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Road Safety Data Assessment in
Viet Nam for the Establishment of a
National Road Safety Observatory

Final Report

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***Road Safety Data Assessment in Viet Nam
for the establishment of a National Road
Safety Observatory***

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Acronyms

ABP2	-	Australian Bank Partnership
ADB	-	Asian Development Bank
API	-	Application Programming Interface
APRSO	-	Asia-Pacific Road Safety Observatory
ASEAN	-	Association of South East Asian Nations
BRII	-	Building and Road Research Institute
CADaS	-	Common Accident Database
CAS	-	Crash Analysis System
CRVS	-	Civil Registration and Vital Statistics
CSV	-	Comma Separated Value
DFAT	-	Department of Foreign Affairs and Trade
DRIVER	-	Data for Road Incident Visualization Evaluation and Reporting
DRVN	-	Directorate for Roads of Viet Nam
FARS	-	Fatality Analysis Reporting System
GBD	-	Global Burden of Disease
GIDC	-	Government Integrated Data Center
GIS	-	Geographic Information Systems
GPS	-	Global Position System
GRSF	-	Global Road Safety Facility
GoVN	-	Government of Viet Nam
ICT	-	Information Communications Technology
iRAP	-	International Road Assessment Program
IRTAD	-	International Traffic Safety Data and Analysis Group
ITF	-	International Transport Forum
MIROS	-	Malaysian Institute of Road Safety Research
MHROADS	-	Malaysian Highway Road Accident Analysis and Database System
MAAP 5	-	Microcomputer Accident Analysis Package
MoF	-	Ministry of Finance
MoH	-	Ministry of Health
MoJ	-	Ministry of Justice
MoPI	-	Ministry of Planning and Investment
MoPS	-	Ministry of Public Security
MoT	-	Ministry of Transport
M-ROADS	-	MIROS Road Accident Analysis and Database System

NH1A	-	National Highway 1A
NRSO	-	National Road Safety Observatory
NRSP	-	National Road Safety Portal
NTSC	-	National Traffic Safety Committee
OECD	-	Organization for Economic Cooperation and Development
PPA	-	People's Police Academy
PRS	-	Police Reporting System
RCVIS	-	Road Crash and Victim Information System
STRADA	-	Swedish Traffic Accident Data Acquisition
SDG	-	Sustainable Development Goals
ToR	-	Terms of Reference
TDSI	-	Transport Development and Strategy Institute
UN	-	United Nations
VRD	-	Viet Nam Register Department
WHO	-	World Health Organization

Executive Summary

The World Bank has been assisting the Government of Viet Nam (GoVN), through the National Traffic Safety Committee (NTSC), to establish a National Road Safety Observatory (NRSO) for Viet Nam, improve road safety data systems, and update the National Road Safety Strategy and Action Plan for Viet Nam.

Input to the updated national strategy observed that there is insufficient attention given to the overall results framework (beyond simply the number of fatalities and serious injuries) that is required to achieve significant and sustainable reductions in serious road trauma. This reflects a need to strengthen both national governance and leadership arrangements for road safety, and road safety data systems (including road crash data systems), which are the focus of this report.

Establishing a National Road Safety Observatory

An institutional analysis was undertaken as part of the preparation for the establishment of the NRSO. The NTSC provides an essential governance and leadership role for road traffic safety in Viet Nam, and needs support through increased road safety lead agency capacity within the NTSC Office. The mandate and resourcing of the national road safety lead agency is a critical factor in a country's road safety progress.

The NTSC is focused on all aspects of traffic safety, not just road traffic safety. This means that despite the thousands of road traffic fatalities in Viet Nam each year, road traffic safety must formally compete for attention within an overall traffic safety portfolio. Unlike the other transport modes, there is no single administrative arm of the GoVN dedicated to road traffic safety in Viet Nam.

The NTSC demonstrates very strong political support for road traffic safety, with clear responsibilities assigned to the Deputy Prime Minister, the Transport Minister and other senior political figures. This political support needs to be backed up by a stronger governance system and improved road safety management within its office. The inter-agency "Board" function performed by the NTSC itself needs to be backed up by an inter-agency "Executive" function, with a regular meeting of agency leaders to support joint Ministerial decision making, supported by a dedicated professional road traffic safety Secretariat, established within the NTSC Office. A regular National Road Safety Forum is also proposed for discussion of road traffic safety issues with stakeholders outside government. These reforms will improve horizontal coordination of road traffic safety issues, strengthen road safety management capacity, and allow very busy Ministers to achieve more in the course of their quarterly NTSC meetings.

The establishment of the NRSO, operating under delegation from the NTSC, provides a critical opportunity to strengthen the essential road safety lead agency function for Viet Nam. As well as strengthening road safety management capacity, the establishment of the NRSO will improve inter-agency governance oversight of road safety data systems. This governance role supports existing responsibilities, such as the management of the crash database system by the Ministry of Public Security's (MoPS) and improve the integration and sharing of appropriate road safety data amongst government and non-government stakeholders.

Recommendations

It is recommended that:

1. The functions and powers of the NTSC are strengthened to support the road safety goals of the GoVN;
2. An NRSO is established with a professional dedicated secretariat either through an extension of the functions and powers of the NTSC, or through an established inter-sectoral agency as a component of the NTSC;
3. The NTSC appoints a minimum of five and maximum of seven members of the NRSO, comprising senior level representatives from each of the three core Ministries – Ministry of Transport (MoT), MoPS, and the Ministry of Health (MoH) – and senior representatives from other key national stakeholders;
4. The Chairman of the NTSC appoints one of the three NTSC Vice Chairmen as Chairman of the NRSO;
5. The NRSO is responsible, under delegation from the NTSC, for:
 - a. Leading the development, implementation and evaluation of national road safety strategies and plans;
 - b. Sharing and analyzing road safety data, including the establishment and maintenance of a National Road Safety Portal (NRSP), in coordination with the ministries who each have their own assigned responsibilities in data collection and management;
6. The Chairman of the NRSO convenes a regular meeting of a National Road Safety Forum, comprising government and non-government stakeholders who are committed to Viet Nam's national road safety goals;
7. The NTSC Executive Vice Chairman establishes a professional dedicated NRSO Secretariat, and appoints a head of that Secretariat;
8. Amendments are made to the relevant legal and administrative instruments in accordance with the recommendations which are adopted.

Strengthening Road Safety Data Systems

Comprehensive road safety data is critical to achieving Viet Nam's road safety goals. The establishment of the Traffic Accident Database system by the Ministry of Public Security was a major step forward. An observational study was conducted with the support of the MoPS and MoH to help understand the next best steps in road crash data management for Viet Nam, and this was supplemented by consultation with various stakeholders.

Official data has shown that fatalities have been steadily decreasing in recent years from a high of 12,800 in 2007 to 8,200 in 2020, however this data is considered to be underreported. The 2018 Global Status Report on Road Safety produced by the World Health Organization (WHO) estimated that road fatalities in Viet Nam are three times higher than the official number. Over the course of the last decade, some members of the Association of Southeast Asian Nations (ASEAN) appear to have closed the gap between their national reporting systems and the WHO estimates, however this gap appears to be increasing in Viet Nam. The country's road crash data system now needs to be strengthened in terms of accuracy, completeness, and accessibility.

Road safety data need to continually improve: more reliable data needs to be collected, access and sharing of data must be expanded to all road safety stakeholders; data must facilitate the identification, development, implementation, and evaluation of road safety initiatives. This includes crash data, safety performance indicators, exposure data, and other types of data relevant to road safety.

Improved road safety data collection is essential for each of the three major agencies (MoPS, MoH and MoT) who collect different types of data. Recommendations for improvement of road safety data management in Viet Nam are based on the following principles:

- Data must be used for the development and ongoing evaluation of comprehensive and evidence-based road safety programs;
- Improvements need to address technology and institutional arrangements, and be sustainable;
- Data must be integrated and shared with and easily accessible to stakeholders;
- Data collection and analysis processes must be easy-to-follow, comprehensive and accurate.

While there is no needed change to the current data responsibilities assigned to the government agencies, the establishment of the NRSO, operating under delegation from the NTSC, provides an important opportunity to strengthen Viet Nam's overall road safety data management system. Specifically, it is proposed that an NRSP is established by the NRSO as a hub for sharing road safety data in Viet Nam, most critically with the government ministries who are responsible for road safety.

A workplan has been prepared to establish the NRSO, and this includes projects to further improve road safety data systems such as a logical framework linking delivery of outputs to intermediate safety outcomes, regular reporting, observational surveys, and a road safety research program.

Recommendations

It is recommended (with further detail set out in the report) that:

1. An NRSP is developed within the NRSO which:
 - a. Brings together crash data from MoPS with road data from MoT, enforcement data, safety performance data, International Road Assessment Program (iRAP) star ratings, and data from researchers;
 - b. Shares these data to all relevant road safety stakeholders including researchers, non-government organizations, academia, media, and most critically, to government ministries;
 - c. Provides analytical tools to transform these data into meaningful decisions in road safety;
2. A series of improvements in data collection, resources, and indicators are made regarding the Traffic Accident Database (TAD) in the MoPS;
3. A data collection improvement project is initiated, including the preparation of a single simplified crash data form which to the greatest extent possible, eliminates recording or encoding error;
4. Traffic Police are equipped with a GPS device to record the exact location of a crash;
5. Crash severity levels (Fatality, Serious Injury, Slight Injury, Property Damage) are re-defined, and a fatality is defined as occurring within 30 days of a crash;
6. All police stations have laptops/computers, internet connection, and a working Traffic Accident Database system;
7. In connection, with the TAD of MoPS, the MoH also needs to establish its own national injury and health database which should connect to the TAD in the future. Crash data elements, their definitions, and methods for collection must also be standardized and agreed upon by the ministries through consultations and workshops;
8. The MoPS should regularly and manually cross-check MoH data with the data in TAD until the national injury database is operational;

9. MoH must also undertake a data improvement program in properly classifying cause-of-deaths;
10. Other legal and administrative instruments are changed in accordance with those recommendations which are adopted.

Implementation

This report includes extensive advice on legislative requirements, proposed functions and powers of the NTSC, the staffing and training requirements for the establishment of the NRSO and its Secretariat, a Handbook to guide implementation of reforms, as well as capacity building and budget proposals. Significant road safety data resources have also been prepared to support implementation of the recommendations, including a Terms of Reference for an information and communications technology (ICT) project to establish the NRSP.

A workplan has been prepared to implement recommendations on the establishment of an NRSO and an NRSP sequenced into four phases.

- Phase 1: Approve (Year 1)
- Phase 2: Initiate (Years 1 & 2)
- Phase 3: Demonstrate (Year 3 onwards)
- Phase 4: Strengthen (Year 4 onwards).

An estimated budget has been prepared (in US dollars).

Year 1	Year 2	Year 3	Year 4	Total
\$310,000	\$375,000	\$545,000	\$755,000	\$1,985,000

Phases 1-3 assume the use of third-party contractors to assist existing staff within NTSC to deliver the establishment tasks and activities and begin delivery of the ongoing tasks and activities. This is because of the current difficulty associated with creating the additional permanent positions required, and the need to make rapid progress in establishing the NRSO and strengthening road safety data management systems. It is important that priority is given in Phase 4 to converting these consulting roles into ongoing positions which will sustainably build the capacity of the NRSO over time. This is reflected in capacity building proposals, where a train the trainer approach is proposed to build sustainable training capacity into the future.

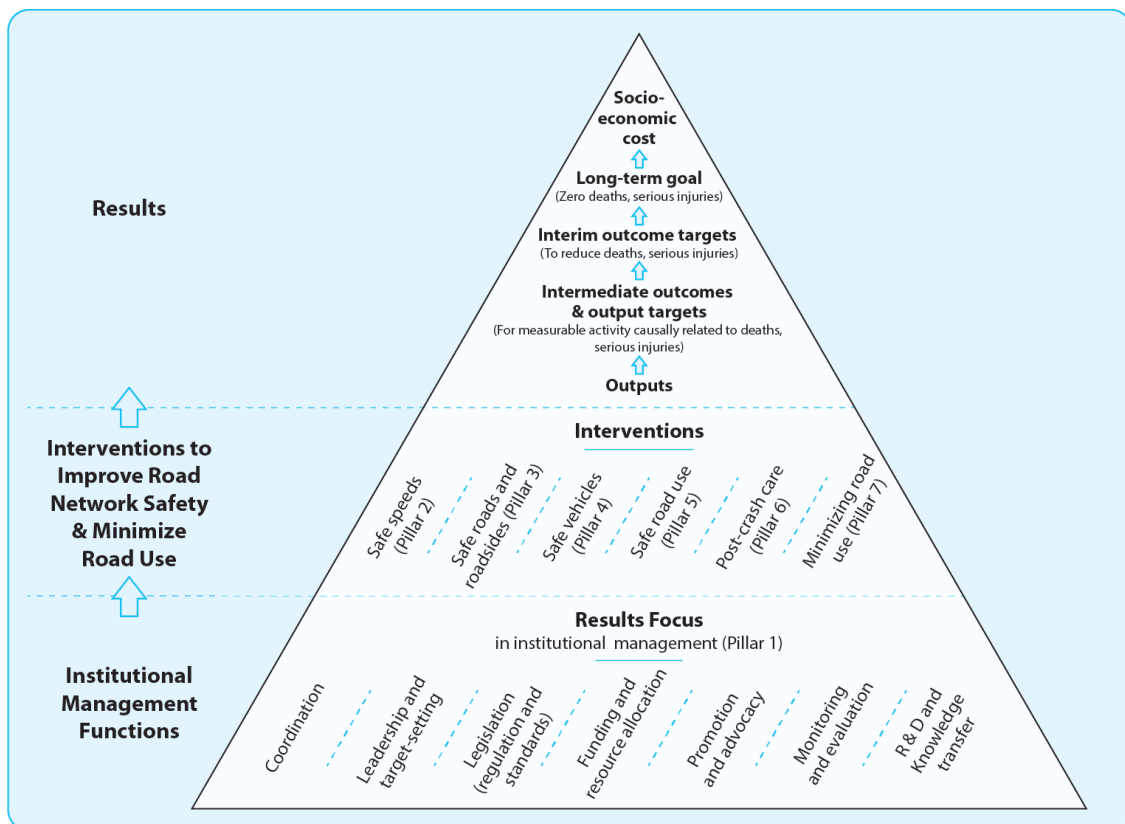
Implementation is a major issue in road safety throughout the world, whether in low, middle or high-income countries. As decisions are made on this reform program, implementation needs to be a major focus of the NTSC's oversight of road traffic safety activity.

1. Introduction

According to the WHO Global Status Report on Road Safety 2018¹ road crashes claim more than 1.35 million lives each year, most of which are in low- and middle-income countries, costing them approximately three percent of their annual gross domestic product. Road crashes can be predictable and preventable, and efforts to systematically reduce crashes can be affected by a lack of accurate and reliable road safety data to support evidence-based and targeted interventions – the quality of data (locally, nationally and globally) is therefore integral to road traffic injury prevention. Data enable governments to identify issues and road safety risks, effectively prioritize funding, monitor the impact of investments, and strengthen cross-agency collaboration and capacity.

Data needs are not limited to road crash fatality and injury data, and extend to data on safety performance, interventions, and institutional management functions. The Global Road Safety Facility (GRSF) developed guidelines in road safety management which provide a framework on how different aspects of road safety relate to each other. At each level of the road safety management framework, data can be collected, monitored, and used to effectively implement a safe systems approach to road safety.

Figure 1: Road Safety Management Framework²



¹ WHO. 2018. Global Status Report on Road Safety 2018. 2018. Geneva: World Health Organization.

² Adapted from Bliss, A, Breen, J. (2013) *Road Safety Management Capacity Reviews and Safe System Projects Guidelines (Updated Edition)*, Global Road Safety Facility/World Bank, Washington D.C.

In this context, the World Bank has assisted the GoVN, through the NTSC, to improve road safety data systems, establish an NRSO for Viet Nam, and update the National Road Safety Strategy and Action Plan for Viet Nam. The project was funded by the Australian Government under the Australian Bank Partnership (ABP2) Program, sub-theme “Ensure Environmental and Social Sustainability of Transport Development – Road Safety Enhancement through Smart Enforcement & Observatory”.

With financing support from the World Bank (2005-2012), a National Road Accident Database System was previously established covering all 63 provinces and cities, managed by the Traffic Police.

This project adds to previous support provided by responding to the GoVN’s request for advisory support with six task activities identified and agreed, as follows:

1. Assist in the update of the National Road Safety Strategy and Action Plan
2. Institutional capacity review
3. Review existing data collection process
4. Capacity building planning
5. Consultation process
6. Workplan for the NRSO.

Attachment 1 sets out the timeline for project deliverables with description and timeframe.

The inception mission was conducted on 14-23 October 2019, and the objective was to meet with the major institutional stakeholders for road safety in Viet Nam and inform the first three activities:

1. Assessment of current Road Safety Strategy and Action Plan, and advice on preparing future strategy and plan,
2. An institutional assessment of requirements and options for establishing a NRSO,
3. Diagnosis of available datasets and data sources, and their quality.

The Inception Report was prepared, and an observational study was initiated to support Activity 3. The objective of the observational study was to assess the actual data practices at local police stations and community-level health clinics.

The outcome of the consultations and data gathering activities were considered in the structure of this report, which are as follows:

- **Road Safety in Viet Nam:** Section 2 comprises a high-level context setting introduction to the current road safety environment in Viet Nam.
- **National Road Safety Observatory:** The institutional requirements for a national road safety observatory are identified in Section 3 along with the respective roles, and the strengths and weaknesses of potential partner agencies and stakeholders are assessed; a good practice model for establishment of the NRSO is put forward; and institutional options are identified and analyzed.
- **Road Crash Data Management:** Data are identified in Section 4 for a sound analysis for road safety; current procedures on data collection and existing datasets are assessed; recommendations are made for improvement of data collection and management. Data resources have been prepared (Attachment 3).
- **Implementation:** The implementation of institutional and data reforms are addressed in Section 5. Implementation resources have been prepared (Attachment 4).

- **National Road Safety Strategy:** The current National Road Safety Strategy and Action Plan are assessed; and recommendations made on a future strategy (Attachment 2).

This report has been prepared to provide sound, evidence-based information and analysis which supports the decision-making process of the GoVN on important road safety institutional and data reforms.

2. Road Safety in Viet Nam

Viet Nam is one of the fastest growing countries in the world. Its 2018 population of 97 million people is growing at a rate of 1.04%, having increased by 50% over the previous 30 years. There has been sustained economic growth over the last 20 years (averaging more than 5% per annum), and many citizens have been lifted out of poverty. Education and health outcomes continue to improve with significant decreases in maternal and infant mortality rates and increases in access to clean water in both rural and urban areas. Viet Nam is now a lower middle-income country.³

Viet Nam has 63 administrative bodies at provincial level (including five municipalities of Hanoi, Haiphong, Da Nang, Ho Chi Minh City and Can Tho), 640 administrative bodies at district level (49 urban districts, 48 boroughs, and 543 rural districts), and 11,055 administrative bodies at commune level (1645 wards, 609 townships, and 8801 communes).

Figure 2: Map of Viet Nam



³ World Bank. 2020. *The World Bank in Vietnam*. Online. www.worldbank.org/en/country/vietnam/overview. Accessed at: January 2020.

2.1 Key road transport data

Viet Nam has an extensive roads development program, which has expanded the road network from 251,818 kilometers in 2006 to 468,147 kilometers in length in 2015 – an 86% increase in just ten years. The majority of the expansion occurred in commune roads (roads managed by communes which more than doubled in length), and urban roads (roads managed by cities and towns which tripled in length).

Table 1: Road network by length in 2015

Road Classification	Length (kms), 2006	Length (kms), 2015
National Highway	17,295	21,109
Provincial Road	23,138	28,911
District Road	54,962	58,437
Commune Road	141,442	325,858
Urban Road	8,567	26,921
Special Road	6,414	6,911

Road traffic has also been growing at a rapid pace, propelled by extraordinary increases in motor vehicles:

- There was a six-fold increase in motor vehicles between 2000 and 2015.
- Private vehicle ownership is 600 vehicles per 1000 people, primarily motorcycles
- Currently, about 300,000 cars and 3,000,000 motorcycles are newly registered each year
- About 3.9 million cars, 58 million motorcycles and 1 million e-bikes were registered in 2018.⁴

2.2 Road crash data

There has been a significant increase in exposure to road traffic injury in Viet Nam over the course of the last 20 years. This exposure is made more serious given that motorcycles, which are the highest risk form of travel on road, comprise about 95% of total motor vehicles in Viet Nam and have been steadily increasing at a higher rate than cars.

In 2018, NTSC reported 18,700 traffic incidents, killing 8,200 people and injuring 14,800 people. This accounts to at least 22 road fatalities and 41 injuries per day. (Figure 3)

While the official data shows that fatalities have been steadily decreasing in recent years from 12,800 in 2007 to 8,200 in 2018, this data is considered underreported. The 2018 Global Status Report on Road Safety produced by the WHO estimated that road fatalities are three times higher than the official number.

WHO's estimates on road traffic fatalities provide a means of comparing safety performance across countries with different levels of road traffic crash reporting systems. The WHO

⁴ Dr. Ing. Khuat Viet Hung. 2019. *For an effective National Road Safety Observatory*. Presentation at Asian Road Safety Observatory Workshop. Bangkok.

estimates also suggested that Viet Nam has not been performing as well as other Member States of the ASEAN (Figure 4), and relative to other countries internationally (Table 2).

