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FIA FOUNDATION

AI&ME:EMPOWERING YOUTH FOR SAFER ROADS

SCALABILITY ANALYSIS REPORT

Final version, April 2024

AIP FOUNDATION
SAFE ROADS FOR LIFE

iRAP
INTERNATIONAL ROAD ASSESSMENT PROGRAMME

ANDITI

ACKNOWLEDGEMENTS

The *AI&Me: Empowering youth for safer roads* project is supported by Fondation Botnar and co-funded by FIA Foundation.

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

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
https://irap.org

Anditi
https://www.anditi.com

AIP Foundation and the International Road Assessment Programme (iRAP) collaborated to produce this Scalability Report and acknowledge, with thanks, the donors 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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15 March 2024

EXECUTIVE SUMMARY

Road safety is a major concern for children around the world. Vietnam suffers heavy yearly losses from road crashes. Young people (10-24) 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.

Focusing on saving children's lives, the *AI&Me: Empowering Youth for Safer roads* project combines the new technology of data collection, road safety knowledge and community engagement to create a safe environment for children going to school. To achieve our goals, the project championed three technological initiatives including the Big Data Screening Method, Star Rating for Schools (SR4S) and the Youth Engagement App (YEA). This report is one of the five deliverables of the project, and presents the findings of the assessment and analysis of the feasibility, efficiency, and scalability of the AI&Me digital framework for addressing road hazards and enhancing the public's awareness of road safety risks.

The scalability assessment of these applications is conducted using a framework of four key criteria: accessibility, acceptability, implementation cost, and sustainability. The evaluation process found that the project tools gather data from diverse sources, including big data platforms and direct input from stakeholders and young people, ensuring the data is both accessible and adheres to data privacy regulations. Strong backing from local communities, especially government officials and young people, combined with international partners' eager support, demonstrates the initiative's wide acceptance and potential to be successfully implemented in other regions. An analysis of costs also shows that investing in these technological solutions is not only cost-effective but also crucial to prevent economic losses caused by road accidents. This project goes beyond simply providing tools. It equips participants with the knowledge and skills to confidently engage with authorities on traffic safety issues. This empowers communities to make informed decisions that lead to lasting improvements, ensuring long-term sustainability.

Based on the results and empirical evidence from the pilot phase in three provinces in Vietnam (Ho Chi Minh City, Yen Bai City, and Pleiku City), the AI&ME project has confirmed the viability of the approach and the potential to replicate the successful and cost-efficient intervention in other countries globally. The approach effectively addresses the challenge of insufficient data for allocating national resources and funds whilst also empowering youth to be more proactive and advocate for a safer road environment.

ABBREVIATIONS

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

Abbreviation	Definition
AIPF	Asia Injury Prevention Foundation
CSV	Comma-separated values data format
FRC	Functional road classes
GHSL	Global Human Settlement Layer
GIS	Geographic information system
iRAP	International Road Assessment Programme
KPI	Key performance indicator
LiDAR	Light detection and ranging
MN-R	Multinet R data
NGO	Non-governmental organization

SR4S	Star Rating for Schools
TAZ	Traffic analysis zones
UN	United Nations
BIG DATA SCREENING	Big Data Screening
YEA	Youth Engagement App

CONTENTS

1 INTRODUCTION

Every year, road crashes are the leading cause of death for young people aged 5-29 years old. In total approximately 1.19 million people are killed with 92% of the fatalities occurring in low- and middle-income countries (WHO, 2023). The United Nations Sustainable Development Goal 3.6 aims to halve road deaths and injuries by 2030, with the safety of young people a particular priority for countries worldwide.

Vietnam is a country that is undergoing rapid economic growth. With that growth, Vietnam faces significant losses occurring each year due to the excruciating consequences of road crashes, with 3,389 young people aged 10-24 dying on the roads, accounting for 15% of all road fatalities and posing enormous economic and social implications for the country (IHME, 2019).

Having a comprehensive traffic data synthesis system to localize, monitor and intervene in areas where road crashes often occur has become absolutely crucial for management agencies. Despite the government's recent efforts to promote the utilization of information technology and digital transformation in various domains, such as road safety management for statistical analysis and reporting purposes, the current data system structure remains fragmented, lacking integration and consistency (Tran et al., 2021). Moreover, certain provinces and cities face limitations in terms of their capacity and resources for data collection and management. While acknowledging the great value of government-sourced traffic data, it is also essential to collect and incorporate the data contributed by the community. Currently, Vietnam lacks an officially designated platform or channel for users to report and update issues related to road safety and road infrastructure, especially infrastructure within the school zones where a significant number of students and pedestrians, who are the most susceptible to collisions, are present. On the other hand, according to the Safe System Approach model endorsed by WHO, Safe Infrastructure is regarded as a crucial element in safeguarding the road users and mitigating collisions and UN Member States have also agreed global road safety performance targets to elevate roads to a 3-star or better standard for all road users.

In response to this issue, the “AI&Me: Empowering youth for safer roads project” was developed with the goal of harnessing proven and emerging technologies to support government agencies in focusing on areas that need intervention in road safety as well as empowering young people to actively participate in the decision-making process. The intervention method applied in the project is the first combination of 3 digital tools including the Big Data Screening methodology, Youth Engagement App (YEA) and Star Rating for Schools (SR4S). After more than two years of piloting, this methodology has proved its effectiveness throughout the AI&Me project supporting efficient and empirical decision-making pertaining to road safety interventions that yield the greatest impact and cost-effectiveness in preserving the lives of children. It also shows the potential to apply technology solutions on scale and replicate this intervention model to many countries around the world.

This report will evaluate the scalability of the intervention method based on the actual pilot implementation and the impact of the method on participants in the AI&Me project, as well as assess how it fits the global strategy for future intervention solutions. These components will be structured into the following main sections in this report, including:

- Project Overview
- Criteria for Scalability Evaluation and Methodology
- Findings from Each Criterion
- Global Access Strategy
- Conclusion and Recommendation

2 AI&ME PROJECT OVERVIEW

1.1 AI&Me Project's Objectives

The "AI&Me: Empowering youth for safer road" is a three-year project that has been piloted in three cities across Vietnam including Pleiku City, Yen Bai City, and Ho Chi Minh City. The project's approach draws on past interventions which successfully promoted public awareness while enabling governments to identify and document hazardous road environments, incorporating community feedback and direct funding to interventions with the greatest potential to save lives.

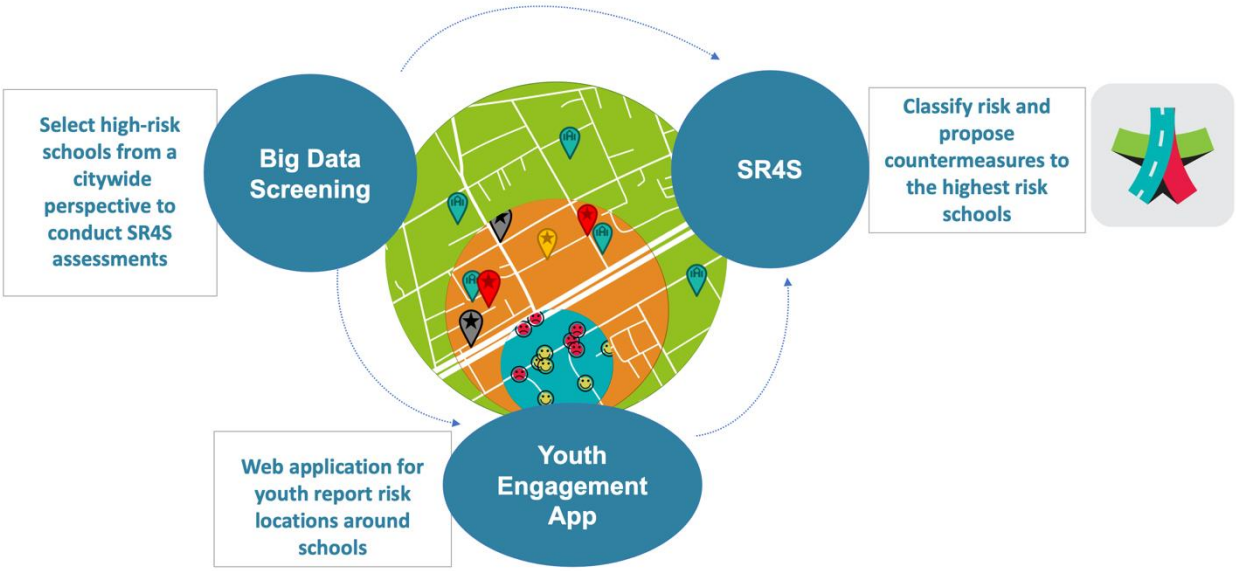
The project's objectives are to:

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 the regions and countries using available sample data and established channels for impact and youth engagement.

1.2 AI&Me Project's approach description:

To achieve the aforementioned goals, the project has incorporated 3 technological initiatives including the Big Data Screening methodology, SR4S and YEA. Together they complement one other and will eventually be integrated into the Citizen Portal for public reference and further decision-making progress.

