, easy, and cost-effective methodology but also recommendations of actions that are built upon the youngsters' concerns.

3. PROJECT OVERVIEW

The *AI&Me: Empowering Youth for Safer Roads* was a three-year project that aims to harness proven and emerging Big data and digital technology to support governments in focusing life-saving road upgrades and speed management toward the locations where young people have indicated they need it most. The project focused on five specific objectives in Figure 1: The five objectives of *AI&Me:*

- 1) Empower young people to actively participate in the decision-making process.
- 2) Equip decision-makers to make effective and evidence-based choices linked to the highest impact and most cost-effective road safety interventions to save young people's lives.
- 3) Develop a prototype digital tool leveraging emerging technologies and existing platforms to empower youth to identify the highest-risk roads they face as they travel to and from school.
- 4) Demonstrate to community members and decision-makers that transparent and evidence-based results can translate into actionable recommendations for public and private actors.
- 5) Prove scalability to other regions and countries using available sample data and established channels for impact and youth engagement.



Figure 1. The five objectives of AI&Me

The project was piloted from March 2021 to March 2024 in Ho Chi Minh City, Gia Lai Province, and Yen Bai Province, Vietnam. With successful initial trial, the project demonstrated its potential for wider impact if

expanded to other regions and countries. The AIP Foundation spearheaded the project in collaboration with the International Road Assessment Program (iRAP) and Anditi. Funding was provided by the Fondation Botnar and the FIA Foundation.

KEY ACHIEVEMENTS

After three years of implementation, the project has reached out to 9,397,309 beneficiaries while achieving several major milestones as mentioned in Figure 2. The *AI&Me's* achievement milestones between 2021 and 2024:

Figure 2. The AI&Me's achievement milestones between 2021 and 2024

AI&ME'S ACHIEVEMENT MILESTONES: 9,397,309 BENEFICIARIES



19.160

PINS FOR LOCATIONS near their schools



demonstrated a respective increase in: STUDENTS' KNOWLEDGE

FROM 55.8% TO 82% STUDENTS' ATTITUDES

FROM 42.1% TO 58.6% STUDENTS' BEHAVIORS

FROM 39.6% TO 57.1%









was recognized and awarded A 2 MILLION US\$ GRANT FROM GOOGLE.ORG to further develop and scale the approach

throughout Vietnam.



Through the SR4S program, MORE THAN 1200 SCHOOLS HAVE BEEN ASSESED

Across MORE THAN 70 COUNTRIES

BIG DATA SCREENING METHODOLOGY

was developed and tested in Ho Chi Minh City, Gia Lai Province, and Yen Bai Province in Vietnam. Based on Big Data, a risk score was created to categorize schools in three cities (high, medium, or low risk) resulting in a list of 106 prioritized schools from a total of 1,063 schools in three target cities.

YOUTH ENGAGEMENT APP (YEA)

was developed and piloted with 1,805 students from 18 schools (8 secondary schools, 7 high schools, 3 colleges/universities) of the three cities.

YOUTH EMPOWERMENT

The students were empowered and used the YEA to share their perceptions by creating 19,160 pins for locations near their schools with notes about the road safety risks they see at each location, raising their voices for streets for life. Youth feedback was incorporated into locations analysis to identify areas needed further assesments. Pre- and post-intervention surveys for 1,468 students demonstrated increases in knowledge, attitude, and behaviors from 55.8% to 82%, 42.1% to 58.6%, and 39.6% to 57.1%, respectively.

SR4S ASSESSMENT

A total of 98 schools out of the 106 schools identified from the Big Data screening have 1-2 star ratings (84 schools with 1 star - 3 schools share location with other schools, 11 schools with 2 stars), indicating high road risks for existing pedestrians. The findings validated the big data screening methodology's ability to identify 106 high-risk schools from a diverse pool of schools.

CITIZEN PORTAL

The combined Big Data, YEA and SR4S results and the recommendations for improvements were discussed with local officials and put on a Citizen Portal embedded in five provincial government websites to support dialogues with communities and decision-makers to ignite change toward a healthy and safe environment for young people to thrive.

ACTIONS FOR CHANGE

AI&Me and other donor-funded projects lead to road safety improvement in seven schools, while the local government developed and implemented upgrades "87 modifications" at 13 schools as a result of collaboration and partnership between the public and private sectors and diverse stakeholders working together to improve safety.

SCALABILITY

The tools and methodologies have been applied nationwide and in other regions immediately. The methodology is documented in a Scalability Impact Report. The Project was recognized by Google.org with the successful awarding of a 2 million USD grant to iRAP to further develop and scale the approach throughout Vietnam and replicate the digital public goods developed beyond Vietnam. Through the established iRAP Star Rating for Schools program more than 1,200 schools have already been assessed across more than 70 countries. New SR4S analyses in Chile and Indonesia will now also use YEA to inform SR4S locations and immediately demonstrate the scalability of the *AI&Me* outcomes.

4. ADVOCATE FOR CHANGES

The project's achievements are a testament to the power of leveraging technology, youth engagement, government commitment, and data-driven approaches to support dialogue with communities and decision-makers to ignite change toward a healthy and safe environment for young people to thrive. By capitalizing on Vietnam's majority-youth population and high digital participation rates, the project was able to effectively engage young people in identifying road safety challenges, initiating infrastructure, and mindset changes.

