Implementation research targeting non-communicable disease risk factors associated with city environments

General Information

Full project title
Air pollution and non-communicable disease: city-wide implementation to reduce transport emissions.

Name of Principal Investigator
Prof Mark Stevenson

Host research institution(s)
The University of Melbourne

Name(s) of Co-Principal Investigator(s)
-

Funding agencies
National Health and Medical Research Council (NHMRC – Australia)

Total amount requested, in US dollars
1,013,817

**Total
amount requested from NHMRC, in Australian dollars**
1,408,079

Total amount requested from FAPESP, in Brazilian reales
0

Total amount requested from CIHR, in Canadian dollars
0

Total amount requested from ICMR, in Indian rupees
0

Total amount requested from AMED, in Japanese yen
0

Total amount requested from SAMRC, in South African rand
0

Total amount requested from HSRI, in Thai baht
0

Total amount requested from MRC and NIHR, in British pound sterling
0

**Please select the
region(s) of the world where the research project will take place.**
East Asia and Pacific

Name of country 1
Australia

Budget country 1 (USD)
683,151

Name of country 2
Vietnam

Budget country 2 (USD)
330,665

Name of country 3
-

Budget country 3 (USD)
-

Name of country 4
-

Budget country 4 (USD)
-

Project start date (month and year)
February 2024

Duration of project, in months
36

Abstract
Road transport-related air pollution arising from the burning of fossil fuels creates an array of negative health impacts. Both short- and long-term exposure to air pollution results in premature mortality, cardiovascular disease, and respiratory diseases such as childhood asthma. There is an urgency therefore, to implement known and efficacious interventions to mitigate the chronic health effects of air pollution. The urgency is paramount for populations living in low- and middle-income countries (LMICs) who are disproportionately exposed to the burden of air pollution. Vietnam, for example, is struggling with a rising prevalence of air pollution, ranked 36th out of 118 countries with the most polluted air. Its two biggest cities, Hanoi and Ho Chi Minh City (HCMC), are among the most polluted cities in Southeast Asia with road transport a leading cause of the air pollution.

The proposed project responds to the urgency to deliver an efficacious intervention that delivers personalised feedback and financial

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incentives (the intervention) that change driving behaviours leading to significant reductions on road transport emissions a leading cause of air pollution. We will apply the Active Implementation Frameworks incorporating co-design with industry, policymakers, and implementation research scientists, along with applying mixed methodologies including a randomised implementation trial, to assess the effectiveness and implementation of personalised emission feedback and financial incentives (delivered via a smartphone app) relative to personalised feedback alone in reducing motor vehicle emissions in two urban agglomerations in Vietnam namely, Hanoi and HCMC.

There is considerable evidence highlighting the impact of personalised incentives for health behaviours including smoking cessation, physical activity, and vaccination and screening. Our research conducted over the past decade has shown that personalised financial incentives delivered via a smartphone app (in conjunction with personalised feedback) significantly changes behaviours. Clearly, smart incentives (tailored to the individual's behaviour) at a low cost are urgently needed. Combining real-time feedback and smart financial incentives related to vehicle emissions is an important intervention, with the potential in the future to capture and monetise the vehicle emissions representing a significant opportunity for low-income cities to invest in sustainable healthy futures.

Layperson summary

Air pollution is a significant population health problem, causing 4.2 million premature deaths worldwide per year. Populations living in low- and middle-income countries (LMICs) are disproportionately exposed to the burden of air pollution with 89% (of the 4.2 million premature deaths) occurring in the South-East Asia (SEA) and Western Pacific Regions (WPR). Vietnam, a LMIC in SEA, is struggling to respond to the rising prevalence of air pollution, ranking 36th out of 118 countries with the most polluted air and its two largest cities, Hanoi and Ho Chi Minh City (HCMC), are among the most polluted cities in SEA with road transport a leading cause of the air pollution. Air pollution in Vietnam leads to numerous non-communicable diseases, resulting in 60,000 deaths per year. We propose to implement in two large urban areas namely, Hanoi and HCMC, an implementation trial in which personalised feedback and smart financial incentives are delivered targeting reduced motor vehicle emissions. The technology, developed by scientists from the University of Melbourne in collaboration with industry partners, has been robustly evaluated (using randomised control trials) highlighting the significant utility of the intervention in influencing driver behaviours.

The aim of this innovative implementation research project is to assess the effects of personalised feedback and financial incentives relative to personalised feedback only, to reduce motor vehicle emissions and to assess the fidelity and sustainability of the intervention. The implementation of the intervention is critical to facilitating changes in driver behaviour leading to reduced transport emissions in these cities. Emission reduction strategies are urgently needed in Vietnam to mitigate the burden of non-communicable diseases attributed to air pollution and to respond to the urgent climate implications arising from the fossil fuelled motor vehicles that are exclusively used in both Hanoi and HCMC.

Implementation partners
Ministry of Health of Vietnam, Ministry of Transport of Vietnam, Ministry of Environment and Natural Resources of Vietnam, Hanoi Taxi Association, Ho Chi Minh Taxi Association, Urban Analytica Pty Ltd

Will your proposal focus on Indigenous populations?
No

Does your proposal use digital health intervention(s)?
Yes

Which NCD risk factor(s) will be targeted in this project?
Air pollution

If you selected 'other,' please indicate which NCD risk factor(s).
-

Which of these best describes the setting(s) in which your research will be conducted?
City centre
Peri urban environment

Will your research focus on any of the following vulnerable groups?
None of the above

Referring to the themes described in the full call text ("Evidence-based interventions" section), which of the following theme(s) will you explore in your application?
Theme 1: Behavioural change interventions

Do you explore themes around climate change or planetary health in your application?
o Yes

Does your proposal explore outcomes outside of the health sector? If so, which?
Environment
Transportation

If you selected 'other,' please indicate which other sector(s).
-

Has your team already obtained ethics approval?
No

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Please describe the ethical considerations arising from this research and any steps you have taken towards reducing the risk to participants, especially disadvantaged groups (3000 characters maximum).

Ethics approval will be sought from the human research ethics committee at The University of Melbourne and reciprocal approval through the ethics committees at the Hanoi University of Public Health and the University of Medicine and Pharmacy at Ho Chi Minh City. All data attained from interviews, surveys and the smartphone app used in the randomised implementation trial will be kept confidential and secure. No data, which could result in the identification of an individual, will be used in reports or journal articles. Drivers participating in the trial (and various face-to-face interviews) will be provided with detailed information on the trial and an informed consent will be signed by the participant. Drivers participating in the trial will be included in periodic raffles of a smartphone, in lieu of financial remuneration for participating in the trial; this applies to both arms of the intervention. This remuneration, along with the financial incentive provided to intervention group 1 will be subject to approval of the Human Research Ethics Committee at the University of Melbourne along with dual approval with the ethics committees at the Hanoi University of Public Health and the University of Medicine and Pharmacy at Ho Chi Minh City. The trial will follow the NHMRC National Statement on Ethical Conduct in Human Research and Good Clinical Practice.

As the technology being deployed in the implementation trial is a spin-off company arising from previous research activities of CIA-Stevenson and given the University of Melbourne has invested in the company, specific strategies will be put in place to ensure there is no conflict of interest. After considerable review by legal teams, the strategy that meets probity criteria are: i) all negotiations with the Director of the company (Urban Analytica -UA), Mr Frank Peppard, will be undertaken by CIB-Pham from the Hanoi University of Public Health; CIB-Pham has no conflict with UA. Once data collection is complete, all data will be transferred to the Hanoi University of Public Health and stored in one of the firewall-protected local network servers maintained by the University.

The chief investigators overseeing the project have been carefully assembled to provide the depth of disciplinary expertise and research breadth required to deliver these important outcomes. We have also been mindful of the challenge of ensuring gender diversity across the team and career development and have included early and mid-career researchers both from Australia and Vietnam to ensure there is an enduring legacy arising from this important project

Is your project a clinical trial?
No

Consent
I agree

Privacy policy and data protection
I agree

Accuracy
I agree

Project participants (1/8)

Type of project participant	Principal Investigator
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Type of project participant	Co-Investigator
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Project participants (3/8)

Type of project participant	Co-Investigator
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Surname	Thompson
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Project participants (4/8)

Type of project participant	Co-Investigator
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Project participants (6/8)

Type of project participant	Co-Investigator
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Project participants (7/8)

Type of project participant	Co-Investigator
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Project participants (8/8)

Type of project participant	Co-Investigator
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NCD Prevention in Cities call: Research Proposal

Application ID: GACDCITIES 103 (NHMRC Application ID: 202745 CIA Stevenson)

AIR POLLUTION AND NON-COMMUNICABLE DISEASE: CITY-WIDE IMPLEMENTATION TO REDUCE TRANSPORT EMISSIONS.

AIMS AND OBJECTIVES

Air pollution arising from the burning of fossil fuels creates an array of negative health impacts. Both short- and long-term exposure to air pollution results in premature mortality, cardiovascular disease, and respiratory diseases such as childhood asthma. The specific health impacts vary based on the pollutant and length of exposure, with the health burden from chronic exposure to air pollutants up to 10 times greater than for acute exposure (3). The proposed research is based on empirical evidence (1, 2) that personalised feedback and financial incentives (the intervention) significantly change driving behaviours and hence vehicle emissions, a leading cause of air pollution. We will apply the Active Implementation Frameworks in two urban agglomerations in Vietnam incorporating co-design with industry, policymakers, and implementation research scientists, along with applying mixed methodologies including a randomised implementation trial, to answer the following implementation questions.

<u>Implementation Research Aim:</u> To assess the effectiveness and implementation of personalised emission feedback and financial incentives (delivered via a smartphone app) relative to personalised feedback alone, in reducing motor vehicle emissions.

<u>Implementation Research Hypotheses:</u> Four implementation research hypotheses will be answered, namely whether:
- H1.   the implementation of emissions feedback combined with financial incentives reduces emissions (implementation outcome),
- H2.   the uptake of the smartphone app and the continual provision of location services (ability to send messages to the driver) throughout the trial will exceed 80% resulting in high implementation *fidelity*.
- H3.   implementation of emissions feedback combined with financial incentives leads to *sustained* (4 weeks post-implementation) reduction in emissions.
- H4.   the implementation of the emissions feedback and financial incentive intervention delivered via the smartphone app will be *adopted* by taxi companies and delivered to drivers post the research project.

<u>Rationale for the Intervention:</u> Road transport-related air pollution not only leads to carbon emissions and the deleterious effects on planetary health but the fine particulate matter ($PM_{2.5}$ and PM_{10}) arising from road transport is significantly associated with premature mortality (4), with the cumulative effects of both PM_{10} and $PM_{2.5}$ reported to increase the risk of cardio-respiratory morbidity and mortality (5). $PM_{2.5}$ alone has been shown to shorten life span through cardiovascular and respiratory disease, with one study (6) attributing nearly 6000 person years of life lost to long-term exposure to anthropogenic $PM_{2.5}$. An important modelling study across nine countries found that if each country met the emissions reduction targets of the Paris Agreement, they could decrease concentrations of fine particulate matter ($PM_{2.5}$ and PM_{10}) by an average of 73% by 2040 and in so doing, prevent an estimated 1.18 million road transport-related air pollution-deaths (7). These recent studies concur with earlier research revealing exposure to fine particulate matter arising from road transport emissions reduced life expectancy by almost 9 years (8).

There is an urgency therefore, to implement known and efficacious interventions to mitigate the chronic health effects of air pollution. The urgency is paramount for populations living in low- and middle-income countries (LMICs) who are disproportionately exposed to the burden of air pollution. More than eighty nine percent of the 4.2 million premature deaths due to air pollution occur in the South-East Asia (SEA) and Western Pacific Regions (WPR) (9). Vietnam, a LMIC in SEA, is struggling with a rising prevalence of air pollution, ranking 36th out of 118 countries with the most polluted air and its two biggest cities, Hanoi and Ho Chi Minh City (HCMC), are among the most polluted cities in SEA (10) with road transport a leading cause of the air pollution.

There is considerable evidence highlighting the impact of personalised incentives for health behaviours including smoking cessation, physical activity, and vaccination and screening (11). Our research conducted over the past decade has shown that personalised financial incentives delivered via a smartphone app (in conjunction with personalised feedback) significantly changes driving behaviours for the better (1, 2). Incentives in the proposed project will be personalised in the sense that the application of financial penalties for each 4-week time-period will be a function of each participant's driving behaviour. Results from our research suggest that personalised financial incentives offer an additional benefit *over and above* the effects of the personalised feedback on behaviours. In our most recent study, we achieved a 2.6-point (scale 0-5) improvement (95% confidence interval (CI): 0.16, 5.04. p=0.04) on a composite measure of driving behaviours when personalised feedback was combined with personalised financial incentives; this was *61% greater* than the improvement from personalised feedback alone (2). These results are consistent with previous studies that have quantified the added value of financial incentives (12, 13). Furthermore, our research highlights that penalties are more effective than rewards of equal value with the potential for low-value penalties capable of delivering net reductions in changing risk behaviours (1). Clearly, smart incentives (tailored to the individual's behaviour) at a low cost are needed. Combining real-time feedback and smart financial incentives related to vehicle emissions is an important intervention, with the potential in the future to capture and monetise the vehicle emissions representing a significant opportunity for low-income cities to invest in sustainable healthy urban futures.
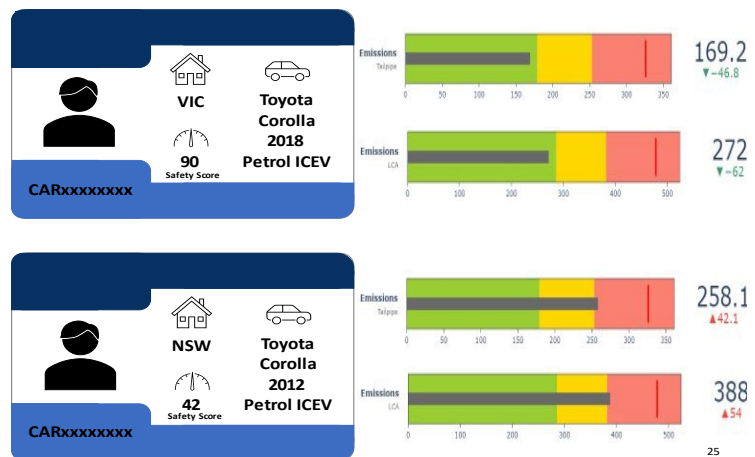

Fig 1: Emissions calculator: Varied vehicle year and driving behaviour and resultant emissions.

Prevention of Non-Communicable Disease Risk Factors associated with City Environments: Vietnam now has 4.9 million cars and 60 million motorbikes (14), almost all are fossil fuelled with limited emission control technology (15) and no effective strategies to mitigate the emissions arising from the exponential growth in motor vehicles. It is not surprising therefore, the quality of air in Vietnam is some of the worst, globally. Implementing an innovative, proven, intervention that will mitigate road transport emissions in Vietnam will contribute substantially to reducing one of the leading risk factors for non-communicable disease.

Vietnam's Road transport system accounts for 18% of Vietnam's greenhouse gas (GHG) emissions and related air pollution (15). Vietnam's per capita transport emissions are higher than those of most other countries due to its inefficient road passenger and bus transport systems, and the over-reliance on private motor vehicles and therefore, increased exposures to health risks

associated with vehicle emissions, noise pollution, and physical inactivity. There is an urgency to implement evidence-based strategies that target these risk factors and thereby transition to a low emission transport system with the associated health co-benefits namely, reductions in respiratory and cardiovascular diseases, and lung cancer. Specifically, the effect of $PM_{2.5}$ and PM_{10} results in a 20% increase in cardiovascular disease mortality risk per 10 ug/m3 increase in $PM_{2.5}$ (16-20) and a 2·5% increase in respiratory disease risk associated with a 10 ug/m3 increase in PM_{10} (21-26).