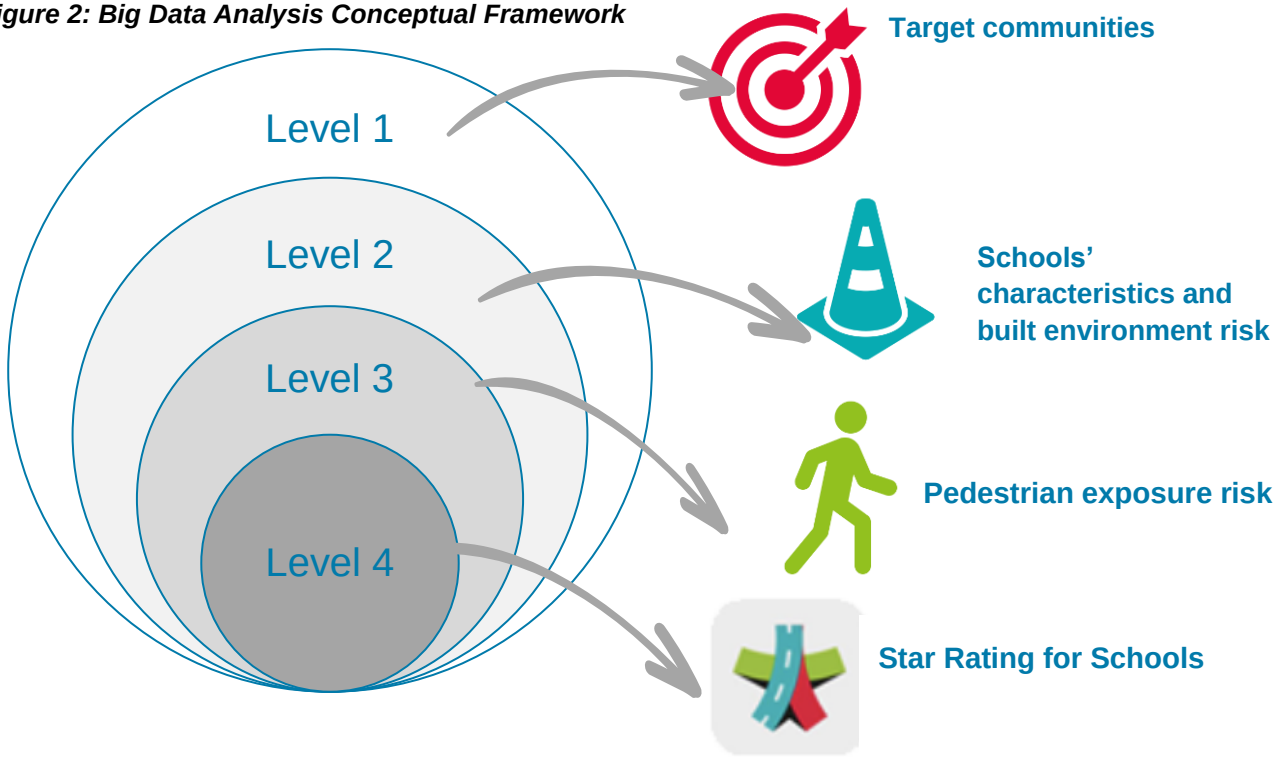
Figure 1: "AI&Me:Empowering Youth for Safer Road" project's overarching approach



Big Data Screening Method

The Big Data Screening Methodology is developed by iRAP, in collaboration with 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 fit-for-purpose access to relevant information while minimizing costs. The method uses commonly available attributes to define pedestrian safety and utilizes them to rank schools from higher to lower road safety risk for pedestrians. The attributes are then categorized in four different analytical levels, where the method optimises the amount of data collected. At each level, the schools are ranked, and only the high-risk ones will progress to the following analysis stage. Although big data is revolutionary and the sources of information are mostly accessible, it is crucial to note that analysis will never be conducted solely digitally. There is always a need for some level of human/manual judgment to ensure the quality of source data, fill gaps or validate the information. This underscores the importance of having a proficient team well-versed in data gathering and manipulation, particularly skilled in utilizing Geographic Information Systems (GIS). The methodology is documented in the project report Big Data Analysis: Methodology for assessing high-risk schools.

Figure 2: Big Data Analysis Conceptual Framework



Youth Engagement App

The Youth Engagement App (YEA) is an intuitive digital risk-perception tool that allows students to map locations where they feel "safe" or "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 on the SR4S platform to help identify areas with high concentrations of pin clusters that allow the prioritization of 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 users to share valuable insights regarding their perceptions of the road environment.

Star Rating for Schools

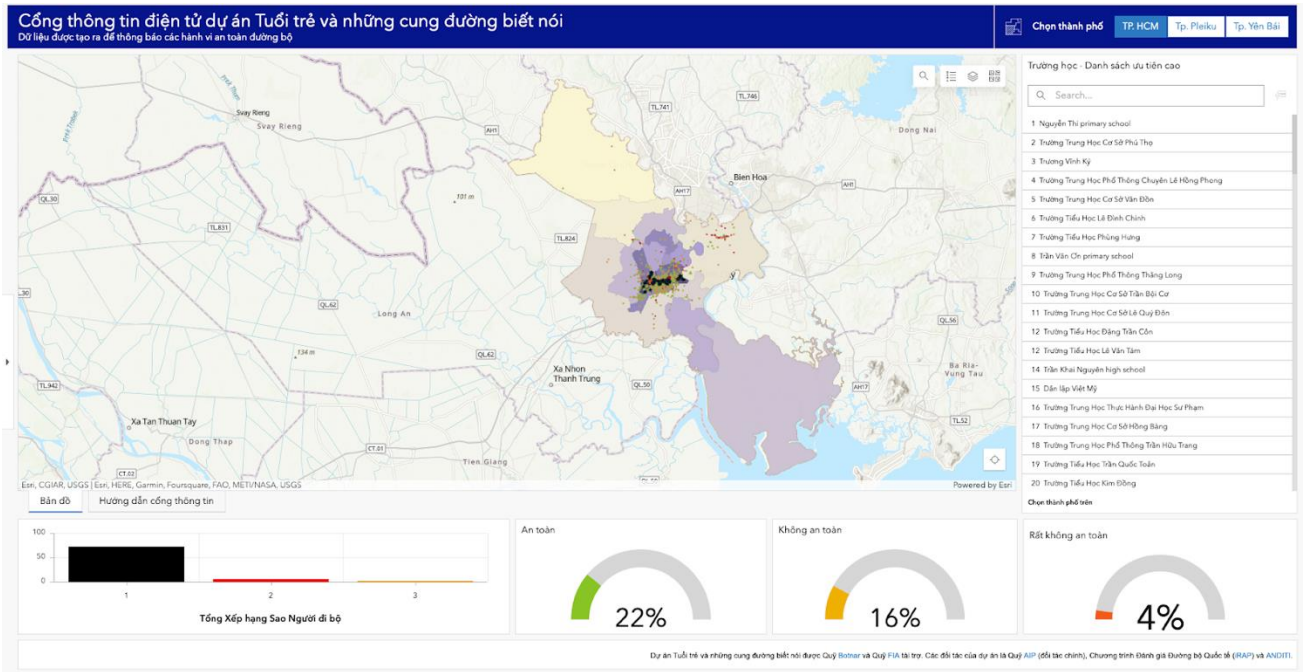
Star Rating for Schools (SR4S) is an evidence-based tool for measuring, managing and communicating the risk children are exposed to on their journey to school. It supports quick interventions that save lives and prevent serious injuries from day one.

The list of high-risk schools screened from the Big Data Screening method combined with data reported by YEA users then undergoes an in-depth assessment of infrastructure through SR4S to produce recommendations that can improve road safety. The evidence-based model uitilizes the iRAP Pedestrian Star Rating where 5 stars are the safest and 1 star is the least safe. 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 at the program website. At the heart of SR4S lies a meticulous and quality assured system for data collection. Trained coders follow standardized guidelines to gather data on various attributes systematically. This systematic approach forms the foundation for calculating road safety risks, ensuring a thorough and accurate assessment.

Citizen Portal

At the end, the Big Data Screening results, youth's feedback, along with SR4S results are uploaded on the Citizen Portal, a web-based tool to be embedded in provincial government websites that enable citizens to access and learn about existing high-risk areas, as well as road sections that have been evaluated and upgraded in terms of infrastructure. This portal also helps government agencies consult, evaluate, and leverage it to secure national or city funds for road upgrades. These factors will 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 in. To access the Citizen Portal click here.

Figure 3: Citizen Portal Data Dashboard



1.3 Project Funders and Partners

About Fondation Botnar

Fondation Botnar is a Swiss philanthropic foundation working to improve the health and wellbeing of young people living in cities around the world. Advocating for the inclusion of youth voices and the equitable use of AI and digital technology, the foundation invests in and supports innovative programs and research, and brings together actors from across sectors to create dialogue and partnerships.

You can find more information at: https://www.fondationbotnar.org/

About FIA Foundation

The FIA Foundation is an independent UK registered charity which supports an international programme of activities promoting road safety, the environment and sustainable mobility. FIA Foundation's aim is to ensure 'Safe, Clean, Fair and Green' mobility for all, playing a part to ensure a sustainable future through:

- Promoting research, disseminating the results of research, and providing information in any matters of public interest which include road safety, automobile technology, the protection and preservation of human life and public health, transport and public mobility, and the protection of the environment;
- Promoting improvement in the safety of motor sport, and of drivers, passengers, pedestrians and other road users which works globally to promote safe, clean, fair and green mobility

You can find more information at: http://www.fiafoundation.org

About AIP Foundation

AIP Foundation is a non-profit organization dedicated to saving lives on the roads and increasing access to safe, equitable and sustainable mobility for all. Beyond empowering underserved road user communities, AIP Foundation tackles injustice related to youth access to education, worker's rights, gender equality and environmental issues.

To find out more, visit http://www.aip-foundation.org/ or connect on Twitter @AIPFoundation.

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. iRAP provides 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.

To find out more, visit http://www.irap.org/

About Anditi

Founded in 2014, Anditi is a data analytics company that specialises in spatial data transformation to provide a better understanding of how data can improve our lives. Anditi provides LiDAR, data analytic and visualisation services for people in government, roads and infrastructure, urban planning, mining and energy industries. Anditi's 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, visualise 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.