This was only possible by establishing a model of change presented in Figure 3. The *AI&Me* Theory of Change has four key sections: (i) the aim, (ii) project implementation, (iii) the behaviour change model, and (iv) the global aspiration, external factors, assumptions, and enablers.

- i. The aim is the overarching goal for the project's implementation and outcomes in Vietnam.
- ii. The project implementation describes the three key elements of the project and how they relate to the behaviour change model. Each activity is colored (yellow or purple) to correspond with the target audiences (young people or government and decision-makers) and numbered (1-4) to indicate which stage of the behaviour change model it relates to.
- iii. The behaviour change model explains the iterative changes we expect to occur for the target audiences as a result of the project's implementation to achieve the project objectives and fulfil its aim. It starts with the baseline situation, which explains the changes expected to be observed during the project period (36 months) and those that can be sustained beyond the timeframe as a result of the project's activities and outputs.
- iv. The global aspiration, external factors, assumptions and enablers describe the key considerations which underpin the project's design.

Another relevant step is to define target audiences. There are two primary target audiences for this project:

- Young people, specifically school students, in the age range of 13-22. Raising education and awareness for this age group is a known benefit in reducing road injuries and fatalities. Furthermore, it is expected that risk tolerance levels between male and female participants will be able to be observed from the inputs via the youth engagement tool.
- Government and decision-makers, primarily local governments (including road and education authorities), are responsible for the policies, management and investment decisions relating to roads around schools. For this group, the key components provided high-quality, evidence-based and verifiable data to inform decision-making, including road user experience data.

Though listed as an enabler, schools themselves are also, in effect, a beneficiary audience for the results of the project. This project requested their active participation, engagement and support - particularly for the successful implementation of the youth engagement component.

HOW AI&ME FRAMEWORK FOR SUSTAINED CHANGE

Similar to many countries, in Vietnam, road investment and design is still very much viewed as a need to increase the speed and capacity of roads rather than addressing the needs of all road users and the enormous burden road crashes place on communities, families, the health system and the economy. Initiatives to address the burden of road crashes are hampered by the lack of reliable data. Road users, particularly young people, lack the agency to communicate or influence change.

The three primary elements of the project (shown at the top of Figure 3. The *AI&Me* Theory of Change) drive the change in awareness, attitudes, and actions of both young people (in this case, school students) and

government and decision-makers. Together, these activities and tools lead to sustained change in how young people communicate their road safety needs and how decision-makers respond to them. Results from all three elements are integrated into a single platform for local authorities, schools and young people to see and understand the results.





5. HOW THE PROJECT SUCCESSFULLY DRIVES THE CHANGES

The project was built on the AIP Foundation and iRAP's previous school-based interventions that effectively raised public awareness while enabling governments to identify and document hazardous road environments. It also integrated youth opinion and allocated funds to activities with the highest potential to save lives in Vietnam. The project advocated for establishing a safe environment for children and young people near schools by combining four components: Big data and digital technologies, youth empowerment, government engagement, public and private collaboration and partnership demonstrated in Figure 4. The Holistic Model of *AI&Me*.



THE FOUR COMPONENTS OF AI&ME:

Figure 4. The Holistic Model of *AI&Me*

5.1 Utilizing Big data & digital technology

The project developed a set of digital technologies aimed at enhancing road safety, especially focusing on the involvement of youth and leveraging Big data for informed decision-making. Here's a breakdown of each tool and its potential contributions: more information is available below.

- **Big data Screening Methodology**: This tool involves the analysis of large datasets related to socioeconomic characteristics, infrastructure quality, traffic flow, and other relevant factors. To identify risk factors associated with road safety. The methodology provided the local authorities with a list of schools ranked by road safety risk to prioritize interventions.
- Youth Engagement App: This App serves as a platform for young people to collect road safety perceptions of locations around the schools. Students reported locations and informed partners of places where a more detailed assessment (SR4S) was needed. The map populated with pins was also added to the Citizen portal to inform local authorities about places within the network where safety perception can impact travel decisions and inform improvements.
- Star Rating for Schools: This tool assesses the safety of school environments and surrounding roads based on specific criteria such as infrastructure design, traffic management, and pedestrian facilities. Assigning the objective evidence-based risk at schools using SR4S provides a clear benchmark for improvement and incentivizes stakeholders to prioritize road safety measures in

school zones. In the project, the SR4S highlighted the risk environment around the schools, with most of the schools rated as 1 or 2 stars highlighting the effectiveness of the Big data screening methodology. Evidence-based recommendations of treatments will also support decision-makers in creating safe environments for youth to walk to schools.



Figure 5. The relationships of technological tools of *AI&Me*

• **Citizen Portal:** This portal serves as a centralized platform for citizens to access all the information generated through the project. It works as a dashboard where the community can access information, and the government can take action based on data and evidence-based methodologies. Together, these digital technologies form a comprehensive framework for enhancing road safety, with a focus on data-driven decision-making, youth engagement, and community participation. By leveraging the strengths of each tool and integrating them into a cohesive strategy, the *AI&Me* approach can effectively address road safety challenges and create safer environments for all road users.