Figure 3: Reported Road Fatalities and Injuries in Viet Nam

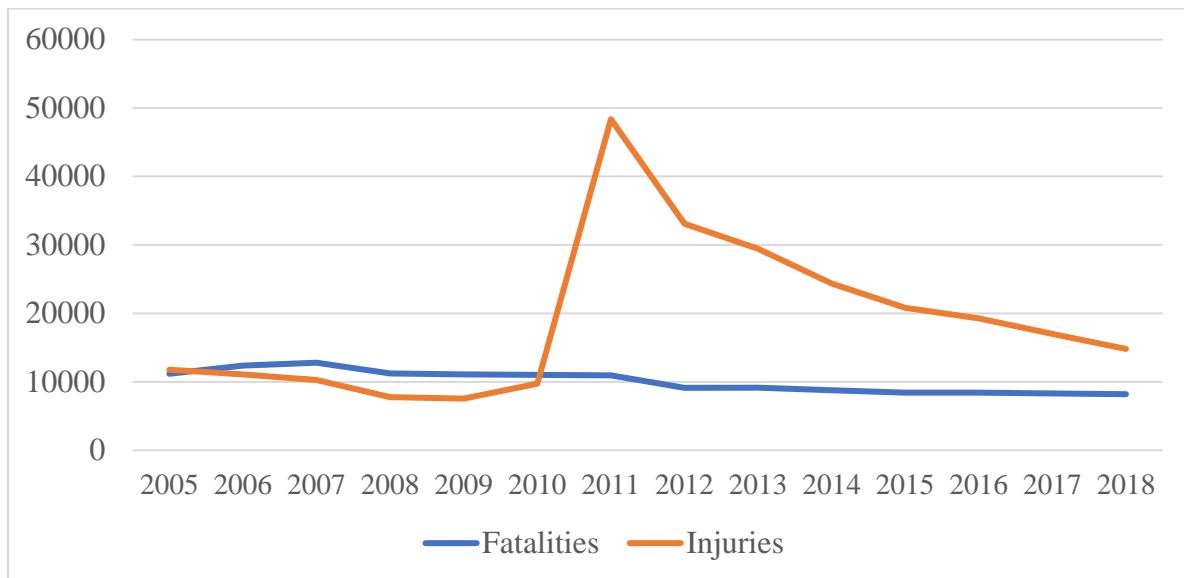


Figure 4: WHO Estimated Fatalities per 100,000 population (ASEAN)

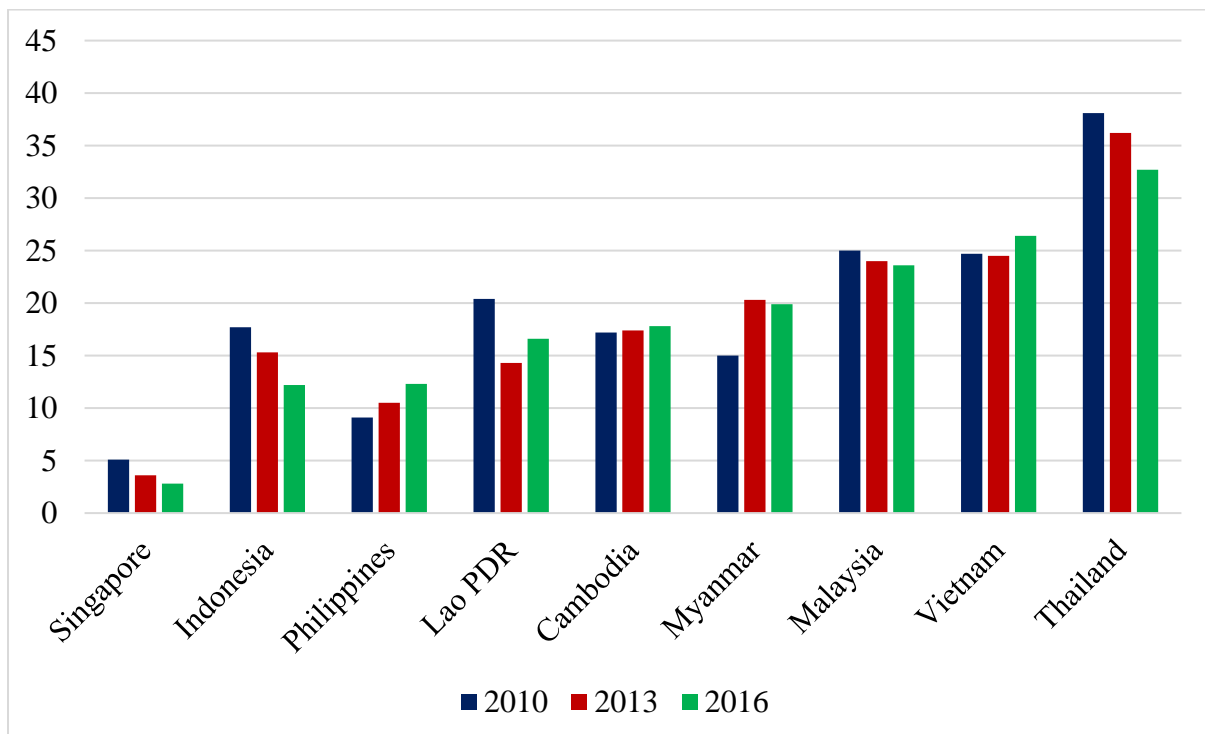
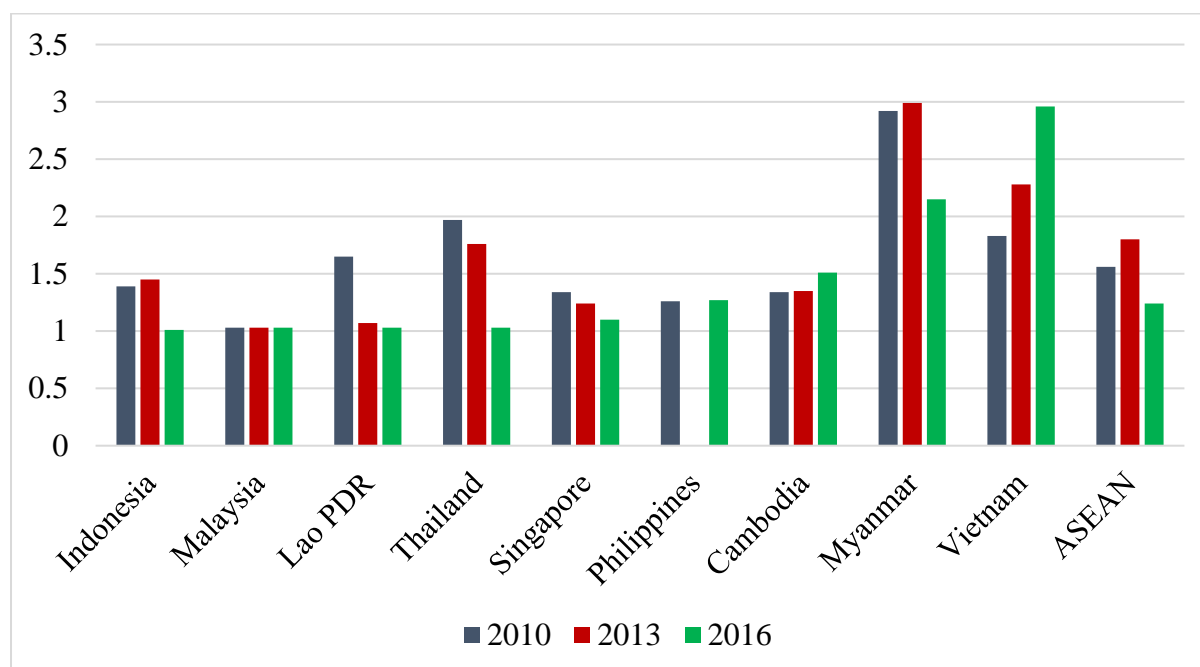


Table 2: WHO estimated road fatalities in Viet Nam compared with non-ASEAN countries

Country	Estimated Fatalities 2016	Estimated Fatalities per 100,000 Population
Viet Nam	24,970	26.4
South Africa	14,507	25.9
India	299,091	22.6
Brazil	41,007	19.7
China	256,180	18.2
Russia	25,969	18.0
United States of America	39,888	12.4
Australia	1351	5.6
Sweden	278	2.8

By comparing WHO estimated fatalities with reported fatalities at a country level, an assessment can be made on the potential gaps in the quality of road traffic crash reporting systems. From 2010 to 2016, a number of ASEAN Member States appear to have closed the gap between their national reporting systems and the WHO estimates, achieving a ratio close to 1:1. (Figure 5). Road crash data in Viet Nam is addressed in detail in Section 4.

Figure 5: Ratio of WHO estimated fatalities to reported fatalities



Another important injury surveillance tool is the Global Burden of Disease (GBD) which, similar to the WHO data, estimates the scale of the road traffic injury problem. Table 3 shows

that road traffic injury is the second highest cause of death for 5-14 year-old in Viet Nam, the most vulnerable and dependent population, and the highest cause of death and of disability for 15-49 year-old in Viet Nam, the most productive population.

Table 3: Road traffic injury burden in Viet Nam 2017⁵

	Road traffic injury as cause of death	Road traffic injury as cause of disability
5 - 14 year-old	2 nd	6 th
15 - 49 year-old	1 st	1 st
Whole population	8 th	3 rd

Road traffic injury has a devastating effect on the people of Viet Nam. There are established methods for assessing the economic cost of road traffic injury in a country such as Viet Nam. Using reported fatalities and injuries, suggests that the economic cost of road traffic injury is about USD 1.99 Billion. However, taking into consideration the underreporting of the road traffic injuries, the economic costs of road traffic injury in Viet Nam is likely to be much closer to USD 18.02 Billion, a figure which has been recently published in a global review of road safety in low and middle income countries by the World Bank.⁶ The World Bank report used a well-established estimation methodology,⁷ and applied a consistent set of assumptions across all low and middle income countries, including use of the WHO fatality estimates, and applying an injury multiplier of 15 injuries to every fatality which is based on the experience of countries with good datasets. Best practice estimations of the cost of road traffic injury in a country are drawn from extensive and carefully designed economic surveys of the population, and of activity associated with crashes. For now, the World Bank estimate simply serves to highlight the sheer scale of the economic burden of road traffic injury in Viet Nam.

There is substantial room for improvement in Viet Nam’s road crash data systems, and in achieving significantly better safety results for the people of Viet Nam.

2.3 Viet Nam National Road Safety Strategy

An effective national road safety strategy is genuinely strategic in outlook and addresses critical priorities. It is integrated with a set of inter-agency management arrangements and is supported by a separate action plan which specifies high priority activities and accountable agencies. The preparation of this first national road safety strategy was a landmark for road safety in Viet Nam.

A detailed assessment of Viet Nam’s National Road Safety Strategy to 2020 is provided in Attachment 2. After the assessment was prepared, a new strategy was finalized. Pursuant to the Law on Government Organization (2015), Directive No. 18-CT/TW of the Secretariat of the Party’s Central Committee (2012) and Resolution No. 12/NQ-CP (2019) regarding the

⁵ Institute for Health Metrics and Evaluation (IHME). 2016. *GBD Compare Data Visualization*. Online. Available from <http://vizhub.healthdata.org/gbd-compare>. Accessed: October 2019.

⁶ World Bank. 2019. *Guide for Road Safety Opportunities and Challenges: Low- and Middle-Income Countries Country Profiles*. Washington DC, USA: World Bank.

⁷ McMahon, K and S Dahdah. 2016. *The True Cost of Road Crashes, Valuing Life and the Cost of a Serious Injury*. London: iRAP.

strengthening of measures for assurance of traffic order and safety and prevention of traffic congestion for the period of 2019 - 2021, the Prime Minister approved a national strategy on road traffic order and safety for 2021 – 2030, with a vision towards 2045 on December 12 2020 (Decision No. 2060/QĐ-TTg).

The new strategy is not assessed here. However, it is important to note that there is a general objective to reduce road traffic deaths and injuries each year, and that there are some significant developments in the new strategy. These include:

- Infrastructure safety ratings – 100% of newly-developed national highways and provincial roads (grade III or higher) and 75% of the length of the national highway network currently in operation are rated 3 stars or more for traffic safety
- Vehicle safety technology – a roadmap for participating in vehicle safety regulations of the United Nations and international organizations is developed and implemented by 2030, including active and passive safety regulations
- Institutional arrangements – Article 2 Implementation is considerably strengthened detailing roles and responsibilities of the National Traffic Safety Committee and the various Ministries which are required to implement the strategy.

These developments improve the alignment of Viet Nam’s road safety direction with the United Nations (UN) Sustainable Development Goals (SDG), and directly relate to the primary focus of this report – the establishment of an NRSO, and the strengthening of road safety data systems.

2.4 United Nations Sustainable Development Goals

SDG 3 Good Health and Wellbeing included an intermediate target of halving road traffic fatalities by 2020, which was the original goal of the UN Decade of Action for Road Safety 2011-2020. The UN General Assembly adopted Resolution 74/299 last August 31, 2020 setting a 50% target reduction of road crash fatalities and injuries by 2030. SDG 11 Sustainable Cities and Communities includes a target of making cities & human settlements inclusive, safe, resilient & sustainable by 2030.



Subsequently, under the leadership of the WHO, UN Member States agreed on a set of voluntary road safety performance targets. These are successfully guiding consideration of an evidence-based set of performance indicators at a national level. The February 2020 Stockholm Declaration made at the 3rd Global Ministerial on Road Safety provides an important recognition of progress over the last decade, issues that need to be addressed, and key steps forward over the next decade.⁸





Table 4 below summarizes the current status of these safety performance indicators and targets in Viet Nam and illustrates a significant gap in monitoring and evaluation programs. As Viet Nam develops a revised road safety strategy to 2030, it will be useful to reflect upon which of these performance indicators are being monitored currently, and which of these need to be incorporated into a national performance management framework for the coming decade.

One of the performance indicators was partly addressed in the latest WHO Global Status Report on Alcohol. This estimates that per capita alcohol consumption in Viet Nam increased from 4.7 liters of pure alcohol for Vietnamese aged 15 years or over in 2010 to 8.3 liters pure alcohol in 2016. This represents a significant increase in exposure to a known risk within the road traffic system. The status report also estimates that there were 6,750 alcohol attributed road fatalities in 2016. 32.4% of road traffic injuries to males were attributed to alcohol, and 19.6% of injuries to females.

Performance management data allows for more sophisticated analysis underlying the headline data on the number of fatalities and injuries. The lack of this type of data in Viet Nam is a critical consideration as Viet Nam works towards the establishment of an NRSO, and the strengthening of the road crash data system.

⁸ <https://www.roadsafetysweden.com/contentassets/b37f0951c837443eb9661668d5be439e/stockholm-declaration-english.pdf>, Accessed: December 2020

Table 4: UN Voluntary Road Safety Performance Targets and their Status in Viet Nam

Safety Performance Indicator	2030 Target	Status in Viet Nam
 <p>Vehicles exceeding the posted speed limit</p>	- 50%	This is a critical measure of compliance with existing speed limits. Information is not currently available in Viet Nam. An evaluation process is quite straightforward to establish given investment.
 <p>Drivers testing above the legal alcohol limit</p>	- 50%	This is a critical measure of compliance with existing speed limits. Information is not currently available in Viet Nam. An evaluation process may be more complex to establish, and an alternative measure is alcohol involvement in crashes.
 <p>Adult motor vehicle occupants correctly using seatbelts</p>	100%	This is a critical measure of compliance with laws regarding a vital piece of safety equipment. Information is not currently available in Viet Nam. An evaluation process is quite straightforward to establish given investment.
 <p>Motorcycle riders correctly using helmets</p>	100%	This is a critical measure of compliance with laws regarding a vital piece of safety equipment. Information is not currently available in Viet Nam. An evaluation process is quite straightforward to establish given investment. Another critical measurement for Viet Nam will be the quality of helmet against accepted international standards.
 <p>International Road Assessment Program (iRAP) safety star rating for Highway network</p>	At least 3 star	This is a critical objective and well tested measure of the safety of the road infrastructure. Some information is available in Viet Nam, but for only limited parts of the network. A more systematic program is quite straightforward given investment.
 <p>Travel on main roads that meet a three-star safety rating or better</p>	> 75%	This is a critical objective and well tested measure of the safety of the road infrastructure. Some information is available in Viet Nam, but for only limited parts of the network. A more systematic program is quite straightforward given investment.
 <p>Country regulates at least 7 of the 8 priority UN vehicle safety standards</p>	100%	Viet Nam is not applying these standards in regard to either new or used vehicles, and this essential information is not available in Viet Nam. A more systematic program is possible given investment in a modern regulatory regime.
 <p>Time between crash and first professional emergency care</p>	metric to be developed	This is important information and is not currently available. A full evaluation process may require systems change within the health sector, but a more limited survey mechanism is possible in the interim.

3. Establishment of a National Road Safety Observatory

This section analyzes institutional road safety management arrangements in Viet Nam, with specific reference to the establishment of an NRSO. It begins with an overview of institutional road safety management functions generally, highlighting interagency mechanisms and lead agency functions, then addresses the Viet Nam context specifically.

Within this overall framework, and in the context of the NRSO establishment task, this section:

- Identifies respective roles of all potential partner agencies and stakeholders;
- Outlines and assesses institutional options for the observatory;
- Proposes a good practice model for establishment of the NRSO.

3.1 Institutional Road Safety Management

Road safety management is recognized as a critical mechanism that will significantly and sustainably improve road safety. Road safety management was first codified and subsequently updated in guidelines prepared by the GRSF, which were developed from a practical, evidential and analytical base.⁹ As referenced in the introduction (Figure 1), these guidelines included a road safety management framework which addresses road safety as a production process with three interrelated elements: *institutional management functions* that produce *interventions* that in turn produce *results*.

3.1.1 GRSF analytical framework

A key feature of the GRSF road safety management framework (refer to Figure 1 in Section 1 Introduction) is the specification of desired road safety results including final outcomes (such as fatalities and serious injuries), and intermediate outcomes (such as traffic speed). Intermediate outcomes are tied to the delivery of outputs (such as tickets issued to speeding drivers) from evidence-based interventions (such as speed enforcement supported by targeted advertising).

Another key feature of the framework are the seven institutional management functions which drive more effective interventions and better results. When given full effect, these functions provide direction on how cost-effective interventions are identified, prioritized, scoped, funded, targeted and delivered. They also assist in building support for sustained road safety improvement and for building the human, financial and institutional capacity needed to sustain that support, and transform it into improved safety results within the community.

The framework has been used to support road safety strategy and development in a number of middle-income countries throughout the world, and can be adapted by the Government of Viet Nam as it considers the most suitable arrangement for the NRSO.

3.1.2 Governance

Good road safety performance requires effective governance, management and coordination across many arms of Government. Institutionally, two inter-related sets of arrangements are needed:

⁹ Bliss, A, Breen, J. (2013) *Road Safety Management Capacity Reviews and Safe System Projects Guidelines (Updated Edition)*, Global Road Safety Facility/World Bank, Washington D.C.

- A very senior governing body, which brings together the heads of national government agencies with road safety responsibilities, and provides a single line of advice to government;
- An agency within government, nominated to act as the lead agency, which supports the governing body, and leads the national effort to achieve the Government’s road safety goals.

There are no set rules or organizational form for these governmental entities as they each need to be established in accordance with a country’s own public sector norms. However, there is increasing international understanding and awareness of how they need to function in order to achieve the country’s road safety goals.

Road safety connects many government agencies, making effective interagency governance systems essential. Road safety requires attention across multiple sectors of society, and arms of government. The three major road safety groupings within government – Health, Transport, and Police – all focus on higher level outcomes, and road safety is a critical element across each, as illustrated by the figure below.

Figure 6: Road safety outcome connections across sectors

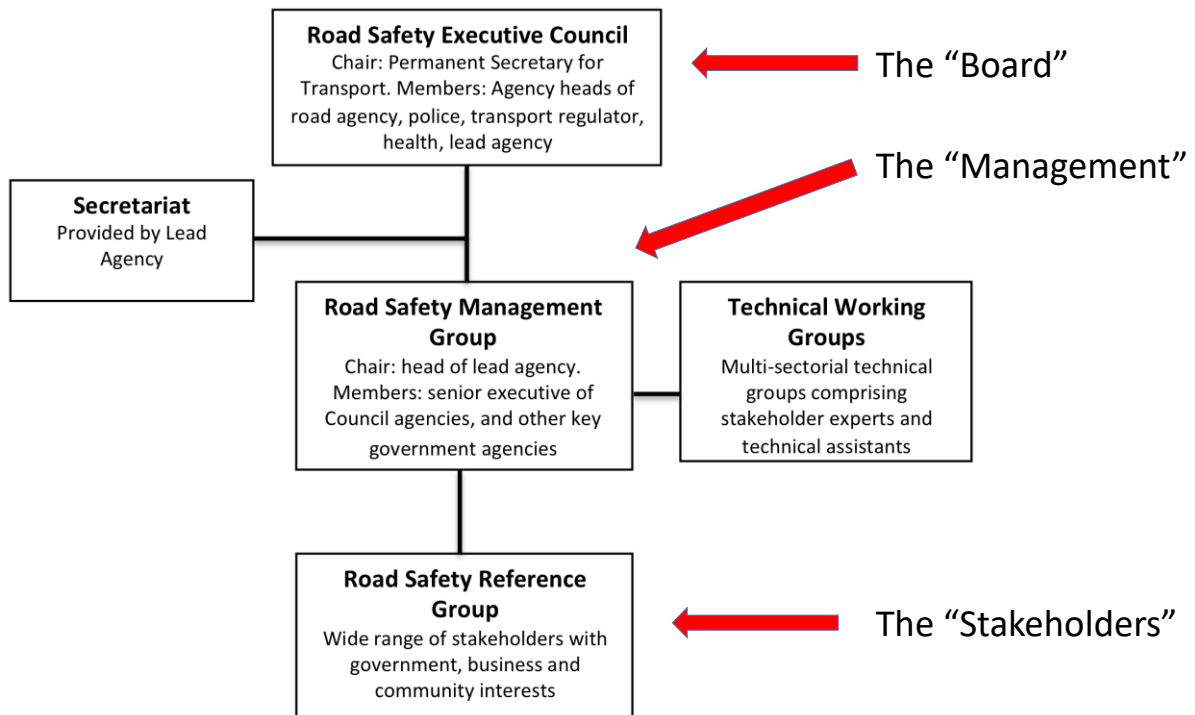


Clearly defined road safety roles and functions for each of the key agencies is required. Each agency must remain vertically accountable to its Minister for the delivery of services to the public. They must also assume responsibility for “whole of government” road safety results and take part in the horizontal coordination of its planning and activity that this requires.

Achieving road safety results often depends upon various stakeholders needing to undertake several related actions simultaneously, making horizontal coordination among stakeholders a critical task. A national effort to tackle drink driving, for example, is likely to require legislation to be prepared by the Ministry of Transport (MoT), reinforced by enhanced enforcement programs delivered by Police, backed up societal and community efforts to repeatedly communicate the expected behavior. Addressing the safety of the road infrastructure is likely to require a clear safety focused strategy developed by the Ministry and delivered by Directorate for Roads Viet Nam (DRVN), and provincial counterparts. Either initiative will need to be supported by the Ministry of Finance (MoF).

This requires constant attention to the type and quality of the interagency governance systems needed to bring all arms of government together in pursuit of the government’s road safety goals. Figure 7 sets out a generic national road safety governance structure, as a means of illustrating the various elements which are required.

Figure 7: Generic national road safety governance structure¹⁰



The “Board” function can usefully adopt a classical governance approach to ensure that Ministers can have confidence that the various arms of government are working effectively together to achieve common road safety goals in Viet Nam. In road safety, the governance tasks can be described as follows:

- Agree the road safety approach and the critical interventions that will be delivered (Strategy);
- Agree which agency will undertake what specific actions, and when (Planning);
- Monitor delivery of each agencies’ commitments (Delivery);
- Evaluate programs, review progress, and improve our efforts (Evaluation).

Board membership needs to represent those arms of government with direct influence on the safety of road users – that is, the institutions which are responsible for:

- Planning, design and operation of the road network;
- Regulating the safe entry and exit of vehicles and drivers, and of commercial transport operators, onto that network;
- Emergency medical response to victims of road crashes.

It needs to be chaired by a senior leader within government. This may be the administrative head of the transport government department, or it could be the political head or Minister. The

¹⁰ Small M, and Runji J. 2014. *Managing Road Safety in Africa: A Framework for National Lead Agencies*, SSATP Working Paper 101.

Board therefore becomes a single point of leadership and advice to government on how the road safety problem will be tackled.

The “Management” function is essential because the Board cannot reasonably be expected to have detailed information on critical aspects of the road traffic safety system. In general, the members of the Board are people who manage multiple aspects of any one portfolio. The head of the national police service, for example, provides a mandate for strong and effective enforcement of road traffic safety law but is likely to have many other law and order issues to manage.

The management function is derived from the institutional road safety management functions outlined above. A senior group of government officials needs to be brought together on a monthly basis, to assess the current road safety results, coordinate delivery of agreed programs, and prepare technically sound and actionable advice to the “Board”.

This group needs to oversee delivery across the road safety partnership of the seven institutional management functions:

- Maintain an unrelenting focus on safety **results**, and strategies to achieve them
- **Coordinate** the contributions of various government and non-government actors
- Review and promote effective change in **legislation**, standards and rules
- **Promote** a safe system response to the road safety crisis
- Raise safety **funding** and allocate it efficiently
- **Monitor** results and evaluate projects
- **Learn** by doing – research, development, and knowledge transfer.