You can find more information at: https://www.anditi.com

3 CRITERIA FOR SCALABILITY EVALUATION AND METHODOLOGY

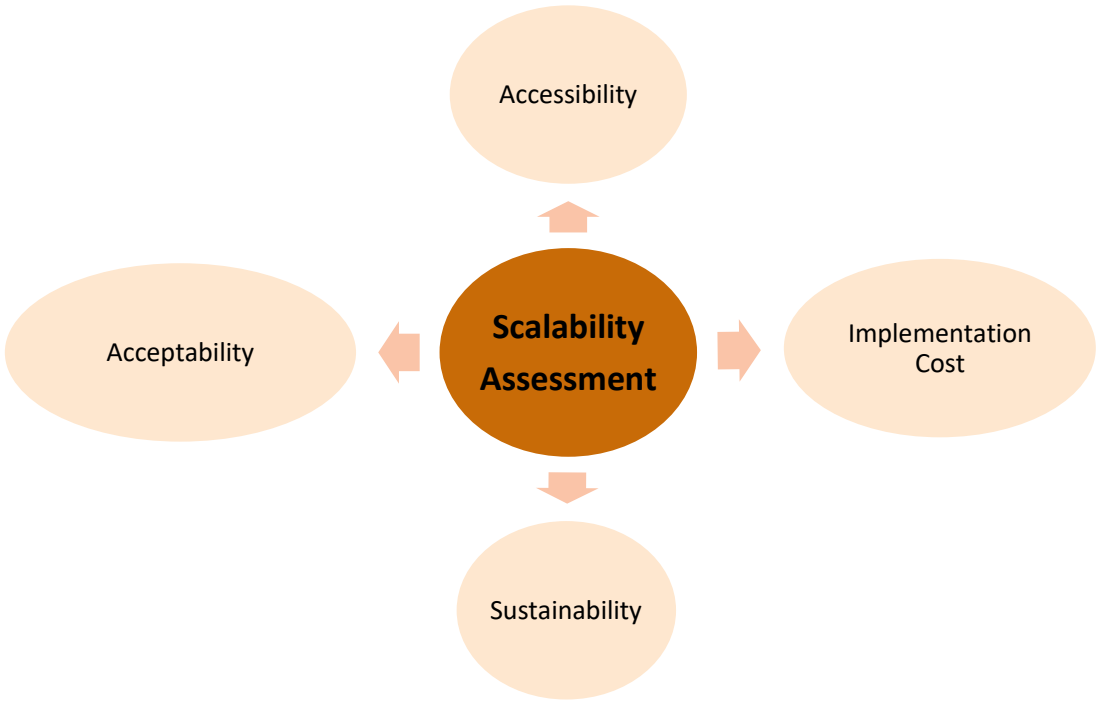
In recent years, the significance of intervention scalability has been underscored by the necessity to replicate interventions in diverse settings while accounting for influential variables. Although scalability evaluation has garnered attention across disciplines, this report will concentrate on pivotal criteria tailored to align with the project's objectives, scope, operations, and contextual factors. These criteria, drawn from the perspectives of various researchers and practitioners, aim to ensure simplicity, relevance and comprehensiveness.

Overall, the framework for scalability assessment of the AI&Me will be evaluated based on four key criteria:

- Accessibility: Accessing the technical data sources is fundamental when scaling up as their information allows an assessment of the resources, infrastructure and expertise required to implement the intervention (Milat et al., 2013). Given the emphasis on leveraging emerging technological initiatives within the AI&Me project, the accessibility to reliable, up-to-date, and licensable technical resources not only impact the project's replicability but also directly influences the efficacy of data analysis and feasibility of the implementing solutions. In the current era of rapid digital advancements, analysts and governments may face fewer hurdles in sourcing data and information. However, it is imperative that access to data sources is accompanied by certain prerequisites. The data acquired must originate from reliable sources while ensuring they are up-to-date, encompassing all essential indicators for analysis, and, more importantly, possessing the requisite licenses and legal permissions for usage and dissemination. To further delineate this criterion, accessibility was disaggregated to 3 sub-criteria:
    - Accessibility to Data Resources: The technology solutions applied in this project are operated based on two main categories of data: Primary and Secondary data. To assess the feasibility of accessing these data sources, the following factors are considered: the openness of the data source, the capability for data collection, and the associated costs for collection.
    - Geographic Coverage of Data: In addition to accessing data sources, it is imperative to ascertain that the collected data comprehensively covers all relevant geographical areas for evaluation, or that data is available for the cities, provinces, or districts under assessment. By delving into the types of data employed and collected across the three components – Big Data Screening, YEA and SR4S, we can learn about the geographic coverage within the pilot phase and the extent to which it may impact scalability.
    - Data Privacy: The AI&Me project relies on data-driven methodologies, each designed to enhance the efficiency and effectiveness of information gathering, ultimately contributing to a more informed and proactive approach to road safety. Recognizing the distinct data privacy characteristics of each data collection method, the AI&Me project consciously works to establish data management terms and procedures. This involves a combination of technological, educational, and procedural measures to guarantee the accuracy, privacy and security of the collected data across the diverse platforms and methodologies employed.
- Acceptability: Determining acceptability was important at every stage of intervention development, particularly when embarking on a new phase of expansion into different target groups, settings or organizational contexts or where health promotion action was not understood or supported by key community or organizational actors (Milat et al., 2013). By involving the two target populations - the youth community and government stakeholders or decision makers - in AI&Me's endeavor, we can evaluate how the intervention's implementation is perceived and embraced, thereby designing a more effective approach that meets the community's needs when expanding the initiatives. To evaluate the acceptance level during the pilot phase, we conducted different surveys with the two target populations and also the global partners via an online survey and focus group discussions to learn about the public opinions on the Big Data Screening and YEA.

- Implementation Cost: The cost of implementation is an important consideration for scalability. For example, in an assessment for the Scalability Assessment and Planning Toolkit conducted among many stakeholders by the Child-Centred Disaster Risk Reduction (CCDRR) and Save the Children, cost and funding was scored generally moderate to high (CCDRR, 2018). Likewise, many surveyed researchers and policy-makers from Milat's research identified cost consideration as important in informing decisions to scale up health promotion intervention (Milat et al., 2013). Additionally, it's important to emphasize that assessing cost-effectiveness enables comparisons of interventions, aiding in the determination of priorities for scaling up. This report will delve into the costs associated with each technology component and assess potential additional expenses required for scaling up in a new country, offering a comprehensive understanding of the cost-effectiveness aspect of this initiative.
- Sustainability: This criterion is a prerequisite in any scalability toolkit or assessment, which is usually linked to the ability of an intervention to promote systemic changes even beyond the project cycle, such as imitation, buy-in and behaviour change (Vuna, 2016). Irrespective of the project's goals, researchers and policymakers may question the intervention's effectiveness and, more importantly, whether the underlying issues have been sufficiently addressed if sustainability is not guaranteed. Beyond just providing technical tools, the ultimate goal of AI&Me is empowerment; this includes strengthening the capacity of target groups to address road safety and encouraging youth to speak out about these social issues, which in turn encourages the government to make long-term changes.

Figure 4: Criteria of Scalability Evaluation



These 4 criteria are complementary and interactive with each other, considering the various internal and external factors that influence the project scalability. The findings from criteria assessments serve two main purposes. First, they enable us to review the accomplishments, challenges and lessons learned from the current project, thereby informing the viability and enhancement of the replication plan for subsequent stages. Secondly, these assessments facilitate the development of a communication and advocacy plan aimed at promoting school zone safety policies.

4 SCALABILITY ASSESSMENT CRITERIA

4.1. Accessibility

4.1.1. Accessibility to data resources

The two types of data within the AI&Me project come from varying sources and require different data collection actions.

Primary data includes data that records user opinions, especially youth, about the safety of road infrastructure via YEA and field data collected for in-depth assessment with the SR4S tool at high-risk schools.

- Users' pins on Youth Engagement App:

  As YEA is an open perception app, all users can pin reviews on infrastructure and share their personal opinions on the app's database system after creating a YEA account. Reported pins are integrated and displayed on the road safety perception map to alert competent individuals or organizations to areas of significance. Additionally, YEA is an open application aimed at youth aged 13 to 22, who are students of secondary schools, high schools and colleges or universities, with permission from the guardian of youth below-18-year-old group strictly required when collecting personal information to ensure compliance with child information privacy conventions. This content will be emphasized more explicitly in the section on data privacy.

  Perceptual data is very challenging to obtain using conventional methods. It requires extensive survey efforts that are both labour-intensive and time-consuming. To address this, the simple YEA app allows broader reach and engagement. The YEA app also allows continuous access so participants can add and update data based on their actual perceptions in relation to safety. This approach and input data not only capture real-time experiences but also provides a dynamic representation of evolving perceptions over time, empowering users to report their experiences seamlessly.

Figure 5: YEA's interface when collecting user's pin

- Field data for SR4S

  SR4S requires assessors to provide on-site images of infrastructure and data on traffic volume, pedestrian flow, and operating speed of vehicles in the area requiring detailed assessment. This data is recommended to be collected through field surveys in the academic year period to ensure the accuracy of road infrastructure conditions that capture the actual vehicle and pedestrian flow when students are present at target schools.

  The accessibility of data is unrestricted, with all road characteristics considered public information. The SR4S data collection guidelines, with instructions for documenting all the road features assessed under SR4S evaluations, can be readily accessed on the official SR4S website. Furthermore, the SR4S coding form is available for free download directly from the website, facilitating an open approach to utilizing these resources.

Figure 6: SR4S's data collection form.

The primary data is mainly collected by an individual user's dedication for YEA and trained human labor for SR4S's field data. The success of assessments is therefore influenced by the amount of data recorded from the app user as well as the SR4S assessor.

While it is simple to obtain this type of data with the app, the challenge is how to engage as many youth as possible, especially from a user-centered app like YEA. The ultimate goal is to encourage youth to be more proactive and share their perspective of the road environment on the platform, thereby creating more perceptual data in YEA and SR4S that provides the analyst and also the local authorities with a comprehensive understanding of the issues and what needs to be done.

Secondary data includes available data that has been previously aggregated, classified or screened from different platforms to serve the Big Data Screening method of analyzing and identifying high-risk schools. The majority of this data comes from big data sources, which vary in terms of coverage, frequency of collection, licensing conditions, and cost. As part of any scaling of the initiative, the available big data sources may vary by country and available budget. Specifically, secondary database sources include:

- Government open data sources:

  Governments from different administrative levels have been collecting, maintaining, and making available data to citizens from national jurisdiction to local authorities. Portals to access the data are available in other parts of the world, providing sociodemographic variables and information about the built environment and crash data history. Identification of the government body and building the relationship with local stakeholders are examples of initiatives that need to be made to access the data.

  Data aggregation level can be an issue with using Government open data sources. Socioeconomic data is typically aggregated by administrative units (e.g. districts) which vary from country to country. Population density and casualties are examples of data that traditionally came through governments open data sources.

- IPUMS Terra (https://www.ipums.org):

  IPUMS Terra is a data hub for human population characteristics, land use, land cover, climate, and other environmental characteristics data worldwide. Developed by the University of Minnesota, it provides census and surveys data for different countries worldwide. The available information depends on the country assessed, but there are options to select timeframes and aggregation levels. Data and services available are free of charge, and data can be downloaded in tabular or GIS format.