Big Data Screening Methodology

The Methodology was developed by iRAP in collaboration with the AIP Foundation and Anditi. It was conceived to harness existing data sources, whether open-source or secured through purchase agreements. Its primary objective is to optimize data collection, ensuring access to relevant information while minimizing costs. The method uses commonly available attributes in pedestrians' macro-level analysis and utilizes them to rank schools from higher to lower road safety risks for pedestrians. The attributes are then categorized into four different analytical levels, where the method reduces the amount of data collected as the level progresses. At each level, the schools are ranked, and only the high-risk ones will progress to the following analysis stage. The Methodology is documented in: <u>Big Data Analysis:</u> <u>Methodology for assessing high-risk schools.</u>

Youth Engagement App



YEA is an intuitive digital risk-perception tool that allows students to map locations where they feel "safe", "unsafe" or "very unsafe" on their journey to school. Students will take or upload photos of the location, select descriptive options, and provide traffic and infrastructure details in the comments section.

All pedestrian assessment pins reported by students on YEA are directly integrated into the SR4S platform to help identify areas with high concentrations of pin clusters and prioritize those points for detailed assessment of infrastructure through SR4S. The webinar *Youth Engagement App for Safer School Journeys* explains the App in detail. Functioning as a versatile data collection tool and more, the YEA serves as a guiding platform for sharing valuable insights regarding youth perceptions of the road environment.

YEA is available for use, and data is open for visualization. To use the App in your projects or to access the data, please contact the project team.



Star Rating for Schools



Star Rating for Schools (SR4S) is an evidencebased tool for measuring, managing, and communicating the risks children are exposed to on a journey to school. It supports quick interventions that save lives and prevent serious injuries from day one.

The list of high-risk schools screened using the Big data method, combined with data reported by YEA users, underwent an in-depth assessment of infrastructure safety using the SR4S assessment tools to produce upgrade recommendations. Star rating results, where five stars are the safest and 1 star is the least safe are generated at each site. Schools with a low star rating of 1 or 2 stars are given priority by the government in the renovation plan. More information about SR4S is available on the program website. At the heart of SR4S lies a meticulous system for data collection using the iRAP global standard. Trained coders follow standardized guidelines to gather data on various attributes systematically. This systematic and quality-assured approach forms the foundation for calculating road safety risks, ensuring a thorough and accurate assessment.

To know more about the SR4S access, <u>https://starratingforschools.org</u>.

The Citizen Portal

The Citizen Portal is a web-based data dashboard that enables citizens and decision-makers to access all the data collected as part of the project. This enables full access to the road safety diagnosis of the areas

under study, giving the community and decision-makers the opportunity to know about existing high-risk areas, as well as road sections that have been evaluated. This portal also helps government agencies consult, evaluate, and leverage it to secure national or city funds for road upgrades. These factors make the "citizen portal" an essential platform for communicating with communities and decision-makers to spark change toward a healthy and safe environment for young people to grow.



The Citizen Portal is available online and can be accessed <u>here</u> or through the QR Code.



Figure 7. Screenshot of the AI&Me Citizen Portal

HOW EVIDENCE-BASED TOOLS CAN TARGET ACTIONS

Case study 1: HCMC to prioritize schools for interventions based on Big data

One of the first project activities challenges the team to develop a methodology for harnessing the potential of available data sources to establish a prioritized ranking of schools in need of intervention. In the absence of a clear starting point, the methodology should encompass a comprehensive screening of all areas within the cities included in the project, aiming to gather as much information as feasible.

Following a literature review focusing on macroscopic analysis for pedestrian safety, a compilation of attributes and potential Big data sources was generated. Notably, social demographic data may be sourced from official governmental databases or open data repositories. Data pertaining to the built environment and infrastructure could be acquired through open street data initiatives. Additionally, information regarding speed and flow may be obtained from telematics sources, albeit requiring procurement. Procuring telematics data, especially from a city the size of Ho Chi Minh City, would exceed the project's budget constraints. Consequently, the project necessitated solutions that strategically narrowed down the area of analysis, collecting speed and flow data only where absolutely necessary. More on the attributes can be seen in Big Data Analysis: Methodology for assessing high-risk schools.

The filtering approach played a crucial role at this juncture. The identified attributes were categorized into three distinct levels. Each level entailed the collection of data and subsequent classification of risks from higher to lower priority. Figure 8. The narrow down by level approach

represents visually the levels and the zoom-in approach carried out at each level.

In the first level, termed 'target community', the primary objective was to focus on high-priority communities. Relevant attributes were derived from available official socioeconomic and sociodemographic information, supplemented by satellite image manipulation. Notably, socioeconomic data is inherently linked to geographic boundaries, with districts serving as the delineating units in the case

of Ho Chi Minh City (HCMC). The four districts deemed as top priority, aligning with the communities targeted by the project, progressed to the subsequent stage. Consequently, in level 2, data collection efforts were concentrated solely within these four prioritized districts.



Figure 8. The narrow down by level approach

With data collected for the entire area of the four districts, the Level 2, 'Schools characteristics and built environment risk' the focus was on the schools. Data from land use, urban infrastructure, road network, and built environment help prioritize schools and the 124 schools in the areas. Again, we rank the schools based on the attributes for Level 2.

Crucial elements for assessing pedestrian exposure risk (speed and flow) are considered in Level 3. At this level, only data for the surrounding schools need to be collected (within the school buffer or the school zone). The Level 3 top high-risk schools are the candidates for the Star Rating for Schools (SR4S) assessments. Conclusively, out of the initial pool of 124 schools evaluated across the four districts, a subset of 57 schools emerged as the top priority for detailed road safety assessments based on evidence and mostly open Big data alternatives.



Figure 9. Location of HCMC final list of priority schools

The SR4S assessments were conducted in 80 locations around 57 schools. None of the assessments resulted in 4 or 5 stars. 92% of the locations (74) were rated with 1 star, 6% (5) with 2 stars, and only 1% (1) with 3 stars. These results confirm that the Big data screening methods were able to identify schools located in high-risk environments.