This pivotal role of “Management” uses these functions as a guide to provide advice to the Board and provide direction to a third essential element of a good practice road safety governance structure – the lead agency.

Road safety is a multi-sectoral issue, therefore a single agency will not be able to deliver a safe road environment. No agency can achieve as much in road safety on its own as it can in concert with others. There is a widespread consensus that good practice road safety in a country requires mandating and resourcing an agency within government to lead the country’s road safety effort. This was the first recommendation of the WHO in its landmark publication the “World Report on Road Traffic Injury Prevention”¹¹ in 2004, which provided advice to low and middle-income countries seeking to tackle the rapid escalation of road traffic injury.

Where a lead agency within the Government is not established, or lead agencies for road safety not nominated, they need to be established and nominated. Often where this has occurred, the lead agency needs to be strengthened, typically in terms of its political mandate from Government, or its resourcing, or both.

Finally, it is important to note the importance of establishing a formal “Stakeholder” function within the overall governance system. Stakeholders do not tend to hold legally established powers regarding roads, vehicles, or users, but are often subject to regulatory requirements. A well-constituted stakeholder group would draw from universities, researchers, consultants, the transport industry, wider business interests, non-government organizations and other community interests. Their defining feature is that they have a keen interest in road safety results, and this needs to be harnessed for two key reasons. They can provide legitimacy for

¹¹ Peden M, Scurfield R, Sleet D, Mohan D, Hyder A, Jarawan E, Mathers C, eds. 2004. *World Report on Road Traffic Injury Prevention*. WHO: Geneva.

road safety actions which may be perceived to have negative impacts in the community. They can also provide an important means of delivering improved road safety, through better understanding and commitment to the safety of their own operations.

3.2 Institutional arrangements in Viet Nam

The different elements which represent good practice in institutional road safety management, but there are no fixed rules. The institutional arrangements must fit the national context. A feature of the institutional arrangements in Viet Nam is the leadership of the NTSC, which is housed within the MoT.

The NTSC is responsible for the coordination of traffic safety, covering maritime, waterways, aviation, rail and road traffic. The Deputy Prime Minister is the Chairman, and the Minister of Transport is the Standing Vice Chairman. The Executive Vice Chairman is appointed by the Prime Minister and is the head of the Office of the NTSC. The Deputy Minister of Public Security is the NTSC Vice Chairman and Deputy Ministers of Transport, Health, Finance, and Information and Communications are all standing members. Leaders of the National Defense, Education and Training, Justice, Construction ministries, and Viet Nam Television, Voice of Viet Nam, and Viet Nam News are members. The standing agency is the MoT.

It is useful to consider matters relating to both structure and management of the NTSC.

3.2.1 NTSC Structure

The structure of the NTSC is set out in Figure 8 below. The highlight of this structure is the very strong political support for traffic safety that it embodies, which is very positive. There are clear responsibilities inferred for the Deputy Prime Minister, the Transport Minister and other senior political figures, including the Chairmen of Provincial Peoples Committees. A number of supporting Ministries and organizations outside government are identified as members, and a standing office or Secretariat is also prominent. A clear expectation of ongoing exchange is inferred between this Secretariat, and the member Ministries.

The structure is focused on all aspects of transport safety, not just road traffic safety. This means that road traffic safety must formally compete for resources and focus within an overall transport safety portfolio, alongside:

- Rail safety, for which the Viet Nam Railway Administration is responsible
- Maritime safety, for which the Viet Nam Maritime Administration is responsible
- Aviation safety, for which the Civil Aviation Authority of Viet Nam is responsible.

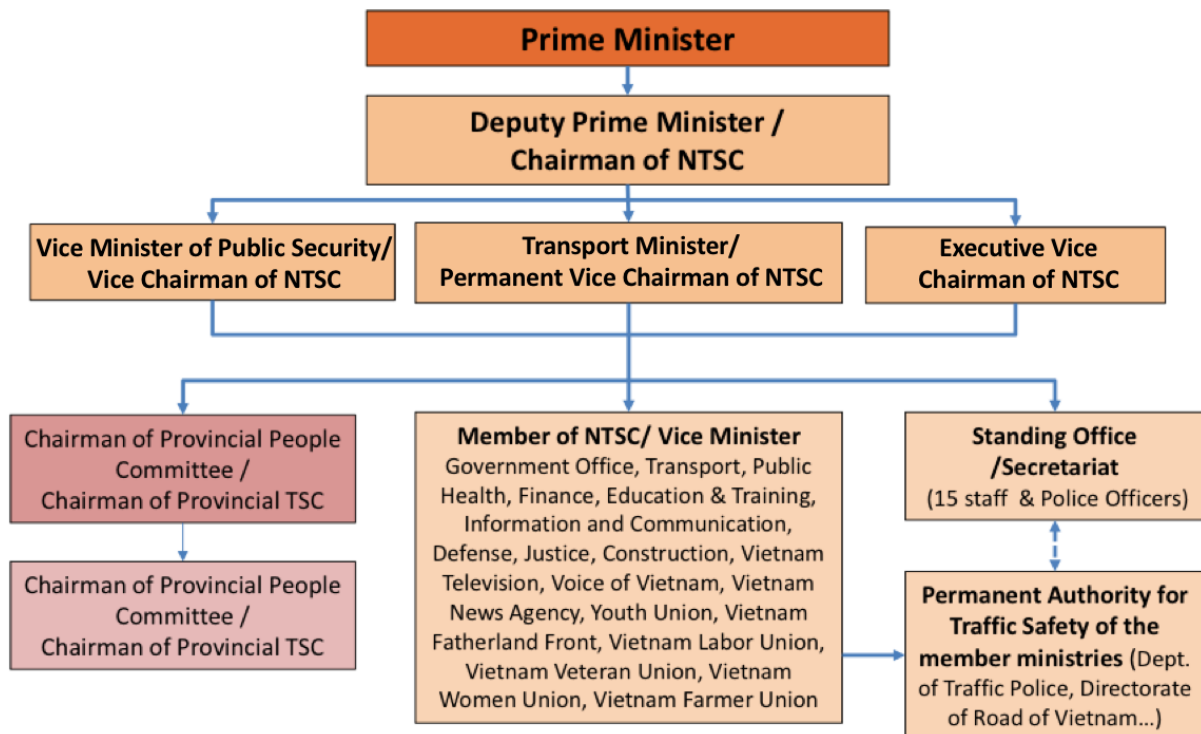
This is not to infer significant challenges do not exist in the safety of other modes, which in some cases include extremely large increases in traffic. However, the Global Burden of Disease Study estimates that 95% of all transport injury deaths in Viet Nam occur on the road¹². Effectively controlling road traffic safety is, however, quite different to effectively controlling the safety of other transport modes. This is illustrated in several ways:

- The road traffic system is generally open with millions of participants to be managed on any one day, whereas rail, maritime and aviation systems are generally closed and require a relatively very small number of participants to be regulated;

¹²Institute for Health Metrics and Evaluation (IHME). 2016. GBD Compare Data Visualization. Online. Available from <http://vizhub.healthdata.org/gbd-compare>. Accessed: October 2019.

- Particularly in maritime and aviation, strict international conventions and protocols are applied for safety purposes which, if not followed, will lead to immediate cessation of commercial operations at either seaports or airports;
- Although the MoT has policy making responsibilities over all transport modes, these are largely delegated to one agency: by contrast, there are four agencies within land transport, as well as several other ministries, which play a critical role;

Figure 8: National Traffic Safety Committee¹³



There is no single administrative arm of the Government of Viet Nam that is dedicated to road traffic safety in Viet Nam. The NTSC was nominated as the lead agency for road traffic safety, but within the Office of the NTSC, there are 15 staff that cover safety of all transportation modes in Viet Nam.

3.2.2 Management

As noted previously, the road safety governance mechanism needs to fit the institutional structures and systems through which the government organizes itself. However, the essential governance and management functions are mixed in together. There is a clear “Board” function, which is the NTSC itself, but this is not differentiated from the “Management” function. It is also not clear which aspects of road traffic safety require formal decision making

¹³ Dr. Ing. Khuat Viet Hung. 2019. *For an effective National Road Safety Observatory*. Presentation at Asian Road Safety Observatory Workshop. Bangkok.

¹² Sustainable Mobility for All. 2018. *2017-2018 Annual Report*. Online. Available at: <http://documents1.worldbank.org/curated/en/276911552323454082/Sustainable-Mobility-for-All-2017-2018-Annual-Report.pdf>, Accessed 2021 March.

within government and which require exchange discussion and agreement outside of government, with “Stakeholders”.

NTSC is an inter-agency coordination organization which is responsible in assisting the Prime Minister in directing ministries, departments and agencies to implement national strategies, projects and interdisciplinary measures to ensure traffic order and safety. It was established through the Prime Minister’s decision (*Decision No.22/2017/QĐ-TTg dated June 22, 2017*) on the organization and operation of the NTSC and the Traffic Safety Committee of centralized municipalities and provinces.

In summary, the NTSC’s road safety responsibilities are to:

- Study and propose road traffic safety plans and coordinate their implementation with agencies;
- Assist in solving emergent and complex issues in road traffic safety;
- Assist in monitoring and evaluating the implementation of Government decrees and resolutions with regards to road traffic safety;
- Guide the Traffic Safety Committees of provinces and municipalities in their implementation of road traffic safety plans and solutions and monitor and evaluate their performance;
- Generate reports on road traffic safety for the Prime Minister and the National Assembly, as required;
- Direct the formulation and expansion of best practices in ensuring road traffic order and safety;
- Engage international organizations in the field of ensuring road traffic order and safety;
- Mobilize social resources in assisting victims of road traffic crashes.

The operational regulations provide guidelines for NTSC in undertaking these duties, in cooperation with other relevant arms of government. These duties include some, but not all the institutional road safety management functions set out previously. For example, there is no clearly expressed results focus, which brings all other functions together to drive sustained reductions in serious road trauma. Furthermore, as illustrated in the analysis of the current road safety strategy, there is clear evidence that road traffic safety objectives are being mixed up with non-safety issues such as traffic jams and congestion. This can significantly distract attention and resources from safety.

Other institutional road safety management functions which are clearly not covered in these duties relate to promotion, and funding and resource allocation. This analysis is based on the English language versions, which may lead to some misinterpretation. However, it is clear that there is a case for strengthening NTSC duties and operations in pursuit of improved road safety results.

The NTSC meets on a quarterly basis, and convenes a regular telephone call with provincial counterparts. A professional Office of the NTSC performs the essential secretariat function. During NTSC meetings, tasks are delegated directly to line Ministries. For example: the MoT is being tasked to prepare a new road safety strategy and action plan. The NTSC appears to be functioning on a very strong vertical management model, with individual agencies being individually tasked.

There does not appear to be any horizontal coordination of road traffic safety issues across agencies, except to the extent that very busy Ministers can achieve this during one quarterly meeting. There is no regular meeting of agency leaders to support joint Ministerial decision

making, or a regular forum for discussion of road safety issues with stakeholders outside government.

While the purpose of this report is not to consider the structure, management, or potential reform of the NTSC, these issues are relevant for the establishment of an NRSO. At present, a draft law has been prepared by the Ministry of Public Security (MoPS) which addresses institutional responsibilities for road safety in Viet Nam. An interagency coordination organization such as the NTSC is necessary whatever the particular institutional responsibilities are. This report considers the existing institutional environment and recognizes that the existing responsibilities of the NTSC may be reformed.

Road crash and injury data need to be managed and shared within a cooperative environment, which will be discussed in detail in the next section. An NRSO needs to be fitted into an interagency governance mechanism such as the existing governance system of the NTSC's, or the governance system of a new interagency coordination organization established under the same legal framework.

3.2.3 Institutional Responsibilities

It is important to define the current institutional responsibilities for road traffic safety within the Government of Viet Nam, especially across the core ministries¹⁴: MoT, MoPS, and Ministry of Health (MoH).¹⁵

The **MoT** is responsible for formulating road safety strategies and policies, and through their respective authorities, is responsible for ensuring that road safety specified activities, functions and duties are implemented. Aside from the NTSC Office, there are several relevant departments and agencies within MOT with road safety responsibilities:

- The **Transport Safety Department** is the advisory organization to support the Minister of Transport in state management for road traffic safety within the MoT, and organizes the implementation of regulations on roads, railways, inland waterways, maritimes and civil aviation traffic safety
- The **Directorate for Roads of Viet Nam (DRVN)** holds responsibility for advising and assisting the Minister of Transport in state management and organizing the enforcement of road transport law in nationwide, and organizing the implementation of public services in road transport following legal regulations
- The **Viet Nam Register** holds responsibility for state registry of transport operations throughout the country, and for vehicle safety standards and inspections.
- The **Viet Nam Expressway Corporation** is a state-owned enterprise, funded by revenues from tolled expressways, and is responsible for the national expressway network.

It should be noted that the responsibility for management of safe roads and transport operations in municipalities and provinces lies with the **Municipal/Provincial Department of Transport**.

¹⁴ Asian Development Bank. 2012. *Viet Nam: Transport Sector Assessment, Strategy, and Road Map*. Online. Available at: adb.org/sites/default/files/institutional-document/33360/files/vie-transport-assessment.pdf. Accessed January 2020.

¹⁵ This definition is drawn largely from a 2012 Asian Development Bank report, recognising that some detailed changes may have been made to the legal mandate of each institution.

The *MoPS* holds state management responsibilities for public order and social safety. This includes road traffic safety mandates for:

- Enforcement of road traffic law
- Detecting and punishing administrative violations of road traffic safety law
- Traffic control and VIP escort
- Preventing and combating crimes and violations on traffic routes
- Registering and issuing motor vehicle number plates
- Road traffic crash investigation and prosecution
- Recording, analyzing, reviewing the causes of traffic crash, setting reporting regime; coordinating the provision of information and data from other Ministries, agencies, local authorities on traffic order and safety; developing traffic safety database (Decision 345/QĐ-UBND dated 7 September 2017 on the promulgation of operational regulations of the NTSC).
- Other tasks assigned by the Prime Minister, and the Chairperson of the NTSC.

Responsibility for these functions within the MoPS are held by the *Department of Traffic Police* and are discharged by Public Security Departments of municipalities and provinces, Public Security Offices of rural districts, urban districts, cities and provincial capital cities and Public Security Posts of communes, wards and towns. (MoPS, 2017)

The *MoH* has an *Accident Injury Prevention Department* and is responsible for the emergency treatment of people injured in traffic accidents. (UN, 2018) The health sector collects road traffic crash data as part of its National Injury Surveillance System, but this is not reported officially (Duc, 2011). Some large hospitals provide related information in their own website, mainly the number of patients, their age and the medical injury/casualty level. (Duc, 2011)

There are other Ministries which are part of the NTSC, such as the Ministry of Education and Training, which is responsible for education and the dissemination of traffic safety regulations and regulations in schools and universities. (UN, 2018) However, the focus of this analysis is on the three agencies which are responsible for the essential elements of Viet Nam's road crash and injury data system.

3.3 Requirements for establishing an NRSO

The GoVN has expressed a need to establish an NRSO. This is considered to be an important step for road traffic safety in the country. Globally, road safety observatories have become an important means of bringing together a range of different data sets and systems which are important for road safety. The approach has been undertaken in both Latin America and in Africa, where countries have come together to establish a common set of road crash and road safety related data indicators. An Asia-Pacific Road Safety Observatory (APRSO) was officially launched in February 2020 at the Stockholm High Level Ministerial Road Safety Conference.

APRSO is currently hosted by the Asian Development Bank (ADB), which plays the role of the Secretariat, with support from the World Bank and other international organizations. It is envisaged that APRSO will become the regional forum on road safety data, policies and practices to ensure the protection of human life on the roads of Asia-Pacific. The scope of APRSO extends beyond simple data collection or coordination, and its agreed objectives are to:

- a) Collect, manage and analyze an Asia and Pacific regional database for road crashes

in Member countries, facilitating on-going applied research and data-driven interventions.

- b) Provide research and technical assistance for Members on road crash data collection systems, standards and norms.
- c) Share research, evidence and technical material, software and necessary tools for collecting and analyzing road crash data.
- d) Share evidence and foster dialogue on road safety within Asia and the Pacific.
- e) Support the creation of a governing body and a lead agency for road safety in every Member state, as well as strengthen existing ones.
- f) Provide capacity building on technical issues and evidence-based guidelines related to road safety.
- g) Establish cooperation agreements for implementing and evaluating road safety action plans among Members.
- h) Monitor the progress on road safety of each Member.
- i) Promote good practice on national and regional road safety policies and strategies.
- j) Informed by research and evidence help assess how to reduce factors that lead to serious road injuries in Member states.

Governance and collaboration are critical features of the design of these multi-country regional bodies, which will also be important in the establishment of an NRSO in Viet Nam.

Nationally, various countries across the Asia and the Pacific region are looking at formally establishing national observatories as a means of supporting the national road safety lead agency to deliver on its mandate. These observatories need to fit the institutional context for road safety in each country. Where there is already a strong lead agency for road safety, for example, an observatory can assume more of a technical and advisory role, reinforcing good data management practices and processes and ensuring good research evidence is made available. In other environments, such as Viet Nam, the opportunity can be taken to establish a stronger overall road safety leadership function within the Observatory, which can assume the overall lead agency role as well as data, monitoring and reporting and research roles.

The focus of this study is on the national observatory and national data systems because the greatest road safety benefits can be achieved through national investment and decision-making processes. However, road safety is also a major local issue. The NRSO needs to be established and national data systems need to be improved, but connections between the national, provincial, city and local levels are critical in Viet Nam. The NTSC and NRSO will need to ensure that over time provincial and local government are supported to adopt stronger inter-agency coordination processes, systematic capacity building programs, and improved data collection and analysis practices. This is an important area for discussion during NTSC's regular engagement which currently takes place with provincial and municipal counterparts.

The requirements for the establishment of the NRSO in Viet Nam are considered in three ways: systems, functions and governance. In Viet Nam, the systems, functions and governance of the proposed NRSO relate to the duties and functions of the NTSC (or a subsequent interagency coordination organization) which would have interagency governance responsibility for the NRSO. It is important to note that the following discussion is based on the premise that:

- all formal responsibilities would lie with the NTSC
- the NTSC would appoint members of the NRSO, and delegate responsibilities to it
- the NRSO would be supported by a professional, dedicated secretariat.

3.3.1 Systems

The NTSC needs to lead all related government agencies in improving three key areas:

- Data management – the quality and quantity of road safety data which is being collected
- Data reporting – the monitoring, reporting and public release of and access to road safety data
- Data analysis – the analysis of road safety data and the use of that analysis to reduce serious road trauma.

It is important that the NTSC is the “owner” of an integrated set of data processes, which allows use of data from multiple sources. This is addressed in detail in Section 4. It is proposed that NTSC leads the development and use of a National Road Safety Portal (NRSP) for Viet Nam. This portal would draw upon data from the MoPS and MoH and other core transport related data from the MoT.

The NRSP would make these data easily available to other Ministries, as well as to researchers and the public. Data sharing of information would need to be governed by clearly defined and documented protocols which restrict data sharing that may identify a person or a vehicle.

3.3.2 Functions

The road safety management functions of the NTSC need to be strengthened and aligned with a typical lead agency. In line with its legal mandate to support the Prime Minister, the functions of the NTSC would be to:

- Develop and oversee implementation of the government’s national road safety strategies and plans, critical actions to deliver on those plans, and investment to achieve the targets set out in those plans, and ensuring data is shared between Ministries in pursuit of the GoVN’s road safety goals;
- Coordinate the contributions from government ministries, departments and agencies, and stakeholders to support the implementation of national road safety strategies and action plans through regular meetings of senior government executives, and engagement with stakeholders;
- To guide the Traffic Safety Committees in the provinces and municipalities in developing and implementing effective road safety strategies and plans;
- Regularly review, develop and maintain a legislative program which focuses on the safety standards applying to roads, vehicles and road users, the management of road safety, and post-crash response;
- Promote a safe system response to road safety issues in Viet Nam from amongst government officials and institutions, and within the wider business and community sectors, who are in a position to significantly improve the safety of road users;
- Ensure that medium- and long-term investment plans for road safety are developed, which are consistent with government targets for road safety, and provide advice to the MoF on resourcing requirements to achieve these targets;
- Develop and oversee implementation of a monitoring and evaluation framework, focused on the safety performance factors agreed in the national road safety strategy and deliverables agreed in national road safety action plans;
- Promote long term investment in road safety research and development; direct ministries, government departments, provinces and municipalities to implement pilot projects to improve road safety; direct the study and application of scientific and technological advances on road safety; and support road safety capacity building programs across government agencies and within particular professions.

The NTSC's capacity to perform those functions needs to be strengthened by establishing the NRSO, delegating its functions to the NRSO, and establishing a professional dedicated secretariat. This would address two key issues identified above:

- The lack of any horizontal coordination of road safety to support decision making by the NTSC
- The lack of any one organizational work group within the Government of Viet Nam which is solely dedicated to road safety.

The specific road safety data management functions of the NTSC also need to be strengthened and delegated to the NRSO. These functions would be to:

- Develop and manage an NRSP for the purposes of providing approved external access to road safety data held by the MoPS, MoH and MoT, and ensuring data are shared between Ministries in pursuit of the Government of Viet Nam's road safety goals;
- Lead oversight function of this portal and coordinate between the three contributing Ministries, including the conditions associated with open access to the data which is brought together within the portal;
- Establish regular processes and procedures to establish and monitor key indicators for road safety, and report publicly on those key indicators;
- Develop plans and programs to strengthen the quality and quantity of road safety data available through the portal, including the establishment of safety performance data;
- Analyze all available data sets and other relevant studies to build understanding amongst all stakeholders of critical road safety issues in Viet Nam and evidence-based responses.

3.3.3 Governance

No change is proposed to the overall NTSC governance system. The NRSO would be established within this system, working under the delegated authority of, and reporting directly to, the NTSC. It would bring road safety management functions and road safety data management functions together in a single reporting line to the NTSC.

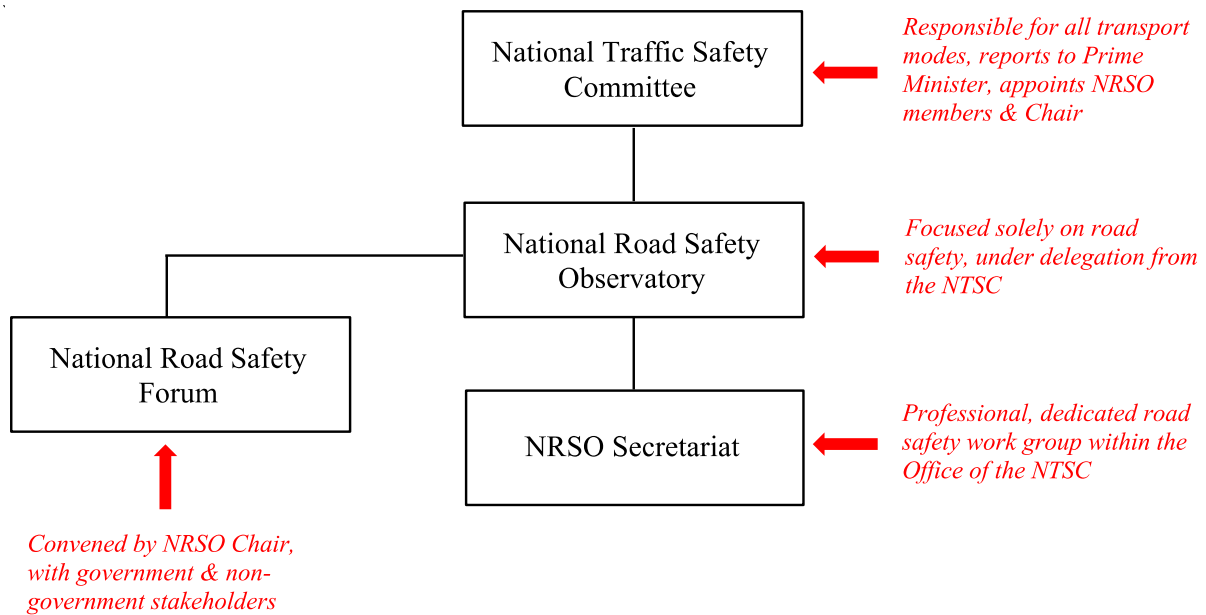
The NRSO would comprise no less than five and no more than seven members, and would include senior functional management across the three core ministries – MoT, MoPS, or MoH – and other key national stakeholders as required. The NTSC would appoint each NRSO member and the NRSO Chair. The NRSO Chair would be appointed from amongst the three core Ministries and could be rotated across these Ministries.