- WorldPop (https://www.worldpop.org)

  The WorldPop program provides high-resolution open data of population distribution. The data comes in grids down to 100m resolution and allows for aggregation into different spatial units such as administrative areas. This data is generated from modeling using factors like census data, UN population estimates, and land use. This data is free to use and is available for every country, although the accuracy varies between countries due to the availability of model input data. This is a valuable dataset to use when other census data is too broad of a scale.

- Global Human Settlements Layer (https://ghsl.jrc.ec.europa.eu)

  The Global Human Settlement Layer (GHSL) provides a variety of open-data products on human settlement distribution. Multi-temporal spatial layers of built-up areas derived from satellite imagery are available with global coverage. The GHSL Landsat derived product provides built-up areas at 30m resolution at the epoch's 1975, 1990, 2000, and 2014. The GHSL data can be used to estimate urban sprawl by comparing the built-up layers between different epochs.

- Satellite images

  Over 3,000 operational satellites that are orbiting Earth are equipped with cameras and sensor information capable of producing high-resolution images from all parts of the globe. Satellite imagery can help assess land use and built environment attributes for transportation, urban planning, and road safety studies. Essential attributes to road safety assessments can be identified using image recognition algorithms like the number of road lanes, the presence of intersections, and more. Additionally, negative difference spectral indices allow tracing changes in urban sprawl.

- Multinet-R (MN-R) data

  The Multinet-R data is a road network database provided by TomTom. It is provided as a navigation tool to find locations, guide routes and display maps for users (17). A range of attributes is available for purchasing that addresses point data, road attributes (e.g. gradient and road curvature), points of interest in cities, speed data and others.

  The MN-R data refers to the TomTom database model where the layers of the TomTom maps are available. Data is supplied in CSV format that allows easy manipulation. This project uses the MN-R data source to identify schools' locations and gather operational information like peak hour flows and operating speed. The MN-R data used in this project was made available via Anditi, which is a TomTom Value-Added Reseller.

Even though certain secondary data sources may impose terms of use or require users to pay a reasonable fee to access the data, the majority of data sources utilized for Big Data Screening is generally affordable, accessible, and adequate in different parts of the world, enabling the analysis to be applied and replicated in other countries. In the case of Vietnam, not all originally proposed attributes in the pedestrian macro-level analysis of Big Data Screening were universally accessible, and certain features were limited to specific cities. However, this did not compromise the analysis due to the method's inherent flexibility, designed to accommodate varying levels of maturity in countries' data collection, maintenance, updating, and availability programs. Consequently, attributes that were either unavailable or partially accessible in the three pilot cities were not excluded from the overall methodology. The rationale behind this decision is rooted in the recognition that these attributes might still be relevant and easily obtainable in other locations.

The table below, extracted from the project report on Big Data Analysis: Methodology for Assessing High-Risk Schools, delineates the data availability for reference.

Table 1 – Attributes' availability

Analysis Level	Attributes	Availability		Data Sources
Level 1	Density of pedestrian casualties (crashes/km2)		Partially available	Provincial Traffic Safety Committee
	Population Density (inhabitants/km2)		Available	IPUMS Terra / WorldPop
	% of population 6-18 years old		Available at the district level	IPUMS Terra
	Area type		Available at the district level	IPUMS Terra
	Income		Proxies available (unemployment)	IPUMS Terra
	Urban rapid growth		Available	Satellite image / GHSL
	Road density (km/km2)		Available	MN-R data
	School density (Schools/km2)		Available	MN-R data
Level 2	Km for road type		Available	MN-R data
	Number of intersections		Available	MN-R data
	% of commercial land use		Not available	-
	Number of transit stops		Partially available – only available at the district level.	City data available
	School road type		Available	MN-R data
	Number of lanes on the school road		Partially available available	Satellite / Google Earth
	Number of students		Available	Provincial Department of Education and Training
	Shift schedule		Not available	-
Level 3	Average operational speed in the buffer zone		Available	MN-R data
	Average operational speed on the school roads		Available	MN-R data
	Average peak flow in the buffer zone		Available	To be collected by Tomtom once Level 3 schools have been identified
Level 3	Average peak flow on the school roads		Available	To be collected by Tomtom once Level 3 schools have been identified

It is noteworthy to mention, data accessibility should increase in the foreseeable future. Many organizations are actively striving to remove barriers like patents and copyrights, particularly in data sources essential for analyses that contribute to significant social benefits, such as road safety assessments. This collective effort aims to foster a more open and collaborative environment, facilitating the free exchange and utilization of valuable data for the betterment of society. Initiatives like the AiRAP partnerships aim to help improve access to, and application of, existing and emerging data sources globally, including advances in artificial intelligence, machine learning, vision systems, LIDAR, telematics and other data sources.

4.1.2. Geographic coverage

In the Big Data Screening method, the accuracy and reliability of information regarding areas with high traffic safety risks are enhanced by increasing the geographical coverage and diversity of data. This is especially relevant as the outcomes of Big Data will have an impact on the selection process of schools with YEA results and the subsequent detailed evaluation utilizing the SR4S tool. The availability and area coverage of data to be collected vary depending on the level of analysis in Big Data and the corresponding attribute requirements.

With the pilot process of the Big Data method in Vietnam, the attributes at level 1 focus heavily on sociodemographic characteristics like population density and income; and variables representing the urban structure like roads density and recent urban growth. These attribute data groups are considered fundamental and can be readily obtained in the majority of countries and cities.

Coming to level 2, the school streets and school surroundings were put at the heart of assessment. Attributes that are more specific and viable with a reduced size of screening to the district level begin to appear such as data for land use, urban infrastructure, road network and built environment thereby helping to localize school areas that are high risk for pedestrians. Level 2 mostly extracts data from TomTom's road network MN-R data (2019 system and satellite image data source), with only two other attributes that require data from local agencies. TomTom MultiNet-R (MN-R) source data is available for approximately 68 million kms of navigable roads, covering 164 countries and 35 territories. MN-R data is updated on a continuous basis and available through TomTom’s weekly incremental map updates with a focus on higher class roads (i.e. those that typically carry 75% or more of road traffic). MN-R availability might vary depending on the country with more details on coverage available on the TomTom website. Although the MN-R TomTom data was the source used in this project, it is not the only data source available for these types of attributes. Waze and Google are alternative data suppliers with similar global coverage.

At level 3, all attributes come from the TomTom Traffic Stats portal which is a database of traffic stats collected from GPS data including average speeds and traffic density on the route to school. These level 3 attributes can be identified quite easily and are relatively straightforward to analyze. During the initial phase of implementing the Big Data method in Vietnam, it is observed that while a majority of the collected data is readily accessible and exhibits extensive coverage, certain attributes still have limited coverage or availability in big cities, such as data pertaining to pedestrian casualties or school shifts. However, a few other attributes and proxies still have equivalent meaning and can be flexibly used instead in the school ranking classification process. Moreover, working closely with the local government also allows the project to obtain a wide range of valuable alternative data, complementing the analysis process of the Big Data Screening methodology

While most data sources used for Big Data Screening data are readily available and typically cover a relatively large area, YEA and SR4S data often begin from scratch and heavily depend on data recorded by YEA users or field surveyors. During the YEA pilot, the app was tested with students in three major cities, namely Pleiku, Yen Bai, and Ho Chi Minh City. Consequently, it is important to note that the pin coverage is mostly recorded within these cities. However, when the application is deployed and utilized in various provinces and countries in the future, the number of users as well as the number of pins recorded will become increasingly diverse and enrich the data coverage on the map. Non-Anonymized data included in the app is accessible to governments upon request.

For the SR4S tool, each survey point will assess road infrastructure attributes along a 50-meter road section. The number of survey and evaluation points on SR4S will vary based on the quantity of areas with numerous

pinpoints reported by users via the YEA application. Having a higher density of user pins in various locations increases the number of potential sites that can be assessed using SR4S.

4.1.3. Data privacy

The AI&Me project revolves around leveraging data, primarily focusing on three key components that depend on robust data collection methodologies. These components explore distinct avenues for gathering information as explained above. Along with that, the data from each component comes with different data management terms and procedures

The Big Data Screening

The confidentiality and privacy considerations associated with spatial data, especially when purchased, pose a primary concern for the Big Data Screening methodology within the Ai&Me project. The implications extend not only to sharing current project results but also to the feasibility of future implementations of the Big Data Screening methodology. Given that these restrictions may not be immediately apparent, a thorough investigation into the privacy implications of each data source becomes imperative. More on the restriction of data sources is described in the Big Data Analysis: Methodology For Assessing High-Risk Schools.

The SR4S

In the context of SR4S, data collection is expressly conducted for SR4S assessments, with assessors explicitly agreeing to adhere to SR4S terms and conditions. These terms underscore that SR4S enables users to access various content, including assembled mapping and result tables derived from diverse surveys. Once the data is submitted and integrated into the SR4S platform, the results become accessible to anyone with authorized access or to the public when results are published by assessors.

It's essential to note that iRAP acknowledges and appreciates the contributions of data holders who permit using their data in SR4S. This collaborative effort extends to various entities, such as governments, authorities, charities, automobile clubs, companies, research institutions, international treaty organizations, trade associations, and regional road assessment programs. Their willingness to share data is pivotal in facilitating the publication and accessibility of SR4S results, fostering a collective commitment to advancing road safety through comprehensive and openly available assessments.

Therefore, data privacy and security do not pose barriers to the application of SR4S beyond Vietnam. Both tools operate without needing individual-specific data, employing aggregated data at the level of regions or specific locations, emphasizing the road environment. This approach ensures that the tools are designed to uphold privacy standards while providing valuable insights and assessments on a broader scale.

The YEA

The data collected by YEA holds a heightened sensitivity concerning data privacy. The app requests personal information during registration, including the user's name and email. Additionally, users are prompted to provide their country, city, and school details. This collected information serves a crucial purpose—associating the pins contributed by users with specific schools. These pins play a pivotal role in comprehending areas surrounding schools where users may perceive safety concerns.

The significance of this data lies in its dual functionality. First, the pins contribute valuable insights to SR4S assessments, enriching the understanding of road safety perceptions around schools. Second, these pinned locations are incorporated into a road safety perception map, serving as a valuable resource for governments. Moreover, students can use this information to advocate for safer roads, fostering a collaborative and community-driven approach to enhancing road safety.