Lessons learned from the project method applied in HCMC:

- The methodology described is adaptable to diverse geographical locations globally. However, it's important to highlight that the calculations and data analysis involved **require the specialized knowledge** of Geographic Information System (GIS) specialists.
- Through our participation in conferences and knowledge-sharing initiatives, we have observed a significant lack of standardization in how organizations prioritize schools. Establishing an evidence-based, standardized methodology is imperative to ensure **consistency and effectiveness** in school prioritization efforts.
- It's crucial to acknowledge that the **availability and structure of data may vary** between cities or countries. While obtaining complete data for all attributes is ideal, it should not serve as a barrier to cities utilizing the methodology. Even in cases where certain attributes are not fully available or partially accessible, the methodology can still be implemented effectively, ensuring valuable insights and actionable outcomes.

Case study 2: Community participation in large scale

The central objective of the *AI&Me* project was to empower youth in advocating for road safety. We wanted to facilitate meaningful engagement, providing opportunities for as many students as possible to voice their concerns to local authorities. Leveraging technology played a pivotal role in enabling community participation on a large scale and can be potentialized for the level of digitalization of the Vietnamese youth society. Youth use apps to obtain information and to communicate with each other, feeling comfortable using new tools.

In this context, the Youth Engagement App was developed and piloted as part of the project. 1805 students actively participated in the study, utilizing the app to pinpoint locations where they felt safe, unsafe, or very unsafe while traveling by walking, biking, riding a motorcycle, or as drivers or car occupants. Remarkably, students collectively reported nearly 20,000 locations of concern.

With a traditional approach relying solely on manual interviews with students, it would have been logistically impossible to register such a vast amount of information comprehensively. Thus, the development and implementation of the app proved to be an invaluable tool for scaling up community participation, allowing for efficient data collection. Figure 10 presents the final map of locations reported for Yen Bai city. The pin colours represented the level of safety reported, where green means safe, orange means unsafe and red, very unsafe.



Figure 10. Location of reported pins in Yen Bai City

Analysis on the locations showed that a high percentage of pins (over 75% in the three cities) were located along the road network, indicating that students are willing to report real locations. Figure 11 shows an example in HCMC of the intersection between Hong Bang Street and Trieu Quang Phuc Street. In total, 79 pins were reported in this location with unsafe and very unsafe rates. For this, 67 pins indicate students feel unsafe or very unsafe because it is difficult or very difficult to cross the street. Analyzing the locations, it's possible to notice the intense traffic and the absence of pedestrians' signals, which might be contributing to students feel unsafe crossing the street.



Figure 11. Example in HCMC: Intersection Hong Bang Street and Trieu Quang Phuc Street

Figure 12 shows the statistics of the pins received during the pilot. It is noteworthy that most of the pinned locations where students feel safe are those rated as high-risk locations by SR4S. These results suggest the difference between students' perceptions of road safety and the technical definition of road safety. Since they are accustomed to their environment and have never experienced a different context, they may find it challenging to imagine that roads can be made safer. This highlights the needs to foster the students' knowledge of road safety to enable them to advocate for better roads. On the other hand, if students report feeling unsafe, decision-makers should not overlook this alert indicating that something is making them insecure traveling in these locations. It is the duty of the government and a responsibility of the society to protect and ensure safe routes to schools.



Figure 12. Statistic of the reported pins in the AI&Me

This data refers to Perceptions and do not aim to replace road safety assessments.

In the SR4S Step By Step Process¹, step number 5 refers to engage the school community, listening to their input and gaining their support. Although this was also done in the project, the YEA data replaces the traditional discussion to understand where the places under concern in the schools are surrounding. Spatial analysis of the locations supports this decision by identifying areas where concentrations of unsafe and very unsafe pins are found. While this could be done visually by examining the pins on the map, the project adopted a quantitative approach, as described in Figure 13. Statistic of the reported pins in the *AI&Me*.

¹ For more information, please visit https://starratingforschools.org/how-to/.



1) Divide the city into grids and count the number of pins in each square

Grid of 25x25m were used in the project.

2) Identify the squares with the highest concentration of pins.

As darker the color the higher is the concentration of pins.

3) Work with the data to identify the issues reported and additional comments

Figure 13. Statistic of the reported pins in the AI&Me

With this approach, the input of users was directly utilized to select locations around the schools where SR4S assessments not only rate the risk but also propose countermeasures to increase safety. This ensures the students' concerns will be adequately evaluated and actions will be taken based on the community perception but also with evidence-based solutions.

Lessons learnt from YEA piloting:

- The app is supporting the collection of **perceptions**. People experience different environments depending on their backgrounds and social and psychological characteristics. Therefore, road safety perception is a **subjective matter**.
- Perceptions do not need validation. Different individuals perceive the environment differently, and there is no right or wrong.
- What is important in not the individual perception but the **collective perception** of the environment (e.g., interested in clusters of pins).
- Youth deserve a vote of confidence. If we are asking them to participate in the road safety decisions, we need to trust and listen to what they have to say.
- Youth want to be heard. They will not continue engaging with the tool if they do not see their voices are being heard and not seeing changes on the ground. They deserve to receive something back.