The NRSO would meet at least eight times a year. The purpose of the NRSO would be to oversee development, implementation and continual improvement of the NRSP, and the development, implementation and evaluation of a national road safety strategy. The NRSO would be supported by a professional, dedicated secretariat which is formed to provide advice and support for the NRSO to deliver on its agreed functions.

The Chair of the NRSO would convene a regular meeting of government and non-government stakeholders in a National Road Safety Forum at least twice a year. Membership of this Forum would be open to all organizations which are committed to the goals of the national road safety strategy. The purpose of the Forum is to ensure that stakeholders are appraised of major road safety initiatives and programs and have an opportunity to provide input to future road safety initiatives and programs. Terms of reference would be prepared for the NRSO and the National Road Safety Forum, for adoption into the government's legal/administrative structure.

Figure 9 provides a simplified illustration of this governance model.

Figure 9: Simplified illustration of governance model



3.4 Institutional options for the NRSO

Road safety is a major issue in Viet Nam and significant effort will be required to reform work in the sector, including road safety reporting processes and practices, and horizontal coordination of many government agencies. In this context and given the clear safety mandates provided in other transport modes in Viet Nam, there is a very good case for establishing a new autonomous entity, with a strong and well-resourced mandate that matches the immense scale of the problem. Within the Viet Nam context, however, this would require the NRSO to be self-funded, and is likely to be very difficult to implement.

The NRSO and its workforce of dedicated road safety professionals needs to be established within an institution of the GoVN. MoH, MoT MoPS, and NTSC were all considered as a potential “home” for the NRSO. The advantages and disadvantages for the establishment of NRSO in each institution are discussed below.

3.4.1 Ministry of Health

Road traffic injury is a non-communicable disease of mobility which disproportionately affects the young and the poor. It is a major public health issue and needs to be treated in a similar fashion to successful programs designed to eliminate malaria and HIV-AIDS. The MoH holds major responsibilities in road traffic injury prevention and emergency response systems for road crash victims. It is expected that sustained investments in a national injury surveillance system will play a major role in achieving a step change in road safety data management which is sought by all stakeholders.

However, there is a need to re-orient the way in which road safety is managed in Viet Nam. Establishing the NRSO within the MoH would be a clear statement of direction about the need for change. There would be significantly fewer costs associated with housing the NRSO within an established agency, but the NRSO may need to be given its own prominence in such a large government agency to succeed. The head of the NRSO would need to be a senior executive reporting directly to the administrative leader of all the Ministry’s functions.

3.4.2 Ministry of Transport

Road safety concerns the movement of people and goods within a road traffic system where roads, vehicles and people are effectively regulated, and movement is controlled so that no one is killed or seriously injured through use of essential public infrastructure services. This is primarily the responsibility of the MoT, which makes this Ministry an obvious potential home for the NRSO.

The MoT already connects many road safety related databases with the MoPS, which would assist in developing the NRSP in the short term. As well, there would be a strong governance connection to the NTSC which is part of the MoT.

However, the NRSO would need to be established as a separate division of the Transport Safety Department, with the administrative head of the Observatory reporting directly to the head of the Transport Safety Department. In order to support this function, it is likely that the head of the Transport Safety Department would need to provide direct leadership in this area. This role will be responsible for ensuring effective coordination across the leadership of all departments within the Ministry, and all other major road safety related units in the MoH and the MoPS, as well as other government agencies.

3.4.3 Ministry of Public Security

MoPS is currently responsible for all aspects of road crash data management in Viet Nam, as delegated in legislation. This includes data collection, collation and reporting, as well as the information technology systems required to sustain this data collection process. It should be noted that these responsibilities would not be materially altered by the establishment of an NRSP which is simply a means of bringing road safety related data and analysis into an accessible, externally oriented application.

The technical requirements associated with establishing a portal would be delivered from a strong platform, given the MoPS' familiarity with the current crash data system. The NRSO would need to be established as a direct report to the head of the Traffic Police Department. This would create some strong vertical alignment of the NRSO with the continued crash data management processes, and there would be a strong case for bringing current crash data responsibilities under the direction of the NRSO. As with the MoT, the head of the Traffic Police Department would need to be fully engaged in leading the horizontal coordination of the NRSO functions across all arms of government.

There is a case to completely separate the portal from the delivery of any of its constituent databases. Section 5 identifies the need for agencies which are currently responsible for road safety related data to significantly improve their data systems. The portal is a significant development project, and the current data agencies need to provide oversight for this project in a manner which supports a major change to the access and use of road safety data in Viet Nam.

3.4.4 National Traffic Safety Committee

It is proposed that the NRSO is established within the NTSC. This would address a number of issues associated with establishing it in other institutions – specifically:

- The NTSC already has an established coordination function regarding transport safety, which directly crosses organizational boundaries;
- The NTSC does not currently hold responsibilities for any of the major databases that will need to be used within the NRSP– this means that:
 - The three core data agencies can continue to focus operations on the quality of those systems;

- The NTSC can most easily act as an honest broker/mediator amongst the three core data agencies in developing the portal;
- This direct functional responsibility for data with NTSC would provide a strong base for developing a stronger road safety lead agency function with the Office of the NTSC.

It is most likely that, over time, a working group can be well established within the NTSC with high levels of technical competence in road safety, with a strong road safety data and road safety management mandate, and with sufficient internal resources and influence over external safety resources. This would provide a base from which an autonomous national road safety lead agency can be successfully established.

There are several administrative options to realize this:

1. The NRSO, Forum and Secretariat are integrated into the current NTSC structure by extension of the functions and powers of the NTSC. This is consistent with current law and requires a proposal to be submitted to the Prime Minister or Deputy Prime Minister for approval.
2. The NRSO is established as an inter-sectoral agency, as a component of the NTSC. This requires a more detailed establishment proposal to be prepared, including review by Ministry of Internal Affairs, and submitted to the Prime Minister or Deputy Prime Minister through the Government Office.
3. The NRSO is established as a new agency in the administrative state structure of the NTSC. This would be as a state-owned administrative organization, following a more involved process prescribed in Decree No.158/2018/NDCP on the establishment, re-organization, and disestablishment of administrative organizations.

Option 1 is most straightforward, even though the staffing and budgeting requirements may be challenging. There are good reasons to pursue this option at an early stage, in order to ensure a well-establishment NRSO and NRSP by law. Option 2 would provide greater institutional strength, but consideration would need to be given to whether this may significantly delay the legal establishment of the Observatory and Portal. Option 3 is not considered suitable at this point.

3.5 Possible model for NRSO

If the NRSO is established as a direct part of the NTSC structure, the following arrangements would apply:

- The NTSC would appoint members of an NRSO,
- The NRSO would be chaired by one of the three Vice Chairmen of the NTSC, who is appointed by the Chairman of the NTSC;
- The NRSO would be responsible, under delegation from the NTSC, for:
 - Leading the development and implementation and evaluation of national road safety strategies and plans;
 - Road safety data, including the establishment and maintenance of an NRSP, and excluding data responsibilities which are currently assigned;
- The Executive Vice Chairman of the NTSC would establish a professional dedicated NRSO Secretariat, and appoint a head of that Secretariat;
- The Executive Vice Chairman would report to the NTSC on all matters relating to the NRSO would convene a regular meeting of a National Road Safety Forum..

The human and financial resources required to establish the NRSO Secretariat is critical. There may be a need for these resources to be built over time. In principle, the resources of the NRSO at the point of establishment should:

- Be commensurate with the large scale of the road trauma problem in Viet Nam;
- Recognize the development of the NRSP is a major development project in its own right, and will require ongoing resources to maintain;
- Provide for the strengthening of the road safety leadership functions within the NTSC to lead development and implementation of national road safety strategies and plans;
- Account for the significant secretariat responsibilities associated with coordinating road safety data and road safety management functions across multiple government Ministries, and external stakeholders.

It is expected that some resources within the existing Office of the NTSC would need to be re-assigned to form the new NRSO Secretariat. Significant additional resources are warranted, based on the additional functions and activities which are required.

There are options for establishing an organizational structure within the NTSC to provide the various support functions for the NRSO. It is proposed that the organizational structure which is adopted incorporates three sets of functions:

- Road safety data functions – the critical task is to undertake detailed negotiation with the three core data Ministries on data sharing, and to provide an oversight on the specification, procurement and implementation of the NRSP. Ongoing functions would be:
 - Ongoing management of the NRSP;
 - Data analysis, monitoring, reporting and publication;
 - Monitoring and evaluation, and research and development;
 - Road safety data advice to the NRSO.
- Road safety management functions – the critical task here is to lead the development, and to oversight implementation, of national road safety strategies and plans for Viet Nam. Ongoing functions would be:
 - Strategy and coordination;
 - Legislation and standards;
 - Funding and resource allocation;
 - Road safety management advice to the NRSO.
- Road safety partnerships functions – this provides road safety secretariat support for the quarterly NTSC meetings, for the regular meetings of the NRSO, for the National Road Safety Forum, and related stakeholder management and public engagement activity, and for leading road safety promotion and professional capacity building activity.

There are of course many ways in which the NRSO can be established. However, the proposed model for the NRSO is consistent with the need to both deliver on the establishment of the Observatory for data purposes, and leverage further road safety benefits by strengthening the national road safety lead agency functions within the NTSC.

4. Strengthening of Road Safety Data Systems

This section provides some literature reviews on road crash data and broader road safety data management, sets out some good practice principles on the subject, reports on a stakeholder analysis and observational study in Viet Nam. This section also provides some recommendations for improving road crash data management in Viet Nam.

4.1 Context

It is widely accepted that the accuracy, completeness, and accessibility of road safety data in Viet Nam can be improved.¹⁶ This is evident in the significant discrepancy between the number of road fatalities reported by the NTSC and the WHO. This discrepancy, appears to have been increasing, was noted earlier in this report.

Further, an earlier study, published in 2012, indicated that the MoH recorded 56% more fatal injuries nearly ten times the number of non-fatal injuries as the MoPS (Table 5). This study examined both the number of fatal injuries and the number of non-fatal injuries reported by the MoH and by the NTSC for 2011.

*Table 5: Comparison of Road Traffic Deaths and Injuries between data from MoPS and data from MoH*¹⁷

	MoPS	MoH
Road Traffic Deaths (2011)	10,950	17,150
Road Traffic Injuries (2011)	48,356	463,212
Mortality Rate	12.5/100K	19.5/100K

Road crash data is collected by the MoPS in accordance with the 2008 Road Traffic Law and reinforced by Decision No. 43/2010/QĐ-TTg of the Prime Minister dated 2 June 2010. Other ministries such as the MoH through the Injury Database System also maintain road fatalities and injuries data, but this is not officially published. In addition, the Ministry of Justice (MoJ) collect fatality data for Civil Registration and Vital Statistics (CRVS) from the Commune People's Committee. These database systems in the MoH and the MoJ vary in data and detail and are not presented in a manner that can be useful for road safety policy and interventions. Other types of data such as vehicle registration data from MoPS and driver licensing data from DRVN are stored in their own database systems.

¹⁶ Duc, N., Hoa, D., Huong, N. and Bao, N. 2011. Study on Quality of Existing Traffic Accident Data in Viet Nam. Proceedings of the Eastern Asia Society for Transportation Studies. Online. Available at: https://www.academia.edu/4140898/Study_on_Quality_of_Existing_Traffic_Accident_Data_in_Viet_Nam Accessed 10 Jan. 2020.

¹⁷ Ngo, A., Rao, C., Phuong Hoa, N., Hoy, D., Thi Quynh Trang, K. and Hill, P. 2012. Road traffic related mortality in Viet Nam: Evidence for policy from a national sample mortality surveillance system. BMC Public Health, Online. 12(1). Available at: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/1471-2458-12-561#citeas>. Accessed 10 Jan. 2020.

The need for robust data to support evidence-based interventions warrants close consideration of the road safety data management system in Viet Nam and ongoing improvement of that system. This section seeks to understand how road safety data is collected and used, based on the following questions:

- What are the qualities of a “good” data management system in terms of function and institutional arrangement?
- Who are the main stakeholders in road crash data collection and analysis in Viet Nam, and what are their mandates?
- What organizational, procedural, resource and mandate issues do these government ministries face in collecting and analyzing road safety data?
- How can road crash data be improved in Viet Nam?

This analysis involved extensive consultations with key stakeholders: MoPS, MoH, MoT, NTSC, Hanoi Traffic Safety Department, and external stakeholders such as the WHO, and the Hanoi University of Public Health. An observational study was subsequently conducted at traffic police stations as well as commune and ward health stations in three different localities. The observational study enables a deeper investigation on data collection and analysis most specifically on data collection procedures, resources, and quality. A literature review of models of road crash data management systems throughout the world was also undertaken.

4.2 Good Practice Review

This section addresses different aspects of road safety data management systems, to build a comprehensive view of good practice that is relevant for consideration in Viet Nam. It does not assume that what is successful in one place can or should be simply replicated in another, but instead takes the respected manuals and documented experiences of other countries to consider multiple options. A detailed literature review can be found in Attachment 3A.

4.2.1 Framework

A well-known quote says, “what is not measured is unknown and what is unknown cannot be managed.” This directly applies to road safety. The quality of decisions made on road safety reflects the quality of road safety data in a country.¹⁸ It is argued that nations which have the lowest road fatality rates are often those which implement a data-driven approach to road safety.¹⁹ Without data, it is more difficult for people to realize the magnitude of the road safety problem and prioritize it over other country issues.²⁰ Road safety data are essential to identify and determine the nature of issues and formulate corresponding strategies and actions. They enable government and stakeholders to invest resources, design cost-effective programs and

¹⁸ Montella, A., Andreassen, D., Tarko, A., Turner, S., Mauriello, F., Imbriani, L., Romero, M. and Singh, R. 2012. Critical Review of the International Crash Databases and Proposals for Improvement of the Italian National Database. *Procedia - Social and Behavioral Sciences*. Online. 53, pp.49-61. Available at: <https://www.sciencedirect.com/science/article/pii/S1877042812043212>. Accessed 10 Jan. 2020.

¹⁹ Johnston, I. 2010. Beyond “best practice” road safety thinking and systems management – A case for culture change research. *Safety Science*. Online. 48(9), pp.1175-1181. Available at: https://www.researchgate.net/publication/245130786_Beyond_best_practice_road_safety_thinking_and_systems_management_-_A_case_for_culture_change_research. Accessed 19 Jan. 2020.

²⁰ Barffour, M., Gupta, S., Gururaj, G. and Hyder, A. 2012. Evidence-Based Road Safety Practice in India: Assessment of the Adequacy of Publicly Available Data in Meeting Requirements for Comprehensive Road Safety Data Systems. *Traffic Injury Prevention*, 13(sup1), pp.17-23.

monitor road safety performance.²¹ They enhance accountability of road and transport providers, traffic enforcers, and policymakers.²²

Ultimately, data are required to effectively implement the safe system approach to road safety.²³ Road safety data should be able to account for fatalities and serious injuries. Governments should strive to make sure that these numbers are accurate and reliable and that information on these (for example, circumstances that lead to fatalities and injuries) are also available.

Data systems should include information on roads, vehicles and road users, and involve different stakeholders who will need the data to effectively perform their responsibilities in road safety. For example:

- Road infrastructure providers will need data to determine high-risk infrastructure, design roads with appropriate speeds, and remove road hazards;
- Traffic enforcement agencies will need data to be able to deliver effective road traffic safety enforcement operations;
- Transport ministries will need data to come up with mandatory safety equipment in vehicles;
- Researchers will need the data to innovate and conduct in-depth road safety studies.

Data do not only cover crash data but also other data that augment, support, and contextualize road safety analysis. Other types of data such as Safety Performance Indicators (SPIs) and Process and Implementation Indicators enable and facilitate a better understanding of safety risks that lead to crash fatalities and severe injuries.

4.2.2 Data Management Approaches

There are many different models of institutional responsibility for the management of crash data systems, leaving aside various other responsibilities for relevant non-crash data as well as funding or training. There are instances where the police have their own database system such as in Ghana, instances where the main crash database is outside of the police as is the case of New Zealand and Korea, instances where the police share a database with other government entities such as in Sweden, and instances such as in Indiana in the USA where database management is outsourced to the private sector. These are discussed further and in Attachment 3A: Crash Data Literature Review.

4.2.3 Summary of Best Practice

A summary of the findings from the literature review in Attachment 3A is set out here:

1. An essential principle of good road safety management is to continually improve the quality of road safety data systems, which should be easy to access and use by as many stakeholders as possible, while ensuring that identity data about individual people or vehicles are protected.

²¹ Ibid.

²² Gudmundsson, H., Hall, R.P., Marsden, G. and Zietsman, J. 2016. Sustainable Transportation Indicators, Frameworks, and Performance Management. Berlin, Heidelberg Springer.

²³ WHO Global Status Report on Road Safety 2018. 2018. Geneva: World Health Organization.

2. Crash data is primarily collected by police, and should be combined with or linked to other important road safety data from other sources, such as injury data from the health sector and road, vehicle and user data from the transport sector.
3. The national crash database system is ideally managed by the national road safety lead agency, and at the very least under the oversight of the lead agency. The lead agency must be responsible for maintaining other types of data, facilitating database linkages, among others. In addition, this entity should have a clear and strong legal mandate and capable technology and resources to be able to collate datasets from different agencies and manage the database system.
4. Non-crash data such as data on infrastructure, vehicles, road user behavior, road assessments, and contextual data such as population, the number of vehicle kilometers driven by type of road users, are essential to understanding the nature of road safety issues as well as designing effective programs.
5. Information and communication technology systems should be leveraged to streamline and help validate every part of the data collection process (such as collecting data at the crash scene using mobile phones, consolidating and sharing data among stakeholders, automating the completion of select fields). There are instances however, where paper forms can still be effective as long as forms are designed and managed to standardize reporting.
6. Institutional arrangements within and between agencies are important to support coordination of road safety data management, standardization of forms and definitions, sustainable funding, and other related functions such as regular training in data entry, crash investigation and injury assessment.
7. Clear guidelines should be set for all aspects of data collection, reporting and analysis including timelines for various tasks to be completed, and interactive manuals and hotlines to support queries and troubleshooting.
8. The data management system needs to be sufficiently flexible to support ongoing improvement, such as facilitating data linkages and integration, adjusting indicators, or refining analytical tools.
9. Fatality is defined as a fatal injury occurring within 30 days of a crash. Serious injury is defined as having been admitted at the hospital for at least 24 hours or having been treated by a specialist because of concussions, severe lacerations, and fractures. These definitions should be incorporated into workflows and communicated to all encoders and investigators.
10. The assessment of the severity of injuries should be done by medical professionals, and not by the police officer at the scene of the crash.
11. Default analytical tools should be in place to easily report in tables and graphs, generate black spots and, most importantly, apply geographic information systems. The goal is to enable comprehensive analysis guided by the Safe Systems Approach.
12. System management and oversight should be continuous and sustainable – for example, focusing on ongoing training for data collectors, as well as quality assurance of data, and the resilience of the information and communications technology.

4.3 Collecting and using road safety performance data in Viet Nam


The focus of this report is on the collection, collation and use of road crash data in Viet Nam. However, the NRSO needs to have an overview of all road safety data, including exposure data (number of vehicles or licenses, volume of traffic) and performance data.

Road safety performance data is particularly important because it:

- provides direction for the design of cost-effective interventions
- allows performance of major infrastructure, vehicle and behavior programs to be monitored
- allows meaningful targets to be set over an extended period of time.


As the NRSO is established, and a long-term strategy developed for road traffic safety in Viet Nam is developed and implemented, it will be important to establish the key safety performance indicators that will be used. Some examples of safety performance indicators are outlined below, drawn from the voluntary road safety performance targets identified by the United Nations, set out in Section 2. Each indicator is discussed in response to the following questions: Why is this data important? How is this data collected? Who collects this data? How is this data used? What other data is relevant? How to progress in Viet Nam?


The list is not intended to be comprehensive. Rather, these examples highlight some case study priorities and opportunities for the NRSO to lead the collation and use of important road safety performance data.²⁴


Speeding	Status in Viet Nam
 <p data-bbox="427 925 707 992">Vehicles exceeding the posted speed limit</p>	<p data-bbox="786 925 1390 992">This road safety performance data is not currently available in Viet Nam.</p>
<ol style="list-style-type: none"> Why are these data important? Speeding is a major risk factor for road crash injuries, contributing to both crash risk and crash consequences. A 5% cut in average speed can result in a 20% reduction in the number of fatal road crashes. How are these data collected? Speed data can be collected through roadside monitoring devices, automated speed enforcement devices, or vehicle monitoring applications. It is useful to know the applicable speed limit, the vehicle category (simplified – motorbike, light vehicle, heavy vehicle), the time and day, and the actual free speed for each vehicle (with no obstructions). The actual free speed is used to determine the percentage of vehicles exceeding the speed limit. Who collects these data? This should be collected by an organization (a credible research institute or a transport agency) other than the agency responsible for enforcing speed, so that there may be no incentive or perceived incentive to adjust the result. How are these data used? This data can be used to track progress over time in reducing the proportion of vehicles exceeding the posted speed limit, through general deterrent speed enforcement programs delivered by MoPS. The data can also be used to design behavioral communications that reinforce enforcement programs. What other data is relevant? Average operating free speed data can also be collected at the same time, and used to track average speed across the network, which can also be reduced through changes to speed limits and road infrastructure, MoT. How to progress in Viet Nam? A research institute could be commissioned to design and oversee a national speed survey, beginning with a pilot project across two or three road types, in 	

²⁴ These case studies have been informed by: World Bank. 2019. *Guide for Road Safety Opportunities and Challenges: Low- and Middle-Income Countries Country Profiles*. Washington, DC, USA: World Bank, and Van den Berghe, W., Fleiter, J.J. & Cliff, D. 2020. *Towards the 12 voluntary global targets for road safety. Guidance for countries on activities and measures to achieve the voluntary global road safety performance targets*. Brussels: Vias institute and Genève: Global Road Safety Partnership.


a rural and urban setting. The goal is to establish over time a single annual national survey which allows results to be measured at both a national and a provincial level.