Improves health in disadvantaged populations: The burden of disease attributable to road transport-related air pollution disproportionately affects populations. Children and the elderly are most acutely affected. Air pollution-related deaths peak among babies in the early (0-6 days) and late (7-27 days) neonatal groups, reflecting how particulate matter can cause lower-respiratory infections in new-borns. These deaths then peak again in the older age groups, as air pollution contributes to lower-respiratory infections as well as noncommunicable diseases that develop over time, such as ischaemic heart disease, stroke, COPD, and lung cancer (27).

Contributes to Planetary Health and a City's Resilience to the Impact of Climate Change: More than half of the worlds greenhouse gas (GHG) emissions have arisen in the period post the United Nations Framework Convention for Climate Change in 1992 (28), with road transport one of the most significant contributors to these emissions. The societal challenge to mitigate GHG emissions by 2030 and net zero by 2050 (29, 30) is a significant challenge highlighting the urgency to deliver pragmatic solutions now.

Transport emissions have grown more than any other sector in Vietnam, nearly doubled since 1980, and road transport accounted for the bulk of emissions with 91.95% (31). To be consistent with the Paris Agreement goal of limiting global warming to 1.5°C, Vietnam's 2030 emissions reduction target must be 15.8%. There are no strategies to mitigate the carbon emissions arising from the overwhelming and exponential use of internal combustion engines in Vietnam which is a significant challenge given the urgency to unlock climate action. In a recent Vietnamese report (32), aside from recommending a shift from ground- to water-based transport, it also suggests implementing strategies to improve fuel economy (a co-benefit arising from the implementation of the proposed project) which could lead to a decrease of 15.8 million tons of carbon dioxide by 2030 (32).

Expected Impacts of the GACD Call: The findings arising from this research will provide city leaders with an intervention delivered by currently available technology and an implementation strategy that can be delivered and maintained across cities in Vietnam. Importantly, the findings arising from the research will highlight the benefits of co-design and cross-sectoral implementation.

At the population level, drivers will be able to monitor the impact of their adoption of the technology in terms of their own contribution to emission reductions and fuel savings. Longer-term, we propose to establish the sustainability and other UN Sustainable Development Goal (SDG) credentials of the technology; this is likely to occur by developing an advanced methodology for publication by Gold Standard (GS) - GS is the international voluntary carbon emissions certifier thereby contributing to the mitigation of the effects of climate change.

STUDY TEAM AND RESEARCH ENVIRONMENT

We have undertaken extensive co-design of the intervention and the implementation processes for the project. The co-design has involved meetings between the scientists both in Australia and Vietnam, harnessing the extensive collaborations with the various government agencies, building relationships with the taxi associations, and working with the technology provider to ensure all elements of the proposed implementation can be delivered in Vietnam.

We have support from government leaders in Vietnam including, Ms Luong Mai Anh, Director of the Ministry of Health's Environment Management Department, Ms Nguyen Hoang Anh, Head of the Ministry of Natural Resources and the Environment's Pollution Control Department, and Mr Tran Huu Minh, Chief of the National Traffic Safety Committee Vietnam, Ministry of Transport (see attached letters of support). We have also developed a close working relationship with the management staff of both the Hanoi Taxi Association and the Ho Chi Minh City Taxi Association – the implementation trial will target taxi drivers in both cities. The taxi associations have provided a letter of support and have indicated they will correspond with their members in relation to the study and will assist with recruitment of the drivers into the implementation trial.

The smartphone application (see Figure 3 on page 7) will be provided by the Australian company, Urban Analytica (UA). Details on what the smartphone app delivers is described below (see Page 7). UA is a company arising out of the University of Melbourne. All dealings with UA are with the Company's Director, Mr Frank Peppard. Mr Peppard has provided a letter of support indicating the ability of UA to extend their technology so that it can be delivered in Vietnam. The smartphone app is currently in market in Australia with 11,000 drivers/cars providing data on a daily basis. The app is in the top 15 transport apps by use in Australia with UA having the largest repository of detailed telematics data (telematics captures behavioural data on drivers) on consumers in Australia, which combines both QBE (Australia's largest insurer) and the RACQ (Queensland's largest general insurer). UA has also supported clients including the government of the State of New South Wales, Australia via their State Insurance Regulatory Authority, university research groups at the University of Western Australia and with the government of the State of Victoria, Australia. UA will provide the smartphone app for the purpose of the research free of charge, however, costs for data security along with costs associated with preparing the app for use in Vietnam will be budgeted for along with UA staff involvement.

The research will be a collaborative program, led by Prof Mark Stevenson from the University of Melbourne and A/Prof Cuong Pham from the Hanoi University of Public Health. Prof Stevenson has extensive experience (over 15 years) working in Vietnam and has built strong collaborations with universities and various government ministries particularly the Ministry of Health. Prof Stevenson has held research grants and consultancies with his Vietnamese colleagues on the grant including supervising (in collaboration with A/Prof Thompson), Dr Thanh Ho's doctoral studies. The collaboration across all investigators is extensive with leading implementation scientist Dr Dominika Kwasnicka providing oversight of many of the implementation methodologies. Our breadth of experience in implementation research is also illustrated by A/Prof Jason Thompson, Dr Kerry Nice and Prof Stevenson's currently funded NHMRC grant involving cities in multiple countries and our recent Lancet Series on Transport, Health and Urban Design which involved six international cities (33).

The Australian investigators sit within the highly acclaimed Transport, Health, and Urban Design Research Lab within the Faculty of Architecture, Building and Planning at the University of Melbourne. The research lab delivers urban analytic and public health policy solutions associated with transport, health, and cities. The research team has extensive expertise across big data and collaborates extensively with the research teams and academic leaders, globally.

The Vietnamese investigators are experienced academics and implementation scientists from two of the most prestigious universities in Vietnam, namely Hanoi University of Public Health (HUPH) and the University of Medicine and Pharmacy at Ho Chi Minh City (UMP HCMC). A/Prof Cuong Pham is the director of the Center for Digital Health (CDH) and Center for Injury Policy and Prevention Research (CIPPR), two research centres of HUPH that focus on NCDs prevention and control in Vietnam. Dr Nhung Nguyen, also from HUPH, is the Vice Director of the Training and Research Institute for Child Health of the Vietnam National Children's Hospital and an expert on air pollution and public health. A/Prof Dang Tran, an expert on environmental health and air

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pollution, is the Vice Director of the Grant and Innovation Centre and Vice Head of the Department of Environmental Health, UMP HCMC. Their leading positions at highly acclaimed research centres guarantee the best facilities and resources for the implementation of the project in Vietnam.

To ensure the long-term implementation outcomes are in place namely, the smartphone app has been adopted by the taxi association and delivered to all taxi drivers, extensive collaboration with the taxi companies will be maintained to ensure an incentive rewards program will continue (in conjunction with government partners) to ensure the continual reductions in emissions beyond the implementation of the research project. Throughout the project, the various government and industry partners will be involved in the planning, design, and delivery of the intervention. The staff and students involved in the research will have an opportunity to spend time within the government agencies and the technology company will provide mentoring to the academic staff involved in the implementation of the intervention. Clearly, there are considerable commercialisation opportunities arising from this research and the Vietnamese colleagues and staff (involved in the field work) will be actively involved in the processes that deliver a sustainable product.

Finally, the investigators have access to resources, infrastructure, facilities, and significant industry partnerships necessary to deliver the implementation program. Ranked in the top 1% of researchers in his field, globally, and leading a research lab focused on innovation and global reach in a period of big data, Prof Stevenson is uniquely placed to lead this important research.

RESEARCH PLAN, METHODOLOGY AND OUTCOMES

Implementation Framework and Strategies:

As highlighted in Figure 2, we will apply the Active Implementation Frameworks (AIFs) (34-36) along with the RE-AIM Framework (37) to deliver this implementation research project. The AIFs culminated from a systematic review of the implementation science literature and comprises 5 components deemed necessary to implement innovation in practice: the aim of the current proposal. The first two components namely, i) a useable innovation and ii) implementation drivers are apparent within the proposed grant. We have a developed and innovative technology which is delivered via a smartphone app and our comprehensive stakeholder engagement in preparation for the submission of this research project, included in-depth interviews with leading policymakers/stakeholders recruited to provide valuable insights on the proposed implementation strategy; a necessary criterion for 'driving' the implementation of the innovation. For further details on the implementation drivers, see details under stakeholder engagement (below). The remaining components of AIFs comprise the iii) implementation stages, iv) the improvement cycles and v) the implementation teams. These components are illustrated in Figure 2 and described in detail under elements of the emission reduction implementation trial (EmIT) and the important governance structures established to continuously improve the delivery of the intervention.

The RE-AIM Framework (32) will be applied through the initial and full implementation stages of the proposed research. RE-AIM will guide the planning and evaluation of our intervention according to the 5 key RE-AIM outcomes: Reach, Effectiveness, Adoption, Implementation, and Maintenance. RE-AIM will be used to translate research into practice and to guide our team to ensure that our proposed intervention is suitable and effective in the real-world settings in Vietnam. The framework will be used, in an iterative fashion, across the first 12 months of the project to ensure we understand the relative strengths and weaknesses of the technology implementation. In-depth interviews with the taxi drivers and managers will inform much to this stage. We will measure the intervention **Reach** – the absolute number, proportion, and representativeness of individuals who are willing to participate in our intervention – this detail is highlighted in the early stages of the recruitment into the trial. Reach will be operationalised as the number of taxi drivers who were informed about the project compared to the number of drivers who signed up and ultimately took part; uptake of the intervention will be indicative of the interest.

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We will explore, qualitatively, what the reasons for intervention uptake and key reasons for not taking part were. We will also assess if there are typical characteristics of the drivers who take part in our intervention as compared to the drivers who chose not to take part. We will also assess the **Effectiveness** defined as the impact of our intervention in reducing vehicle emissions (main implementation outcome), including potential negative effects (if any). We will also measure **Adoption** defined as the absolute number, proportion, and representativeness of the settings and intervention agents (e.g., taxi companies that deliver the intervention) who are willing to initiate the intervention post-implementation. For the purpose of this research project, for 'Adoption' we will have three nested levels: higher level (adoption by the government and policymakers who are likely to implement the law that mandates the use of the intervention), middle level (adoption by the taxi companies who are likely to take on the intervention and provide it during and after the research project), and participant level (adoption by the taxi drivers who are willing to participate in the intervention). **Implementation** will be measured at the setting level, implementation here refers to the intervention agents' fidelity to the various elements of an intervention's procedure, including consistency of delivery as intended and the time and cost of the intervention. At the individual level, implementation refers to taxi drivers' use of the intervention. We will also measure **Maintenance** defined as the extent to which our intervention becomes standard practice and is sustained after the research period. Maintenance on the individual level will be operationalised and measured as a long-term use of the app.
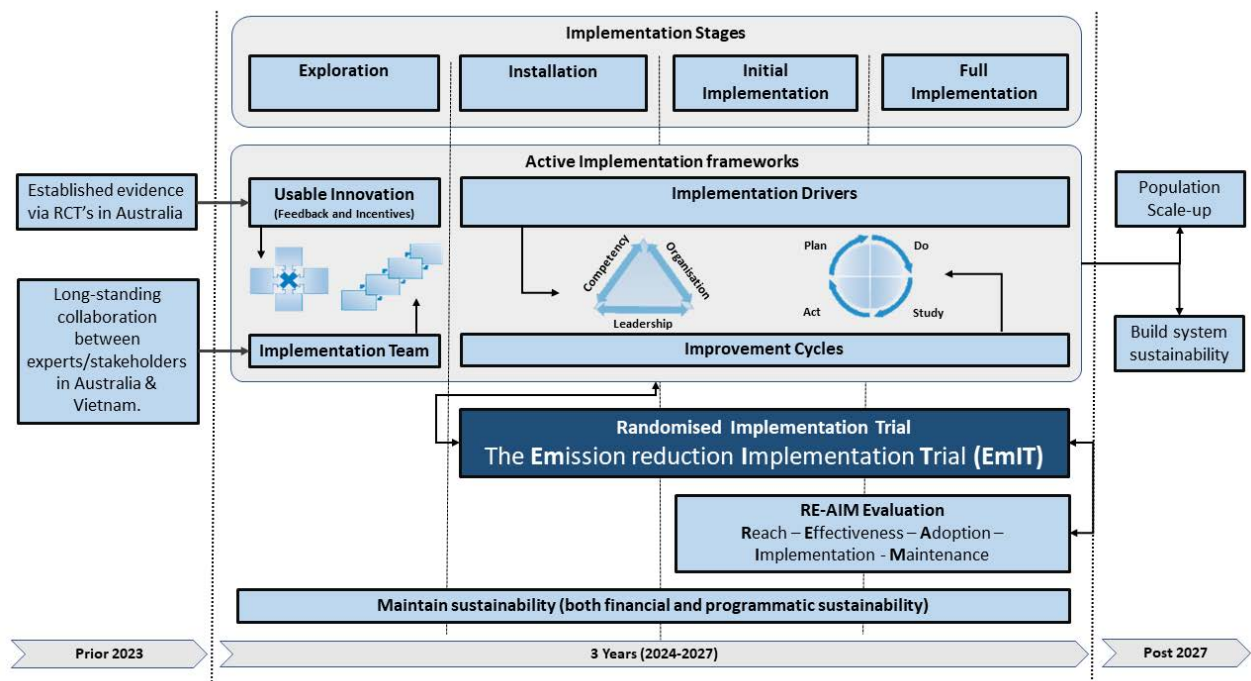

Figure 2: Application of the Active Implementation Frameworks and RE-AIM Framework to the: Air Pollution and Non-communicable Disease: city-wide implementation to reduce transport emissions.

Randomised Implementation Trial: The **Em**ission reduction **I**mplementation **T**rial (**EmIT**) will assess the effectiveness of personalised feedback and financial incentives (implementation strategy) relative to personalised feedback only, to reduce motor vehicle emissions (implementation outcome).

The proposed multi-centre two-arm parallel-group individually randomised implementation trial will be the first study to target population-level reductions in motor vehicle emissions among taxi drivers (Implementation population) across 2 large urban agglomerations in Vietnam.

Taxi drivers from the leading companies in Hanoi (n=3) and Ho Chi Minh City (n=3) will be recruited to participate in EmIT. We have established a strong relationship with the respective city-based taxi associations who have indicated their support for the trial. The taxi drivers, hereafter referred to as participants when recruited into EMIT, will be randomised 1:1 to either emissions feedback + financial incentive or emissions feedback alone and followed for 5 months. Reporting of the findings will follow the Standards for Reporting Implementation Studies (StaRI) (38) in conjunction with the CONSORT guidelines (39).

Figure 3: Emission Score from smartphone App

Study Participants: There are three inclusion criteria that will need to be met to participate in the trial namely i) the participant must be a staff member from one of the following taxi companies in Hanoi (Mai Linh, Hanoi Group, and Thanh Nga) and/or Ho Chi Minh City (Vina Sun Taxis, Taxi Mai Linh and Vina taxi HCM), ii) the participant drive's the same motor vehicle on each work day, and iii) the participant must own and use a smartphone.