Case study 3: *Empowering Youth for Safer Roads*: Insights from the Star Rating for Schools (SR4S) training

Hoai Tam, a senior student at the University of Transport and Communication, Ho Chi Minh City Campus, was actively engaged in the pilot of the Youth Engagement App across three provinces as part of the *AI&Me*: Empower youth for safer roads project. Alongside 1,805 peers, he participated in this initiative aimed at fostering youth involvement in enhancing road safety. Throughout his involvement, Tam learned about road safety knowledge, YEA usage, and the utilization of the Star Rating for Schools (SR4S) to advocate for safer roads. With a specialization in public transportation engineering, Tam is particularly keen on supporting tools for assessing infrastructure conditions in 57 high-risk schools in Ho Chi Minh City. This assessment also contributed to his study and future work. "SR4S allows us to measure the safety levels of school zones'

infrastructure," Tam explains. "It serves as a tool to provide evidence-based data for authorities to implement necessary modifications to ensure the safety of students and pedestrians."

Within the framework of the *AI&Me* project, the results from SR4S assessments, coupled with the input gathered through YEA pins reported by youth, were undergone thorough analysis. These insights are then presented to local authorities for infrastructure planning and optimizing resource allocation. This collaborative effort empowers youth to voice their concerns regarding road safety and fosters a sense of ownership over their safety, particularly in school zones.



Hoai Tam, a senior student at the University of Transport and Communication, Ho Chi Minh City Campus

Tam emphasizes the practical relevance of SR4S, particularly in addressing the pressing social issue of safeguarding vulnerable road users, such as pedestrians and students. "Ensuring adequate infrastructure around school zones is imperative," he asserts. He hopes that the SR4S tool and YEA platform can be further refined and tailored to better suit Vietnam's unique context, ultimately serving as invaluable reference resources for local authorities.

5.2 Youth Empowerment: Protecting those who need it most

Often, young people are not fully empowered to participate in the political process, leaving them to feel helpless about the dangers they face. Risk tolerance, inexperience and reliance on the most vulnerable forms of transport - walking and cycling - make young people particularly prone to being killed or injured in road crashes. Road change decisions must consider the everyday lived experiences, concerns, and feelings of the local community. Young road users should be able to convey their concerns and recommendations to those who can help them. In addition, the youth's understanding of road safety risks before the beginning of the project was basic.

The project results showed an increase in young people's awareness of road risks. Also, it proved that an easy, exciting, accessible channel for young people to self-advocate for road safety actions can help young people increase their curiosity on how they travel and understand the scale of road safety issues, feeling recognized and valued. Participating in empowering activities can help youth believe that safer roads are possible and make them more motivated to participate in this change. They now believe that their concerns will be heard and taken seriously by decision-makers. Ultimately, this sustained change will lead youth to avoid unsafe travel habits. Road safety can trigger this maturation process, where today's youth will grow into productive, healthy adults who actively participate in the political process and are engaged in shaping the solutions not only for road safety but also for other social issues.

HOW TO INCREASE YOUTH COMMITMENT

The *AI&Me* project aims to promote empowering processes for young people. School students in the age range of 13-22 are the primary target audiences of the *AI&Me* project. Education and awareness raising for this age group is an important benefit in actively protecting their well-being and empowering them to initiate change.

The youth participation in the project was scaled through the use of YEA. YEA enables youth to mark and rate their perception of the safety of locations along their way to and from school. The development of the App relies heavily on the input of youth and communities to address their essential needs. Given this idea, the project team conducted in-depth interviews and focus group discussions with students, teachers and parents from different age groups (secondary school, high school and college/university) in three target cities to collect ideas for the App. In this way, youth felt more curious, recognized, valued, and motivated to



Students of Nguyen Hue Secondary School, Pleiku City

contribute to the project. Youth feedback was incorporated into the App during the entire App development phase.

The project helped to increase youth commitment and learning during the The implementation. project recruited and trained 1,805 young students from 18 secondary schools, high schools and universities on safe infrastructure around the school zone, how to use the Youth Engagement App, and the significance of their role and responsibilities in safe mobility. These efforts resulted in enhanced

knowledge and skills in advocating for road safety. The knowledge and skills they learned helped them appraise their community. They used the YEA App to share their perception by creating 19,160 pins for locations near their schools. Their findings make it easier to identify risk locations surrounding school zones for further assessments in order to determine school zone star ratings. This put them closer to the decision-making power in developing and implementing community change.

The project encouraged youth to engage in a range of other communication activities. A music video featuring two Vietnamese rappers, Datmaniac and Cam, was created to inspire young people to join in the project. Another initiative was a competition to improve awareness of safe mobility among young students and help them advocate for their needs to local governments through successful interaction campaigns. The project also offered backpacks, booklets, and keychains with the logos of the *AI&Me* project, Fondation Botnar, AIP Foundation, and iRAP to remind people of their role and encourage them to join in the project.

Young people are capable of doing incredible and even beyond-belief things. When young people are inspired, educated, and raised in an environment where others openly encourage and value their opinions and thoughts on different issues, they can shape and develop society to become much better. Pre- and post-intervention surveys of 1,468 youngsters demonstrated increases in knowledge, attitude, and

from 55.8% to 82%, 42.1% to 58.6%, and 39.6% to 57.1%, respectively. These changes bring the project closer to the vision of a world where youth are empowered and all neighborhood streets are livable, safe, sustainable, and walkable.