Drink Driving	Status in Viet Nam
 <p data-bbox="427 456 730 524">Drivers testing above the legal alcohol limit</p>	<p data-bbox="791 456 1383 524">This road safety performance data is not currently available in Viet Nam.</p>
<ol style="list-style-type: none"> <li data-bbox="209 573 1383 674">1. Why is this data important? A driver alcohol level just over 0.05 BAC, the legal limit in Viet Nam, doubles the risk of a casualty crash. The risk of a fatal crash increases even more sharply. Young drivers and motorcycle drivers are at much greater risk again. <li data-bbox="209 678 1383 936">2. How is this data collected? Data on the presence of alcohol can be collected at drink driving enforcement stops, with appropriate information controls, using drink driving enforcement equipment. It is useful to know the vehicle category (simplified – motorbike, light vehicle, heavy vehicle), the time and day, and the driver/rider age and gender. Because it requires a bodily sample to be provided, this can be a relatively complex survey. Collaboration between a research institute and Police is essential. In addition, blood alcohol level of road users who are killed in a road crash can be used as an outcome measure and this can be derived from crash records. <li data-bbox="209 940 1383 1003">3. Who collects this data? This is usually collected by the enforcement agency who will have the mandate and resources to conduct these tests. <li data-bbox="209 1008 1383 1108">4. How is this data used? This data can be used to track progress over time in reducing drink driving, through general deterrent speed enforcement programs delivered by MoPS. The data can also be used to design behavioral communications that reinforce enforcement programs. <li data-bbox="209 1113 1383 1240">5. What other data is relevant? The number of roadside alcohol tests administered by Police is also used as a measure of the likely effectiveness of the general deterrence enforcement program which relies on mass testing to increase the perceived risk of detection amongst the driving population. <li data-bbox="209 1245 1383 1375">6. How to progress in Viet Nam? A research institute could be commissioned, in collaboration with MoPS, to design and oversee a driver/rider alcohol survey, beginning with a pilot project which covers both a rural and urban setting. The goal is to establish over time a single annual national survey which allows results to be measured at both a national and a provincial level. 	

Seatbelts	Status in Viet Nam
 <p data-bbox="427 286 735 383">Adult motor vehicle occupants correctly using seatbelts</p>	<p data-bbox="791 304 1385 365">This road safety performance data is not currently available in Viet Nam.</p>
<ol style="list-style-type: none"> <li data-bbox="209 421 1342 551">1. Why is this data important? Front seat occupants wearing seat belts are at a 45-50% lower risk of fatality and serious injury, and rear seat occupants are at a 25% lower risk. Vehicle occupants not wearing a seatbelt are 30 times more likely to be ejected from a motor vehicle during a road crash. <li data-bbox="209 555 1369 685">2. How is this data collected? Seatbelt data can be quite easily collected through roadside observational surveys conducted by trained observers, and automated camera applications are also possible. It is useful to identify use in both front and back seats, the time and day, and the gender. <li data-bbox="209 689 1369 786">3. Who collects this data? This should be collected by an organization (a credible research institute ideally) other than the agency responsible for enforcing seatbelt use, so that there may be no incentive or perceived incentive to adjust the result. <li data-bbox="209 790 1326 920">4. How is this data used? This data can be used to track progress over time in increasing the proportion of adults properly using available seatbelts, through general deterrent speed enforcement programs delivered by MoPS. The data can also be used to design behavioral communications that reinforce enforcement programs. <li data-bbox="209 925 1369 1021">5. What other data is relevant? This method can also used for gathering information about use of special restraints by children, which should be augmented by separate surveys regarding the proper fitment of these restraints and adult knowledge of appropriate use. <li data-bbox="209 1025 1385 1155">6. How to progress in Viet Nam? A research institute could be commissioned to design and oversee a national speed survey, beginning with a pilot project in a rural and urban setting. The goal is to establish a single annual national survey which allows results to be measured at both a national and a provincial level. 	

Helmets	Status in Viet Nam
 <p data-bbox="427 1355 756 1415">Motorcycle riders correctly using helmets</p>	<p data-bbox="791 1355 1385 1415">This road safety performance data is not currently available in Viet Nam.</p>
<ol style="list-style-type: none"> <li data-bbox="209 1471 1369 1568">1. Why is this data important? Head injuries cause more than 50% of motorcyclist road crash fatalities, making the correct use of a standard helmet vital. Helmeted motorcyclists have a 28-73% lower fatality rate and a 46-85% lower injury severity rate. <li data-bbox="209 1572 1385 1738">2. How is this data collected? Helmet wearing data can be quite easily collected through roadside observational surveys conducted by trained observers, and automated camera applications are also possible. It is useful to identify use by all motorcycle passengers, the time and day, the gender and whether the person is a child or an adult. An assessment is also required regarding whether the helmet is being correctly worn. <li data-bbox="209 1742 1369 1839">3. Who collects this data? This should be collected by an organization (a credible research institute ideally) other than the agency responsible for enforcing seatbelt use, so that there may be no incentive or perceived incentive to adjust the result. <li data-bbox="209 1843 1326 1966">4. How is this data used? This data can be used to track progress over time in increasing the proportion of adults properly using available seatbelts, through general deterrent speed enforcement programs delivered by MoPS. The data can also be used to design behavioral communications that reinforce enforcement programs. 	

5. **What other data is relevant?** A critical issue in Viet Nam is the safety quality of the helmet, and separate studies involving helmet suppliers, not just road users, should be conducted to assess the proportion of acceptable quality helmets to strengthen consumer protection.
6. **How to progress in Viet Nam?** A research institute could be commissioned to design and oversee a national helmet wearing survey, beginning with a pilot project in a rural and urban setting. The goal is to establish a single annual national survey which allows results to be measured at both a national and a provincial level.

Roads	Status in Viet Nam
 <p data-bbox="427 645 722 748">International Road Assessment Program (iRAP) safety star rating</p>	<p data-bbox="786 595 1350 797">A global iRAP analysis has estimated that \$3.8 billion investment in infrastructure and speed management in Viet Nam would generate approximately 1.97 million fewer fatalities and serious injuries over 20 years, at a benefit:cost ratio of 19:1.</p>
<ol style="list-style-type: none"> 1. Why is this data important? iRAP safety star ratings are a very well-established methodology tested throughout Asia and the world that provide an objective assessment of the safety of a road for different user types. Each additional star in the five-star rating system denotes a road which is approximately twice as safe as the lower star, and a three star road is regarded as the minimum acceptable safety rating. Rating and improving even 10% of the network is likely to address most fatal and serious crashes. 2. How is this data collected? There is extensive information available on the iRAP star rating system (www.irap.org). Broadly, video is captured of the roadway and roadside, then coded into a database with additional crash and road data integrated as it is available. The iRAP system called VIDA then generates a safety star rating for every 100 meter of road. 3. Who collects this data? A number of organizations across the world have been accredited by iRAP to undertake the video capture, data analysis and produce star ratings mapped according to vehicle occupants, motorcyclists, cyclists and pedestrians. 4. How is this data used? The data can be used in many different ways. The analysis can be used to develop evidence based safety investment plans, which estimate the investment required to reduce deaths and serious injuries, and the economic savings that will result. This makes it a powerful strategy setting and monitoring tool. The results of the analysis can be used as the basis for developing a program of specific infrastructure improvements on the road, and tracking progress over time. 5. What other data is relevant? Any existing road asset data, crash and injury data, and motor vehicle traffic and speed data, are valuable inputs to the safety star rating exercise, but the iRAP system is sufficiently robust and useful even when there are gaps in this data. 6. How to progress in Viet Nam? Some limited iRAP studies have been undertaken in Viet Nam, demonstrating their use in the local environment. An iRAP study could be put to competitive tender for 5-10% of the national highway network, as the beginning of a full safety star rating exercise. This would be particularly valuable if a significant infrastructure investment could be made to apply the results and demonstrate success in the use of iRAP as the strategic management tool for infrastructure safety in Viet Nam. 	

4.4 Stakeholder Analysis and Observational Study

Various ministries and stakeholders were consulted on their views on road safety data to understand current practices in road crash data collection and reporting. An observational

study was subsequently conducted which involved going to 4 police stations and conducting detailed assessments regarding resources, data collection process and data quality. The four police stations are Bac Tu Liem, Di Anh Binh Duong, My Tho Tien Gang, and Chau Thanh Tien Gang. The same assessment was undertaken with three commune clinics namely Di An Ward Clinic, Tan Huong Commune Clinic, and My Phong Commune Clinic. A summary of the observational study is included in Attachment 3C. The following are findings from these data gathering activities which inform the recommendations made later in this report.

4.4.1 2019 Resolution

In 2019, the Prime Minister signed the “**Resolution on strengthening traffic order and safety and combating traffic in the period 2019-2021**”, which sets out the targets and deliverables of each ministry with regards to road safety. This resolution is an important starting point in developing recommendations for the improvement of road crash data in Viet Nam. Pertinent points in the resolution are the following:

- MoT to develop and establish a transport database, traffic control system and share this to the police and provincial and municipal People’s Committees;
- MoT to share data on driving licenses with the MoPS;
- MoPS to establish regulations on the sharing of statistics and data to all relevant authorities;
- MoPS to build a national database on crashes and violations of traffic order and safety; and
- MoH to establish data collection on crashes in health facilities and share this data to the NTSC and Traffic Safety Committee.

The resolution reflects the seriousness of the Government of Viet Nam in establishing systems and policies that enable and facilitate the consolidation and sharing of road crash data among ministries. This also reflects that these linkages are currently not present but are continually being pursued and developed.

4.4.2 The Role of Ministry of Public Security in Data Collection

The Traffic Police Department within the MoPS has the legal mandate to collect official crash data for Viet Nam. MoPS has multiple levels of offices: Public Security Departments of municipalities and provinces, Public Security Offices in rural districts, urban districts and cities; and Public Security Posts in communes, wards, and towns.

The MoPS database, called the Traffic Accident Database (TAD) is the platform that stores Viet Nam’s official crash data. In Viet Nam, road safety data collection has positive attributes that can be emulated by other countries:

- *MoPS has a clear and strong legal mandate to collect official crash data.* Protocols and legal instruments are in place that make responsibilities clear such as who collect the data, standardizes how this data should be collected, and sets the process of data collection. The legal mandate of the MoPS is reflected in the 2008 Road Traffic Law and reinforced by Decision No. 43/2010/QĐ-TTg of the Prime Minister dated 2 June 2010. The traffic police also have set protocols in data collection found in Circular No. 58/2008 / TT-BCA dated October 28, 2009 by the MoPS. The statistical work is done by a single traffic police unit in charge in the locality, so duplication of records is avoided.
- *Circular 58 of the MoPS and corresponding amendments* set out the regulations on the collection and management of crash data by the MoPS. This policy document specifies the responsibilities of each police department, defines crash severities, enumerates

recording and reporting standards, and sets out the development of a crash database system.

- *An existing crash database system exists and is continually developed.* There is an existing system that is available and is used throughout the country. MoPS recognizes aspects that need improvement such as adjusting the definition of fatality and the importance of linking datasets and database systems. MoPS is also in the process of upgrading its IT system and even developing a mobile app for easier crash data entry. There are trained encoders in each police station who use the Traffic Accident Database system. Encoders have enough computer skills and have been trained to use the system.
- *Equipment is available.* Traffic Police squads in districts, cities, and towns are equipped with computers. The computers are installed with database software and have high-speed internet connection to import data from and export data to the Traffic Accident Database managed by the Central Traffic Police Department. Stations also have breath analyzers and some have traffic cameras.

The TAD is based on the Microcomputer Accident Analysis Package (MAAP 5), which was developed under a World Bank project. Database specifications are summarized below.

Table 6: Database specifications for MAAP

Specification	Description
Intranet Access	Yes
Internet Access	Yes, but access is limited to police
Availability of Global Position System (GPS), Geographic Information Systems (GIS)	Geo-referenced but limited GIS data set because police are not collecting GPS coordinates
Software Linkage	Software stands alone. Data can be downloaded and then shared
User Interface	User-friendly, quick, easy
Local language	Yes
Produces analysis	Yes
Data and Analysis format	Limited to tabular reports in Excel and Word, Simple Map analysis
Access	Restricted to Traffic Police

Opportunities for improvement have also been identified during the consultations and the observational study.

Aside from the extensive data responsibilities held by the MoPS, road safety data is critical to effective traffic enforcement activity. Good quality crash data allows Traffic Police officers to target their resources to the places and times where crashes are most likely to occur, and thereby deter those crashes from occurring. An excellent example of this is targeting drink driving enforcement on the evening hours and the days of the week when alcohol consumption is at its peak. Good quality performance data allows Traffic Police commanders to monitor the performance of different traffic enforcement units, to learn how to improve the effectiveness of enforcement operations, and to manage the performance of those traffic units.

Data Collection Process

The traffic police follow a set protocol when a crash happens. A crash can be reported to the police by civilians, organizations, or the media. Traffic police will be deployed to the crash site and will call relevant units/agencies after a preliminary investigation of the scene. Some of the units called include: Police Investigation, Forensics, or Ward or Commune Police; the local Traffic Safety Committee; and medical responders. The police record information on the site manually on Form 01 and 02 which are specified in MoPS Circular 58.

Data requirements in Form 01 include:

- Report Number
- Time of Accident
- Location
- Number of Fatalities and Injuries
- Number of Damaged Vehicles
- Brief Summary of the Cause of Accident

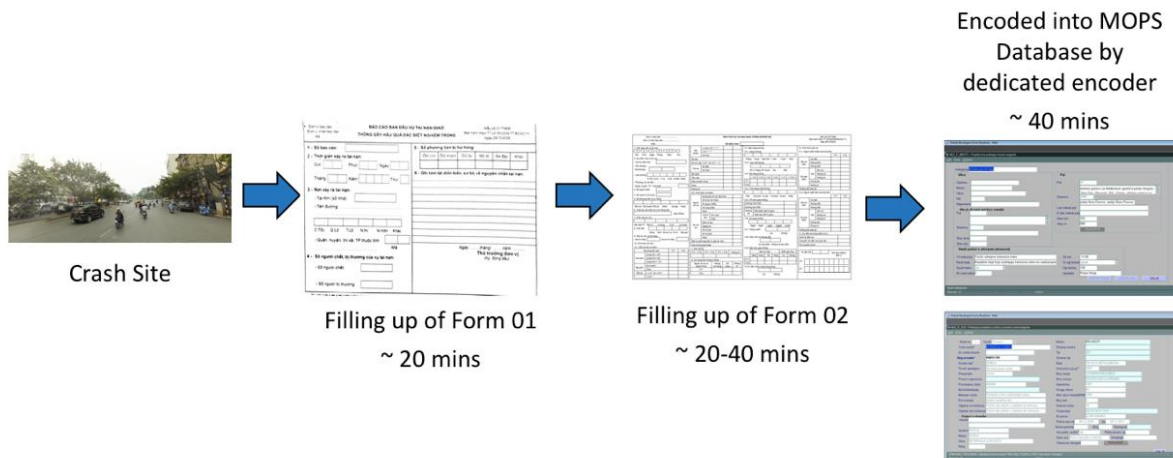
Data requirements in Form 02 include:

- Time of accident
- Location
- Fatalities
- Injuries
- Number of Damaged Vehicles
- Financial Lost
- Accident Severity
- Weather Condition
- Hit and Run
- Type of Collision
- Level of Fault
- Use of Mobile phone
- Road condition
- Type of safety protection
- Expected countermeasure
- Map
- Involved Vehicles
- Driver and Pedestrian details
- Detail of victims on vehicles

All these indicators need to be completed. The forms are usually completed at the crash site and must be submitted within 24 hours. It is estimated that the police spend 20 minutes to complete Form 01 and an additional 20 to 40 minutes to complete Form 02. A screenshot of Form 01 and Form 02 are included in the figures below.

An illustration of the data collection process in MoPS is seen **Error! Reference source not found.** below.

Figure 12: Data collection process in MoPS



This data collection process presents several issues:

- *The manual forms are open to interpretation and errors.* Some of the fields have no assigned values, such as the collision diagram sketch. This makes the form highly prone to error especially because two different people (an officer at the crash scene and an encoder at a computer terminal) will be using and reading the form. Data entry is not standardized, handwriting can be illegible, and the form can be vulnerable to loss or damage. When the data is uploaded into the system, it may contain incorrect information. It is possible to redesign the manual form to minimize errors.
- *Lack of GPS Devices.* While the manual form includes a field on GPS coordinates, it is rarely completed by the police because of a lack of GPS devices.
- *The process is very time consuming.* Completing both forms can take up to an hour and encoding them into the TAD can take up to 40 minutes. The two forms duplicate effort, as they can contain the same information, and open to human error.
- *Lack of working computers and internet access.* Not all police stations have a working computer and for those who have computers, not all have internet access. If there is no computer, forms are sent to the head office or to a nearby police station for encoding. It was found that not all forms are encoded. Query and troubleshooting response times are inadequate and hamper the use of the system.

Human Resources

Respondents from the observational study unanimously agreed that they need more training in crash investigation. Without training, it will be difficult for police to conduct proper investigation which will then result to distorted data.

Encoders on the other hand have adequate computer skills in Microsoft Word, Excel, and using the internet. There are assigned officers for encoding but they also fulfill other tasks such as investigation and patrol. There are encoders available during weekends, nighttime, and holidays. If there are no dedicated encoders, then the officer taking care of the case is the one encoding into the system. The encoders do not receive regular training, but they have been trained when the software was first installed in the police station. There is also a manual

provided for the use of the system. The Traffic Police Bureau is responsible for system troubleshooting. Hotlines are available but not usually used. In addition, there is no indication that the police is able to use all the analytical tools in the TAD system.

Data Requirements

Forms and data requirements should be as simple as possible and should address the needs of the users. It is understood that the road crash forms used by the police is mainly designed for prosecution and that it is difficult to physically complete the road crash data forms at the crash scene. This suggests that the forms need to be redesigned taking into consideration the time it takes to complete the task. If other data sources are available and reliable, then certain fields (such as type of road or vehicle size) can be completed through the system and the form can be further simplified.

An improvement in the forms would enable the police officer to focus on fields that can only be collected at the crash scene. Exact GPS coordinates are important, particularly for road treatments, but is rarely completed on the manual form, and GPS devices are also not available in stations.

The observational study indicated other fields which are not usually completed:

- estimated cost of physical damage (which is only useful for prosecution not safety purposes);
- use of mobile phone (yes/no);
- helmet and seatbelt (yes/no);
- crash severity; and
- collision sketch.

An example of how the form could be standardized is to have standard collision diagrams which on-scene police can choose from. Currently, the collision diagrams are deduced from the collision sketch or the form of collision, but these do not sufficiently capture collision types.

One of the major quality issues is the definition of crash fatalities as fatalities occurring within 24 hours, which is largely due to the lack of coordination between police and health sectors. This results in fatality data being understated, and injury data relying on the personal judgment of the police who are not medically trained.

Crash severity levels can be improved. Currently, there are five levels which are defined in more detail in Circular 58:

- Traffic Collision;
- Minor;
- Serious;
- Very Serious; and
- Significantly Serious.

The main issue with these severity levels is that injury is assessed subjectively using percentages. For example, as stipulated in Circular 58, a minor crash is a crash where one of the persons involved have an injury with severity from 11% to 31%. The method for assessing these injuries is not standardized and can lead to confusion and underreporting. Furthermore, these levels are prone to error especially if injuries lead to fatalities within 30 days. It is difficult to update records if there are multiple and complicated severities.

Finally, it is likely the cause of crashes is overly ascribed to driver or human error. Without a proper and detailed investigation of the circumstances that lead to the crash, it would be

difficult to make such a judgment on the spot. However, it is likely that without proper appreciation of the Safe Systems approach and without proper training in investigation, investigators will simply fault the driver for the crash. Form 02 is clearly designed for court purposes and not crash investigation. It can be improved by eliminating fields which are open to interpretation and assigning pre-set values.

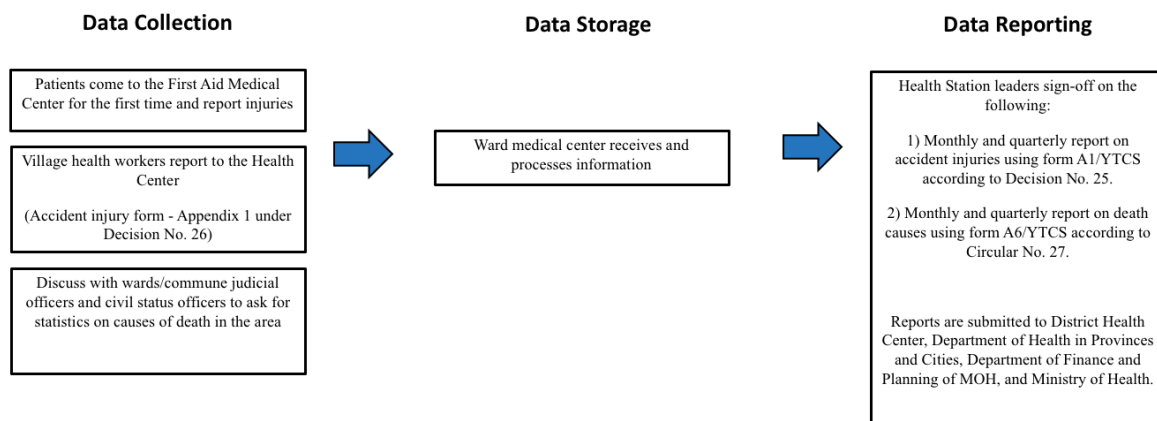
Aside from crash data, the MoPS also maintains a database system for vehicle registration data. The main issue with the vehicle registration data is that the database is not maintained during the life of the vehicle. For example, MoPS only maintains counts of motorcycles during registration and because of that, there is no way to determine the current number of motorcycles on the road. Furthermore, the MoPS TAD and the vehicle registration database are not integrated.

4.4.3 Ministry of Health

The Preventive Medicine Department in the Ministry of Health collects road safety data (Duc, 2011), however they do not publish this data, except for a few large hospitals who utilizes their own website. The recorded data is mainly the number of patients, their age and the medical injury/casualty level.²⁵ The MoH issued an official form (“Accident-Injury Form”) in 2006 and assigned responsibility for this work to the Preventive Medicine Department. All health agencies at central, provincial, district, ward/village levels are responsible for completing this form. The Minister of Health subsequently issued Circular No. 27/2014 / TT-BYT (dated 14 August 2014) which provides guidance on health statistics and provides forms applicable to provincial, district and commune health facilities. Currently, 11 out of 63 provinces are using computerized database systems down to the commune-level.

The data collection process in MoH is illustrated below:

Figure 13: Data collection process in MoH



A comparison of data from Preventive Medicine Department with data from the Traffic Police Department published in 2012 is summarized in Table 7. One important finding was that

²⁵ Duc, N., Hoa, D., Huong, N. and Bao, N. 2011. Study on Quality of Existing Traffic Accident Data in Viet Nam. Proceedings of the Eastern Asia Society for Transportation Studies. Online. Available at: https://www.academia.edu/4140898/Study_on_Quality_of_Existing_Traffic_Accident_Data_in_Viet_Nam Accessed 10 Jan. 2020.

hospitals follow the internationally accepted 30-day definition for road fatalities, as opposed to the 24-hour definition by MoPS.

As noted previously, there have been significant discrepancies between MoH and MoPS data, particularly for non-fatal data which is similar in many low middle- and high-income countries – the health sector is much more likely to directly receive non-fatal injury data than the police sector. However, MoH’s issues with data collection of commune and ward health facilities were also identified during the observational study:

- *Database system is still in establishment phase.* Data on injuries caused by traffic accidents are in the form of aggregate data. Specific reports must be extracted from the system (from localities with electronic records) or must be manually looked up from medical examination and treatment books.
- *Reliability of cause of injury largely depends on patient’s testimony.* The reliability in determining the cause of injury due to traffic accidents is questionable since it is based on statements from family members without verification from the competent authorities, including police force.