While the YEA collects personal information, it's important to underscore that this data serves a noble purpose—empowering communities, informing safety assessments, and fostering advocacy for improved road safety. The

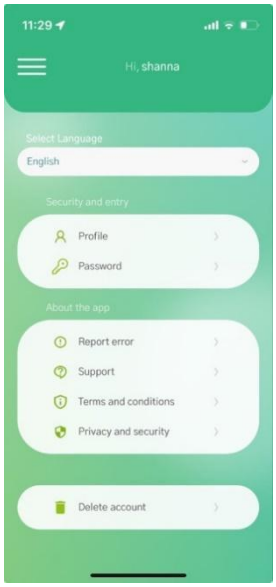
responsible use of this information is paramount, with privacy considerations woven into the fabric of the app's design to ensure that user data is handled with the utmost care and following established privacy standards.

The Youth Engagement App (YEA) collects additional demographic details, such as date of birth and gender, and information on how users commute to and from school. These data points are crucial in conducting nuanced analyses by age range. The insights from these analyses serve as valuable guidance for policymakers, offering recommendations to promote sustainable and safe transportation modes tailored to specific target groups.

Users of the app can report road safety concerns by pinning locations on the map, leaving comments, and even uploading photos. The pinning process records the coordinates (latitude and longitude), and users can choose either their current location or manually select a place on the map, allowing flexibility in reporting. These coordinates, transport mode, and reported safety levels can be downloaded by previously authorized third parties, specifically moderators. It's noteworthy that iRAP strictly approves users qualified as moderators, ensuring responsible information handling.

For enhanced transparency and privacy protection:

- The downloadable information is anonymized, with no personal details provided to third parties.
- Photos taken within the app, primarily focusing on roads of concern, are subject to a privacy-conscious approach. Although not all photos can be audited, they are visible only to the students who captured them, moderators, and the YEA administrator. Automatic blurring of faces in pictures adds a layer of privacy protection.
- Moderators conduct sample audits of photos and comments to identify and address inappropriate content or misuse.



The Youth Engagement App (YEA) has established robust legal frameworks to govern its usage through a Terms & Conditions document and a Data Privacy Policy. These documents serve as the guiding principles for applying YEA and managing data privacy, applicable not only in Vietnam but also in other contexts. The Terms & Conditions delineate the rules and expectations for users engaging with the app, while the Data Privacy Policy outlines how user data is handled, stored, and protected. Both documents are accessible within the app and were also shared with guardians when they approve the participation of users under 18 years old in the project.

Figure 7: Terms & Conditions and Data Privacy Policy available for YEA users in the app 'Settings' menu

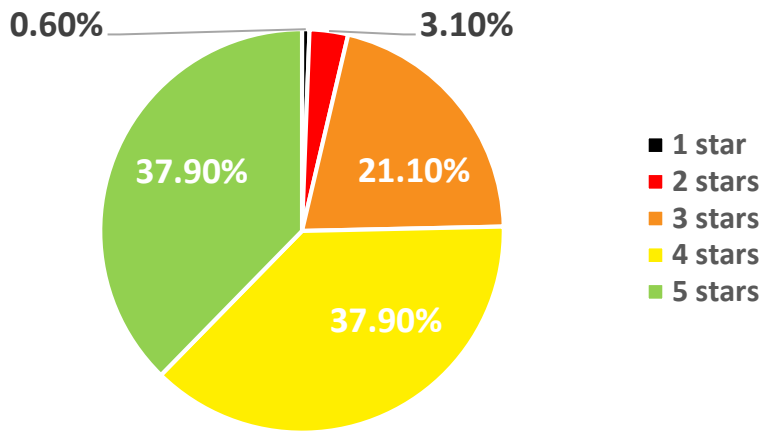
4.2. Acceptability

Government stakeholders and youth were the two main target groups that were identified from the beginning of the AI&Me project. Participation and buy-in from this critical group determined the success of the pilot program and that user experience will be of the utmost importance when expanding the intervention to other areas. At the same time, this process entails constant monitoring, close collaboration, and advocacy on the part of project implementers.

In the AI&Me project, authorities were kept in the loop and invited to participate as well as contribute to the implementation plan. The project's training and information-sharing activities were designed to offer a great opportunity for the government to become acquainted with current advanced technology initiatives and enhance the individual and organizational capacity in terms of utilizing, managing, and communicating the data to achieve long-term reductions in fatalities and injuries due to road crashes. These endeavours not only afford government stakeholders a deeper comprehension of the project's aims but also facilitate the collection of their invaluable feedback and recommendations. This, in turn, enables the intervention model to be tailored effectively to diverse contexts, thereby addressing crucial challenges faced by local communities. On the other hand, obtaining support from the government benefits the implementation process for the technological initiatives, such as providing valuable alternative local data to make the Big Data Screening analysis more effective .

YEA was born as a platform bridging the gap between youth and local government, with the primary goal of amplifying youth voices and encouraging their active participation in the decision-making process, thereby contributing to addressing social issues like road safety. Consequently, youth's contribution is present in every stage of YEA's lifecycle, spanning from ideation and development to piloting and deployment of the application. Deliberate efforts are made to foster the engagement of young individuals in various aspects, encompassing experiential participation, evaluation, and the solicitation of feedback. The overarching objective of these endeavours is to bring a mobile application designed by youth, fit for youth and promoted by youth. Every pin submitted by a student on YEA represents an individual's perspective and contributes to the amplification of youth voices. The more pins recorded into the app system, the more likely it is to capture a large volume of students' opinions and identify more road safety issues.

Figure 8: The score rated by students when asking about YEA's usefulness and practicality



To assess the level of support for the initiative, various evaluations were conducted among both youth and government stakeholders through questionnaire surveys, in-depth interviews, and focus group discussions. The results demonstrated that:

- **86%** and **100%** of surveyed government stakeholders found the Big Data Screening Methodology and YEA **useful for the government to identify high-risk communities/locations easier**, respectively.
- **75% of participating students highly rated (from 4 stars or higher) YEA as useful and practical on the 5-star scale** in the pilot phase, demonstrating that YEA has the potential to grow and be well received by the community in the future. Insights from users that rate as less than 4 starts were used to upgrade the app or are listed in a desired list for next upgrades. (Figure 8)

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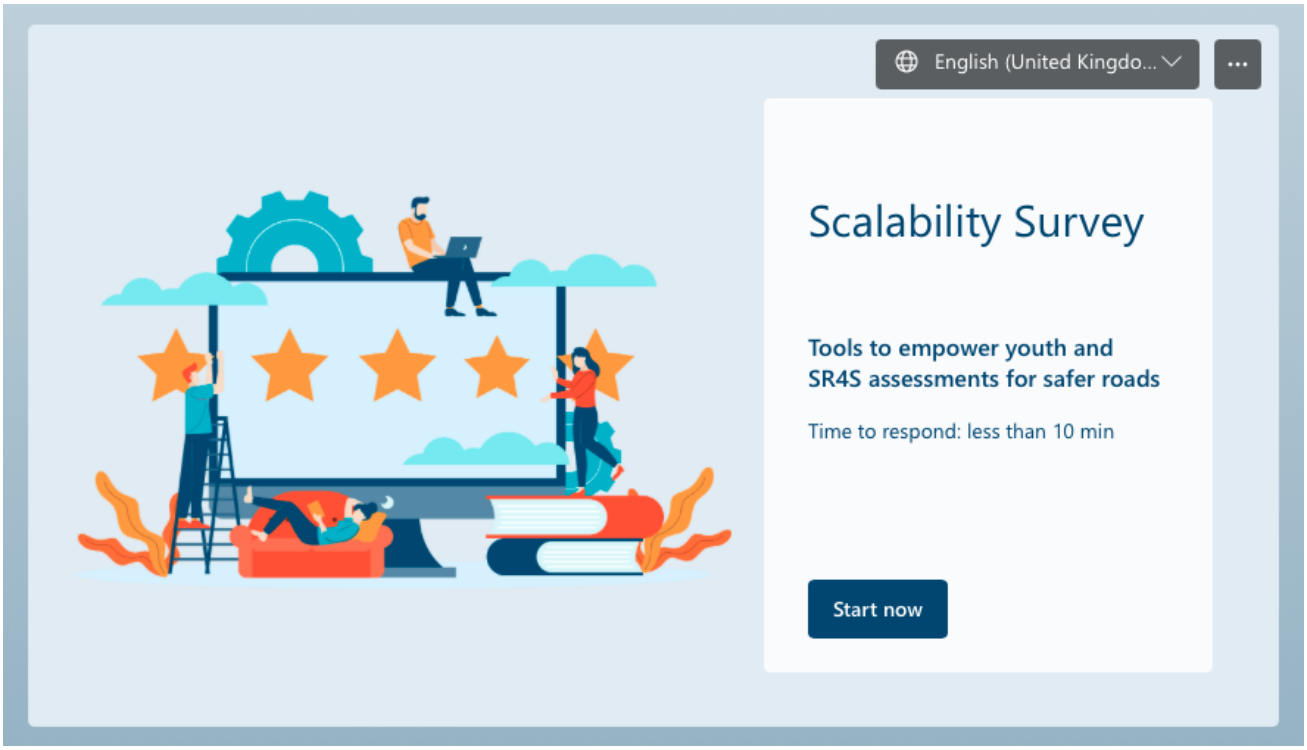
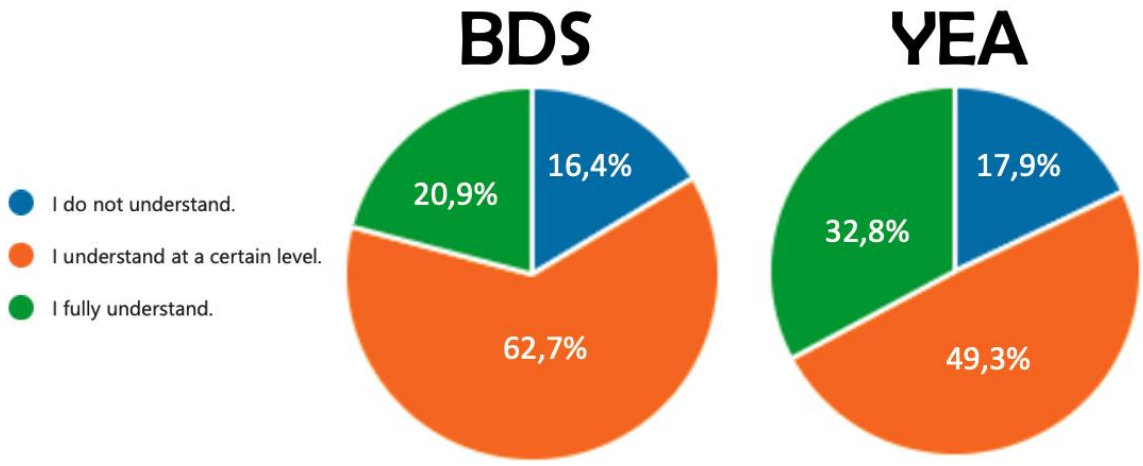
Figure 9: Scalability survey interface