HOW YOUNG PEOPLE DRIVE CHANGES

Case study 1: Youth joining forces to report common problems creates the scale for positive change



Nguyen Tu Uyen, a ninth-grader student at Nguyen Du Secondary School (The student's name was changed)

Nguyen Tu Uyen, a ninth-grader student at Nguyen Du Secondary School, is one of the 500 primary students taking part in Pleiku City's Youth Engagement App pilot. On her way home before joining the project, she discovered a lot of pavement potholes. But there's no way for her to report the problem straight away. She then understood that she needed everyone to join her and work together in order to create an overwhelming impact if she desired to create change. "If only a small number of people request road improvements, those requests may not be considered or valued," Tu Uyen said, adding that "young people often hesitate to directly report the road issues to the authorities, or even they see that road safety is not their own responsibility."

She believes that the YEA was truly helpful because it is a tool that enables young people like her to promptly report whether they feel safe or uncomfortable when travelling on roads. Tu Uyen 's friends were also slightly unsure about the value of her

pins and whether decision-makers would actually take them into consideration.

She now has a stronger belief in the changes involving the voices of young people as a result of her participation in several project activities, particularly after witnessing the improvements to the roads surrounding her school zone. Tu Uyen, a representative of students from 18 project schools, wants to maximize the YEA's impact. They believe that in order to help students and all other road users travel on safe roads, the project should launch more promotional campaigns to increase awareness of and usage of the YEA.

Case study 2: Proactively and confidently voicing road safety concerns with decision-makers



Nguyen Phuong Lan (right) and her friend, 10th grader students from Hoang Quoc Viet High School in Yen Bai City (The student's name was changed)

One of the two students who spoke on behalf of their school to bring up the issue of students' risks in unsafe school zones during the government meeting was Nguyen Phuong Lan, a 10th grader student from Hoang Quoc Viet High School in Yen Bai City. She brought up the issue of her friend's road accident that occurred on November 18, 2023, directly in front of their school gate. She said: "There are currently automobiles travelling in mixed traffic due to poor infrastructure, and the school gate area has narrow sidewalks - which have even been encroached upon for business purposes – making it dangerous at drop-off and pick-up time. Students find it more difficult and riskier to cross the street when there isn't a pedestrian crossing". Anh and her classmate bravely spoke up and told the authorities what they wanted to see changed to create a safer school zone. This gathering is one of the *AI&Me* project activities to help youth advocate for themselves to policymakers. As a result, four schools, including Bui Ngoc Anh's school, were improved by the project and other donor-funded projects, and seven other schools were improved by the local government in her city.

Case study 3: Vehicle obsession and desire to create infrastructure change to make pedestrians safer through reporting opinions on the YEA application

Vu Van Tuan, an 11th grade student at Tran Huu Trang High School, participated in the *AI&Me* project. Tuan is a person who likes to walk and his parents encourage him because it helps improve his health. However, road traffic in Ho Chi Minh City is quite dangerous and some deserted roads also contain many dangers.

When he was young, the road around his house was quite deserted at that time, there were some people driving at high speed and refusing to give way to pedestrians. Unfortunately, he was hit by a car while walking on the street to buy things for his mother, leaving him with a lot of psychological trauma. It left Tuan with an obsessive fear of vehicles. Since then, Tuan did not dare to walk across the street, he could only cross the street on the road with traffic lights and crosswalks but it would take a lot of Tuan's travel time because he would have to go quite a distance to find it. Besides, Tuan did not know who to share or report to when he encountered those problems to get them fixed. Therefore, Tuan only wishes that there would be traffic lights or pedestrian lights, speed limit signs, crosswalks, etc. every kilometer for him to cross the street more easily.



Vu Van Tuan, an 11th grade student at Tran Huu Trang High School (The student's name was changed)

Through the training and group discussion, Tuan had the opportunity to learn about the Youth Engagement App (YEA) and felt that the YEA application was a very suitable support tool for him to be able to share safe/unsafe locations when traveling. "I realize my own important role in bringing my voice and opinions to the authorities. From there, I hope they will listen and make early changes in infrastructure so that students can have safe roads to school and home, especially pedestrians. Furthermore, I also shared and spread the YEA application to my parents, friends and community", he expressed. Even though the project has ended its pilot phase, Tuan still uses the YEA application every time he needs to report safe/unsafe/very unsafe locations on the way to school and home.

5.3 Government engagement

Governments around the world make decisions that have an impact on how we deliver the solutions that improve safety outcomes for youth. For this reason, government participation was considered as a critical component in raising awareness about the importance of youth safety, the potential of innovative approaches to improving road safety and sustainable development, and our contributions to the communities in which we operate and live. Governments and decision-makers are making road safety



Shanna Lucchesi, iRAP Project Coordinator delivered the YEA training for government stakeholders and teachers in Pleiku city.

policy/infrastructure decisions based on insufficient data without community input or a sense of their community's "big picture" risks. Data on road safety is often incomplete, of poor quality or altogether absent, particularly for means of transportation popular among young people, such as walking and cycling. The majority of government officials may lack the technical awareness and capability to engage with young people effectively.

One of the key success factors of the change has been the proactive engagement of government stakeholders at the national and provincial levels in all project stages. The framework for government

engagement and ownership has been established, which has led to positive awareness and attitudes about the data gap and the importance of community input from the local authorities. The project raised government awareness of youth safety and the potential of innovative approaches through meetings, trainings and events to increase their buy-in and target action more efficiently.