Table 7: Select comparison of hospital and police database in Viet Nam ²⁶

Item	Database of MoH	Database of MoPS
Definition of Crash	Similar	
Object of Record	Each record is related to one patient	Each record is related to one accident
Main inputted information	Related to medical trauma and health damage of patient	Related to causes, situation, and consequences of accident; for prosecution purposes
Agencies recording primitive information	All medical establishments from grass level until central	All Traffic Police Squads
Fatality Definition	Death immediately or within 30 days of a crash	Death immediately or within 24 hours (sometimes 7 days)
Data on Injury	Detailed and clear	Incomplete
Database System	Still in establishment	Working
Accessibility	Difficult	Difficult

- *Death certificates have no reliable clinical information.* Confirmation of death due to traffic accidents is reliant on family members correctly completing the death registration forms.
- *Health data is prone to duplication.* While records are not duplicated within individual health clinics, duplication can occur when patients transfer hospitals or if there are multiple patient visits to the hospital, and if fatalities are reported at both the

²⁶ Ibid.

ward/commune and the health center. This is largely due to the lack of connected systems.

The Curative Department in MoH get injury data from provincial hospitals. Each hospital provides a report based on a template provide by MoH. Hospital directors are responsible for the data that they provide. One person in MoH is in charge of aggregating the data for the whole country. According to the Curative Department, one of the main weaknesses of their data is the underreporting of fatalities. This is because, in Viet Nam, there is a culture of bringing home the injured before he or she dies in the hospital. Because of this, some of the fatality data are not captured.

A 2018 study on fatality recording by MoH concluded that the completeness of recorded deaths in commune health stations is relatively high and that this can be improved by triangulating the data with the Civil Registry and Vital Statistics (CRVS) and other local sources (Hong et. al, 2018). While this is the case, issues on properly assigning cause-of-death are identified and should be addressed.²⁷ This implies that there is also an issue of underreporting of road crash fatalities within MoH.

Death registration and compilation of data is primarily done by the MoJ for each province in Viet Nam through the CRVS.²⁸ Civil registries can provide the most accurate and reliable fatality data, but a fully functional civil registration system has yet to be established in Viet Nam. Fatality data is collected through interviews with family members because a lot of deaths occur in the household instead of the hospital, training of data collectors is not consistent, and data is largely dependent on those who lack medical training.²⁹

Aside from the extensive data responsibilities held by the MoH, road safety data is important for the Ministry's wider public health responsibilities. Road traffic injury is a non-communicable disease and a principal cause of death and disability, and so good quality road crash and injury data allows this to be monitored over time. Road safety performance data is important to the design of effective behavior change programs within the community. Their own injury data is also critical to making best use of post-crash trauma response resources – from roadside attendance to the crash victim, through transport to a properly equipped health or specialist trauma facility, the training and deployment of specialist staff, and crash victim rehabilitation.

4.4.4 Ministry of Transport

There are two main databases within the MoT.

The Viet Nam Register Department (VRD) performs the state inspection of all types of motor vehicles throughout the country.³⁰ They are responsible for the inspection of cars, buses, and

²⁷ Hong, T., Hoa, N., Walker, S., Hill, P., and Rao, C. (2018). Completeness and Reliability of Mortality Data in Viet Nam: Implications for the National Routine Health Management Information System. PLOS ONE, [online]. Available at: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0190755>. [Accessed 20 July 2020].

²⁸ Rao, C., Osterberger, B., Dam Anh, T., MacDonald, M., Thi Kim Chuc, N. and Hill, P. 2010. Compiling mortality statistics from civil registration systems in Viet Nam: the long road ahead. *Bulletin of the World Health Organization*, 88(1), pp.58–65.

²⁹ Walton, M., Harrison, R., Chevalier, A., Esguerra, E., Chinh, N.D., Hai, H., Duong, D.V. and Giang, H. 2017. Improving hospital death certification in Viet Nam: results of a pilot study of injury-related fatalities. *Injury Prevention*, 24(5), pp.324–331.

³⁰ United Nations. Road Safety Performance Review Viet Nam. 2018.

trucks and for each inspection, they collect an inspection fee and road use fee. There is no indication that the vehicle inspection data is integrated with other database systems such as with the vehicle registration data within MoPS.

The DRVN is responsible for advising and assisting the Minister of Transport in managing the state's road transport, and for carrying out the state management of road transportation in the whole country. The DRVN has a licensing database system, as well as bridge and road data and a road sign database. DRVN has provided MoPS with full access to the licensing database which MoPS uses to update their violation database. Any revocation of a driver's license is updated by the MoPS onto the DRVN database.

4.4.5 Other Databases

Other relevant data systems have been implemented at the local level namely the TRAHUD system in Hanoi (associated with the Japan-Viet Nam Project for Traffic Safety Human Resource Development in Hanoi 2006-09) and the Handicap International system piloted in Ho Chi Minh City in 2010.³¹ Recently, World Bank's DRIVER has also been introduced.

Another crucial data collector and provider is the Government Integrated Data Center (GIDC), established by Decision No. 29/QĐ-TTĐT dated March 28, 2013. The GIDC is an agency under the Vietnam Government Portal which is part of the Office of the Government. The GIDC collects aggregate and summary reports from ministries particularly crash summary reports from MoPS which is then circulated to all Ministries. Beyond crash summary reports, they also collect all types of reports across all fields and ministries including census reports, education, trade, among others.

The Global Status Report on Road Safety is a report published by the World Health Organization as a tool to monitor performance and progress of countries in road safety. One particular item that the WHO monitors is the road crash fatality data among countries. The fourth and most recent report was published in December 2018, reporting on 2016.

The WHO report details the methodology for estimating country fatalities, which is based firstly on civil registration and vital statistics data received from countries. Based on the availability of these data, WHO developed groupings for countries. Viet Nam is included in Group 2 along with India and Thailand where cause of death data is only available for a single year or a few years, where alternative sources of death data are used, or where civil registration coverage which is lower than 80%. In this Group 2, WHO uses other sources to estimate the number of fatalities, specifically in Viet Nam's case the 2004 report of the Global Burden of Disease Study. Cause-of-death modelling was used which was based on all-cause mortality levels (excluding HIV, war, and natural disasters), gross national income per capita and region. To estimate the distribution of causes of death in Viet Nam, patterns of data from China, India, and Thailand were used. This is supplemented by research of mortality rates in Viet Nam.

These estimates show the upward trend in the number of fatalities and emphasize that improvements to data collection by the government are urgently needed.

Aside from the extensive data responsibilities held by the MoT, road safety data is critical to effective management of the road traffic system. For example, good quality crash data allows

³¹ Duc, N., Hoa, D., Huong, N. and Bao, N. 2011. Study on Quality of Existing Traffic Accident Data in Viet Nam. Proceedings of the Eastern Asia Society for Transportation Studies. Online. Available at: https://www.academia.edu/4140898/Study_on_Quality_of_Existing_Traffic_Accident_Data_in_Viet_Nam Accessed 10 Jan. 2020.

the Ministry to target infrastructure maintenance and improvement budgets to those parts of the road network where they will deliver the greatest economic and social benefit. Their responsibilities for collecting the primary exposure data sets regarding traffic volumes, motor vehicles, and their drivers not only support every other aspect of the road traffic system. Good quality data across the vehicle and driver fields particularly are key to strengthening regulatory management in these areas and making much safer decisions about requirements for the entry and exit of drivers and vehicles into the road traffic system.

4.4.6 Data Sharing, Analysis and Improvement

Stakeholders have agreed that there is a strong need for each ministry to share their data, particularly the data in MoPS's TAD. It appears that the MoPS system is mainly used for prosecution purposes, and not for the analysis of road safety problems and the design of effective road safety programs. While the Traffic Accident Database include analytical tools, these are limited to aggregated tables, graphs, and simple map analysis which are provided in regular reports by MoPS. There is no indication that it allows filtering of data, integration of other datasets (e.g. iRAP assessments, health data), as well as sharing of data to other government ministries and the general public. In addition, based on reports provided by the police, the analytical tools in the TAD are not used.

The TAD system needs to be improved with tools that will allow other government ministries, road safety researchers and analysts to undertake in-depth road safety studies such as black spot analysis. The database should be able to link with other datasets such as data on road infrastructure, vehicle safety, and driver licensing. Also, the police will need training to maximize the tools found in the TAD.

In addition to the improvements to the TAD, a separate data portal is needed which is dedicated to road safety, openly accessible, can integrate different database systems (where possible), and can be used by multiple stakeholders for evidence-based decision-making. The agency that will ultimately house the national portal for road safety data should be capable both in terms of technology and staffing. The agency should not just be able to conduct regular road safety analysis but also should be capable to transform these analyses to programs and engage and hold discussions with multiple stakeholders. Road safety researchers and analysts are needed to make sure that data is used and translated to effective policy and programs.

Linkages between database systems are needed to have a comprehensive view and analysis of road safety. The linkage between MoPS and MoH is currently not feasible because the national health database is still in the process of establishment. In addition, the MoPS lacks the incentive to establish linkages with other database systems such as the bridge and road database or with iRAP since they do not need this information for prosecutions, which is the current focus of the TAD. Establishing these linkages requires the involvement of NTSC which is the lead agency for road safety, and has been identified as the best organizational location for an NRSO.

Currently, there are no database systems that systematically collect and measure road safety performance data such as driving speeds and motorcycle helmet use which should be a priority in Viet Nam. These types of data should regularly be collected and in-depth studies on these performance indicators should be conducted. Typically, the road safety lead agency would lead these types of activities.

4.4.7 Recommendations for Road Safety Data Management in Viet Nam

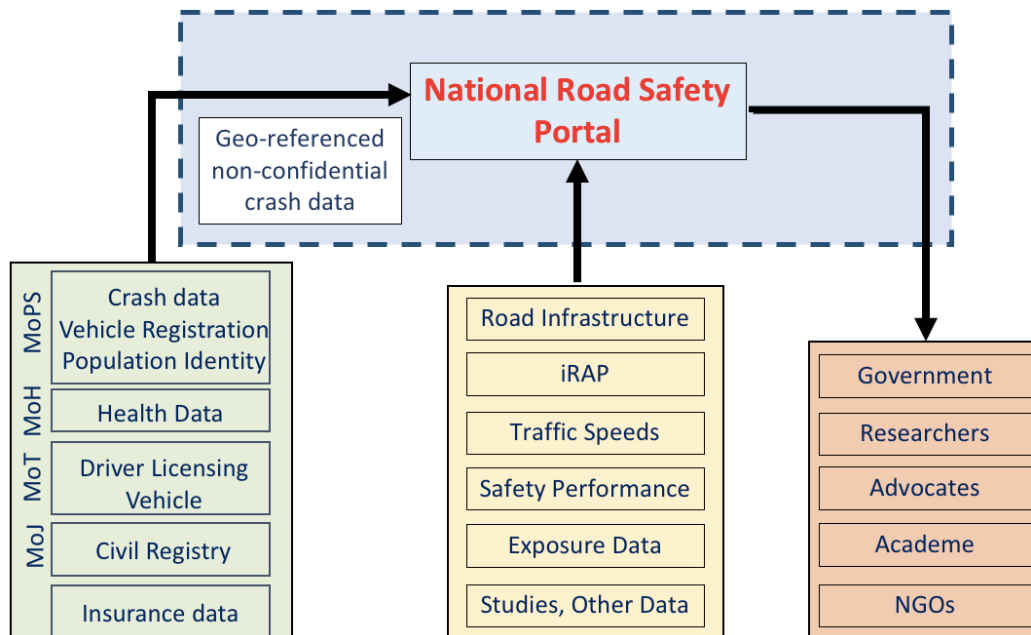
Recommendations for the improvement of road safety data management in Viet Nam are based on the following principles:

- Data must be used for the development of comprehensive and evidence-based road safety programs;
- Improvements need to address technology and institutional arrangements, and be sustainable;
- Data must be shared with and easily accessible by stakeholders;
- Data collection and analysis process must be easy-to-follow.

It is recommended that a National Road Safety Portal (NRSP) is developed for Viet Nam. This stand-alone portal would be developed and managed on behalf of the NTSC (the lead agency for road safety) by the NRSO, through its dedicated Secretariat. NTSC is in the best formal position to establish linkages with different database systems. They will be able to use the data for analysis and coordinate with agencies regarding plans and monitoring of programs and also generate reports for stakeholders.

It is recommended that the following data framework is followed for Viet Nam:

Figure 14: Proposed Framework for National Road Safety Portal



This data framework mainly has two components:

1. an internal database that collects and integrates crash data from different sources; and
2. a public-facing platform that integrates the crash data with other road safety data and shares it with all stakeholders.

MoPS Internal Crash Database - TAD

The internal crash database is the current TAD hosted, managed, and used by the MoPS. In this arrangement, the MoPS remains as the primary collector of crash data in line with current legal and policy instruments. As planned by the police, the internal crash database is the main repository of crash data and it will be linked to other database systems managed by the other ministries such as the health database, civil registry, as well as licensing and vehicle registration data. The MoPS is seeking to improve the accuracy and reliability of crash data by

implementing these data linkages. This will be crucial for the reliability and accuracy of crash data in Viet Nam. In addition, an application programming interface³² (API) can be used to share crash data to the portal without exposing personal data.

Implementation of the following data collection steps is recommended:

- MoPS collects crash data at the crash site and encodes it in TAD;
- DRVN and MoH manage their own database systems for licensing and health data, respectively;
- The TAD is linked to these database systems: health data from MoH, licensing data from DRVN, vehicle registration data within MoPS, civil registry, and insurance data to update and validate crash records in the TAD;
- Data integration is undertaken through an API;
- Fatality and injury data are then updated through these linkages; and
- Non-confidential data in the TAD is shared to the general public through the NRSP.

In connection, with the TAD of MoPS, the MoH also needs to establish its own national injury and health database which should connect to the TAD in the future. Recommended crash data elements that will be reported by the MoH are identified in Attachment 3D. The MoPS will then need to facilitate the integration of the crash data and the health data from MoH through a matching method. It is recommended that secondary identifiers be used (birthday, age, gender, time, date, and location of crash) to integrate the two database systems.

The MoPS expressed support for using primary indicators such as personal details for the matching method, which is ideal but might need legislative changes for privacy and confidentiality. The MoPS should regularly and manually cross-check MoH data with the data in TAD until the national injury database is operational. In addition to the development of an injury and health database, MoH must also undertake a data improvement program in properly classifying cause-of-deaths. It has been recommended that applying verbal autopsy methods in classifying cause-of-deaths will improve the quality of data.³³ Furthermore, it is recommended that the health database be linked to the CRVS to improve the collection of fatality data in hospitals.

The detailed day-to-day tasks regarding data collection and integration is enumerated in the Attachment 4C.

Public-facing platform - NRSP

The NRSP is the responsibility of the NTSC and is the primary road safety platform that integrates crash data with other types of road safety data and shares it to other ministries and to the general public. The NRSP needs to be authorized and certified as the official road safety data portal of the country. This integration involves:

- MoPS through an API will automatically and electronically share and push individual crash records from the TAD to the NRSP. These crash records will not contain and

³² Application Programming Interface (API) is a set of rules that allow programs to talk to each other. In this case, the MoPS Traffic Accident Database and the National Road Safety Portal.

³³ Hong, T., Hoa, N., Walker, S., Hill, P., and Rao, C. 2018. Completeness and Reliability of Mortality Data in Viet Nam: Implications for the National Routine Health Management Information System. PLOS ONE, [online]. Available at: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0190755>. [Accessed 20 July 2020].

confidential data elements but will only contain data elements enumerated in Attachment 3D;

- DRVN will need to provide road and bridge maps and datasets in Comma Separated Value (CSV) files that can be uploaded to the NRSP. These maps allow integration of road infrastructure data with crash data;
- MoT should also provide other datasets either through an API or through uploading a CSV file. These files include iRAP assessments, traffic speed maps, among others;
- NRSO should also leverage and use any other datasets such as safety performance data, exposure data, and studies that can be uploaded to the NRSP and will road safety stakeholders and researchers.

The NRSP would then make these coded data (i.e. data which cannot be used to identify a person or vehicle) easily available to the public, media, researchers and most critically, to other ministries involved in road safety. Data sharing agreements between the different ministries must be drafted and executed to support this. A list of recommended crash data elements that will be shared by each ministry to the NRSP is enumerated, defined, and described in Attachment 3D.

Additional Recommendations for MoPS

The MoPS will continue to collect crash data at the crash site and continue to use and upgrade their TAD system. However, improvements in terms of data collection, resources, and indicators are essential and recommended as follows:

1. It is recommended that a data collection improvement project is initiated, and the preparation of a single crash data form. Data should be collected through a mobile app or a laptop on site but if this is not possible, a manual form can be used. Data fields must have assigned values for selection to the greatest extent possible, in order to eliminate recording or encoding error. The use of movement codes is recommended. (see figure below).

Figure 15: Example of recommended movement codes³⁴

Pedestrian on foot	Vehicle from adjacent direction (Intersection Only)	Vehicle from Opposing direction	Vehicle from Same direction	Manoeuvring	Overtaking	On Path	Off Path Straight	Off Path Curve	Passenger and Miscellaneous
NEAR SIDE 100	CROSS TRAFFIC 110	HEAD ON (NOT OVERTAKING) 120	REAR END 130	U TURN 140	HEAD ON (INCL. SIDE SWIPE) 150	PARKED 160	OFF CARRIAGEWAY TO LEFT 170	OFF CARRIAGEWAY RIGHT BEND 180	FELL IN/FROM VEHICLE 190
EMERGING 101	RIGHT FAR 111	RIGHT THRU 121	LEFT REAR 131	U TURN INTO FIXED OBJECT/PARKED VEHICLE 141	OUT OF CONTROL 151	DOUBLE PARKED 161	LEFT OFF CARRIAGEWAY INTO OBJECT/PARKED VEHICLE 171	OFF RIGHT BEND INTO OBJECT/PARKED VEHICLE 181	LOAD OR MISSILE STRUCK VEHICLE 191
FAR SIDE 102	LEFT FAR 112	LEFT THRU 122	RIGHT END 132	LEAVING PARKING 142	PULLING OUT 152	ACCIDENT OR BROKEN DOWN 162	OFF CARRIAGEWAY TO RIGHT 172	OFF CARRIAGEWAY LEFT BEND 182	STRUCK TRAIN 192
Playing, working, lying, standing on carriageway 103	RIGHT X FAR 113	RIGHT LEFT 123	LANE SIDE SWIPE 133	ENTERING PARKING 143	CUTTING IN 153	VEHICLE DOOR 163	RIGHT OFF CARRIAGEWAY INTO OBJECT/PARKED VEHICLE 173	OFF LEFT BEND INTO OBJECT/PARKED VEHICLE 183	STRUCK RAILWAY CROSSING FURNITURE 193
WALKING WITH TRAFFIC 104	TWO RIGHT TURNING 114	RIGHT RIGHT 124	LANE CHANGE RIGHT (INCL. OVERTAKING) 134	PARKING VEHICLES ONLY 144	PULLING OUT - REAR END 154	PERMANENT OBSTRUCTION ON CARRIAGEWAY 164	OUT OF CONTROL ON CARRIAGEWAY 174	OUT OF CONTROL ON CARRIAGEWAY 184	PARKED CAR RUN AWAY 194

- It is recommended that Traffic Police are equipped with a GPS device, which could be an app installed in their mobile phones. Recording the exact location is one of the most important pieces of information, and the form should not be approved if the field on GPS coordinates has not been completed.
- It is recommended that the single crash data form is simplified and standardized, and that other database systems such as vehicle and license database systems are leveraged to the extent that they are detailed and accurate enough to be integrated with the crash database system. This will not only save time but also will enable the data to be more accurate.
- It is recommended that the definition of a fatality should be within 30 days of a crash. This will require Police to be instructed to follow-up data from hospitals, and the database system to be designed in such a way that updating records is easy to do. Other crash data elements and their definitions are provided in Attachment 3D.
- Regular training in data collection, analysis, and crash investigation must be provided to the police to ensure that quality data is collected and more importantly, that data is used to inform evidence-based decisions in road safety. Additional training on maximizing the tools in the TAD is recommended.
- It is recommended that MoPS ensures that all police stations have laptops/computers, internet connection, and a working Traffic Accident Database system. The Traffic Police Department should have mechanisms in place to quickly address errors with the database system.

³⁴ VicRoads. 2013. How to Use CrashStats. Online. Available at: http://data.vicroads.vic.gov.au/metadata/crashstats_user_guide_and_appendices.pdf Accessed 27 Feb. 2020.

5. Implementation and Next Steps

This section addresses the critical implementation elements and identifies the next steps required to establish Viet Nam's NRSO and strengthen road safety data systems. It is important to note that the decision-making process (Section 5.2) and subsequent legislation (Section 5.3) provide the essential platform from which other steps can be taken.

5.1 Summary of Proposals

A summary of proposals illustrates the scale of the task for the Government of Viet Nam, and the importance of effective implementation. In brief, this study proposes that the Government of Viet Nam:

- Strengthen the functions and powers of the NTSC to support the road safety goals of the Government of Viet Nam
- Establish an NRSO, whose membership and Chair is appointed by the NTSC and is delegated authority for:
 - Leading the development, implementation and evaluation of national road safety strategies and plans
 - Road safety data, including the establishment and maintenance of a National Road Safety Portal
- Establish a professional dedicated Secretariat for the NRSO
- Commission a NRSP which:
 - Brings together crash data from MoPS with road infrastructure data from MoT, enforcement data, safety performance data, and data from researchers
 - Shares these data to all relevant road safety stakeholders including researchers, non-government organizations, academe, media
 - Provides analytical tools to transform these data into meaningful decisions in road safety
- Initiate other projects to strengthen road safety management and road safety data management.

This section addresses implementation matters relating to: the decision-making process, changes to legislation, capacity building, NRSO operational handbook, workplan and budget, and terms of reference for establishment of the NRSP.

5.2 Decision-making process

Section 3 of this report analyzed current institutional arrangements for road safety and recommended the establishment of the NRSO within the NTSC. Two options were identified for doing this, and the implementation path is described below. Option 1 would be most straightforward and quickest to implement, and option 2 would provide greater institutional strength but may take longer.

1. Option 1: The NRSO, Forum and Secretariat are integrated into the current NTSC structure by extension of the functions and powers of the NTSC. This is the most straightforward procedure in which the NTSC seeks approval from the Prime Minister to:
 - a. Integrate the functions of the NRSO into the current functions of the NTSC.

- b. Integrate the functions of the NRSO Secretariat into the functions of the Office of NTSC.
- c. Integrate the functions of the National Road Safety Forum into the functions of the current Traffic Safety Forum.
- d. Add the functions of the NRSP as a technical requirement of the NTSC.

The tasks of NTSC-members stipulated in the Decision No. 354/QD-UBATGTQG (7 September 2017) on Working Regulations of NTSC may be rearranged accordingly.

2. Option 2: The NRSO is established as an inter-sectoral agency, as a component of the NTSC. An “Establishment Schema” document is prepared under cover of an “Establishment Submission” for the NRSO and NRSP, which sets out the following elements:
 - a. Necessity;
 - b. Legal background;
 - c. Aim, scope of management;
 - d. Functions and tasks;
 - e. Organizational structure;
 - f. Establishment roadmap;
 - g. Regulation of organization and actions.