Study Protocol and Procedures: Once a participant consents to participate in the trial, they will complete a brief, self-report survey. The survey will include demographic details along with information on employment characteristics within the company and an assessment of emission-related driving behaviour (40). The survey will be delivered via an online link to a website established to administer (and collect) the survey data. An abridged post-trial survey will be administered the same way. All recruited participants will then download a smartphone app (available for either android or iOS). The smartphone app has been described earlier, has been trialled in Australia and will be cloned following collaboration with Vietnamese colleagues for use in both Hanoi and Ho Chi Minh City (HCMC). Each recruited participant's driving behaviour will be monitored for a four week 'baseline' period. Recruited participants will then be randomly assigned to implementation group 1 (emissions feedback + financial incentive) and implementation group 2 (emissions feedback alone).

We propose to collect data from recruited participants over a 28-week period (4-week baseline, 20-week implementation and 4-week post-implementation). We have included a post-implementation period of 4 weeks as our recent research suggests it is important to evaluate the *sustainability of the implementation strategy* after cessation of the implementation (1). Each driver will be provided with an iBeacon (the size of a credit card) that sits in the glovebox of the car and which the participant will link to their smartphone app. The iBeacon enhances the quality of the data by ensuring only the recruited participants' trips are recorded and not trips the driver may take as a passenger in other vehicles such as Uber trips. The protocols to pair the iBeacon to the driver's smartphone have been trialled and are efficient.

An outline of the study protocol and procedures along with 28-week observational period is highlighted in Figure 4.

Implementation Groups: The implementation consists of personalised vehicle emissions feedback to the driver via the smartphone app. For each day that driving trips are undertaken, participants randomly assigned to *Implementation Group 1* will be sent (via the smartphone app) a summary of their emissions performance. The feedback ensures the participant is aware of whether they are exceeding their emissions, post baseline, and if so, how to reduce their emissions (see Figure
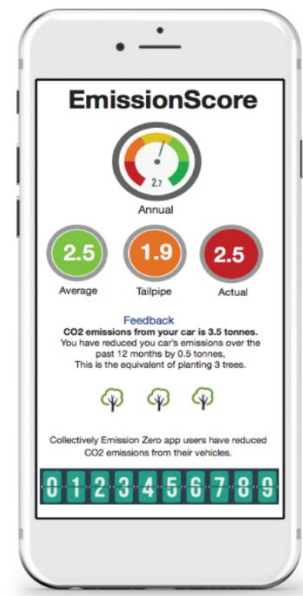
3 for the capture of the smartphone app feedback). Second, driving trips over a week are aggregated and the participant will be provided (via the smartphone app) a score (the Emissions Score) which ranks their performance compared with other participants in the group ranging from 0 – high emissions to 5 – low emissions. Performance rankings will specify a green code for reduced emissions, amber for low—level emissions and red for high-levels of vehicle emissions.

In addition to the emissions score, participants in Implementation Group 1 will also receive a personalised financial incentive also provided via the smartphone. The incentive will be structured as penalties for increased emissions; levied as monthly deduction of VND156,000 (AUD10) from an initial endowment of VND 780,000 (AUD50) deposited into a 'EmIT driving account' (virtual account). The intent is to mimic a Pay-As-You-Drive (PAYD) implementation, where financial penalties can be framed as periodic deductions from an (earned) discount. The 'virtual account' has been successfully implemented in two randomised trials undertaken by the investigators. In line with findings from our previous research comparing penalties and rewards, the use of penalties is also designed to leverage 'loss aversion' and maximise reductions in emissions.

Participants in *Implementation Group 2* will be sent (via the smartphone app) a summary of their emissions performance as per the description above, only.

Rationale linking implementation strategy to trial outcomes: In previous studies, financial incentives have been personalised in the sense that receipt of a reward or penalty is a function of whether or not a participant's driving behaviour falls above or below a *fixed* threshold (2). Informed by results from our previous research (1), EmIT will take the further step of calibrating and personalising the threshold for penalty to (a) limit the potential for 'switch off', and (b) ensure that the financial incentive remains active and relevant for the
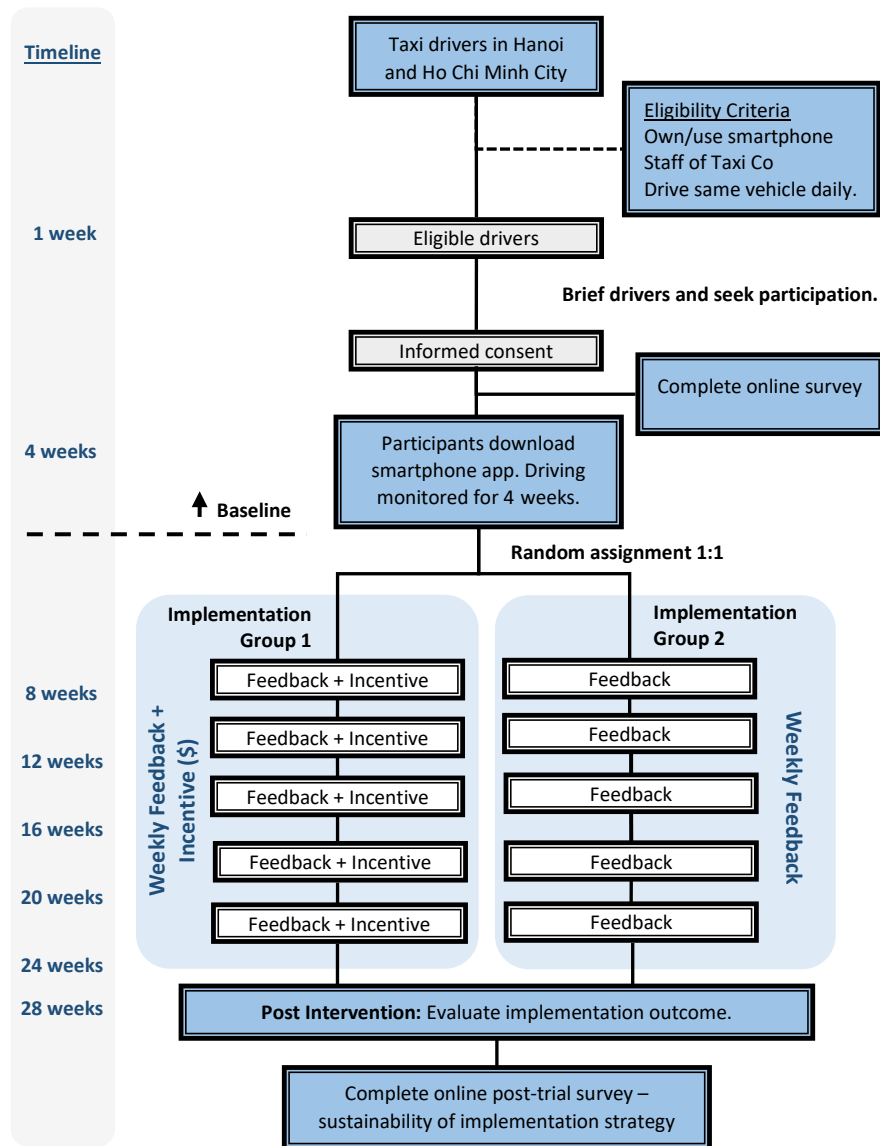

Figure 4: EmIT Trial – Protocol, procedure, and observational period.

participants. Specifically, thresholds will be tailored to individuals using baseline data (i.e., to impose the VND156,000 (AUD10) penalty in Month 1 of the implementation period unless a *small* improvement in emissions reduction is achieved). This threshold will then be lowered progressively each month to incentivise further improvements.

Data Collection, Management and Quality: Data from the online baseline survey will be stored/entered into an electronic database by project staff. The electronic database will be stored on one of the firewall-protected local network servers maintained at the Hanoi University of Public Health. The database will be secured by password protection and access to the database will be limited to authorised project staff. Several strategies will be implemented to maximise data quality.

First, the project managers will be trained before they work on the trial. Second, data forms and processing will be scrutinised for accuracy and completeness. Third, all data entry will be double-checked for accuracy. Fourth, data processing will be automated to prevent errors due to manual tasks. Following the cessation of EmIT (at 28 weeks) the effectiveness of randomisation will be evaluated by comparing implementation group allocations with a central record of the randomisation schedule. The database will be secured by password protection and access to the database will be limited to authorised project staff only.

A Data Safety Monitoring Committee (DSMC) will be established as an independent advisory committee. The DSMC will meet twice a year to monitor the efficacy and safety of the trial. The DSMC will consider reasons for ineligibility and non-participation, adherence to protocol, implementation fidelity, study events (those perceived to be related to the equipment or devices, or otherwise), and withdrawals. The DSMC will be a multidisciplinary group including individuals with scientific expertise from the ministries of health, transport and the environment in Vietnam. The committee will also have a *consumer representative* to ensure end-user representation and engagement during the trial.

Randomisation and Blinding: Following the four-week baseline phase, randomisation of eligible drivers to the implementation groups will be undertaken by randomly permuted block randomisation in a 1:1 ratio, stratified by study site (Hanoi and HCMC). The randomisation list will be computer-generated by an independent statistician from the Hanoi University of Public Health and carried out centrally to ensure concealment. Stratified block permuted randomisation with varying block sizes will be used for each city to ensure balance in allocation within the stratification factors. An independent statistician (funded through the grant) will remain blinded until the database is cleaned, locked and ready for unblinding.

Sample Size: Recent statistics from each city highlights there is a large population of taxi drivers from the respective companies; a total of 4000 in Hanoi and 6000 in HCMC. Based on the findings from our recent research we propose that the implementation strategy namely Implementation Group 1 will reduce emissions (from a 4-week baseline) by 10%. To detect a 0.59-fold relative decrease in the odds of such reduced emissions during the 6-month intervention period for participants in the Implementation Group 1 (IG1) compared to Implementation Group 2 (IG2) (i.e., a 10% reduction in the proportion of drivers reducing emissions, from 30% in IG2 to 20% in IG1, using a two-sided type I error of 5% and a power of at least 80%, a total of 3024 participants are required. Allowing for a 20% non-response rate due to drivers who may choose to withdraw from the trial, drivers who choose to turn their phones off or delete the app, 604 participants per arm, or a total of approximately 3,628 participants, will be required.

Statistical Analysis: The analysis will include all participants according to their randomised allocation (intention-to-treat). The implementation outcomes, whether a driver reduces their vehicle emissions during the 5-month follow-up period (Outcome 1), will be analysed using a Firth logistic regression model adjusted for the stratification factor – the city (n=2). The implementation outcome will be evaluated by obtaining the estimated relative change in the odds of a driver reducing their emissions by 10% during the 5-month follow-up period (i.e., odds ratio) for

participants in the IG1 compared to IG2, a two-sided 95% confidence interval and a p-value. This model provides valid inference in the presence of missing data if the data are missing completely at random (MCAR). A sensitivity analysis will be conducted using multiple imputation to explore the impact of any deviations from MCAR on the results. The remaining outcomes namely the uptake of the smartphone app (outcome 2), assessment of the continual provision of location services (ability to send messages to the driver) throughout the trial (outcome 3) and sustainability of the intervention 4-weeks post-implementation (outcome 4) will be analysed using a constrained longitudinal data analysis (cLDA) (41) model assuming a common mean across groups at baseline and a different mean for each group at each follow-up time point. The model will include factors representing treatment, time (categorical), and treatment-by-time interaction, with the restriction of a common baseline mean across implementation groups, and the stratification factor - city.

To evaluate the sustainability of IG1 *after* the cessation of the EmIT, cLDA and GEE models for the Emission Score and for individual drivers will be extended to include data for the post-intervention period (weeks 24 to 28). Estimation of implementation-by-month interactions over the intervention and post-intervention periods will allow us to trace the time-path of estimated implementation effects.

STAKEHOLDER ENGAGEMENT

Stakeholder engagement is a critical component in the implementation sciences to ensure the success and sustainability of both cultural adaptation and intervention implementation. We will establish four stakeholder groups that will provide important insights across the establishment, delivery and sustainability beyond the research period. The four groups will comprise:

    i. The policymaker group (policymakers from the Ministry of Health, Ministry of Transport, Ministry of Natural Resources and the Environment and the Hanoi and Ho Chi Minh Municipal People's Committees.
    ii. The expert group (national and regional academic experts in public health, transport systems research and the environment.
    iii. The implementing partners (taxi associations and taxi company representatives).
    iv. The end users (taxi drivers n=12).

In each group, stakeholder representatives will be mapped using an analysis matrix based on their level of interest, level of influence, impacts and goals, engagement methods and strategies, level of engagement, communication frequency and communication channels.

We will use mixed methods that include both qualitative methods (i.e., individual and focus group sessions) and quantitative methods (i.e., surveys), depending on the characteristics of the stakeholders, and the stage in which we have reached in the implementation strategy. For example, in the exploration stage, we (the research team) will host initial meetings with the stakeholders to introduce the study and the main concepts surrounding the EmIT. This meeting will be followed by individual interviews/meetings to understand each stakeholder's needs, goals and potential foreseen problems associated with the implementation. At this meeting the research team will also gather feedback on the content of the implementation strategy, the methods to be used and cultural relevance. Challenges arising from stakeholder engagement from previous projects undertaken by the research team in Vietnam (i.e., lack of reciprocity or shared vision, time, capacity and trust) will provide useful insights to the current proposal.

The research team will also develop a strategic communication plan to accelerate the implementation. Our communication strategy will involve developing and disseminating an implementation package; publishing social media briefs and peer-reviewed research manuscripts; planning and hosting a stakeholder summit and workshops; and attending and presenting at key conferences.

GOVERNANCE AND ETHICS

The governance model will maximise intellectual exchange, collaboration, academic and key stakeholder outputs, facilitate translation and align the implementation outputs to national policies surrounding clean air (see Directive on reinforcement of controlling air pollution (Directive 03/ CT-TTg) and Law on Environmental Protection (55/2014/QH13)). Central to the governance model is an Executive Committee co-chaired by CI-Stevenson and CI-Pham and involving the chief investigators (n=6) representatives from government (n=2), and industry (technology and taxi companies, n=2). The Executive Committee will be responsible for the overall direction of the research project ensuring delivery of milestones are achieved and maintaining ongoing engagement of the stakeholders throughout the 3-year study period. The co-chairs will meet weekly via zoom conferencing whilst the full Executive Committee will meet monthly, also via zoom conferencing. The co-chairs, in collaboration with the Executive Committee, will develop in the first month of the research project, a set of agreed principles related to decision-making; managing conflicts of interest and the explicit contributions of each chief investigator and employed staff on the project. We, the chief investigators, having collaborated over many years, are aware of the importance of such protocols. As well, we propose to hold an annual meeting in Vietnam of all chief investigators and stakeholders.

Added to the governance model is a further committee, namely the EmIT Management Committee. This committee will oversee the delivery of the EmIT and the committee will meet *twice a year*. A representative from the environmental health portfolio of the Ministry of Health will chair the committee; the committee will comprise government representatives from the Ministry of Transport (n=1), the Ministry of Natural Resources and the Environment (n=1), the taxi industry (n=2), the chief investigators (n=2) and the yet to be appointed, trial manager. The committee will meet twice a year and will monitor all elements of the conduct and progress of the EmIT. The committee will review adherence to the EmIT protocol and will ensure the trial is being conducted as per the criteria laid out under the ethics approval.