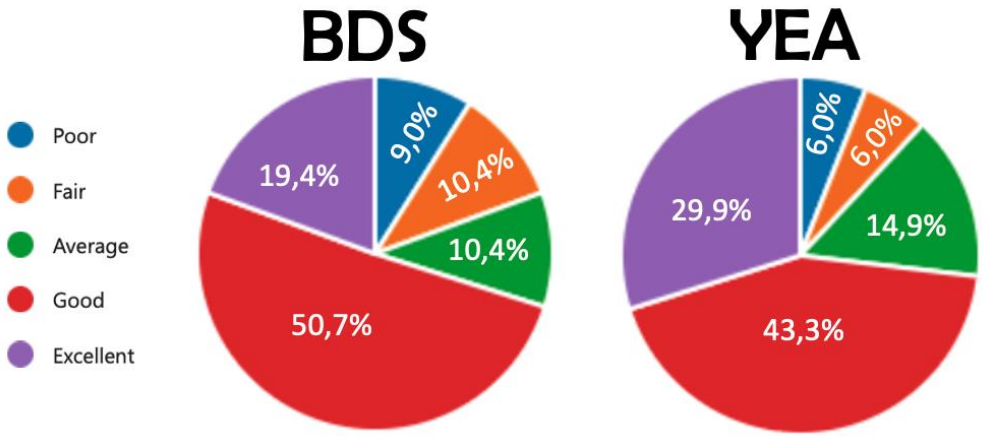
Apart from the survey conducted with target groups in the AI&Me project, an additional survey was done with partner organizations on a global scale. The survey was distributed to the participants of the SR4S mailing list and was open to receive responses from Nov 3rd to Nov 14th 2023. In total, 67 individuals from 37 countries shared perspectives on the viability of implementing the Big Data Screening method and YEA as part of their work in various countries

Figure 10: Responses to the question "Do you understand the aims of the tools, how it works and the outputs it provides?"



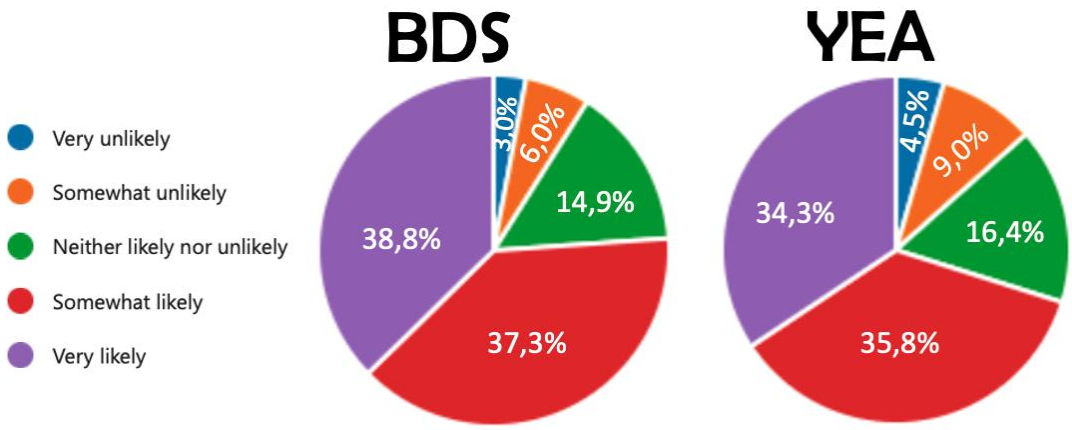
More than 82% of the respondents had a basic understanding of the purpose, operation, and outcomes of the above two methods. (Figure 10)

Figure 11: How would you rate the value of the tools to support road safety actions in your city/region or country?



More than 70% see value in these two methods to enhance road safety action in their country and region. (Figure 11)

Figure 12: Responses to the questions "Considering the necessary funds and knowledge, how likely you or your organization are to use the tools?"



More than 70% of respondents assessed that their organization can apply these two methods considering the necessary funds and knowledge. (Figure 12)

The scalability survey focused on Big Data Screening and YEA. SR4S, on the other hand, is an evidence-based assessment tool that has been validated by many organizations and national governments around the world for its effectiveness and has been widely used to assess more than 1,200 schools in 70 countries. These positive reviews demonstrate the level of support from community and government for the technology-based approach to traffic safety that Big Data Screening, YEA, and SR4S offer to the table.

It's noteworthy that nearly half of the respondents (49%) were not familiar with Big Data Screening, and this percentage is even higher (60%) in the case of YEA. This is to be expected given the first ever application of the tools in Vietnam and reinforces the need for a well-planned communications strategy as part of any expansion to other countries.

4.3. Costs for additional countries developed

The AI&Me tools were initially piloted in Vietnam but were strategically developed for global applicability linked to the existing Star Rating for Schools program that has now been successfully implemented in 70 countries. This impactful program has been made possible through generous support from donors and sponsors, notably FIA Foundation, FedEx, 3M and Prudence Foundation and well-connected and passionate Lead Partners with established impact in child and youth road safety.

4.3.1. SR4S cost

The FIA Foundation and Global Programme Partners, 3M and Prudence Foundation, have played a pivotal role in sustaining the SR4S secretariat. Their contributions enable the provision of online tools, applications, training, and supporting resources on a global scale, with a commitment to making these resources freely accessible worldwide. The SR4S program, under the management of iRAP, benefits from the oversight of the iRAP Global Technical Committee (GTC) for technical development. This collaborative effort ensures the program's adaptability and effectiveness across diverse international contexts.

The costs associated with applying SR4S within this governance structure are primarily tied to staff or volunteer hours dedicated to data collection, analysis, and reporting. The extent of these costs is contingent upon the number of schools assessed. Additionally, iRAP strongly recommends allocating budgetary resources for quality assurance to uphold the accuracy and reliability of the assessments.

4.3.2. Big Data Screening cost

The associated costs for the Big Data Screening methodology under the AI&Me project encompass the acquisition of data, the necessary time for analysis and reporting and side activities to engage local government.

The methodology adopts a strategic approach, acknowledging the challenges inherent in collecting data, particularly speed and flow. To address these challenges, the methodology utilizes distinct levels to progressively narrow the analysis area, reducing the scope where data collection is required as the levels progress.

The breakdown of costs and methodology levels includes:

- *Level One:*

Data Sources: Primarily relies on attributes from open sources or government census databases.

Cost Consideration: Generally, it is more cost-effective as it leverages readily available and open data.

- *Level Two:*

Data Sources: Involves attributes that can be sourced from open data platforms like OpenStreetMap, albeit requiring manipulation, which can escalate costs.

Cost Consideration: This entails increased costs due to the need for data manipulation.

- *Level Three:*

Data Sources: Requires data typically obtained through telematic services, often involving purchase. The acquisition is therefore limited to the surroundings of high-risk schools identified in levels two and three.

Cost Consideration: This represents the highest cost level as it involves purchasing specific data for targeted areas.

The detailed attributes, data sources, and the scope of analysis are expounded upon in the report titled "Big Data Analysis: Methodology For Assessing High-Risk Schools." This comprehensive document provides a thorough understanding of the methodology, data sources, and areas of analysis.

Continuous engagement with government stakeholders also occurred throughout the deployment of Big Data Screening methodology. This involved a range of activities, such as meetings, workshops, and training. The purpose of these activities was not only to inform stakeholders about the project's overall goals and activities but also to provide knowledge of the new methodology for identifying high-risk locations and how to utilize it effectively within the context of Vietnam. It is noteworthy that all activities related to the Big Data Screening methodology in this pilot phase were conducted amidst the backdrop of the COVID-19 outbreak, which led to the allocation of resources for the organization of virtual events.

4.3.3. YEA cost

The Youth Engagement App (YEA) is a free-to-use tool maintained under the auspices of iRAP and the SR4S program. Recognizing its unique purpose as an application designed for and utilized by children, the app must be accessible in their native languages. As outlined earlier, language poses a significant barrier to the widespread adoption of the YEA in countries. During the course of the project, only English and Vietnamese were available in the system.

Acknowledging this challenge, the app has been developed strategically to minimize the text components as much as possible. However, to truly overcome language barriers and facilitate broader utilization, the YEA necessitates translation and implementation services to introduce new languages into the system.

Key considerations in addressing language barriers include:

Translation Services: Collaborate with professional translation services to accurately translate the app's content into various languages.

Implementation Services: Integrate the translated content seamlessly into the app's interface, ensuring a user-friendly experience in the newly added languages and conducting thorough testing to verify the functionality and linguistic accuracy of the translated elements.

The initiative can enhance its global reach by prioritizing translating and implementing the YEA into diverse languages, empowering children worldwide to contribute actively to road safety. This approach aligns with the inclusive and accessible nature of the YEA, fostering a collaborative environment for meaningful engagement across different communities.

While YEA strives to be a mobile application that is easy for all users, including beginners, to use and quickly inform about high-risk locations, boosting the app's usage among young people entails substantial effort from local government stakeholders, coordination with schools, and multiple communication campaigns. The design of school-based activities and communication campaigns can be customized to suit the preferences of young individuals and the specific circumstances of each nation, allowing for a diverse and adaptable approach. However, it is essential to highlight that the primary objectives of these activities are to advocate for YEA and to ensure that young people comprehend that their voices are acknowledged through the app. This, in turn, motivates and empowers young individuals to actively express their opinions on road safety matters and other social concerns. Without of any of these factors, the app will be unable to reach a substantial number of young people and gather a significant number of pins during the pilot in Vietnam.