The following process then applies:

- a. The documents are sent to all relevant agencies for consideration (such as MOPS, MOH);
- b. The documents are revised following feedbacks from agencies, and submitted to the Ministry of Internal Affairs (MIA) for appraisal;
- c. The documents are revised following feedback from the MIA appraisal, and submitted to the Government Office;
- d. The Government Office submits the Establishment Schema and Submission to the Deputy Prime Minister and Prime Minister for consideration and approval.

Some key issues to support the decision-making process of either Option 1 or Option 2, and subsequent implementation are discussed in subsequent sections. This includes further materials on: legislative instruments, staffing and training, a handbook on creating and maintaining an NRSO, workplan and budget, and Terms of Reference for ICT consultants to help develop the NRSP.

Following through on this decision making process unlocks the ability to move to legislation and on to the institutional and data changes needed to support improved road safety results in Viet Nam.

5.3 Legislation

All government institutions are governed by law, setting out their functions, and prescribing how those functions are to be performed. The law relating to the NTSC, as the interagency coordination organization for road safety in Viet Nam, needs to be strengthened in several ways especially in terms of functions and powers of the NTSC, so that it can:

- Have a stronger coordination and leadership role to support the government’s road safety goals;
- Establish an NRSO to support this leadership;

- Establish a dedicated work group of road safety professionals to act as a Secretariat of the Observatory and perform the functions of the NTSC;
- Establish an NRSP to provide a central repository of all road safety data and make this data available publicly, under agreed protocols.

This detail is addressed in Attachment 4A. Further refinement may be needed, and legislative drafting may be required, but the essential legislative requirements are set out, in order to deliver the necessary institutional and data reforms.

5.4 Capacity Building

In order to strengthen the capacity of the NTSC to support the Government of Viet Nam's leadership, significant additional resources are required. This includes additional professional staff to establish the NRSO Secretariat, and to develop and implement the NRSP; and additional training and development resources. Further detail is provided in Attachment 4B.

It is noted that proposals for staffing, and for training and development include the use of consultants. This is because of the current difficulty associated with creating the additional permanent positions required within the Government of Viet Nam to achieve national road safety goals, and the need to make rapid progress in establishing the NRSO and strengthening road safety data management systems. To the greatest and quickest extent possible, it is important that the leadership of the NTSC and the NRSO prioritize the conversion of these consulting roles into ongoing positions which will sustainably build the capacity of the NRSO over time.

Directly addressing the staffing and training and development matters set out here is critical to the NRSO and the NRSP being established and to their success.

5.4.1 Staffing

Capacity building within the Observatory should be considered a deliberate and ongoing task for the next decade. It is assumed that implementation of the proposals set out here will need to be staged. This should be pursued with the goal of a fully capacitated Observatory, capable of delivering the support required for the NTSC and the Government of Viet Nam to achieve national road safety goals.

Given the scale of the road trauma problem in Viet Nam and the recognized need to considerably strengthen road safety management capacity, it is important to recognize that the possible staffing identified here is a starting point. Simply shuffling existing staffing into these positions will not work. More staff are required to meet Viet Nam's road safety needs.

By developing organizational capabilities across the range of institutional management functions particularly, the NRSO Secretariat can assume a critical leadership role for road safety in Viet Nam. It may develop in the future as an autonomous multi-sectoral agency within the Government of Viet Nam.

5.4.2 Training and development

Professional development is a significant issue for road safety everywhere. As a multi-disciplinary subject, road safety benefits from many different disciplines. However, without a robust curriculum framework, training may revert to a reflection of current practice, or what the presenter is working on, or can offer in a commercial environment.

A curriculum framework is provided here which is intended to establish an overall philosophy and approach to professional road safety education in Viet Nam. It will require adjustment to

fit within Viet Nam's own tertiary education framework and require development of specific training and courses of varying types to be delivered.

This framework should serve a full range of road safety professionals in Viet Nam. It should support new road safety leaders to be developed through the NTSC, MoPS, MoH and MoT. However, it should also support the development of Traffic Police who need to be trained in crash attendance and data recording.

The proposed curriculum framework comprises four elements:

1. Graduate Capabilities: Leadership; Analysis; Quality; and Safety;
2. Program Learning Outcomes, across three programs: Road Safety Management; Road Safety Interventions; and Road Safety Knowledge and Results;
3. Course Learning Outcomes;
4. Courses & Course Components.

In addition to the proposed over-all road safety curriculum, targeted trainings on road safety data have been developed for managers, technical staff and the police. The objective of the managerial-level training is to enable authorities to use data to develop evidence-based strategies and policy and infrastructure interventions in road safety. For the technical training, the aim is to equip engineers, planners, and other technical staff with analytical tools and knowledge in developing interventions. Finally, targeted training for police aims to empower the police force to reliably and accurately collect data. These targeted trainings are designed to be one-time trainings for new participants as well as a refresher training.

A train the trainer approach is proposed to build sustainable training capacity into the future.

5.5 NRSO Handbook

A handbook has been prepared to support the establishment and ongoing operations of the NRSO, including its work to develop and operate the NRSP. This detail is provided in Attachment 4C.

This document is based on the recommended strengthening of the NTSC, recognizing that any decision to establish a new interagency coordination organization would still necessitate a handbook such as this. The Handbook documents in one place:

- The functions and powers, and operations, of the NTSC;
- The purpose, composition and operation of the NRSO;
- The purpose, composition and operation of the National Road Safety Forum;
- The structure and operation of the NRSO Secretariat.

The Handbook also provides guidance and direction on the establishment and performance of seven institutional management functions. This includes identification and description of key tasks and the regularity with which these are required.

Finally, the Handbook provides guidance and direction on the performance of key road safety data tasks – specifically:

- Tasks associated with the integration of data within the MoPS Traffic Accident Database;
- Tasks associated with the functionality of the NRSP.

The draft Handbook provided here can be used as a reference point. As precise decisions regarding the establishment of the NRSO and NRSP are made, the Handbook can be adjusted accordingly, and formally approved as an operational document.

5.6 Workplan and Budget

A workplan and budget has been prepared (Attachment 4D) to implement recommendations on the establishment of an NRSO and an NRSP.

It recognizes that this represents significant change which needs to be appropriately sequenced and delivered over time. The workplan has therefore been sequenced into four phases.

- Phase 1: Approve (Year 1)
- Phase 2: Initiate (Years 1 & 2)
- Phase 3: Demonstrate (Year 3 onwards)
- Phase 4: Strengthen (Year 4 onwards).

In order to promote the earliest and easiest implementation, the establishment of the NRSO requires use of the simplest administrative mechanism. As the functionality of the NRSO is initiated and demonstrated, a stronger mechanism requiring greater consideration will be used to strengthen the NRSO as the national lead agency for road safety in Viet Nam.

Phases 1-3 assume the use of third-party contractors to assist existing staff within NTSC to deliver the establishment tasks and activities and begin delivery of the ongoing tasks and activities. Indicative budgets have been prepared accordingly. Decisions made to strengthen the NRSO in Phase 4 mark the point where the ongoing tasks of the NRSO are delivered by NRSO staff, and the use of external contractors is focused on specialized development projects. A separate, full staffing and budgeting exercise is required to support this phase and decision.

An estimated budget has been prepared.

Year 1	Year 2	Year 3	Year 4	Total
\$310,000	\$375,000	\$545,000	\$755,000	\$1,985,000

Decisions about the establishment of the NRSO and the NRSP, as set out in legislation, will affect the final workplan and budget.

5.7 ICT Terms of Reference

A terms of reference document has been prepared to support a process for engaging specialist external information and communication technology assistance. The Firm/Consultants will be expected to develop the NRSP and undertake all steps from initial data assessments and consultations with stakeholders, the actual development of the platform to training and supporting the implementation of the platform.

The project will include the following tasks:

- Task 1: Inception Report and Kick-off;
- Task 2: Initial Data Assessment and Consultation with Ministries;
- Task 3: Development of NRSP;

Task 4: Platform Deployment and Testing;
Task 5: Manuals and Training Activities;
Task 6: Program Monitoring and Support.

It is important that NTSC has the professional capacity to develop and oversee this critical project.

5.8 Implementing Effective Reform

The proposals and recommendations in this study each require decision and investment from the Government of Viet Nam in order to be implemented. The task of implementing effective road safety reform is not simple. Implementation is a major issue in road safety throughout the world, whether in low, middle or high-income countries. In general, evidence-based solutions to the road safety problem are well known. Even where the evidence comes from a seemingly different national context the essential safety principles are the same and easily amenable to application in different countries. However, significant volumes of serious road trauma remain widespread across all road networks.

Implementation problems exist at many different levels. For example, there may be a lack of awareness amongst decision makers about the actual scale of the problem, or a lack of knowledge amongst responsible institutions and officers about how to address the problem, or simply a lack of priority for the mix of policy and investment decisions that are required. Where implementation problems are identified, they must be addressed in a manner which is consistent with the overall reform goal.

The NTSC is a strong political force for good in the safety experienced by the people of Viet Nam as they use the road every day. Road traffic injury dwarfs all other transport safety issues in Viet Nam. This study responds to an important request from the NTSC regarding the establishment of a National Road Safety Observatory and the strengthening of road safety data systems. It is critical that the NTSC give the greatest priority to mandating and resourcing implementation of these institutional road safety and data management reforms, which can be expected to provide lasting benefits to the safety, health and wellbeing of the community.

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Attachment 1: Project Summary and Timeline

Deliverable	Description	Timeframe
1. Inception Report	<ul style="list-style-type: none"> • Inception Mission • Project Activities, Deliverables & Timeframe • Initial Observations 	October - November 2019
2.a Draft Project Report	<p>A draft report addressing each of the six activities:</p> <ol style="list-style-type: none"> 1. Assessment of current Road Safety Strategy and Action Plan, and advice on preparing future strategy and plan (Activity 1) 2. An institutional assessment of requirements and options for establishing a NRSO (Activity 2) 3. Diagnosis of available datasets and data sources, and their quality (Activity 3) 4. Capacity building curricula and plan to establish the NRSO (Activity 4) 5. Roadmap and cost estimate for the proposed NRSO (Activity 5) 6. Workplan for the NRSO (Activity 6) 	February - June 2020
2.b Final Project Report	A final report, following engagement with and direction from NTSC and stakeholders on the draft report	July - October 2020
3. Information Communications Technology (ICT) Project Terms of Reference (ToR)	ToR for a unified crash data collection database suitable for use in competitive tendering process	October 2020
4. Dissemination workshop	Final workshop to disseminate the findings with local stakeholders	April 2021

Attachment 2: Assessment of Viet Nam’s National Road Safety Strategy

Pursuant to the Governmental Organization Law (2001), and as proposed by the Ministry of Transport (MoT) (Statement 967/TTr-BGTVT February 24 2011, Statement 8398/TTr-BGTVT October 8 2012, and Official Letter 3459/BGTVT-ATGT May 7, 2012), the Prime Minister of Viet Nam made Decision 1586/QĐ-TTg October 24 2012, regarding the National Road Safety Strategy by 2020 and a vision to 2030 (the Strategy).

This attachment assesses the approved Strategy in 2012 for the purposes of supporting a good quality strategy development and implementation process for the next decade. There are opportunities to improve the alignment of the strategy with international good practice, and strengthen management and delivery systems. After this assessment was prepared, a new strategy was approved on December 12, 2020.

The assessment follows the structure of the approved Strategy. It has been undertaken with the English language translation of the Strategy, and so the assessment may not correctly interpret the intent of the strategy. No criticism is intended of any person or institution involved in the development or implementation of the document. The assessment is made against a set of characteristics which are found in effective road safety strategies.

Summary

Road safety needs to be considered within a wider societal perspective, but care is required to ensure that safety is considered along with other priorities. For example, the Strategy states that “the national road safety strategy aims to establish and maintain social order in the transportation sector.” However, social order should not be the aim of a road safety strategy. A road safety strategy should be focused on reducing or eliminating the impact of road traffic fatalities and serious injuries.

The overall objective statement of the Strategy includes “to reduce traffic accidents and road traffic jams”. Road traffic jams are very frustrating for users and reduce the reliability and efficiency of the road traffic system, and a high motorization rate warrants a closer look at safety risks, especially of vulnerable road users. However, a focus on traffic congestion in a road safety strategy is likely to impair safety results. At the same time, the Strategy makes reference to the following essential elements of road safety:

- Strengthening traffic safety law enforcement;
- Supporting the safety of disabled, older and child users;
- Improving traffic safety management and legal instruments across all levels of government;
- Developing a modern traffic safety database;
- Improving regulatory control of motor vehicles and of driver licensing;
- Expanding first aid posts and rescue stations across national highways.

The Strategy also makes reference to upgrading the safety condition of the road infrastructure, but some care is required to ensure high priority is given to treatments which are capable of significantly reducing or eliminating serious road trauma. For example, rest stops, escape ramps, and automatic warnings will not be as effective in eliminating trauma as roadside and median barriers or speed reducing roundabouts and platforms at intersections.

Strategic priorities are critical to providing direction over the life of a strategy. It is encouraging to see the various priorities covered in the Strategy – including education and propaganda,

institutions, roads, vehicles/drivers, enforcement, and emergency response reflect the priorities established in many countries and relate well to the five pillars established in the United Nations Decade of Action 2011-2020. The NTSC is required to assist the Prime Minister in directing the implementation of the Strategy. Ministries, provinces and cities directly under the Central Government have the responsibility of implementing the Strategy as well as its associated short, medium and long-term action plans. The implementation section of the current Strategy may be too generic. Funding, for example, requires a commitment to identifying what resources are necessary, and what revenue mechanisms will be used to raise the necessary funds.

1 Characteristics of an effective road safety strategy

An effective national road safety strategy is genuinely strategic in outlook and addresses critical priorities. It is integrated with a set of inter-agency management arrangements, and is supported by a separate action plan which specifies high priority activities and accountable agencies. It is prepared in consultation with a variety of government and non-government stakeholders, and within the national context of the country.

The Strategy has been assessed against characteristics which are described below:

Vision & Targets

- An ultimate vision of road safety for the country – this could be elimination of fatalities and serious injuries, or a statement of relative performance in the interim such as matching the safest countries or cities elsewhere.
- Quantitative targets covering, for example:
 - Safety outcomes – for example, fatalities, serious injuries;
 - Safety performance indicators (reflect the strategic priorities for all government agencies) – for example, motorcycle helmet or seat belt wearing rates;
 - Safety delivery.

Critical Analysis

- Description of the critical road safety issues which are facing the jurisdiction now and which are expected to be faced over the life of the strategy.
- Description of the strategic approach that will be taken to address these issues (this should be well aligned with good practice models such as the Safe System approach and UN Decade of Action).

Strategic Direction

- A set of strategic directions which, if followed, will provide lasting road safety improvements over the lifetime of the strategy. This can take many forms, such as a “headline” with descriptive sentence, and explanatory text.
- These strategic directions should link the vision, the targets (particularly intermediate outcome targets) and the critical analysis, and lay the platform for a separate road safety action plan. If there are major initiatives which are already agreed, these could be highlighted.

Management and implementation

- The road safety management arrangements for implementing the strategy, including:
 - Which body is accountable for overseeing successful implementation of the strategy, and the lead agency arrangements to support this;

- How the implementation of the strategy will be monitored and reported upon, including mid-term evaluations;
- The sources of funding to implement the strategy, and mechanisms for allocating funding, through a Road Safety Fund for example.

As well as the Strategy itself, developing a separate action plan helps ensure the strategy is effectively implemented and monitored over different time periods of at least two and no more than four years. Key design features for an action plan are:

- Actions are well aligned to major safety issues and research evidence that action will significantly improve safety;
- Specific activity or policy goals are documented, such as increase investment in safety engineering treatments by a certain percentage, or pass new law to reduce drink driving limits for commercial drivers;
- Specific institutional accountability and timeframe for delivery;
- Agreed reporting and evaluation framework and timeframe.

2 Viewpoint

This section of the Strategy articulates the common responsibilities for traffic safety across society, government, and users, and the need for consistency with national socio-economic and transport development strategies. A national road safety strategy is typically prepared in retrospect – that is, the road traffic system has been left to evolve in a manner that is resulting in a very large number of fatalities and serious injuries, and it is decided that something should be done about this. Road safety needs to be considered within a wider societal perspective, but care is required not to subjugate safety to other priorities. For example, the Strategy states that *“the national road safety strategy aims to establish and maintain social order in the transportation sector.”* Social order is not however the aim of a road safety strategy. A road safety strategy should be focused on road traffic fatalities and serious injuries.

This section of the Strategy also expresses the value of making the traffic environment *“safe, civilized, modern, friendly and sustainable”*. A safe road traffic environment is one in which there is an absence of fatal or serious injury. If that is achieved in an objective and measurable sense, it is likely to assist more subjective and less easily measurable outcomes such as *“civilized”*, *“modern”* or *“friendly”*. However, it is possible to demonstrate these outcomes without making any progress on *“safety”*. It should be noted that the application of modern road traffic safety principles is a key part of a sustainable transport approach.

It is important to articulate an overall philosophical framework in a strategy. The viewpoint expressed in the Strategy could focus much more on road traffic safety. Road traffic safety should be seen as part of a wider sustainable transport framework, and sit comfortably within existing planning frameworks, and the wider national context. However, the essential issue for the road safety strategy should be the number of fatalities and serious injuries on Viet Nam’s roads and what will be done about it.

3 Objectives

This section is divided into a statement of overall objectives, the goal for the period 2012-2020, and the vision to 2030.

3.1 Overall Objective

The overall objective statement includes reference “*to reduce traffic accidents and road traffic jams*”. This illustrates the problem of not focusing sufficiently on safety within the overall viewpoint or philosophical framework. Road traffic jams are very frustrating for users, and reduce the reliability and efficiency of the road traffic system. They are, however, largely irrelevant to road safety.

There is also reference to “develop road transport infrastructure to meet transport demands, which is not a road safety focus. In fact, the history of road transport infrastructure development across the world, historically, is associated with making land transport less safe, not safer. More roads, capable of handling more motor vehicles, travelling at higher speeds, have exposed more people to road traffic injury.

3.2 Specific Goal

The first goal stated is to reduce the number of road traffic fatalities by 5-10% annually. If achieved, this would represent terrific progress over the strategy period. However, goal or target statements such as this are ideally backed up by a results framework. Broadly, good practice is for a results framework to have three elements:

Safety Outcome Targets

Safety outcome targets are the highest-level results being sought – reduced fatalities and serious injuries. As a public health measure, and to assist in comparison purposes across countries, a target is also often set for fatalities per 100,000 population.

Safety Performance Targets

Safety performance targets are needed to focus resources and monitor progress on safety critical issues. These should be drawn from research evidence that if these outcomes improve, safety has improved. The UN has specified some voluntary targets.

Delivery Targets

In order to improve the safety performance targets and achieve safety outcome targets, these targets specify a number of significant interventions that will be delivered, ideally through a separate action plan document.

It is positive to note reference made to the following, which are all important to road safety:

- Strengthening traffic safety law enforcement;
- Supporting the safety of disabled, older and child users;
- Improving traffic safety management and legal instruments across all levels of government;
- Developing a modern traffic safety database;
- Improving regulatory control of motor vehicles and of driver licensing;
- Expanding the network of first aid posts and rescue stations across on national highways.

Several references are made to upgrading the safety condition of the road infrastructure, which include using international assessment programs – assumed to be iRAP – focusing on corridors, eliminating serious crash sites, and corridor safety, and suggesting separated lanes for powered two wheelers. This is also positive, but some care is required to ensure high priority is given to treatments which are capable of significantly reducing or eliminating serious road trauma. For example, rest stops, escape ramps, and automatic warnings will not be as effective in eliminating trauma as roadside and median barriers or speed reducing roundabouts and platforms at intersections.

Driver compliance with laws is referenced, which is important. The driver licensing system is the key to ensuring they have sufficient knowledge. Enforcement mechanisms should be in place to firmly address drivers who do not comply with the main safety rules of the road. Goals are set for 100% of educational levels to be taught road traffic safety law, and traffic law knowledge disseminated to 85% of traffic participants. These targets are not goals which are commonly set in the best performing countries.

One goal is to invest in construction and development of mass public transport. This is important because it will allow people to move across cities in the safest possible manner. The question is whether or not this should be a focus of a road safety strategy. A good practice national road safety strategy would clearly reference the importance of mass public transport, but there are likely to be much more cost-effective means of reducing serious road trauma.

Finally, reference is made to reducing traffic congestion in major cities. As inferred above, congestion and traffic jams are largely irrelevant to a road safety strategy and including reference to them in a road safety strategy diverts attention and resources from the key purpose of a road safety strategy, which is reducing fatal and serious injury. A similar reference is the construction of a modern traffic control center – traffic control and management is not synonymous with safety.

3.3 Vision to 2030

The vision to 2030 appears to be largely a projection forward from the goal statements covering the period of 2012-2020. This does not meet what might be commonly regarded as a vision statement.

Vision has been an important part of the road traffic safety discussion internationally over the last two decades. Most famously, Vision Zero, developed in Sweden, is based on the ultimate ethical goal of eliminating fatal and serious injury from the road traffic system. This elimination goal underpins what is referred to as the Safe Systems approach to road safety, which has been spreading throughout all continents, and amongst low, middle and high-income countries.

4 Strategy Orientations

Strategic orientations are critical to providing direction over the life of a strategy. They should reference high quality safety interventions in a certain field, and give priority to projects which research evidence shows are highly likely to achieve or support achievement of significant safety improvements. This has the effect of increasing priority to important actions and decreasing priority to less important or ineffective actions.

It is therefore positive to note this section of the Strategy, and that these strategic orientations in the Strategy direct the implementation schedule, list of programs and investment projects which follow the strategy.

It is also positive to note that the various orientations covered in the Strategy – education and propaganda, institutions, roads, vehicles/drivers, enforcement, and emergency response – reflect the priorities established in many countries, and relate well to the five pillars established in the United Nations Decade of Action 2011-2020. These five pillars are:

1. Road safety management;
2. Safer roads and mobility;
3. Safer vehicles;
4. Safer road users;

5. Post-crash response.

Each orientation in the Strategy is addressed below.

4.1 Educate and propagandize road traffic safety

As described, this area relates most directly to the promotion and knowledge transfer functions within the institutional road safety management field. The most valuable orientations refer to:

- Enhancing the quality of traffic safety law enforcement;
- Using traffic safety as a criterion to evaluate organizations and officials;
- Ensuring leaders of transportation enterprises take responsibility for road traffic safety;
- Developing propagandist networks at grass-root levels.

Below are several levels in which education and propaganda needs to be addressed:

1. Safety Teachers: Post school educational training in universities and vocational colleges which generate professionals who will hold responsibilities in road traffic safety, such as those in engineering (roads and traffic, civil, automotive etc.) or health (injury prevention, emergency medicine, rehabilitation etc.).
2. Safety Professionals: Systematically building professional road traffic safety capacity within government, business and the community. This needs to reflect major evidence-based advances in knowledge about effective management and leadership of road safety, primary safety treatments to roll out in the planning and design and operation of the road network, accelerating new vehicle safety technology into the fleet, good practice road traffic enforcement, and trauma management.
3. Safety Leaders: Systematically promoting road safety as a major societal issue to political and administrative leaders within government, business, and community interests. These activities need to explain modern road traffic safety principles and encourage these leaders to take safety focused decisions (such as improved safety legislation and more safety investment) to reduce serious road trauma.

It is easy for significant resources in this area to be poorly invested, and important that activities are appropriately sequenced. Once the professional education and awareness activities are underway, with committed safety leadership and professional practice for example, attention can be usefully turned to the users of the road traffic system, who are getting killed and seriously injured.