The proposed governance model has been implemented successfully in previous international collaborations involving the chief investigators. Central to our governance model when working between high- and middle-income countries is the explicit documentation and delivery of data governance and intellectual property. We propose to adhere to the 4 tenets of digital data governance that are critical for participant protections for vulnerable populations in low- and middle-income countries namely, ethics and consent, data access, sustainability and a legal framework (42)

Ethics approval will be sought from the human research ethics committee at The University of Melbourne and reciprocal approval through the ethics committees at the Hanoi University of Public Health and the University of Medicine and Pharmacy at Ho Chi Minh City. All data attained from interviews, surveys and the smartphone app used in the EmIT will be kept confidential and secure. No data, which could result in the identification of an individual, will be used in reports or journal articles. Drivers participating in the EmIT will be provided with detailed information on the trial and an informed consent will be signed by the participant. Drivers participating in the EmIT will be included in periodic raffles of a smartphone, in lieu of financial remuneration for participating in the trial; this applies to both IG1 and IG2. The financial incentive provided to IG1 will be subject to approval of the Human Research Ethics Committee at the University of Melbourne along with dual approval with the ethics committees at the Hanoi University of Public Health and the University of Medicine and Pharmacy at Ho Chi Minh City. The trial will follow the NHMRC National Statement on Ethical Conduct in Human Research and Good Clinical Practice. Participation in the trial will not result in physical or psychological risk to the drivers.

As the technology being deployed in the EmIT is a spin-off company arising from previous research activities of CI-Stevenson and given the University of Melbourne has invested in the company, specific strategies will be put in place to ensure there is no conflict of interest. After considerable

review by legal teams, the strategy that meets probity criteria are: i) all negotiations with the Director of the company (Urban Analytica -UA), Mr Frank Peppard, will be undertaken by CI-Pham from the Hanoi University of Public Health; CI-Pham has no conflict with UA. Once data collection is complete, all data will be transferred to the Hanoi University of Public Health and stored in one of the firewall-protected local network servers maintained by the University. The analysis of the data will be supervised by A/Prof Pham and A/Prof Tran from the respective Vietnamese universities.

The chief investigators overseeing the project have been carefully assembled to provide the depth of disciplinary expertise and research breadth required to deliver these important outcomes. We have also been mindful of the challenge of ensuring gender diversity across the team and career development and have included early and mid-career researchers both from Australia and Vietnam to ensure there is an enduring legacy arising from this important project.

SUSTAINABILITY OF THE PROJECT, DISSEMINATION, AND POTENTIAL IMPACT

The technology that delivers the feedback and financial incentives related to emission reduction will, under the early stages of the AIF, be developed for implementation in Vietnam. At the cessation of the trial, having undertaken an ongoing iterative assessment of the implementation strategy, throughout the three-year project, the technology will be suitable for full scale deployment across Vietnam. The government stakeholders involved in the project will be well-placed to lead the next phase of implementation and hence the ongoing sustainability of the technology and ongoing emissions reduction.

Research undertaken in Australia has shown significant benefit from implementing personalised feedback and financial incentives in influencing driving behaviours. The findings from the proposed study extends this finding to a low- and middle-income country context. Having an understanding that this innovative intervention applies in urban settings from high to low-income country settings and across varying cultural settings, paves the way for global scale-up delivering an intervention that addresses reductions in greenhouse gas and particulate emissions, thereby playing an important role in responding to the climate crisis associated with greenhouse gas emissions and mitigating the prevalence of fine particulate matter which is associated with premature mortality and the increased risk of cardio-respiratory morbidity.

We propose in the period after the research project (2027) we will prepare an assessment of economic costs and benefits of the technology deployment versus economic returns as well as overall sustainability returns factoring in all UN SDG contributions (Including UN SDG 13 (Emissions), UN SDG 3 (Air Quality), UN SDG 11 (Sustainable communities and Cities).

Knowledge translation will be an integral element of project and will continue in 2027 as part of our focus on scalability of the intervention. Within the AIF, at the full implementation stage (see Figure 2), we propose to establish a knowledge translation task group. The group will comprise representatives from the advocacy group Vietnam Clean Air Partnership (VCAP) along with stakeholders from the 3 ministries involved in the project. We will leverage existing activities such as The Vietnam Clean Air Day to raise insights from the research project and to initiate widespread uptake of the emissions reduction intervention strategy. In addition, we are committed to the advancement of implementation science related to chronic disease prevention and will ensure our research findings are published in leading international journals such as Implementation Science, Implementation Research and Practice and Implementation Science Communication.

PROJECT TEAM'S ENVIRONMENTAL FOOTPRINT

The environmental footprint associated with the proposed project is negligible and will likely arise through emissions generated via air travel as a consequence of delivering the project. We have minimised air travel in the project to an annual meeting and we have allocated funds under airfares in the budget to cover carbon offsets for the travel. Other than the annual meeting, all meetings will be held 'virtually'. All surveys will be undertaken electronically and most of the data capture will be via the smartphone application; such technology has a low carbon footprint.

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National Health and Medical Research Council (NHMRC) NCD Prevention in Cities call: Budget sheet.   GACD application ID: GACDCITIES 103,   NHMRC application ID: 202745

Chief Investigator A	Prof Mark Stevenson	
Project Title	Air pollution and non-communicable disease: City-wide implementation to reduce transport emissions.	

Budget	Defintition		Year 1	Year 2	Year 3	Total
Salary (in AUD)	Nominate the requested level and percentage (%) of Personnel Support Package (PSP) for each team member for each year (refer to Section 5.1.1 and Appendix D of **GACD Non-Communicable Disease Prevention in Cities Funding Call 2023 Grant Guidelines**). If a team member is not requesting a salary, they need to be entered as 0.	Professor Mark Stevenson, Chief Investigator A, 50% of PSP 5.	$52,398.50	$52,398.50	$52,398.50	$157,196
		Associate Professor Cuong Pham, Chief Investigator B	0	0	0	$0
		Associate Professor Jason Thompson, Chief Investigator C	0	0	0	$0
		Associate Professor Dang Tran, Chief Investigator D	0	0	0	$0
		Dr Kerry Nice, Chief Investigator E, 20% of PSP 3.	$16,481.60	$16,481.60	$16,481.60	$49,445
		Dr Nhung Nguyen, Chief Investigator F	0	0	0	$0
		Dr Dominika Kwasnicka, Chief Investigator G, 20% of PSP 4	$19,466.80	$19,466.80	$19,466.80	$58,400
		Dr Thanh Ho, Chief Investigator H, 100% of PSP 3.	$82,408	$82,408	$82,408	$247,224
		Project Manager at HCMC, 100% of PSP 2.	$74,943	$74,943	$74,943	$224,829
		Project Manager at Hanoi, 100% of PSP 2.	$74,943	$74,943	$74,943	$224,829
Direct Research Costs and Equipment (in AUD)	Direct Research Costs (refer to 5.1 and Appendix D of **GACD Non-Communicable Disease Prevention in Cities Funding Call 2023 Grant Guidelines**).	IT Services - Urban Analytica	$139,000	$42,000	$42,000	$223,000
		4 iPads for survey and interview	$3,996			$3,996
		Funds to cover financial incentive/ penalty	$37,800	$37,800		$75,600
		Survey prize	$5,000	$5,000		$10,000
		Travel costs for team meetings and other activities	$10,900	$10,900	$10,900	$32,700
		Accommodation and Per Diem for team meetings	$6,000	$6,000	$6,000	$18,000
		Travel costs for GACD Annual Scientific Meetings	$8,000	$8,000	$8,000	$24,000
		Accommodation and Per Diem for GACD Annual Scientific Meetings	$4,500	$4,500	$4,500	$13,500
	Equipment Costs (refer to 5.1 and Appendix D of **GACD Non-Communicable Disease Prevention in Cities Funding Call 2023 Grant Guidelines**)	iBeacons	$15,120	$15,120	$15,120	$45,360
Total (in AUD)			$550,957	$449,961	$407,161	$1,408,079
Total (in USD) *Please use 1 March 2022 conversion rate: 1 AUD = 0.72 USD*			$396,688.97	$323,971.85	$293,155.85	$1,013,817

Application GACDCITIES 103 NHMRC ID 202745 – CIA Stevenson:

Air Pollution and Non-communicable Disease: City-wide Implementation to Reduce Transport Emissions.

■ **Personnel:**

Professor Mark Stevenson, Chief Investigator A, 50% of PSP 5, total AUD $157,196

CIA-Stevenson is currently seeking NHMRC Leadership funding. If the application is not successful, he will require partial salary support to conduct this research as he is a full-time researcher funded through research grants. CIA-Stevenson will oversee the project and will have insight across all elements including budgeting, recruitment of staff, delivery of the project.

Dr Kerry Nice, Chief Investigator G, 20% of PSP 3, total AUD $49,445

CIE-Nice is a full-time research fellow in the Transport Health and Urban Design Research Lab. He attains all salary support from research grants. His time on the grant reflects the salary requested. CIE-Nice will contribute his expertise in relation to air pollution, urban modelling and estimates around emission reductions arising from delivery of project.

Dr Dominika Kwasnicka, Chief Investigator G, 20% of PSP 4, total AUD $58,400

CIG-Kwasnicka is a full-time Senior Research Fellow and attains salary funding from research grants. Who contribution to the grant will be covered by this salary fraction. CIG-Kwasnicka is a leading implementation scientist and she will lead activities related to all elements of the AIFs and Re-AIM ensuring we are capturing the important components to ensure the sustainability of the intervention"

Dr Thanh Ho, Chief Investigator H, 100% of PSP 3, total AUD $247,224

CIH-Ho is a postdoctoral fellow who will work full-time on this grant. He has no salary cover aside from the funding from the grant. CIH-Ho will be integral to the delivery of the project. His ability to engage with researchers from both countries, his knowledge of the field based on his research experience attained from his doctoral studies places him as the ideal researcher to have oversight of the day-to-day operations.

Project Manager at HCMC, 100% of PSP 2, total AUD $224,829

These funds are required to support delivery of the project in HCMC. This yet to be appointed candidate will work closely with CID-Dang and CIH-Ho to ensure the logistics, communications, relationships and data capture are being undertaken.

Project Manager at Hanoi, 100% of PSP 2, total AUD $224,829

These funds are required to support delivery of the project in Hanoi. This yet to be appointed candidate will work closely with CIB-Cuong, CIF Nhung and CIH-Ho to ensure the logistics, communications, relationships and data capture are being undertaken.

■ **Material and equipment:**

IT Services - Urban Analytica, total AUD $223,000

This includes the following services:

- 20% time for an IT staff member at Urban Analytica (UA) to maintain the system for the project dealing with queries arising from project: AUD $30,000 pa (AUD $90,000 in total).

- Mapping changes to the UA smartphone app - using Open Street View: AUD $10,000

- Smartphone App changes to Vietnamese: AUD $10,000

- Clone of current smartphone app: AUD $23,000

- Software programming and beta testing in Vietnam: AUD $54,000

- Ongoing AWS storage over the 3 years $1000 per month: AUD $36,000

Funds to cover financial incentive/ penalty ($50 per driver), total AUD $75,600

This fund covers the financial incentives for participated drivers.

Survey prize, total AUD $10,000

Prizes to facilitate participation in the survey.

4 iPads, total AUD $3996

The iPads facilitate the face-to-face meetings and focus group research in Hanoi and HCMC. 4 iPads (2 in each city) will be purchased for fieldworkers to use.

iBeacons, total AUD $45,360

iBeacons will be purchased and provided to drivers recruited in to the EmITs (n=3024) at a cost of AUD $15 per iBeacon. This is a device the size of a credit card that will be paired to the drivers' phone to ensure we attain the most robust data from the smartphone of the driver. Basically, it will indicate when the EmIT participant is driving the vehicle and when a non-participant might be driving.

iBeacons cannot be provided by the participating institutions since it requires certain technology and manufacturing facilities.

■ **Travel:**

Travel costs for team meetings and other activities, total AUD $50,700

Flights (total AUD $32,700.00): An estimated 11 return economy flights between Melbourne and Vietnam are needed at a cost of AUD $2700 per flight. This cost also includes the cost of paying for carbon offsets. These trips are for CIA-Stevenson and CIF-Ho to attend the annual face-to-face meetings and for CIC-Thompson, CIC-Nice and CIH Kwasnicka to also attend one meeting (Over three years - AUD $29,700). We also budgeted for 6 domestic flights for CID-Dang and CIF-HO between HCMC to Hanoi at AUD $500 return (Over three years - AUD $3,000).

Accommodations and Per Diem (total AUD $18,000): Accommodation in Hanoi for 6 people (4 days per annum) with hotel cost at $150 per day and per diem $100 per day (transport, food).

Travel costs for two team members to attend GACD Annual Scientific Meeting, total AUD $37,500

Flights (total AUD $24,000.00): Return economy international flights (2 per annum x 3 years) with the assumed destinations are Melbourne & London (GACD Annual Scientific Meeting 2022) and flight cost at AUD $4000 per flight.

Accommodations and Per Diem (total AUD $13,500): Accommodation in the same assumed location that is London for two team (10 days per annum x 3 years) members with hotel cost at AUD $300 per day and per diem cost at $150 per day (transport, food).

Personal Information

- Name (including title): Professor Mark Stevenson
- Email address: mark.stevenson@unimelb.edu.au

Primary affiliation: University of Melbourne

Employment history

- **University of Melbourne**

  2015 - Present | *Professor of Urban Transport and Public Health in the Melbourne School of Design, Melbourne School of Engineering, Melbourne School of Population and Global Health*
  2015 - Present | *Director of the Transport, Health and Urban Design Research Lab (THUD)*

  Prof Stevenson has an appointment across three faculties and is the Director of the THUD Research Lab that comprises a cross-disciplinary research team of 22 academics exploring how the effects of urban and transport systems influence the health of urban residents. The Lab has attracted considerable international funding and is focused on innovation and global reach in era of big data.

- **Monash University**

  2010-2015 | *Professor and Director of the Monash University Accident Research Centre*

  Prof Stevenson was responsible for the Centres 5-year research vision and strategy and the centres financial and operational management. The Centre comprised 70 research and technical staff with an annual budget of $6m. He established the renowned Leadership Program in 2012 which is the hallmark of the Centre's successful educational program which continues today.

- **The University of Sydney**

  2003-2010 | *Professor of Injury Prevention at Sydney Medical School*
  2006-2010 | *Senior Director, Research and Development at The George Institute for Global Health*
  2003-2006 | *Director, Injury and Trauma Care Division at The George Institute for Global Health*

  Prof Stevenson was responsible for the development and delivery of the Institutes research strategy along with managing the research pipeline in both Australia and China. The role involved establishing extensive collaborations with institutions and individuals nationally and globally as well as supporting individual staff collaborations. He managed 160 staff and managed annual budgets exceeding $12m.