4.3.4. Overall costs

The table below presents overall estimates for the services described below. Indeed, it's important to note that the estimates provided below are general approximations for the related services. As mentioned, these figures can vary over time and across different countries, and they should be considered preliminary estimates rather than final quotes. Additionally, it's acknowledged that there are additional costs related to project management, local community engagement, and communication/dissemination activities, which can vary significantly based on country-specific factors and organizational approaches.

Table 2 – Estimates costs for the implement the framework

Tool	Service	Costs in CHF
Big Data Screening	Data purchase Analysis and reporting	26,000 per city (Ho Chi Minh City Size – Metropolitan city)
	Stakeholder engagement via online activities to disseminate results	10,000
YEA	Translation	2,500 per language
	Government and schools' engagement, YEA promotion and data collection	40,000 per 3 provinces
SR4S	Identify data points to assess Data collection Quality assurance Analysis and reporting	30,000 Per 100 schools

For a developing country like Vietnam, the estimated economic losses by road crashes is equivalent to 2.9% of Vietnam's GDP, which is higher than the "threshold" of 2.80% of GDP by ESCAP formula. (WHO, 2015; Nguyen, 2008). Moreover, each road traffic injury hospitalization costs the patient and family on average US$363 or 6 months of average salary (Nguyen, 2012). The expenditure allocated by the AI&Me project towards mitigating these preventable losses not only demonstrates its significant value and long-term utility for the country's economy but also underscores its potential to save numerous lives on the roads. With the rapid advancement of technology and the project's expansion, there lies the opportunity to integrate more advanced components into this solution to optimize the procedure and increase cost-effectiveness during implementation.

4.4. Sustainability

As the initiative grows and develops, sustainability will be a critical factor to consider. Successful scaling up requires not just expanding the intervention's geographical area and adjusting based on actual needs, but also making sure it will persist beyond the scope of the project's cycle and keep benefiting many individuals and communities.

Despite being developed recently and piloted with basic features in a small group of audiences, YEA has demonstrated great initial potential with remarkable positive feedback from the target students and teachers regarding its interface and underlying meaning. The influence of YEA on young individuals is also reflected in the cognitive and behavioral changes, which can be referred from the project's Public Facing Report. As YEA gains popularity among young individuals, it is anticipated that they will feel motivated and confident to communicate using "road safety language" and advocate for safer journeys. However, it's essential to note that youth are only likely to persist in reporting locations if they perceive that their pins, their concerns, their voices are being taken seriously and addressed by local authorities. Hence, government commitment is also a crucial element in fostering youth engagement and ensuring scalability .

To achieve that goal, the Citizen Portal was developed as a digitalized platform for storing, updating, and sharing road safety data. This platform integrates information gathered from all three methods - Big Data Screening, YEA, and SR4S – and then embedded into the province's website for reference by the public. Through the Citizen Portal, local authorities and road engineering experts can leverage its extensive data and interactive interface to identify locations requiring priority road improvements, allocating resources, and informing decision-making and subsequent action plans. Concurrently, the project conducted numerous training activities aimed at equipping government partners with the necessary tools, knowledge, and understanding of the data obtained, thereby building the stakeholders's capacity, emphasizing their engagement and strengthening support for the intervention.

From a financial standpoint, the sustainability of the tools relies on iRAP's ongoing collaboration with funders and donors to offer cost-effective, evidence-based solutions. The tools and methods refined through the AI&Me: Empower Youth for Safer Roads project will be maintained and continuously supported by SR4S sponsors, donors, and global program partners. These entities have demonstrated long-term commitments to iRAP and the SR4S initiative along with the implementing Lead Partner networks around the world.

The initial achievements from the pilot phase of the AI&Me project lay the groundwork for the technology to be improved and scaled up in the long run. As long as road infrastructure issues persist and pose risks to road users, the initiatives will continue to be useful for the relevant stakeholders to address the relevant challenges and for youth to communicate their concerns to the higher level.

5 GLOBAL ACCESS OF AI&ME FRAMEWORK

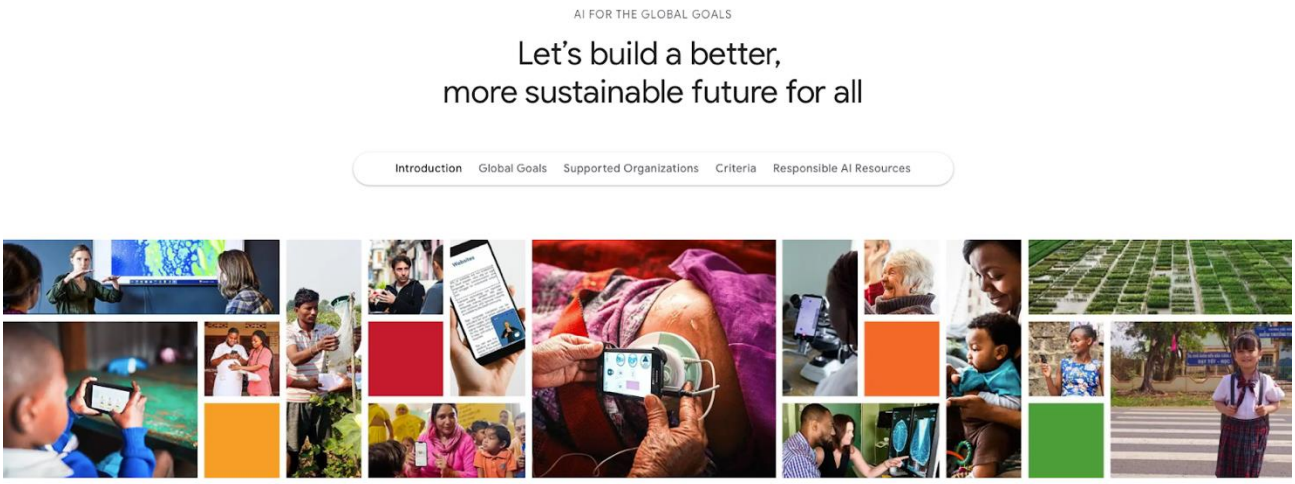
Another criterion that is widely acknowledged and scored very high in many scalability assessments is the adaptability of the approach as it demonstrates the ability for other organizations or practitioners to adopt and localise the approach and intervention model. With the AI&Me project currently at the first development and pilot stage there will be a range of enhancements and improvements to scalability that will be considered in any expansion within Vietnam or through to other countries. While this report will not include adaptability criteria at this stage, the approach has been built with adaptability in mind, in particular with respect to Big Data Screening. Further detail about the global access plan is provided in the following section.

As highlighted earlier in this report, road safety remains a global challenge, with all countries still grappling to mitigate the number of fatalities on their roads and meet international road safety targets. The AI&Me Project provides a valuable new resource to ensure an efficient deployment of time and resources to use new technologies that can speed and scale up global change.

Despite being initially piloted in Vietnam, the tools were intentionally crafted with a global audience in mind. Having said that, it was the success of the project and the positive feedback from the Vietnamese community regarding its accomplishments that propelled the individual tools and the AI&Me Framework to gain awareness beyond Vietnamese borders.

A notable testament to the project's success was the recognition of its potential for nationwide scaling. Google.org selected iRAP as one of 15 organizations to receive support through a US$2 million philanthropy grant as part of their larger AI for the Global Goals Impact Challenge aimed at projects utilizing artificial intelligence (AI) to advance progress towards the Sustainable Development Goals. The project submission for the AI for the Global Goals Impact Challenge builds upon the maturity achieved by the AI&Me framework, including upgrades to Big Data Screening, YEA, and SR4S that will support cost-effective scaling. The next generation of these tools will incorporate new AI components, enabling further automatic and accelerated detection of attributes and introducing innovative solutions to enhance youth engagement with YEA and active participation in decision-making. The success of the two-year project also hinges on the robust partnership among iRAP, AIP Foundation, and ANDITI, who will collaborate closely with the University of Zagreb in tackling the upcoming challenges and opportunities.

Figure 13: Vietnamese students represented in the Google.org Ai for the Global Goals Challenge.



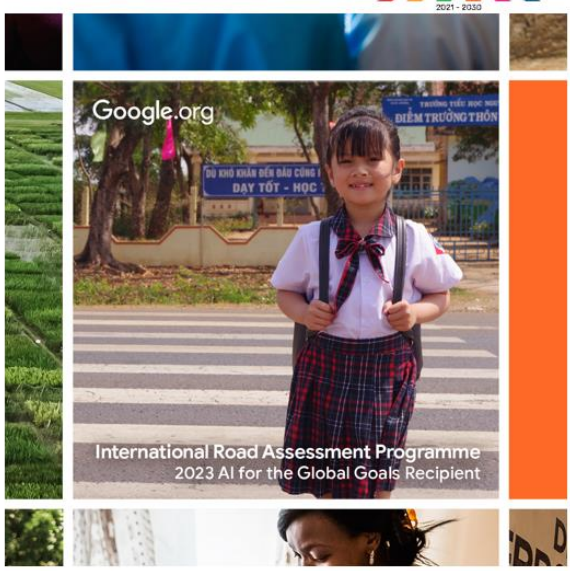
Google AI for the Global Goals

- **$2m Google AI Grant**

  iRAP's Star Rating for Schools and AiRAP partnerships will be scaled up to provide a country-wide star rating evaluation of road infrastructure around schools in Vietnam and support the upgrades at the highest-risk schools.

Project Partner Google.org

Lead Partner AIP FOUNDATION SAFE ROADS FOR LIFE



While the nationwide application of the AI&Me Framework continues to utilize Vietnam as a primary case study, discussions on the individual tools have extended to multiple countries. The Big Data Screening component garnered international attention at the Walk 21 Conference 2022 held in Dublin, Ireland. Following this, the methodology was presented to organizations in The Netherlands, the UK, India, and Zimbabwe. Two prominent challenges echoed by these organizations included a shortage of funds for data gathering and a lack of expertise in data processing. This feedback was also reflected in responses from the scalability survey, with one participant stating, "In Uganda, we have limited human resources who are knowledgeable in the application of the method and many financial challenges to undertake the assessment". Hence, facilitating data access and ongoing improvements to the methodology for streamlining the process, as well as fostering the development of local capacity, should be key action points for the Big Data Screening global strategy.