HOW TO ENGAGE THE GOVERNMENT

Understanding and meeting the needs of the government assists the project in attracting the attention of the local authority teams. According to our pre-intervention survey, 80 percent of the surveyed government stakeholders expressed that there was still a lack of data about high-risk areas, particularly those lacking safe infrastructure, and the opinions of community and youth in road safety improvement projects are important or very important. The *AI&Me* project has provided the Vietnamese government with data-driven decision-making in road upgrades and speed reduction.

The project also relies on the support of the local government's ownership to carry out pilot testing and make decisions based on the results. Vietnam's National Road Safety Strategy 2020 focuses on road crash "black spots" and urges local governments to invest in IT for traffic management and smart transport solutions. A new Youth Law, in effect since January 2021, allocates more resources to youth dialogue and engagement, creating a favorable environment for participatory approaches to government infrastructure planning. The *AI&Me* project activities were designed to align with the Annual Government Plan to mobilize government representatives' participation.



Phan Huu Hieu, Chief of Gia Lai Traffic Safety Committee used the YEA at the training

Overall, the AIP Foundation has secured the government's commitment at both national and provincial levels. At the beginning of the project, the AIP

Foundation shared and discussed the project work plan with the National Traffic Safety Committee (NTSC). NTSC is an inter-agency coordinator, which is responsible for assisting the Prime Minister in directing ministries, sectors and localities to implement national strategies and projects on ensuring traffic safety and order as well as deploy interdisciplinary solutions in this field on a national scale. At the national level, AIP Foundation has signed a 5-year Agreement (2020 - 2025) with NTSC and the Ministry of Education and Training (MOET) on implementing road safety interventions. NTSC and MOET have instructed their sub-levels to work with the AIP Foundation based on the approved projects in target provinces. At the provincial level, the Provincial TSC has taken ownership of this project through a signed Memorandum of



Government stakeholders and school teachers participated in the YEA training

Understanding (MOU). Based on the AIP Foundation's long working experiences and effective partnerships with governments in Vietnam, we mobilized the current structure of NTSC, MOET, and their provincial departments to steer project activities. In each of the MOUs signed, the roles and responsibilities of each government partner and of the AIP Foundation were defined.

In addition to formal or informal stakeholder meetings to update the progress of the project and discuss project activities, the project also raised government and schools' awareness through a variety of activities, including

orientation workshops, training and events. Together with Anditi and iRAP, AIP Foundation hosted several trainings on Big data Screening and Youth Engagement App for government stakeholders and representatives from high-risk schools in three target cities. The main objective was to introduce these innovative approaches to target action more efficiently, demonstrate how they work, and how the data generated can be helpful for their decision. Teachers were also instructed on how to use the App to pass on the knowledge to their students.

Experts from the Ministry of Transport participated in the training on YEA for local government officials and teachers, where they delivered a session on adequate road conditions of a safe school zone in Vietnam. In the meantime, the National Traffic Safety Committee attended the YEA launching events and offered

enthusiastic support for the project. This contributes to increasing government buy-in and ownership of the project, as well as familiarity with the YEA App, making it easier for the AIP Foundation to advocate for government acceptance of YEA's results and scaling it up in the following year. Post-training surveys showed that 86% of participants found the Big data Screening methodology presented in the training useful/very useful for government stakeholders to identify high-risk communities/locations more easily. In addition, 100% of the surveyed government stakeholders found youth opinions valuable in identifying high-risk areas.



Government stakeholders and school teachers participated in the YEA training

A study visit to Melbourne, Australia, was a great chance for the Government officials to exchange experiences with and learn from Victoria's road safety experts about their road safety initiatives. The



Media clippings covering the AI&Me project

delegation was especially interested in how evidence-based data could be used to advocate for policy changes. This visit was very helpful in persuading government representatives to support funding for safe school zones and road safety education for youth, as well as in modifying attitudes and behaviors to recognize the need for long-term investment in safe school areas.

Local media coverage promotes the pilot, encourages participation, and provides positive attention and reinforcement for government

engagement. These will enhance the government's buy-in and ownership of the project and, therefore, make it more favorable for government decision-making at a later stage.

HOW THE PROJECT RESULTS WERE CONSIDERED BY THE GOVERNMENT

Case study: Listening to youth for safer roads

Youth participation in the policy-making process is under-represented in Vietnam, particularly in the country's mountainous areas like Yen Bai. Chief of Yen Bai Traffic Safety Committee, Mr. Tran Xuan Quyet was one of the main pioneers involved in the project. He advises the Yen Bai Traffic Safety Committee on a regular basis, enabling various departments to make sure that traffic safety in the province is maintained. At the start of the project, Mr. Quyet and other government officials were concerned about its efficacy and whether the youths' feedback was accurate enough for the authorities to use as a guide for making decisions about how to enhance infrastructure safety.

He participated in all project activities in a variety of roles as a participant or facilitator. Despite his lack of technological skills, he worked really hard to learn about the YEA and experienced it on his own. He also oversaw schools to help with the YEA pilot, which involved 500 youth. Additionally, he participated in the project-hosted study tour to Australia with the national and other provincial governments to learn about the safe road infrastructure in Melbourne's school zones. Upon receiving the youth and star ratings of 25 schools in Yen Bai, he was key in presenting and advocating for the results to higher authorities and local authorities.