- **The University of Western Australia**

  2001-2003 | Associate Professor in the School of Population Health
  2001-2003 | Director and Founder of the Injury Research Centre

- **School of Public Health, Curtin University**

  1999-2001 | Associate Professor of Epidemiology
  1997-1998 | Senior Lecturer and Head, Department of Epidemiology and Biostatistics
  1995-1996 | Senior Lecturer, 1990-1995 | Lecturer

- **US Centers for Disease Control and Prevention**

  1998-1999 | Epidemiologist

- **Harvard School of Public Health**

  1996-1997 | Postdoctoral Fellow

Education and qualifications

Degree or qualification	Awarding institution	Year
Doctor of Philosophy (with distinction)	The University of Western Australia	1995
Master of Public Health	Curtin University	1988

Previous and current grant funding in past 10 years

Funding award type	Amount	Role	Years
ARC Life Course Centre	$32m	CI	2022-2026
NHMRC Partnership Grant	$1.1m	PI	2022-2024
ARC Life Course Centre, Agile Funding Grant	$96,000	PI	2022-2024
Melbourne Energy Institute Grant	$30,000	CI	2020
ARC Linkage Grant	$560,000	PI	2020-2023
NHMRC UKRI-NHMRC Built Environment And Prevention Research Scheme	$1.3m	CI	2020-2023
Melbourne Energy Institute	$30,000	CI	2020
Research collaboration grant (University of Melbourne & Tongji University	¥40,000 CNY	CI	2018
NHMRC Research Fellowship	$707,000	PI	2018-2022
CAPABLE grant by the Asia Pacific Network (APN)	$55,600	CI	2018
ESPRIT Hallmark Seed Funding grant UoM	$13,684	CI	2018
ARC Linkage Grant	$560,000	CI	2017
Grant by the Chinese Government's 111-Program	$5m	CI	2017-2020
ACT Governments 2017 Road Safety Program	$50,000	CI	2017
ARC Linkage Grant	$1.8m	PI	2015-2018
Low Carbon Living Cooperative Research Centre	$586000	PI	2015-2017
ARC Linkage Grant	$1.4m	PI	2013-2015

Selected Recognitions

Name of recognition, prize or award	Description of award	Year
Australian Academy of Health and Medical Sciences (FAHMS)	Fellow	2022-present
Elsevier Atlas Award	Top paper from Elsevier's 3800 journals	2020
Australasian College of Road Safety (FACRS)	Fellow	2008
National Health and Medical Research Council	Research Fellowships	2007-2022
CS Sports Medicine Prize	Awarded for the WA Sports Injury Study	2001
Centers for Disease Control & Prevention, USA.	Nominated for the CS Shepard Science Award	1997

Selected professional involvement.

Name of body or committee	Brief description	Years
Australian Urban Research Infrastructure Network	Board Member	2022-present
World Health Organization	Expert Advisory Panel	2008-2020
United Nations	Expert Group Member - The Future State of Cities in a World with Pandemics	2020
Tongji University, Shanghai, China	International Scholar	2018-present
Independent Council for Road Safety International - India	Board member	2016-present
Australasian College of Road Safety	Member of National Executive, Chair (NSW), Elected Lifetime Fellow,	2004-present
International Epidemiological Association	Membership	1991-Present

Career breaks N/A

Supervision and mentoring

To date, Prof Stevenson has graduated 15 doctoral students and 18 masters by research students and currently supervises 5 doctoral students and 5 masters by research students.

Publications

Prof Stevenson has published more than 285 publications with 13607 citations in last 10 years, his H-index=59

10 recent relevant publications:

- Wijnands, J. S., Nice, K. A., Seneviratne, S., Thompson, J., & **Stevenson, M**.). The impact of the COVID-19 pandemic on air pollution: A global assessment using machine learning techniques. Atmospheric Pollution Research, 2022, 13(6), 101438.
- Waidyatillake N, Campbell T, Vicendese D, Dharmage S, Curto A, **Stevenson M**. Particulate Matter and Premature Mortality: A Bayesian Meta-analysis. International Journal of Environmental Research and Public Health, 2021, 18, 7655: 1-21
- Ho, T. P., **Stevenson, M**., & Thompson, J., et al. (2021). "Evaluation of Urban Design Qualities across Five Urban Typologies in Hanoi." Urban Science 5(4): 76.
- **Stevenson M**, Mortimer D, Wijnands J, Harris A. The effect of telematic based feedback and financial incentives on driving behaviour: A randomised trial. Accident Analysis & Prevention. 2021, 159, 106278.
- Mortimer D, Wijnands J, Harris A, **Stevenson M**. Persistence or reversal? The micro-effects of time-varying financial penalties. Journal Of Economic Behaviour & Organization, 2021, 188: 72-86
- Thompson J, **Stevenson M**, Wijnands J, Nice K, Aschwanden G, Silver J, Nieuwenhuijsen M, Rayner P, Schofield R, Hariharan R, Morrison C. A global analysis of urban design types and road transport injury: an image processing study. Lancet Planetary Health. 2020;4(1): e32-e42.
- Mortimer D, Wijnands JS, Harris A, Tapp A, **Stevenson M**. The effect of 'smart'financial incentives on driving behaviour of novice drivers. Accident Analysis & Prevention. 2018 Oct 1;119:68-79.
- **Stevenson M**, Harris A, Mortimer D, Wijnands JS, Tapp A, Peppard F, Buckis S. The effects of feedback and incentive-based insurance on driving behaviours: study approach and protocols. Injury prevention. 2018 Feb 1;24(1):89-93.
- **Stevenson M**, Thompson J, de Sa TH, et al. Land use, transport, and population health: estimating the health benefits of compact cities. *Lancet.* 2016;388(10062):2925-35
- Sallis JF, Bull F, **Stevenson M**, et al. Using science to guide city planning policy and practice: how to achieve healthy and sustainable future cities. Lancet, 2016, 388(10062): 2936-2947.

Non-publication research outputs

- Beck B, Zapata-Diomedi B, **Stevenson M** et al. A report for VicHealth: Active Transport Research Priorities for Australia. 2021
- **Stevenson M**. Submission to the Zero-emission vehicle enquiry, Victorian State Government Committee, September 2021.
- Oxley J, Cuong Pham V, Jamaludin A, **Stevenson M**. Evaluation of Child Injury Prevention Interventions in Vietnam. Report to UNICEF Vietnam, Hanoi, Vietnam, May 2011.
- **Stevenson M**. Submission to the STAYSAFE Committee of the NSW Parliament inquiry into Pedestrian Safety. July 2009.

Additional information

Prof Stevenson is the most esteemed researcher in public health research in Australia and globally. He has led numerous landmark studies and in 2016 was invited by the Editor of the Lancet to lead a series on Urban Design, Transport and Health. He has procured more than $68 million in research funding and published in the leading international medical journals. His research is highly cited and has contributed to significant policy changes both nationally and globally. For example, his research on road crashes associated with mobile phones whilst driving has been cited as the empirical evidence supporting legislative change across Australia, NZ, Canada, US and the UK. His recognition, internationally, has been acknowledged by 26 invitations to give keynote addresses at international meetings in the last 5 years. Many of these invitations are to highly prestigious meetings including an invitation to present at the 71st Meeting of the United Nations in New York and the global meeting of City Mayors hosted in Bogota.

Personal Information

- n Name (including title): Associate Professor Cuong Viet Pham
- n Email address: pvc1@huph.edu.vn

Primary affiliation

Hanoi University of Public Health

Employment history

- n **Center for Digital Health**
  2022 – present | *Director*
  Assoc.Professor Pham oversee the development and implementation of all Center's research activities

- n **Center for Injury Policy and Prevention Research**
  2014 – present | *Director*
  Assoc.Professor Pham manages the Center and is responsible for planning, organizing, inspecting, monitoring and evaluating the implementation of the plan and assigned tasks of the Center.

- n **Hanoi University of Public Health** 2012 – present | *Associate Professor,*
  2010 – 2022 | *Head, Department of Health Informatics.*
  2011 –2014 | *Head, Department of Scientific Research Management*
  2002 –2011 | *Coordinator of the Center for Injury Policy and Prevention Research*
  2001 –2010 | *Vice head of department of Biostatistics and Informatics*
  May 1995 | *Lecturer in the Dept. of Biostatistics and Informatics.*

  Assoc.Professor Pham leads Department of Scientific Research Management and Department of Health Informatics and teaches injury prevention, public health and research method courses.

Education and qualifications

Degree or qualification	Awarding institution	Year awarded
PhD *Doctor of Philosophy in Interdisciplinary Program in Biostatistics and Information Technology.*	**Tulane University, Louisiana, United States**	2005
B.A. *Bachelor of Science in Mathematics and Computer Science*	**Hanoi University, Hanoi, Viet Nam**	1994

Previous and current grant funding

Funding award type	Award amount	Role (*e.g.,* Principal investigator, co-Investigator)	Years of award
Campaign for Tobacco for Kids	$300,000 $200,000	PI PI	2023-2024 2018-2022
Global Health Advocacy	$119,000	PI	2023-2024
National Institute of Health (US)	$350,000 $320,000	CI CI	2022-2026 2016-2021
Bloomberg Phylanthropies	$450,000	CI	2015-2019 2020-2024
Global Road Safety Partnership	CHF145,000	PI	2021-2022
International Development Research Center (IDRC), Canada	$430,000	PI	2014-2017

Professional involvement

Name of body or committee	Brief description of engagement with this body or committee (1-2 sentences)	Years active
Vietnam Public Health Association	Membership and attendance of international conferences.	15

Career breaks N/A

Supervision and mentoring

Supervision of 8 PhD students (Hanoi Univerisity of Public Health). Supervision of more than 10 Master of Public Health, Master of Hospital Management thesis (Hanoi Univerisity of Public Health)

Publications

Selected publications:

- Armstrong E, Yin X, Razee H, **Cuong P. V**, et al. Exploring Barriers to, and Enablers of, Evidence-Informed Hip Fracture Care in Five Low- Middle-Income Countries: China, India, Thailand, the Philippines and Vietnam [published online ahead of print, 2022 Jun 9]. Health Policy Plan. 2022;czac043. doi:10.1093/heapol/czac043

- Nhung L. H., Dien T. M., Lan N. P., Thanh P. Q., & **Cuong P. V**. (2021). Use of Project ECHO Telementoring Model in Continuing Medical Education for Pediatricians in Vietnam: Preliminary Results. *Health Services Insights*. https://doi.org/10.1177/11786329211036855

- Paw E, Shammassian B, Mehmood A, Stevens K, **Cuong P. V**, Bachani A. 4B.001 Qutative assessment of trauma care in Hanoi, Vietnam. *Inj Prev*. 2021;27(Suppl 2):A33 LP-A33. doi:10.1136/injuryprev-2021-safety.100

- Qingfeng Li, Oluwarantimi Adetunji, **Cuong Viet Pham**, Ngan Thi Tran, Edward Chan, Abdulgafoor M. Bachani (2020), Helmet use among motorcycle riders in Ho Chi Minh City, Vietnam: results of a five-year repeated cross-sectional study, Accident Analysis & Prevention, Volume 144, 2020, https://doi.org/10.1016/j.aap.2020.105642.

- Oluwarantimi Adetunji, Qingfeng Li, **Cuong Viet Pham**, Ngan Tran Thi & Abdulgafoor M. Bachani (2020) Seatbelt and child restraint use among vehicle occupants in Ho Chi Minh

City: an observational study in Vietnam, International Journal of Injury Control and Safety Promotion, DOI: 10.1080/17457300.2020.1774620

- **Cuong, P. V**., Casswell, S., Parker, K., Callinan, S., Chaiyasong, S., Kazantseva, E., Meier, P., Mackintosh, A.-M., Piazza, M., Kazantseva, E., Gray-Phillip, G., Parry, C. D. H. (2018). Cross-country comparison of proportion of alcohol consumed in harmful drinking occasions using the International Alcohol Control (IAC) study. *Drug and Alcohol Review,* online : 14 Feb, DOI: 10.1111/dar.12665. http://onlinelibrary.wiley.com/doi/10.1111/dar.12665/epdf

- **Pham Cuong V**.; Tran, Hanh T. D.; Tran, Ngan T. Alcohol Consumption and Binge Drinking Among Adult population: Evidence from the Chililab Health and Demographic Surveillance System in Viet Nam. Journal of Public Health Management and Practice. 24:S67-S73, March/April 2018.

- **Pham, Cuong V**.; Luong, Anh M.; Bachani, Abdulgafoor M.; Nguyen, Tuan V.; Tran, Ngan T.; La, Quang N. Injury Mortality in Vietnam: Patterns and Trends, 2005-2013 Journal of Public Health Management and Practice. 24:S44-S51, March/April 2018.

Additional information

Cuong Pham is Associate Professor of Public Health at Hanoi University of Public Health (HUPH), Vietnam. He received a B.S. degree in Hanoi. and Ph.D. in Tulane University, New Orleans, US. He has been active in the area of injury prevention in Low and Middle-income countries for over 25 years and has been a frequent contributor to the national and international research projects, strategy for the road safety, drowning and violence prevention. Beside doing research, Assoc. Prof Pham is also involved in teaching injury prevention and research method courses for students at HUPH as well as health and related staff at different levels in Vietnam. His current research is in developing and implementing a Master of Public Health program with a concentration in injury research at HUPH.

Personal Information
- Name (including title): Associate Professor Jason Thompson
- Email address: jason.thompson@unimelb.edu.au

Primary affiliation   University of Melbourne

Recent Employment history

- **Associate Professor, and Australian Research Council Future Fellow, Department of Medicine, Dentistry and Health and Faculty of Architecture, Bulding and Planning – (2023-Current)**
  Associate Professor within the Transport, Health and Urban Design Research Laboratory in the Melbourne School of Design. I supervise a team of post-graduate research fellows focused on agent-based modelling, artificial intelligence, and machine learning methods applied to urban and social systems research.

- **Australian Research Council Discovery Early Career Researcher Award Fellow, Melbourne School of Design – (2018-2022)**
  In 2017 I was awarded an Australian Research Council Discovery Early Career Award Fellowship. This project was focused on the application of Agent-Based Modeling to re-creating synthetic health systems and injured populations moving through injury insurance, compensation, and rehabilitation systems.

Education and qualifications

Degree or qualification	Awarding institution	Year awarded
PhD (Medicine)	Deakin University	2015
Master of Clinical Psychology	University of Ballarat	2005
Bachelor of Science (Honours)	Deakin University	1997
Bachelor of Science	Deakin University	1996

Previous and current grant funding

Funding award type	Award amount	Role	Year
Australian Council of Deans of Health Sciences Aged Care Workforce Modelling	$40k	PI	2023
Australian Research Council Future Fellowship	$957k	PI	2023
University of Melbourne Future Fellowship Establishment Grant	$100k	PI	2022
NHMRC CRE on Post Injury Recovery	$2.5m	PI	2021
NHMRC Ideas Grant – Harnessing the benefits of autonomous vehicles for health	$780k	PI	2020
ARC – Discovery Managing the risks posed by artificial general intelligence	$460k	PI	2019
Feature selection for suicidality in serving and ex-servinig Australian Defence Force personnel – Phoenix Australia	$14k	PI	2019
University of Melbourne Early Career Research Grant	$17k	PI	2019
University of Melbourne, Faculty of Architecture, Building and Planning ECR Research Grant	$15k	PI	2018
ARC – Discovery Early Career Researcher Award (DECRA)	$366k	PI	2017
University of Melbourne DECRA Establishment Award	$25k	PI	2017
University of Melbourne Early Career Research Grant	$20k	PI	2016
University of Melbourne ECR Grant	$5k	PI	2016

Recognitions

Name of recognition, prize or award	Description of award	Year
Award for Excellence in Engagement	Infectious Disease Modelling delivered to Victorian Government	2020
ARC – Australian Research Council Future Fellowship	Modelling of Australian Health System Design	2022
ARC - Discovery Early Career Researcher Award (DECRA)	Modelling of Australian Injury System Design	2017

Professional involvement

Name of body or committee	Engagement with this body or committee	Years Active
Operations Research Society	Member	3
Complex Systems Society	Member	7
COMSES	Member	5
Computational Social Science Society of the Americas	Member	7
Australasian College of Road Safety	Member	7
Australian Economics Society, Victorian Branch	Member	7
American Psychological Society – Rehabilitation Psychology Division	Member	10
American Psychological Society – General Psychology Division	Member	10
American Psychological Society – Health Psychology	Member	10
Australian Injury Prevention Network	Member	10
Australian Health Practitioner Registration Board	Registered Psychologist	15
WorkSafe Victoria Mental Health Advisory Panel	Panel Member	4

Recent Significant Publications

- **Thompson, J.,** et al. (2022). "A framework for communicating the utility of models when facing tough decisions in public health." Health Research Policy and Systems **20**(1): 107**.**

- Nice, K. A., Nazarian, N, Lipson, M, Hart, M., Seneviratne, S. & **Thompson, J.** et al. (2022). "Isolating the impacts of urban form and fabric from geography on urban heat and human thermal comfort." Building and Environment **224**: 109502.