The YEA was presented internationally also in a workshop in the Autonomy Mobility World Expo 2023 and in the Walk 21 conference 2023, this time hosted in Kigali, Rwanda and in several webinars, including the first iRAP Knowledge sharing session. Numerous organizations have expressed keen interest in adopting the app, and negotiations for new pilots are currently underway.

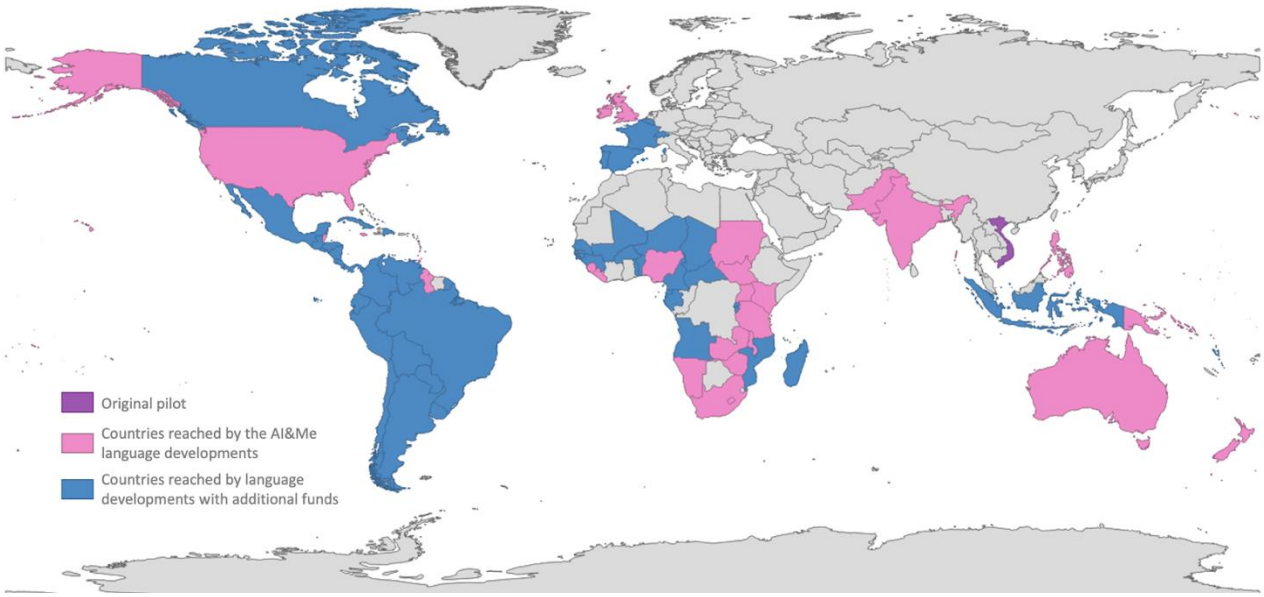
As highlighted in this report, two primary obstacles hindering widespread adoption of the tool are limited smartphone/internet accessibility and language constraints. To address the issue of smartphone/internet availability, several strategies have been identified based on the pilot results. It became evident that additional investments in the app are necessary to enable usage without an internet connection.

Overcoming the absence of smartphones can also be achieved by integrating road safety discussions into the school curriculum. The pinning activity can be conducted collectively, with students engaging in discussions about road safety concerns and suggesting locations for pinning using a shared device. This approach offers the advantage of facilitating open discussions on road safety matters under the supervision and support of teachers in a safe environment. Many students may not have anyone to talk to about the dangerous situations they face on the road, and schools should provide this opportunity for youth to express their concerns.

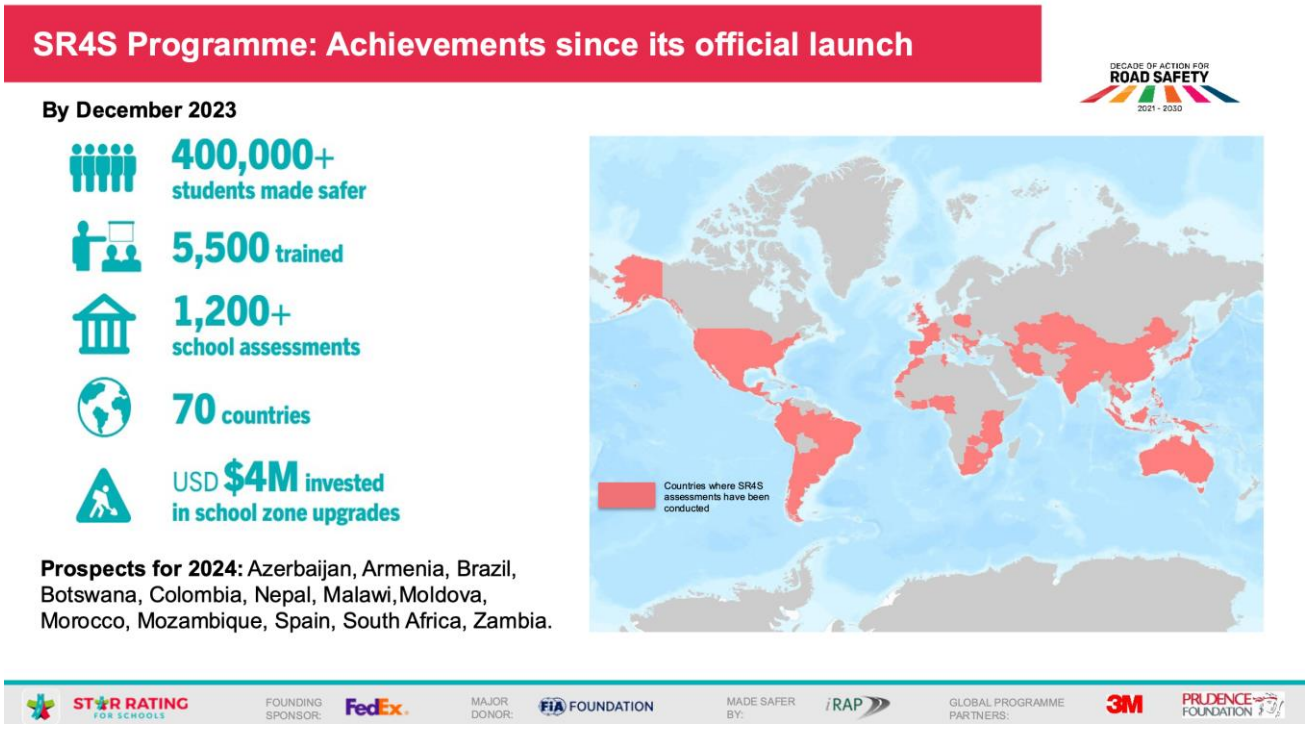
Regarding the language barriers, iRAP have been working with partners and funders to overcome this challenge. The app was developed originally in English and Vietnamese, which already presented a huge potential of scalability for all the countries that have English as an official educational language or as part of English studies. Thanks to the generous support of the FIA Foundation and the Millennium Challenge Corporation (MCC), the app will now be accessible in four additional languages: Spanish, Portuguese, French,

and Bahasa Indonesia. This expansion includes more than 60 countries, providing students with the app in their native languages.

Figure 14: Global access of YEA



Finally, the SR4S is already a global partnership of those interested in improving the safety of children and ultimately delivering 3-star or better pedestrian journeys to, from and around schools. To facilitate the global delivery and oversight of the Star Rating for Schools programme, a range of world-leading NGOs involved in school road safety provide the first point of contact for those seeking to undertake the Star Rating of roads around a school. As of the date of this report, SR4S has successfully assessed more than 1,200 schools across 70 countries. The program's 5,500 trained partners have mobilized US$4 million to invest in upgrades for school zones, positively impacting over 400,000 students.



6 CONCLUSION AND RECOMMENDATIONS

The three-year development and pilot phase of the AI&Me project yielded remarkable achievements and valuable insights, along with opportunities for refining its approach. The assessment findings underscore the tremendous potential of the technological initiatives to scale up in new countries and regions, guided by its adherence to four key criteria: Accessibility, Acceptability, Implementation Cost and Sustainability:

- Data for the initiative, drawn from various sources including Big Data platforms and direct collection from stakeholders and youth, remain adaptable and compliant with data management protocols, supporting Accessibility.
- The robust support from local communities, particularly from government stakeholders and youth, alongside enthusiastic endorsement from international partners, signifies high levels of Acceptability and scalability potential.
- Comparative analysis reveals the Cost-effectiveness and urgency of investing in these technological solutions compared to economic losses from road crashes, emphasizing the importance of targeted intervention.
- Beyond tool provision, the initiative focuses on empowering recipients with knowledge and skills, enabling confident engagement with authorities on traffic safety matters, thus fostering community improvement through informed decision-making and ultimately demonstrating its sustainability.

As this intervention model has solely been proven effective through trials in Vietnam, extending its reach to other nations also demands careful consideration of local nuances. Firstly, ensuring the accuracy of identifying high-risk areas nationwide necessitates the recurrent updates of crucial data such as census figures, income levels, unemployment rates, and school statistics, ideally facilitated by the national government. Additionally, the availability of annually documented traffic collision data proves to be highly advantageous.

Leveraging the prevalence of smartphones among local teenagers streamlines the utilization of the YEA app and facilitates seamless feedback collection from the target audience. Maintaining close coordination within the school system will enable effective outreach and communication with youth groups.

The ultimate linchpin for the project's success lies in the strong commitment of the local government. As emphasized in the Sustainability criterion, what this initiative aims is not just merely offering advanced technological tools, but to build capacity and drive actions from decision-makers to enhance the road environments and tackle their citizens' concerns. Consequently, witnessing tangible change resulting from youth's involvement not only motivates youth but also emboldens them to voice their concerns with confidence. While minor difficulties may arise along the process, adherence to the aforementioned principles will substantially mitigate risks and create new opportunities for the initiative, rendering it highly scalable, especially in low- and middle-income countries.

Moving forward, the AI&Me project will carry out a regional assessment to identify the next country to scale its intervention model and further evaluate the adaptability aspect of the scaling-up process by reviewing the outcomes, the challenges and lessons learnt. This endeavor is geared towards enhancing the scalability of our initiatives and making significant contributions to the United Nations global goals and the reduction of the death and injury of young people worldwide.

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