Mr. Tran Xuan Quyet, Chief of Yen Bai Traffic Safety Committee presents at the stakeholder workshop

"YEA aims to empower young people by advocating for

safer roads and by helping to create awareness among them". More importantly, Mr. Quyet continued. "The province government has chosen to allocate funds for road improvements surrounding school zones along major provincial routes because they greatly value the project's outcomes and effectiveness". With his

active support and enthusiasm, he advocates for improving a dozen modification items from the provincial government budget in schools along the main roads in Yen Bai City. Mr. Quyet believes that YEA is a low-cost, effective reference tool for road safety practitioners like him in advisory and decision-making for resource allocations.

5.4 Public-Private Partnership and Collaboration

Public-private partnerships involving multiple partners (government, AIP Foundation, iRAP, Anditi, GRSP) and funders (Fondation Botnar, FIA Foundation) have developed as a strong and successful method for improving road safety and the well-being of young people and children.

The partnership and collaboration among project partners were fundamental to the *AI&Me* project and established from the planning stage. While iRAP was designing and developing the tools based on road safety evidence, Anditi supported the work with data collection and analysis. AIP Foundation brought all the local context, working in the field, collecting feedback, and being in close contact with the national and local government, school representatives, and students. The project partners' teamwork enabled the project to overcome the challenges faced and made the developed tasks successful.

The combined results from Big data, YEA, and SR4S assessments and their recommendations in 106 prioritized schools were discussed with the local government and city authorities through informal and formal meetings. The Citizen Portal was delivered to support advocacy for measures to ensure safety around schools and provide an efficient and effective basis for stakeholder engagement.

AIP Foundation linked the data from this project to other activities undertaken with the support of the Global Road Safety Partnership, FIA Foundation and other donors to implement a good template model for a safe school zone that supports the local governments to efficiently scale the successful improvements and apply the same standards in the remaining locations.

As a result of this coordinated effort, school-related road improvements have been planned and implemented by the local government, funders and private partners to deliver safer outcomes for youth and youth of the future. Google.org and Fondation Botnar have backed a project to scale *AI&Me* techniques in Vietnam and other countries, utilizing iRAP networks and digital public goods developed by the *AI&Me* initiative.

6. KEY LEARNINGS AND RECOMMENDATIONS FOR SCALABILITY

Engaging dialogues among adolescents and decision-makers is vital to spark change toward a healthy environment for all stakeholders. Young people were active participants in the project identifying risky road spots as well as empowering them to express their opinions with authorities and help identify the best use of resources. This enables governments to direct life-saving road enhancements and speed management efforts to areas where young people have identified needs and know there is community support for their implementation.

The project's greater government buy-in and ownership allowed the *AI&Me* approach to directly influence road safety decision-making and elevate road safety as a priority issue around schools. During the implementation, the AIP Foundation engaged them in the planning process, kept the government up-to-date on all activities, and involved them in meetings/workshops/events, and trainings on the new tools and methodologies.

While parents were urged to participate and support younger ones in utilizing the YEA, in practice, students demonstrated their ability to express their road safety perceptions on their own. Only students under the age of 18 required parental permission to use the App when registering. Using technologies that support the government with evidence-based data allowed the risk young people and children are exposed to on a journey to school to be efficiently measured, managed and communicated. Big data, SR4S and YEA, are now informing strategic investment in infrastructure upgrades, saving lives and preventing serious injuries every day. It is also empowering and informing global and community advocacy to address the leading killer of young people worldwide - road traffic deaths.

Differences in size and administrative boundaries affected the way the Big data methodology was applied in each of the cities. In the case of Pleiku City and Yen Bai City, the Level 1 analysis was omitted due to the need for sociodemographic information on a more detailed level at the city level. However, due to the scale of the town, this did not impact the analysis since the number of schools committed to by the local government could be identified by considering the entire city territory. That is the target community in these two cases was the entire city. Level 1 was well suited for the HCMC case where initial screening was critical to target resources. Starting from a citywide perspective, it helped identify the areas with a high density of road crashes and where people potentially walk more. Level 1 optimized the data collection effort to focus on the denser and more centralized communities. The second and third levels then worked as planned in these high priority areas. It was decided during this process that the Level 2 and 3 analysis would be completed for all of the identified schools, without further targeting, as the initial screening had already prioritised the desired number of schools. The Level 2 and 3 analysis still provided valuable data to rank the school based on the risk and prioritize investments.

This flexibility in how the Level 1-3 analysis is undertaken is important and allows a fit for purpose outcome in any scaling of the initiative in Vietnam or worldwide that maximizes available data and resources of all partners. The Big data methodology is relatively simple and easy to obtain attributes using Big data sources, although some manipulations and human verification are needed. Most of the Big data sources used are available in different parts of the world and at a low cost. Therefore, the application and the results reinforce the potential scalability and repeatability of the *AI&Me* methodology ensuring youth can be empowered for Safer Roads worldwide.

The Youth Engagement App requires good internet access. The schools could not afford an adequate internet connection for every student to utilize the App simultaneously. Students' limited access to the internet will have an impact on the success of promoting the use of the app. To overcome this limitation iRAP implemented refinements to allow users to utilize the app offline.

It is important to note that the Youth Engagement App supports the collection of perceptions. People experience different environments depending on their backgrounds and social and psychological characteristics. Therefore, road safety perception is a subjective matter. Perceptions do not need validation. Different individuals perceive the environment differently, and there is no right or wrong. What is important is not the individual perception but the collective perception of the environment (e.g., interest in clusters of pins) which will support the decision-makers road safety practitioners to identifying spots with clusters of unsafe pins for more detailed assessments with the evidence-based Star Rating for Schools tools that help prioritize and allocate resources for the improvement of safety to reduce road injury.

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