- Hulme, A., & **Thompson, J.** et al. (2022). "The need for a complex systems approach in rural health research." BMJ open **12**(10): e064646.

- **Thompson, J.** & C. Cruz-Gambardella (2022). "Development of a Computational Policy Model for Comparing the Effect of Compensation Scheme Policies on Recovery After Workplace Injury." J Occup Rehabil 32(2): 241-251.

- Wijnands, J. S., Nice, K., Seneviratne, S., & **Thompson, J**. et al. (2022). "The impact of the COVID-19 pandemic on air pollution: A global assessment using machine learning techniques." Atmospheric Pollution Research **13**(6): 101438.

- Olmez, S., & **Thompson, J.**, et al. (2022). "An Agent-Based Model of Heterogeneous Driver Behaviour and Its Impact on Energy Consumption and Costs in Urban Space." Energies 15(11): 4031.

- **Thompson, J**., et al. (2022). Modelling SARS-CoV-2 disease progression in Australia and New Zealand: an account of an agent-based approach to support public health decision-making. The Australian and New Zealand Journal of Public Health, https://doi.org/10.1111/1753-6405.13221.

- Ho, T. P., Stevenson, M., & **Thompson, J.**, et al. (2021). "Evaluation of Urban Design Qualities across Five Urban Typologies in Hanoi." Urban Science **5**(4): 76.

- Blakely, T., **Thompson, J.**, et al. (2021). "Association of Simulated COVID-19 Policy Responses for Social Restrictions and Lockdowns With Health-Adjusted Life-Years and Costs in Victoria, Australia." JAMA Health Forum **2**(7): e211749-e211749.

- **Thompson, J.**, Stevenson, M., Wijnands, J., Nice, K., Aschwanden, G., Silver, J., Nieuwenhuijsen, M., Rayner, P., Schofieldm, R., Hariharan, R., Morrison, C. (2020). A global analysis of urban design types and road transport injury: an image processing study. Lancet Planetary Health. 4(1): e32-e42.

Career breaks N/A

Supervision and mentoring

I currently supervise 5 PhD students and have acted as a chairperson and panel member on a further 6 PhD student panels

Selected recent conference presentations:

- **Computational Social Science of the Americas -** Policy Modeling Workshop Convenor, Santa Fe, October, 2022.
- **Agent-based modeling in crise -** European Social Simulation Conference, Milan, September 2022.
- **Modeling crises in a crisis** – European Social Simulation Festival, March, 2021.
- **Be careful what you wish for – The highs and lows of modeling controversial public policy** - Keynote presentation, European Social Simulation Festival, March, 2021.
- **Bringing computational social science into mainstream policy making for COVID-19** – Presentation to the Australian Health Protection Principal Committee (AHPCC), September, 2020.
- **Achieving Zero – Bringing computational social science into mainstream policy making for COVID-19** – Covid Community Action Summit, United States, January, 2021.
- **The use of agent-based modelling to assist public health decision-making –** Autonomous Agents and Multi-Agent Systems Conference, MABS Workshop, May, 2020.
- **The use of agent-based modelling to assist public health decision-making –** Conference of the European Computational Social Science Society, September, 2020.
- **A global analysis of urban design and road injury –** Complex Systems Society Conference, NTU, Singapore, September, 2019.
- **Injured by design: A global perspective on urban design and road transport injury –** The Complex Systems Society conference, Singapore, October, 2019.
- **Utilisation of computer vision techniques in understanding the relationship between urban design and health** – Re-Visioning Transport and Health Meeting, University of Cambridge School of Medicine and Public Health, Cambridge UK, July 2019.
- **Potential effects of introducing autonomous vehicles on crash rates among vulnerable road users –** Agent-Based Modelling of Urban Systems Satellite Session, AAMAS, Montreal, Canada, May 2019.

Selected recent invited seminar presentations:

- **Modeling the Australian Aged Care Workforce –** Australian Council of Deans of Health Sciences AGM, Canberra, 2023
- **Agent-Based Modeling for Policy** – CRE for Better Outcomes for Compensable Injury presentation, March 2023.
- **Agent-Based Social Simulation in Crises** - Keynote presentation, Leiden, The Netherlands - February 2023.
- **Summer Institute of Computational Social Science** – Invited panellist and workshop presenter as part of the inaugural SICCS workshop at the University of Sydney, NSW – July 2022.
- **International Disease Prevention & Control Summit** – Invited Panel Presentation on the Utilisation of data in pandemic control, July 2021.
- **World Health Network** – Simulating Elimination, July 2021.
- **Bringing computational social science into mainstream policy making for COVID-19** – Leadership Lessons in COVID times, Sciana Health Leadership Forum, Germany, May, 2021.
- **Modeling crises in a crisis** – The Sir Christopher Wren Club, May, 2021.
- **The use of Agent-Based Modeling during Victoria's 2nd wave** – Department of Health and Human Services, Victorian Public Health Trainees 'Waterpump' Group, Melbourne, March, 2021.
- **Responding to Revolution; Utilising new methods to explore the relationship between transport, health and urban design** – School of Medicine and Public Health, CEDAR/MRC Epidemiology Unit joint seminar series, University of Cambridge, Cambridge, UK, June 2019.
- **The use of Agent-Based Models in optimising health system policy** – RAND Corporation, Santa Monica, California, 2019

Additional information

All professional and academic positions CI Thompson has held have focused on the translation of research into practice across the areas of public health systems, transportation systems, health care systems, and post-injury rehabilitation, insurance, and rehabilitation system design.

GACD
GLOBAL ALLIANCE FOR CHRONIC DISEASES
AN ALLIANCE OF HEALTH RESEARCH FUNDERS

Personal Information

- Name (including title): Associate Professor Dang Ngoc Tran
- Email address: tranngocdang@ump.edu.vn

Primary affiliation

University of Medicine and Pharmacy at Ho Chi Minh city

Employment history

- **University of Medicine and Pharmacy Ho Chi Minh City: Ho Chi Minh City, Vietnam**
  2011-01 to present | *Lecturer and Vice head of Department of Environmental and Occupational Health; Faculty of Public Health.*
  2019-06 to present | *Vice director, Grant and Innovation Center*

  In charge of following courses:
  - Environmental Health (Under & Post-graduate, both theory and practical courses)
  - Occupational Health (Under & Post-graduate, both theory and practical courses)
  - Environmental disaster prevention and management (Under-graduate course)
  - School health (Under-graduate course)

- **University of Tsukuba: Tsukuba, Ibaraki, Japan**
  2014-04 to 2017-03-25 | *Research assistant in Environmental Epidemiology lab*

- **KNCV Tuberculosis Foundation: Vietnam office**
  2017-09 to 2019-09 | *Data management*

Education and qualifications

Degree or qualification	Awarding institution	Year awarded
Associate Professor	University of Medicine and Pharmacy at Ho Chi Minh City	2023
PhD in Human Care Science	University of Tsukuba	2017
Master of Public Health	University of Tsukuba	2014
Bachelor of Public Health	University of Medicine and Pharmacy at Ho Chi Minh City	2010

Previous and current grant funding

Funding award type	Award amount	Role	Years of award
Wellcome Trust Fund	$8,445,649 AUD	Co-investigator	2023-2028
Department of Science Ba Ria – Vung Tau Province	$2,250,974,605 VND	Principal investigator	2021-2023
LASER PULSE, USAID	$133,544 USD	Principal investigator	2021-2023
Department of Science HCMC	$2,800,000,000 VND	Main investigator	2020-2022
National Foundation for Science and Techonology Development (NAFOSTED) – National Health and Medical Research Council (NHMRC)	$415,807$AUD	Main investigator	2019-2021
National Foundation for Science and Techonology Development (NAFOSTED)	40,000 $USD	Co-investigator	2016-2018

Recognitions

Name of recognition, prize or award	Description of award	Year awarded
Sciene and Technology Award: Golden Globe 2022	Excellence in Science and Technology for Young Researchers (under 35 years old) in Vietnam. This is the most precious award in science in Vietnam for the young researcher	2022
First ranking award, National Conference for Young Researcher in Medical Science, Vietnam 2018	For the most recognized presentation at the national conference	2018
First ranking award, National Conference for Young Researcher in Medical Science, Vietnam 2016	For the most recognized presentation at the national conference	2016

Professional involvement

Name of body or committee	Brief description of engagement	Years active
Frontier in Public Health	Journal guest editor	2 years
Environment Research: Health	Journal Editor	2 years
MedpharmRes	Journal Editor	5 years

Career breaks: N/A

Supervision and mentoring
Supervision of 2 PhD students (University of Medicine and Pharmacy at Ho Chi Minh City)
Supervision of 6 MPH students (University of Medicine and Pharmacy at Ho Chi Minh City)

Publications
Select publications about climate change, air pollution impacts on health.

- **Dang TN**, Vy NTT, Thuong DTH, Phung D, Van Dung D, Le An P. Main and added effects of heatwaves on hospitalizations for mental and behavioral disorders in a tropical megacity of Vietnam. Environ Sci Pollut Res Int. 2022 Aug;29(39):59094-59103. doi: 10.1007/s11356-022-19898-1. Epub 2022 Apr 5. PMID: 35378653.

- Thuong DTH, **Dang TN**, Phosri A, Siriwong W, Dung TTT, Vy NTT, Kallawicha K. Fine particulate matter and daily hospitalizations for mental and behavioral disorders: A time-series study in Ho Chi Minh City, Vietnam. Environ Res. 2022 Oct;213:113707. doi: 10.1016/j.envres.2022.113707. Epub 2022 Jun 16. PMID: 35718167.

- Nguyen VT, Doan QV, **Dang TN,** et al. The protective effect of green space on heat-related respiratory hospitalization among children under 5 years of age in Hanoi, Vietnam. Environ Sci Pollut Res Int. 2022 Oct;29(49):74197-74207. doi: 10.1007/s11356-022-21064-6. Epub 2022 May 30. PMID: 35635669.

- **Dang TN**, Honda Y, Van Do D, Pham ALT, Chu C, Huang C, Phung D. Effects of Extreme Temperatures on Mortality and Hospitalization in Ho Chi Minh City, Vietnam. Int J Environ Res Public Health. 2019 Feb 2;16(3):432. doi: 10.3390/ijerph16030432. PMID: 30717328; PMCID: PMC6388260.

- Luong LMT, Phung D, **Dang TN**, Sly PD, Morawska L, Thai PK. Seasonal association between ambient ozone and hospital admission for respiratory diseases in Hanoi, Vietnam. PLoS One. 2018 Sep 24;13(9):e0203751. doi: 10.1371/journal.pone.0203751. PMID: 30248114; PMCID: PMC6152873.

- Van Gemert F, de Jong C, Kirenga B, Musinguzi P, Buteme S, Sooronbaev T, Tabyshova A, Emilov B, Mademilov M, Le An P, Quynh NN, **Dang TN**, Hong LHTC, Chartier R, Brakema EA, van Boven JFM; FRESH AIR. Effects and acceptability of implementing improved cookstoves and heaters to reduce household air pollution: a FRESH AIR study. NPJ Prim Care Respir Med. 2019 Aug 15;29(1):32. doi: 10.1038/s41533-019-0144-8. PMID: 31417087; PMCID: PMC6695425.

- Luong LTM, **Dang TN**, Thanh Huong NT, Phung D, Tran LK, Van Dung D, Thai PK. Particulate air pollution in Ho Chi Minh city and risk of hospital admission for acute lower respiratory infection (ALRI) among young children. Environ Pollut. 2020 Feb;257:113424. doi: 10.1016/j.envpol.2019.113424. Epub 2019 Oct 18. PMID: 31672367.

- Gasparrini A, Guo Y, Sera F, **Dang TN**, et al. Projections of temperature-related excess mortality under climate change scenarios. Lancet Planet Health. 2017 Dec;1(9):e360-e367. doi: 10.1016/S2542-5196(17)30156-0. PMID: 29276803; PMCID: PMC5729020.

- Vicedo-Cabrera AM, Guo Y, Sera F, **Dang TN**, et al. Temperature-related mortality impacts under and beyond Paris Agreement climate change scenarios. Clim Change. 2018 Oct;150(3-4):391-402. doi: 10.1007/s10584-018-2274-3. Epub 2018 Sep 13. PMID: 30405277; PMCID: PMC6217994.

- Kim Y, Kim H, Gasparrini A, **Dang TN**, et al. Suicide and Ambient Temperature: A Multi-Country Multi-City Study. Environ Health Perspect. 2019 Nov;127(11):117007. doi: 10.1289/EHP4898. Epub 2019 Nov 26. PMID: 31769300; PMCID: PMC6927501.

<u>Non-publication research outputs</u>

I published the scientific results into the mass media (e.g., newspapers, television, etc..):
- Báo thanh niên (Thanh Nien newspaper): <u>City people need to wear 2 masks when going out on the street</u>
- Báo pháp luật (Phap Luat newspaper): <u>Fine particulate matter 'killer' in Ho Chi Minh City: How to wear a protective mask?</u>
- Afamily: <u>Doctor of environmental health guides to choose and use masks properly on bad air quality days</u>

In the LASER PULSE project, I published a policy guidelines "A guide for schools on dealing with air pollution" for Vietnam

<u>Additional information</u>

Assoc. Prof Tran is a public health researcher, with his interest in investigating the effects of air pollution, climate change, and health as well as the interaction between environmental and genetic factors in the mechanisms of disease. Assoc. Prof Tran has the expertise and solid skills in biostatistics, environmental health risk assessment, and environmental epidemiology. He is involved with several projects funded through grant bodies in Vietnam (NAFOSTED, Ho Chi Minh City Department of Science), Australia (NHMRC), Europe (HORIZON 2020), America (USAID), in which he plays a role as a main investigator. In response to COVID 19, Assoc. Prof Tran g is seeking innovative solutions for the prevention of COVID 19 in Viet Nam, he is also a member of the Expert Committee providing consulting for COIVD-19 responses at the Center for Disease Control Ho Chi Minh City. His contribution to responding to COVID-19 has received the Contribution Award from the Ministry of Health in 2022.

NCD Prevention in Cities call:
Academic CVs

Personal Information

- n Name (including title): Dr. Kerry Nice
- n Email address: kerry.nice@unimelb.edu.au

Primary affiliation

University of Melbourne

Employment history

- n **Transport, Health and Urban Design (THUD) research lab, Faculty of Architecture, Building and Planning, University of Melbourne**
  2016-Present | *Research Fellow.*
  Research in urban design, transport, health, micro-climates, and urban green space using neural network machine learning, agent based modelling, and climate modelling.

- n **School of Earth, Atmosphere and Environment, Monash University/CRC for Water Sensitive Cities**,
  2016-2021| *Research Fellow*.
  Research in urban climates and human thermal comfort (HTC) with a focus on urban micro climate modelling and WSUD (water sensitive urban design).

- n **LexisNexis/Reed Elsevier-London, UK; Colorado, USA**
  2000 – 2008 | *Consulting Software Engineer.*
  Java J2EE engineering and design to develop enterprise publishing process flow applications.

Education and qualifications

Degree or qualification	Awarding institution	Year awarded
PhD	Monash University	2017
Master Environment and Sustainability	Monash University	2011
B.A.	University of Colorado	1990

Previous and current grant funding

Funding award type	Award amount	Role (*e.g.,* Principal investigator, co-Investigator)	Years of award
ARC Centre of Excellence: Agile Funding Grant Scheme	$100,000	CI	2022-2023
ARC Discovery	$422,000	CI	2021-2023
Swiss National Science Foundation	453,764 CHF	CI	2022-2024
NHMRC UKRI-NHMRC Built Environment And Prevention Research Scheme	$608,000	CI	2020-2023

Melbourne Energy Institute	$30,000	PI	2020
Graham Treloar Early Career Researcher Fellowship/ABP Research ECR Project Grant	$10,000	PI	2016

Professional involvement

Name of body or committee	Brief description of engagement with this body or committee (1-2 sentences)	Years active
International Association for Urban Climate (IAUC)	Membership and attendance of international conferences. Organization committee for international conferences.	11
Australian Meteorological and Oceanographic Society (AMOS)	Membership.	11
ARC CRC for Water Sensitive Cities	Associate investigator	8
ARC Centre of Excellence for Children and Families over the Life Course (Life Course Centre)	Associate investigator	1

Career breaks N/A

Supervision and mentoring
Supervision of 3 PhD students (Monash University and University of Melbourne). Supervision of 1 honours student (Monash University). Supervision of 10 Master of Information Technology capstone projects (University of Melbourne)

Publications
Selected publications on urban heat modelling, urban systems modelling, and urban infrastructure detection:

- K.A. Nice, N. Nazarian, M.J. Lipson, M.A. Hart, et al., Isolating the impacts of urban form and fabric from geography on urban heat and human thermal comfort, Building and Environment, 2022

- P.K. Cheung, C.Y. Jim, N. Tapper, K.A. Nice, S.J. Livesley, Daytime irrigation leads to significantly cooler private backyards in summer, Urban Climate, 2022.

- J.S. Wijnands, K.A. Nice, S. Seneviratne, J. Thompson, and M. Stevenson, The impact of the COVID-19 pandemic on air pollution, Atmospheric Pollution Research, 2022.

- J. Thompson, R. McClure, T. Blakely, N. Wilson, et al., Modelling SARS-CoV-2 disease progression in Australia and New Zealand, Australian and New Zealand Journal of Public Health, 2022.

- S. Seneviratne, K.A. Nice, J. Wijnands, J. Thompson, Mark Stevenson, Self-supervision, Remote Sensing and Abstraction, Digital Image Computing: Techniques and Applications 2021.

- J. Thompson, M. Stevenson, J. S. Wijnands, K. Nice, G.D.P.A. Aschwanden, et al., A global analysis of urban design types and road transport injury: an image processing study, The Lancet Planetary Health, 2020.

- K.A. Nice, J. S. Wijnands, A. Middel, et al., Sky pixel detection in outdoor imagery using an adaptive algorithm and machine learning, Urban Climate, 2020.

- J.S. Wijnands, H. Zhao, K.A. Nice, et al., Identifying safe intersection design through unsupervised feature extraction from satellite imagery, Computer-Aided Civil and Infrastructure Engineering, 2020.

- J. Wijnands, K. Nice, J. Thompson, H. Zhao, and M. Stevenson, Streetscape augmentation using generative adversarial networks: optimising health and wellbeing., Sustainable Cities and Society, 2019.

- K.A. Nice, A. Coutts, and N.J. Tapper, Development of the VTUF-3D v1.0 urban micro-climate model to support assessment of urban vegetation influences on human thermal comfort. Urban Climate, 2018.

Non-publication research outputs
Selected industry and CRC Reports:

- M. Siebentritt, M. Eadie, T. Watson, et al. (2022). Cool Suburbs: User Guide and Science Rationale. Western Sydney Regional Organisation of Councils

- K. Nice, (2021). Managing urban heat in water sensitive cities: research and policy responses. Melbourne, Australia: Cooperative Research Centre for Water Sensitive Cities.

- Fishermans Bend Taskforce (2020) Fishermans Bend Urban Ecology Study: Volume 1 September 2020.

- M.A. Renouf, S.J. Kenway, N. Bertram, et al. (2020) Infill Performance Evaluation Framework. Melbourne: Cooperative Research Centre for Water Sensitive Cities

- N. Tapper, S. Lloyd, J. McArthur, K. Nice, and S. Jacobs, (2019). Estimating the economic benefits of Urban Heat Island mitigation – Biophysical Aspects. CRCWSC Milestone Report. Melbourne, Australia

Additional information
Kerry's research currently focuses on the investigation of urban factors impacting the accessibility of active transport, assessing the impacts of urban vegetation on transport, health, and micro-climates, and using artificial intelligence, especially deep learning using neural networks, to assess the influence of urban characteristics on urban environments and ultimately on the people who live there.

Kerry previously worked as a senior and consulting software engineer for 13 years in Colorado, New York, and London focusing on building enterprise level multi-tiered workflow applications in Enterprise Java (J2EE).

He has been an active researcher full-time since 2016.

He is currently teaching two courses in the Faculty of Architecture, Building and Planning: Representing Spatial Information and Spatial Analytics

Personal Information

- Name (including title): Dr Nhung Thi Trang Nguyen
- Email address: ntn2@huph.edu.vn

Primary affiliation:
Hanoi University of Public Health

Employment history

- **Fundamental Sciences Faculty, Hanoi University of Public Health: Hanoi, Vietnam**
  2002- present | *Lecturer and Researcher*

  - Lecturing in biostatistics, data analysis and research methodology for master and bachelor of Public Health
  - Conducting research on environmental health and non-communicable diseases

- **The training and research institute for Child Health, Vietnam National Children's Hospital**
  2021- present | *Deputy director*

  - Manage and operate the scientific research activities for Vietnam National Children's Hospital
  - Conducting research relating to children's health at the Vietnam National Children's Hospital

Education and qualifications

Degree or qualification	Awarding institution	Year awarded
Doctor of Philosophy (PhD) in Epidemiology	Swiss Tropical and Public Health Institute University of Basel, Switzerland	2017
Master of Public Health Methodology	School of Public Health, Université Libre De Bruxelles, Brussels, Belgium	2007
Engineer of Mathematics- Applied Informatics	Hanoi University of Science and Technology, Hanoi, Vietnam	2001

Previous and current grant funding

Funding award type	Award amount	Role (*e.g.,* Principal investigator, co-Investigator)	Years of award
The Joint Programming Initiative on Antimicrobial Resistance (JPIAMR)	€500.000 EUR	CI	2022-2025
United States Agency for International Development (USAID)	$15'000 USD	PI	2021
National foundation for Science & Technology Develop (NAFOSTED);	$55'000 USD	PI	2020-2023
SSEAC-Vietnam Seed Research Grant	$10'000 AUD	PI	2019-2021
United States Agency for International Development (USAID)	$15'000 AUD	PI	2019-2020

Recognitions

Name of recognition, prize or award	Description of award	Year awarded
Vietnam Ministry of Health	Distinction achievement on science research and teaching	2021
Vietnam Ministry of Health	Distinction achievement on science research and teaching	2016

Career breaks: N/A

Supervision and mentoring

Supervision of one PhD student, 42 Master's students at the University of Public Health

Publications

Selection publication relating to the proposal

- **Nhung NTT,** Duc VT, Ngoc VD, Dien TM, Hoang LT, Ha TTT, Khue PM, Truong NX, Thanh NTN, Jegasothy E, Marks GB, Morgan G. Mortality benefits of reduction fine particulate matter in Vietnam 2019. *Frontier of Public Health* 2022; 10.

- **Nhung N.T.T**, Jegasothy E, Ngan NTK, Truong NX, Thanh NTN, Marks GB, Morgan GG. Mortality Burden due to Exposure to Outdoor Fine Particulate Matter in Hanoi, Vietnam: Health Impact Assessment. *International Journal of Public Health* 2022; 67.

- Nguyen, Q. A., T. H. Nguyen, J. Beardsley, C. D. Castle, A. K. Dang, Z. V. Dingels, J. T. Fox, C. L. Hoang, S. Lewycka, Z. Liu, A. H. Mokdad, **N. T. T. Nguyen**, S. H. Nguyen, H. Q. Pham, N. L. S. Roberts, D. O. Sylte, B. X. Tran, K. B. Tran, G. T. Vu, S. L. James and T. H. Nguyen (2020). "Burden of injuries in Vietnam: emerging trends from a decade of economic achievement." Injury Prevention: injuryprev-2019-043352.

- **Nhung, N. T. T**., C. Schindler, N. Q. Chau, P. T. Hanh, L. T. Hoang, T. M. Dien, N. T. N. Thanh and N. Künzli (2020). "Exposure to air pollution and risk of hospitalization for cardiovascular diseases amongst Vietnamese adults: Case-crossover study." Science of The Total Environment **703**: 134637.

- Amini, H., **Nhung. NTT**, C. Schindler, M. Yunesian, V. Hosseini, M. Shamsipour, M. S. Hassanvand, Y. Mohammadi, F. Farzadfar, A. M. Vicedo-Cabrera, J. Schwartz, S. B. Henderson and N. Künzli (2019). "Short-term associations between daily mortality and ambient particulate matter, nitrogen dioxide, and the air quality index in a Middle Eastern megacity." Environmental Pollution: 113121.

- **Nhung, N. T. T.,** C. Schindler, T. M. Dien, N. Probst-Hensch and N. Künzli (2019). "Association of ambient air pollution with lengths of hospital stay for Hanoi children with acute lower-respiratory infection, 2007–2016." Environmental Pollution **247**: 752-762. doi:https://doi.org/10.1016/j.envpol.2019.01.115.

- Thanh NTN, Ha Le, Tra MTM, **Nhung NTT**, Ha PV, Hung BQ. Current status of PM2.5 pollution and its mitigation in Vietnam. *Global Environmental Research.* 2018;22(1&2).

Non-publication research outputs

- Findings from health impact assessment of air pollutants in Hanoi had hand over to Hanoi Environmental Protection (Hanoi EPA) for the establishment of an Air Quality Management Plan.
- Methodology of health impact assessment has been used to develop the training curriculum for student at Hanoi University of Public Health

Additional information

Dr Nhung received her PhD in Epidemiology in Switzerland in 2017. She has worked as a data analyst on studies that were. conducted at Hanoi University of Public Health (e.g. Vietnam National Injury Survey 2002, Vietnam National Injury Survey 2010, Vietnam Evidence for Health Policy, Injury survey in children in Vietnam). Recent year, In recent years, her research areas have mainly focused on health impact assessment of air pollution and some environmental factors. She has 20 published papers in international journals and 30 Vietnam national papers. She is the leader of a research team on the health effects of ambient air pollution in Vietnam.

Since 2021, Ms Nhung joined the Vietnam National Children's Hospital as Deputy Director with the role of science activity management. She has been certified by the by Vietnam Ministry of Health to conduct clinical trials.

Personal Information

- n Name (including title)**:** Dr Dominika Kwasnicka
- n Email address**:** dom.kwasnicka@unimelb.edu.au

Primary affiliation

University of Melbourne.

Employment history

- n **Digital Health at the Nossal Institute for Global Health, Melbourne School of Population and Global Health, University of Melbourne, Australia**
  2020 – present | *Senior Research Fellow*

- n **Faculty of Psychology, SWPS University of Social Sciences and Humanities, Poland**
  2019 – present | *Senior Research Fellow funded by the Foundation for Polish Science*

- n **Curtin University, Australia**
  2017 – 2019 | *Research Fellow funded by Healthway, The West Australian Health Promotion* Foundation

- n **Curtin University and Central Queensland University, Australia**
  2015 – 2017 | *Postdoctoral Research Fellow funded by the Health Collaborative Research Network, Australia.*

- n **Newcastle University, United Kingdom.**
  2014 – 2015 | *Research Associate funded by the Medical Research Council, United Kingdom.*

Education and qualifications

Degree or qualification	Awarding institution	Year awarded
Doctor of Philosophy in Health Psychology and Behavioural Medicine	Newcastle University, England	2015
Master of Science in Public Health and Health Services Research	Newcastle University, England	2014
Master of Arts, Psychology	University of Aberdeen, Scotland	2010

Previous and current grant funding (selected)

Funding award type	Award (in AUD)	Role	Years of award
Active Women over 50: An effectiveness-implementation randomised controlled trial. MRFF Effective Treatments and Therapies (Stream 1).	1,210,256.00	Co-Investigator	2023 - 2026
Active Women over 50 in rural, regional and remote areas: an effectiveness-implementation trial. MRFF Dementia Ageing and Aged Care Mission (Stream 2).	1,218,977.00	Co-Investigator	2023 - 2026
Scale-up of the *Australian Fans in Training* men's health behaviour change program: A randomized controlled hybrid implementation trial. Funded by The Australian Heart Foundation.	1,000,000.00	Associated-Investigator	2022 - 2025
DigiCare4You - An intersectoral innovative solution involving DIGItal tools, empowering families and integrating community CARE services for the prevention and management of type 2 diabetes and hypertension (GNT2007006) funded by NHMRC - European Union.	489,307.09	Co-Investigator	2021 - 2026

How can we improve implementation of digital care solutions to transform the care of chronic conditions? Funded by the Novo Nordisk Foundation, Denmark.	70,390.00	Co-Investigator	2021 - 2022
Connect Up. Technology, Talk and Touchline. Strengthening social linkage, inclusion and physical activity through innovative online platforms, funded by the Community Grants Hub, the Department of Social Services, Australian Government.	670,660.00	Principal investigator	2021 - 2024
Digital technologies to measure and promote sustainable health behaviour change, funded by the University of Melbourne and Berlin University Alliance, through the German Government Excellence Strategy.	54,000.00	Principal investigator	2021 - 2021
Harnessing information technology to improve self-management behaviours and health outcome in people with heart failure: A smarthome ecosystem Living Lab Study; NHMRC Ideas Grant (2004316).	1,120,225.80	Principal investigator	2021 - 2024
Acceptability and feasibility of risk guidance in acute myocardial infarction via a technology enabled disease management program, funded by the Baker Department of Cardiometabolic Health (11638).	200,000.00	Co-Investigator	2021 - 2023
Exploring health issues associated with rotation/FIFO work employing intensive longitudinal assessment methods. Global Health studentship, Curtin University – Aberdeen University Alliance.	80,000.00	Co-Investigator	2019 - 2023
Choosing Health: A theory-based online-delivered intervention to promote weight loss maintenance: A within person randomised controlled trial. Funded by the Foundation for Polish Science through the EU European Structural and Investment Funds, Poland. (POIR.04.04.00- 00-5CF3/18-00).	336,846.04	Principal investigator	2019 - 2022
Investigating within-person patterns and trajectories of dual e-cigarette and tobacco use: a mixed methods study. Funded by Cancer Research UK Tobacco Advisory Group, England.	105,684.92	Co-Investigator	2019 - 2020

Recognitions

Name of recognition, prize or award	Description of award (What work was being recognised?)	Year awarded
The Ministry of Science and Education Award, Poland	Awarded by the Polish Ministry of Science and Education to top 200 Early Career Researchers working in Poland across different disciplines.	2020
The Stan Maes Early Career Researcher Award	Awarded by the European Health Psychology Society (EHPS) to acknowledge exceptional Early Career Researchers for their contribution to health research.	2019
The Herman Schaalma Award	Awarded by the EHPS to acknowledge the best PhD dissertation in the field of health psychology, addressing key challenges in health behaviour research and adopting novel and rigorous theory and methodology.	2016

Professional involvement

Name of body or committee	Brief description of engagement	Years
Open Digital Health	Director and Co-Founder of this not-for-profit organization aiming to accelerate digital health through open sharing of evidence-based digital health tools.	2018 - current

Health Redesigned Pty Ltd	Chief Executive Officer, research and evaluation consultancy, digital health and behavioural science.	2020 - current
European Health Psychology Society	Executive Committee Member responsible for coordinating National Delegates from 45 countries.	2020 - current
Society of Behavioral Medicine	Council Member of the Communications and Publications Advisory Group	2020 - 2022
Society of Behavioral Medicine	Committee Member of the Open Science Working Group - formulating society recommendations	2019 - 2020

Career breaks

2017-2019: working at 0.6FTE due to caring commitments
2020-2023: working remotely due to COVID-19 pandemic

Supervision and mentoring

Past: I have co- supervised 5 undergraduate students at Curtin University and co-supervised 1 Master student at the University of Melbourne to completion. I coordinated and trained 6 coaches, 15 research assistants, and 2 research nurses working across different research projects.
Current: I am currently a co-supervisor of 2 PhD students, working on projects that I proposed and secured funding for. I am also a co-leader overseeing *the Connected Health* Centre for Research Excellence Trainees program providing ongoing mentorship to the Trainees (approx. 25 members).
Published a book: Kwasnicka D. & Lai A. (2022) *Survival Guide for Early Career Researchers*, New York, Springer, 1st Ed. DOI: 10.1007/978-3-031-10754-2

Publications (in the last 5 years – 50 in total, relevant ones listed below)

- Shoneye, C. L., **Kwasnicka, D.**, Mullan, B., Pollard, C. M., Boushey, C. J., & Kerr, D. A. (2022). Dietary assessment methods used in adult digital weight loss interventions. *Journal of Human Nutrition and Dietetics.* DOI: 10.1111/jhn.13101
- Seneviratne, S., Desloge, A., Haregu, T., **Kwasnicka, D.**, Kasturiratne, A., Mandla, A., Chambers, J., Oldenburg, B. (2022). Characteristics and Outcomes of Community Health Worker Training to Improve the Prevention and Control of Cardiometabolic Diseases in Low and Middle-Income Countries. *INQUIRY,* 1-15. DOI: 10.1177/00469580221112834
- **Kwasnicka, D.**, *et al.* (2022). White Paper: Open Digital Health–accelerating transparent and scalable health promotion and treatment. *Health Psychology Review*, 1-37. DOI: 10.1080/17437199.2022.2046482
- **Kwasnicka, D**., *et al.* (2020). Theory-based digital intervention to promote weight loss and weight loss maintenance (Choosing Health). *BMJ Open*, *10*(11), e040183, DOI: 10.1136/bmjopen-2020-040183
- **Kwasnicka, D.,** *et al.* (2020). A gender-sensitised weight-loss and healthy living program for men with overweight and obesity in Australian Football League settings (Aussie-FIT). *PLoS Medicine*, *17*(8), e1003136. DOI: 10.1371/journal.pmed.1003136

Non-publication research outputs

- **Training Package:** *Moving towards precision behavioural science* training in novel personalised research methods delivered to approx. 600 researchers, healthcare professionals, and policymakers
- **Book: Kwasnicka D.** & Sanderman R. (2021) Psychological Insights for Understanding Covid-19 and Health, London, Routledge, 1st Ed, Taylor & Francis Ltd DOI: 10.4324/9781003119951
- **Book: Kwasnicka D.,** *et al.* (2021), Practical Health Psychology: Translating Behavioural Research to Practice. Vol.1. DOI: 10.17605/OSF.IO/M72P5

Additional information

I am a full-time researcher, working across countries, health conditions and topic areas with a main focus on implementation science, digital health and behavioural science. Currently, I work part-time at Minderoo (not-for-profit organization) developing a bespoke impact evaluation of Thrive by Five International – an early childhood development health promotion program implemented in 30 lower-middle-income countries. I lead the Practical Health Psychology, an online international publication that informs healthcare professionals about the most topical findings in behavioural science research (www.practicalhealthpsychology.com). The publication is translated into 30 languages and disseminated across 65 countries, with 120,000 readers annually.

Personal Information

- Name (including title): Dr Thanh Phuong Ho
- Email address: thanh.ho@unimelb.edu.au

Primary affiliation
University of Melbourne

Employment history

- **Transport, Health and Urban Design (THUD) research lab, Faculty of Architecture, Building and Planning, University of Melbourne**
  2018-Present | *Researcher and Research Assistant.*
  Research in urban design, active transport, urban health, air pollution and architecture.

- **Faculty of Architecture and Engineering, Phuong Dong University**
  2014-2018 | *Lecturer and researcher*
  Teach and research in architecture, urban design and urban planning.

- **Department of Architecture and Urban Studies (DASTU), Politechnico di Milano**
  2012-2013 | *Tutor and Research Assistant*
  Teach and research in architecture, urban design and urban planning.

Education and qualifications

Degree or qualification	Awarding institution	Year awarded
PhD *Doctor of Philosophy in Urban Design, Sustainable Architecture, Urban analysis and development, Transport Planning*	**University of Melbourne**	**2023**
Master of Science *Master of Science in Urban Design and Sustainable Architecture*	**Politechnico di MIlano**	**2013**
Bachelor of Science *Bachelor of Science in Architecture*	**Hanoi Architectural University**	**2011**

Previous and current grant funding

Funding award type	Award amount	Role (*e.g.,* Principal investigator, co-Investigator)	Years of award
Australia Research Council Centre of Excellence for Children and Families over the Life Course (Life Course Centre	32m (5 years).	R.A	2022-2027
Australian Research Council (ARC) Linkage Grant	$560,000 (3 years)	R.A	2020-2023
Australian Research Council (ARC) Linkage Grant	$550,000 (3 years)	R.A	2017-2020

Professional involvement

Name of body or committee	Brief description of engagement	Years
The Australian Research Council (ARC) Centre of Excellence for Children and Families over the Life Course (the Life Course Centre)	Member	2022 - current

Career breaks N/A

Supervision and mentoring

Mentoring and supervising undergraduate students.

Publications

5 recent relevant publications

- Stevenson, M., Thompson, J., & **Ho**, T.P. (2023). Big Data and Urban Health. In *Oxford Research Encyclopedia of Global Public Health*.
- Lowe, M., Adlakha, D., Sallis, J. F., Salvo, D., Cerin, E., Moudon, A. V., **Ho, T.P** ... & Giles-Corti, B. (2022). City planning policies to support health and sustainability: an international comparison of policy indicators for 25 cities. *The Lancet global health,* 10(6), e882-e894.
- Boeing, G., Higgs, C., Liu, S., Giles-Corti, B., Sallis, J. F., **Ho, T.P**,... & Arundel, J. (2022). Using open data and open-source software to develop spatial indicators of urban design and transport features for achieving healthy and sustainable cities. *The Lancet Global Health*, 10(6), e907-e918.
- Stevenson, M., Thompson, J., Godic, B., & **Ho, T.P** (2021). City Design and the Transmission of COVID-19. In *COVID-19 Pandemic, Geospatial Information, and Community Resilience* (pp. 137-144). CRC Press.
- **Ho, T. P**., Stevenson, M., Thompson, J., & Nguyen, T. Q. (2021). Evaluation of Urban Design Qualities across Five Urban Typologies in Hanoi. *Urban Science,* 5(4), 76.

Non-publication research outputs
Outputs on different media platforms from results of research
- **Ho, T.P**. & Nguyen, T.Q. Green architecture and sustainable development from Asian experience: technology or vernacular wisdom?. *Architecture Magazine of Vietnam Association of Architects*. 2017; N05.2017, P13-19.
- **Ho, T.P**. & Nguyen, T.Q. Happiness through architecture. Architecture Magazine of Vietnam Association of Architects. 2017; N05.2017, P84-89.
- **Ho, T.P**., Nguyen, T.Q. Zaha Hadid: Methods of architecture designs. Architecture Magazine of Vietnam Association of Architects. 2017, N03.2017, P100-107.
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Additional information
Dr. Thanh Ho is an early career researcher and one of the key members of the Transport, Health and Urban Design Research Lab at the University of Melbourne since 2018. His doctoral degree and current research focus on the relationship between urban design, public health, urban air and noise pollution, and physical activities (particularly walking) in cities of low- and middle-income countries in Asia. He has published various peer-reviewed articles and book chapters in international journals and publishers including The Lancet Global Health and Urban Science. His research has been also acknowledged and enhanced through his presentations at international conferences, as well as his participation in international research networks. Dr Ho is a regular peer reviewer for high-quality academic international journals such as Sustainability and Land. In addition to his research, Dr Ho is also involved in teaching architecture, urban design, urban science and research method courses at undergraduate and postgraduate levels, and practising professionally as an architect and urban designer in Vietnam, Italy and Australia.

Global Alliance for Chronic Diseases
Wellcome
215 Euston Road
London NW1 2BE
United Kingdom

3 June 2023

Re: Confirmation of University of Melbourne support for the NHMRC-Global Alliance for Chronic Diseases (GACD): Non-Communicable Disease Prevention in Cities Funding Call 2023 – [CI Stevenson – Air pollution and non-communicable disease: city-wide implementation to reduce transport emissions].

The University of Melbourne is pleased to support the project mentioned above in the NHMRC-GACD 2023 funding scheme and the University's role as the Administering Organisation for this grant should this application be successful.

About the University of Melbourne

Established in 1853, the University of Melbourne is Australia's leading research and teaching university. It is a founding member of the Group of Eight – Australia's leading research-intensive universities – and is consistently ranked among the leading universities in the world for research and teaching. With over 100 research centres and institutes (including 9 hospital partners/hospital-based departments), over 9,000 full time equivalent staff and over 50,000 students, we bring together expertise from across the University and connect with thought leaders around the world to tackle society's complex problems in innovative ways.

The University is deeply committed to translational medical research that improves health and economic outcomes for Victoria by building on our existing partnerships with health services, industry and medical research institutes.
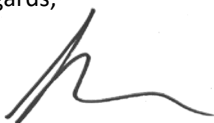
Project Proposal

There is an urgency to implement known and efficacious interventions to mitigate the chronic health effects of air pollution. The urgency is paramount for populations living in low- and middle-income countries (LMICs) who are disproportionately exposed to the burden of air pollution. The proposed research will implement an intervention in Vietnam that delivers personalised emissions feedback and financial incentives to change driving behaviours and hence vehicle emissions, a leading cause of air pollution. We will apply the Active Implementation Frameworks incorporating co-design with industry, policymakers, and implementation research scientists, along with applying mixed methodologies including a randomised implementation trial to enact city-wide reductions in air pollution.

Overview of the University of Melbourne's contribution

Subject to the impacts of COVID-19, the University of Melbourne will commit resources and research expertise as detailed in the application. The University of Melbourne also confirms it can meet the minimum Public Liability and Professional Indemnity insurance requirements should this application be successful.

The attached proposal is highly synergistic with the University's research aspirations as outlined in our strategic plan, _Advancing Melbourne 2030_. We enthusiastically commit to leading, supporting and participating in this proposed project.

Kind regards,

Frank Anastasopoulos, Director
Research Grants, Contracts and Finance
The University of Melbourne

Environmental Quality Management Division
The Pollution Control Department, Ministry of Natural and Resources Environment
Address: 10 Ton That Thuyet street, Nam Tu Liem district, Hanoi, Vietnam

Date: 5/29/2023

Dear Sir/Madam,

Re: Letter of Support
NHMRC- 2023 Global Alliance for Chronic Diseases Grant Application – App ID 2027451

On behalf of Environmental Quality Management Division, Pollution Control Department, Ministry of Natural and Resources Environment, please accept this letter of support for the research team in their application for NHMRC- 2023 Global Alliance for Chronic Diseases Grant.

The Ministry of Natural Resources and Environment is an agency of the Government, performing the function of state management in the fields of: land; water resources; mineral resources and geology; environment; meteorology and hydrology; climate change; survey and mapping; integrated management and protection of natural resources and environment of seas and islands; remote sensing; state management of public services in the fields of the Ministry's management.

Environmental Quality Management Division, Pollution Control Department, Ministry of Natural Resources and Environment strongly supports the proposed project which will utilise personalised emission feedback and smart financial incentives to reduce transport-related air pollution in Vietnam. We believe that this innovation project will help us to better understand eco-driving behaviors, transport-related air pollution and potential measures that can help to mitigate emissions, and ultimately improve health outcomes. It is nesscesary for Vietnam and other low and middle income countries in improving transport safety and sustainable mobility.

If you require more information about Environmental Quality Management Division, Pollution Control Department, Ministry of Natural and Resources Environment, please contact us via email: pcd@monre.gov.vn

Sincerely,

Ms Nguyen Hoang Anh,
Head of Environmental Quality Management Division
Pollution Control Department
Ministry of Natural and Resources Environment

urban analytica

3 June 2023

Global Alliance for Chronic Diseases
Wellcome
215 Euston Road
London NW1 2BE
United Kingdom

Re: Confirmation of Urban Analytica's support of the NHMRC-Global Alliance for Chronic Diseases (GACD): Non-Communicable Disease Prevention in Cities Funding Call 2023

As the Managing Director of Urban Analytica Pty Ltd, this letter confirms our support for the implementation study proposed by a renowned research team from Australia and Vietnam led by Professor Stevenson. UA has invested extensively in time and funding to research, and develop practical, low-cost tools for reducing vehicle emissions. We are delighted therefore, to partner with the research team to deliver our technology in Vietnam.

The research outlined in the proposal is innovative and utilises our technology well, and we have no doubt it will deliver sustainable reductions in vehicle emissions, which is urgently needed to reduce the growing health burden associated with chronic diseases arising from air pollution in Vietnam.

In discussion with the research team at the University of Melbourne and colleagues in Vietnam including the taxi industry, UA has agreed that:

1. the funding allocated in the budget will meet the requirements to develop the technology for delivery in Vietnam; and

2. we support the submission of this grant and have agreed to work closely with the investigators and industry partners to deliver the technology as required and outlined in the proposed timeframe.

If you require further details, please do not hesitate to contact me.

Yours sincerely,

Mr Frank Peppard
Managing Director
Urban Analytica Pty Ltd

Vietnam National Traffic Safety Committee
Address: 80B Tran Hung Dao street, Hoan Kiem district, Hanoi, Vietnam

Date: 5/29/2023

Dear Sir/Madam,

Re: Letter of Support
NHMRC- 2023 Global Alliance for Chronic Diseases Grant Application – App ID 2027451

On behalf of National Traffic Safety Committee Vietnam, please accept this letter of support for the research team in their application for NHMRC- 2023 Global Alliance for Chronic Diseases Grant.

National Traffic Safety Committee is an inter-agency coordinator 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. The committee is tasked with instructing and inspecting the implementation of plans and solutions to ensure traffic safety and order by the traffic safety committees of the provinces and centrally-run cities. The committees also propose or directly resolve local petitions to deal with situations or incidents to ensure traffic safety and prevent traffic congestion.

National Traffic Safety Committee Vietnam strongly supports the proposed project which will utilise personalised emission feedback and smart financial incentives to reduce transport-related air pollution in Vietnam. The committee believe that this innovation project will help us to better understand eco-driving behaviors, transport-related air pollution and potential measures that can help to mitigate emissions, and ultimately improve health outcomes. It is nesscesary for Vietnam and other Low and middle income countries in improving transport safety and sustainable mobility.

If you require more information about the National Traffic Safety Committee Vietnam, please contact us via email: hminh_utc@yahoo.com

Sincerely,

CHÁNH VĂN PHÒNG

Trần Hữu Minh

Tran Huu Minh
Chief of the Office,
National Traffic Safety Committee Vietnam