Simple exhortations for users to behave better or follow the rules are not effective. Education and propaganda campaigns for road users only tend to be effective if they are directly associated with promoting and reinforcing a legal, compliance or environmental initiative. This could be informing people to only purchase motorcycle helmets which meet national and global safety standards, or that a major speed enforcement initiative will soon commence, or how to use motorcycle lanes on the highway. They may also be valuable for helping to develop a climate of public support for highly effective safety programs, such as regulating vehicle safety according to UN standards, applying strict safety criteria to the issue and retention of driver licenses, or restricting motor vehicle speeds to safe levels.

4.2 Institutions, policies

This is the critical area for any national road safety strategy. There is positive reference to:

- Strengthening and enhancing institutional capacity at both a central and local level;
- Completing road traffic safety data initiatives and establishing a national center for road traffic safety data;

- Improving human resource development for traffic safety.

This area could be considerably strengthened by more direct reference to the institutional road safety management functions, which are well established in the literature. These have been described as:

- Results focus;
- Coordination;
- Promotion;
- Legislation;
- Funding and resource allocation;
- Monitoring and evaluation;
- Research and development and knowledge transfer.

Strategic leadership and management in road safety rely on developing and enhancing a strong capability across each of these functions. This also relates to two other factors – firstly, the establishment of a national interagency governance mechanism to bring all major stakeholders together in pursuit of the country’s road safety goals (the NTSC performs this function). Secondly, the need for a strong professional body to act as the national lead agency for road safety (the Office of the NTSC performs this function). These matters are addressed in some detail in Section 3 of the Report.

4.3 Traffic infrastructure and road traffic organization

Safe planning, design and management of the road network is fundamental. Achieving this is very difficult with the legacy road traffic systems which are in place in many countries. There is positive reference in the Strategy to the need to:

- Implement primary safety treatments on the road network, such as median barriers, dedicated facilities for motorcycles and pedestrians, and closing rail level crossings;
- Use assessment programs (such as iRAP) to better target safety improvement on the network;
- Address commercial encroachment (which affects vulnerable user safety) with local authorities;
- Update facilities to accelerate public transport patronage.

As noted above, it is important that safety is the focus on investment in road infrastructure and road traffic organization under any national road safety strategy. Mass public transport will provide safety benefits and should be undertaken, but there are likely to be more cost-effective means of tackling the major road safety issues in Viet Nam.

Of more concern is the regular reference in the Strategy to major project investment in major roads and transportation infrastructure without any reference to safety as a key goal of that investment. Safety must be a central consideration in all new road and transport infrastructure investment. This can be easily undertaken by setting safety performance policies for an infrastructure investment, and using well recognized assessment systems such as iRAP to monitor and evaluate implementation of those safety policies.

4.4 Law enforcement of road traffic

This orientation is important, but it is expressed in a very generic manner. It provides little direction to the Ministry of Public Security (MOPS) which is responsible for road traffic safety law enforcement, other than to “improve”. One major change appears to be flagged which is

to modernize the detection and enforcement of road traffic violations, which is assumed to relate to a modern speed camera system.

Road traffic safety law enforcement is quite different to any other law enforcement activity, and it can be useful to explicitly recognize and reinforce this in any national road safety strategy. Rather than “*catch criminals*” who break laws regarding property or personal violence, the primary task is to develop and implement general deterrence enforcement strategies which “*deter road users*” from breaking key safety laws in road traffic. General deterrence strategies are focused on key behavioral issues – drink driving, speeding, helmet and seatbelt wearing, and phone use – which are susceptible to major improvements through rigorous application of the law. They seek to increase road users’ fear of being detected by traffic police, and road users’ expectation that traffic law may be applied to anyone, at anytime, and anywhere.

The focus of traffic police needs to be on enforcing the law. However, once operational strategies are put into effect, results can be further improved by deploying carefully designed propaganda campaigns which heighten drivers/riders’ perceived risk of detection for breaking key safety laws.

4.5 Means of transport and their drivers

Continual quality improvement in the management of motor vehicle registration, as well as safety and environmental testing and inspection, are the key themes addressed in this orientation. Upgrades and new construction of testing stations are identified as an initiative, together with investment in public transport access for disabled users.

The UN vehicle safety regulations are a critical aspect of any vehicle safety regime. National compliance with the key passenger car, motorcycle, and motorcycle helmet, safety standards needs to be addressed. These UN standards address the key crash risks in Viet Nam such as frontal and side impact crashes, pedestrian crashes and motorcycle crashes. As new motor vehicles entering the fleet are likely to stay in use for 20 years or more, any delay in applying international vehicle safety standards may have a negative safety impact in Viet Nam for decades to come.

Ongoing implementation of a project is intended to improve the quality of training, examination, and issue of driver's licenses. This would focus on developing traffic training curriculum suitable for remote areas and the disabled. There are many evidence-based safety reform options available in many countries’ driver licensing systems to ensure that effective regulatory systems are in place, that only competent and safe motor vehicle drivers are on the road, and that there are consequences for non-compliant drivers.

Commercial transport operator licensing is also critical, and it is understood that there is a requirement for safety management systems by all such operators in Viet Nam, which provides an important platform for future safety improvement.

4.6 Salvage, rescue and give emergency aids to road traffic accidents

The construction of rescue stations and emergency-aids stations on highways is given priority, particularly expressways.

A comprehensive approach is required to understand the most effective response to the various post-crash response needs. These may include providing support at the community level for first responders; introduction of a single national emergency number; consolidating the national ambulance service to improve service for road crash victims; and improvement of public health units, in terms of coverage, equipment, and staff capability.

5 Innovative Solutions in the 2013–2015 Period

It is useful for a strategy to identify some key activities which will be initiated to begin implementation of a national road safety strategy. The decision to release the strategy is often a very useful time to help explain why a certain set of interventions will be introduced, or what sort of interventions and actions can be expected over the life of the strategy.

It is not useful to analyze a specific set of innovative solutions which were set to be delivered 5-7 years ago. However, the innovative solutions which have been listed in the Strategy often refer very closely backwards to the strategic orientations, or forwards to the implementation schedule or investment projects. This suggests a lack of definition in the strategy as a whole.

It is also difficult in reviewing the list to identify what will be done to a reasonable degree of specificity. For example:

- How will road traffic safety “*leadership*” and “*coordination*” be strengthened within the executive committees of the party hierarchy, as well as between ministries, branches, localities and socio-political organizations?
- What additional strategy, planning and program requirements will be placed on provincial governments?

An example in this attachment of a useful statement about an innovative solution is that traffic will be separated by a median barrier along the entire length of National Highway 1A (NH1A) by 2016. This is an action which will implement the strategy – a clearly articulated intervention (median separation) will be delivered in a precise manner (NH1A) by a certain date (2016).

6 Implementation

This section addresses Articles 2, 3 and 4 of the strategy decision and the section on funding.

The NTSC is required to assist the Prime Minister to direct implementation of the Strategy. Ministries, branches, provinces and cities directly under the Central Government are to take responsibility for implementing the strategy and short, medium and long-term action plans. The NTSC and the relevant Ministries are to regularly check and update the Strategy.

Each of these are essential but may be too generic to assess implementation of the strategy. Funding is a good example. Funding is a specific implementation matter which is addressed in a generic statement about maximizing all resources, both international and particularly domestic, and attracting investment to ensure sufficient funds for implementing the national strategy. This area is critical, but can prove difficult. The Ministry of Planning and Investment (MPI) and the Ministry of Finance (MOF) are held responsible for ensuring resources to implement the strategy. This runs the risk of being meaningless however, unless there is an agreed and documented commitment to identifying what resources are necessary, and what revenue mechanisms will be used to raise the necessary funds. There are a range of options available for this, such as the establishment of a dedicated national road safety fund.

An implementation schedule in each stage from 2012–2020 and 2021–2030 is attached, along with a table of programs and investment projects according for 2012–2015 and 2016–2020. However, these do little to clarify what specifically will be implemented.

7 Revising the Road Safety Strategy and Action Plan

The MoT has been delegated the task of leading the development of a new road safety strategy and action plan by the NTSC. The Transport Development and Strategy Institute (TDSI) within the MoT will be engaged to formally review the current strategy and develop a new strategy and action plan. This report provides some support for that task by assessing (at a high level only) the current approved Strategy, as well as by advising on establishing an NRSO and on strengthening road safety data systems.

The best process for developing a road safety strategy needs to reflect the current institutional settings for road safety in any country. The process may also be improved if it is considered as part of a future reform of those institutional settings. These settings are addressed in the following section of the report. This analysis of the approved Strategy concludes by putting forward a possible process and set of tasks for preparing a revised National Road Safety Strategy and Action Plan for Viet Nam.

Broadly, five phases are proposed to the strategy development process.

1. Preparation

Early project planning is required, including gaining Ministerial approval for the preparation of a strategy, and ensuring that stakeholders are engaged at an early stage. This is important to ensure political ownership of the strategy and stakeholder ownership of its implementation. Ministers need to be kept regularly informed of progress and any issues that emerge. Stakeholders need to have an opportunity to provide input to the technical analysis, and the development process which will be undertaken.

Project preparation also needs to include the establishment of a formal project leadership structure, if an appropriate structure does not already exist. The NTSC has commissioned the strategy, and it is important that they establish a Strategy Leadership Group or similar which brings the key government agencies within the NTSC together to provide technical direction and leadership as the strategy is being prepared. This could be chaired by the Executive Chairman of the NTSC Office, and include the heads of the Traffic Police, the Transport Safety Department and other senior leaders. As well as preparation of an agreed project plan and establishment of a leadership group to drive the strategy, two other inputs would be useful. One is an assessment of the current situation, which describes the current road safety programs and assesses progress against the previous strategy. Another is a high-level analysis of good practice road safety strategies internationally. These inputs should be available for stakeholder consideration as strategy development begins.

2. Analysis

Consideration should be given to the implementation of the current strategy and action plan, and a report prepared on particular strengths, weaknesses, opportunities, and challenges to be considered as the next strategy is developed. This could be augmented by technical papers addressing issues which are known to be of strategic importance. These could include:

- A national data analysis;
- Current infrastructure condition and safety investment plans;
- Speed management;
- Vehicle safety regulation and compliance;
- Driver licensing systems and road traffic enforcement.

The goal is to prepare concise background material that allows a wide range of stakeholders to engage in the strategy development process. This should be accompanied by a small number of questions to drive engagement, such as:

- What are the critical road safety issues facing Viet Nam currently?
- What are the key road safety changes which Viet Nam should initiate under a new strategy?
- What should be the national vision for road safety in Viet Nam?
- What performance targets should be set for Viet Nam over the next decade?
- What institutional management arrangements are required to implement the strategy?

3. Engagement

This phase needs to be well planned. It needs to be based on a publicly available document which sets out the major road safety issues, and it should be focused on a small set of engagement questions. Answers to these questions provides potentially critical inputs to the content and nature of a draft strategy. It is likely that stakeholders will propose ideas which have:

- no supporting evidence to suggest the proposal should be pursued for safety purposes
- evidence that suggests the proposal may have negative safety consequences
- evidence that the possible safety improvements are negligible.

It is important that the engagement process is well resourced, with informed people in place to support strategy discussions, so that all views are heard, and some views are not inadvertently validated as a key element of the strategy. With these constraints in mind, there are many options for engaging stakeholders, and consideration is required about what will work best in Viet Nam. Some examples of options successfully used in road safety strategy setting are:

- National workshops, led by national road safety leaders, in a small number of provinces and cities, which seek direct input on the key consultation questions;
- Provincial meetings, and commune level discussions, which are designed to build support for a new approach to road safety;
- Scientifically developed surveys of the population to test acceptance of key ideas, such as a national vision, or particular interventions which are being considered;
- Preparing a strategy development website, which includes analytical material, engagement questions, and encourages people to lodge submissions during the strategy development period.

4. Validation

A draft strategy is prepared drawing upon the analytical inputs and the discussion and submissions from stakeholders during the engagement phase. The draft strategy needs to be reviewed at both a professional and a political level ahead of being released in final draft form to Stakeholders. Stakeholders can then review the final draft and consider this within a validation workshop. This has the benefit of ensuring that there is a common understanding amongst stakeholders of:

- The key analytical issues addressed, particularly regarding vision and targets
- The implications of the various strategic directions that are being put forward
- Reinforcing stakeholder commitment to implementing the strategy
- Developing a short list of actions to begin implementing the strategy

5. Publication

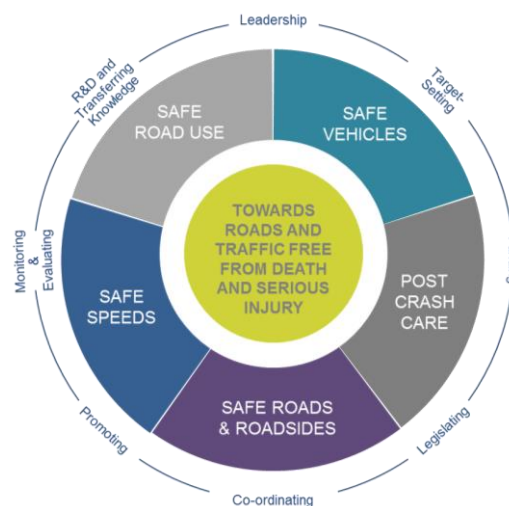
The final document can be published and disseminated once it has been endorsed by the NTSC and formally approved by the government. This should be accompanied by consistent messages, based on formal government decisions, regarding:

- The vision, targets and directions of the new strategy
- Implementation arrangements for delivery of the strategy
- Major initiatives which will be undertaken to launch the strategy.

8 Applying the Safe System Approach

Finally, it is important that there is an underpinning safety philosophy which can shape the development and implementation of the road safety strategy. Globally, the consensus across multilateral and regional institutions is that a systems-based approach is required to tackling road safety. The “*Safe System*” approach is based on a philosophical commitment to eliminating fatal and serious injury, using management systems to ensure that every part of the system (eg, road, vehicle, human) is strengthened so that users are protected from injury. Some background is provided in a box, and a good illustration of it is provided in the figure below.³⁵

Figure 16: An illustration of the Safe System approach to road safety



The approach is grounded in significant research which demonstrates two essential ideas:

1. That humans make mistakes in road traffic and these mistakes should not result to fatal or serious injury. A study in Australia highlighted that over half of all fatal injury crashes and almost all non-fatal injury crashes were the result of “*system errors*”, rather than extreme behaviors by users (such as heavy drinking or speeding).³⁶
2. That humans are extremely vulnerable to fatal or serious injury, depending upon the impact speed of any road traffic crash. A major road safety report in the Netherlands concluded that in order to minimize the chances of fatality impact speeds should be restricted to:
 - 30 km/h in areas where pedestrians or cyclists are present;
 - 50 km/h at intersections where side-impact crashes can occur;
 - 70 km/h if there is no median protection from frontal-impact crashes.³⁷

³⁵ Loughborough University. 2017. Loughborough Design School Safe System Course.

³⁶ Wundersitz LN, Baldock MRJ. 2011. The relative contribution of system failures and extreme behaviour in South Australian crashes (CASR092), Centre for Automotive Safety Research, Adelaide.

³⁷ Wegman, F. & Aarts, L. (eds.) 2006. *Advancing Sustainable Safety; National Road Safety Outlook for 2005-2020*. SWOV, Leidschendam.

Eliminating road fatalities and serious injuries – the Safe System approach

The Organization for Economic Cooperation and Development (OECD) and the International Transport Forum (ITF) published a landmark report *Towards Zero* on road safety in 2008, inspired by the reframing of road safety as a societal health issue in the best performing countries such as the Netherlands and Sweden.³⁸

The report documented what has become known internationally as the “Safe System” approach, now recognized throughout low, middle and high-income countries as the basis upon which good road safety practice rests. The safe system approach was described in a variety of ways including:

- Challenging the view that road traffic injury is the price to be paid for achieving mobility and economic development by setting a societal goal of eliminating road deaths and serious injuries, with interim targets set along the way;
- Accentuating the safety responsibility of designers of the road network for achieving road safety results, and promotes a shared vision amongst all parts of society;
- Aiming for a road traffic system which can accommodate human error, so that road users are not exposed to crash forces likely to result in death or serious injury;
- Demanding equity in addressing the safety needs of both motorized and non-motorized users, and alignment with the goals of sustainable development;
- Strengthening all elements of the road safety management system, especially institutional management functions, to achieve sustainable success.

This approach should not be regarded as fixed – the ideas and practices will continue to evolve. It stands in stark contrast to largely discredited approaches of the past which have presented road safety as a task of perfecting human behavior or (contrary to demonstrated injury prevention evidence) relied on education and information campaigns to reduce road trauma.

A shift towards the modern, evidenced-based, safe system approach is strongly recommended for Viet Nam.

³⁸ See OECD and ITF. 2008. *Towards Zero Ambitious Road Safety Targets and the Safe System Approach*. Paris. And International Transport Federation. 2016. *Zero Road Deaths and Serious Injuries: Leading a Paradigm Shift to a Safe System*. OECD Publishing: Paris.

Attachment 3: Data Resources

Resources are provided here to support the implementation of the recommendations from this report:

Attachment 3A	Crash Data Literature Review
Attachment 3B	Description of DRIVER
Attachment 3C	Road Crash Data Observational Study
Attachment 3D	Recommended Crash Data Elements

Attachment 3A: Crash Data Literature Review

This literature review of crash data systems around the world has been prepared to provide some guidance as the government finalizes the specifications of the NRSP and the associated data improvement programs of the MoPS and the MoH. This attachment aims to provide a brief review of readily available documents and best practice.

1 Source of National Crash Data

The ultimate objective in determining which is the best source of crash data is knowing which entities can provide data on final crash outcomes especially for those resulting in fatalities and serious injuries. A good data set however will not just include the number of fatalities and injuries but also adequate details on the incident, the road users, the vehicles, and the environment. It is well-known that a single source of data is not enough to have a comprehensive view of road safety.³⁹ Best practice suggests that a combination of sources, usually police and hospital records, allows for a more robust data management system. Having different sources eliminates bias when it comes to identifying problems and corresponding solutions. For example, merely relying on incident details might overstate problems in behavior whereas there can be issues in road infrastructure. Or the availability of detailed injury data (e.g. data that will show that cranial injuries are more prevalent) can reveal issues on vehicle safety standards.⁴⁰

Police Data

According to the WHO⁴¹, 70% of countries use police data as their primary source of crash data. The police are in the best position to collect information on the crash site especially since they also conduct thorough investigations of the crash (vehicles and drivers involved, circumstantial evidence, environmental conditions, etc.). Often, they maintain their own database systems such as in the United States, particularly in Indiana, and in various parts of Australia. There are also instances such as in New Zealand wherein the police directly submit reports electronically through smartphones to the NZ Transport Agency who then manages the Crash Analysis System. (NZ Transport Agency, nd) The NZ Transport Agency is responsible for determining user access policies and sharing the data. They also act as a repository of other database systems such as for vehicle registrations and licenses.

Closer to Viet Nam, in Malaysia the police have their own database system called the Police Reporting System (PRS). Its use however is limited to the police. To address this, the Malaysian Institute of Road Safety Research (MIROS) regularly collects electronic reports from the police and then uploads these into their own database called MIROS Road Accident Analysis and Database System (M-ROADS). This has recently been upgraded to the Malaysian Highway Road Accident Analysis and Database System (MHROADS) which is being used by

³⁹ roadsafety.piarc.org. (n.d.). *Road Safety Manual - World Road Association (PIARC)*. Online. Available at: <https://roadsafety.piarc.org/en>. Accessed 27 Feb. 2020.

⁴⁰ ITF. 2016. *Road Safety Annual Report 2016*. Online. Available at: <https://www.itf-oecd.org/road-safety-annual-report-2016>.

⁴¹ World Health Organization. (2010). *Data systems: a road safety manual for decision-makers and practitioners*. [online] Available at: <https://www.who.int/roadsafety/projects/manuals/data/en/> [Accessed 1 Nov. 2019].

the Highway Patrol. It comes with its own mobile app and web-based interface, however it is only limited to highways.

In other instances, underreporting arises when there is no coordination between police and other government agencies. Determining final crash outcomes will require the police to coordinate with hospitals or insurance companies. Underreporting also happens when definitions for fatalities and injuries are not standardized. In addition, the process for reporting also affects the quality of the data. For example, in Ghana, while the primary source of detailed crash data is the police, this data is not linked with the national road traffic crash database which is hosted by the Building and Road Research Institute (BRRI). Every year, staff from BRRI have to visit police stations to get data from the police. They encode these to the national database system.⁴² This caused underreporting in the country, and a reformed system is being now developed.

It also has to be noted that in many countries there are different kinds of police that all collect road crash data. Often, these different groups do not share data with each other, or use different forms and database systems. For example, in Italy the police who collect crash data are Highway Police, Local Police, Police and Carabinieri (an army corp). It is important to clarify who among the police force will be the source of crash data. If all segments of the police will collect data, it is crucial to have the same form or database and that skills and expertise are at the same level.⁴³

Police and Hospital Data Combined

When police data is inadequate, hospital data can be used to gain a clearer picture of road safety. Hospital data is the next most useful source of information for crash statistics. Hospital data are able to capture data that have not been reported to the police, and it is not unusual for police to capture less than two-thirds of all hospitalizations. Hospital data will typically not have detail about the crash, but will have more accurate and detailed information on the injury than police reports. This is vital information to understanding biomechanical impacts in crashes. Related information can be found in vital registration data, verbal autopsy surveys, hospital in-patient records, and trauma registries.

More and more countries, such as Canada and the United States of America, are therefore now integrating both police and hospital data, ensuring that this linkage is stored, coded and managed properly.

There are alternatives to linking the police and hospital database systems such as in Sweden where both police and hospitals use the same database called STRADA which is managed by the Swedish Transport Agency.⁴⁴ This leads to a more accurate number of fatalities and injuries as well as more detail on vulnerable road users and serious injuries. The police and hospitals both enter data into STRADA and the database matches identical records from both of the sources to avoid duplication. Currently, not all hospitals are enrolled in STRADA therefore the

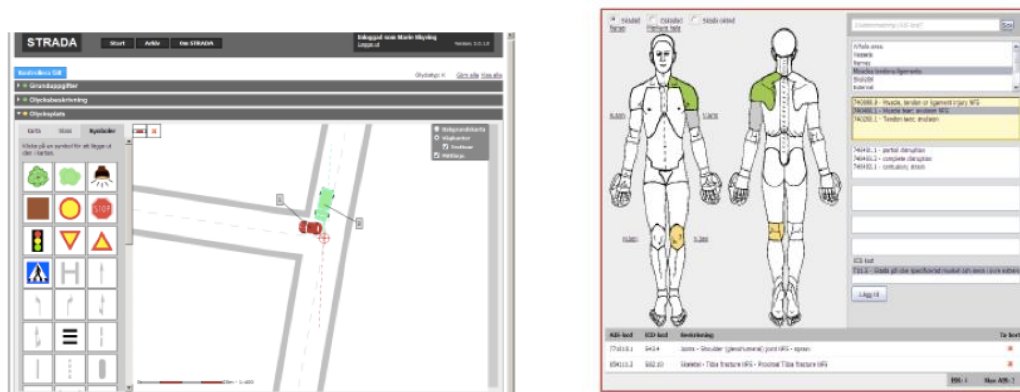
⁴² Salifu, M. and Ackaah, W. 2012. Under-reporting of road traffic crash data in Ghana. *International Journal of Injury Control and Safety Promotion*, 19(4), pp.331–339.

⁴³ Montella, A., Andreassen, D., Tarko, A., Turner, S., Mauriello, F., Imbriani, L., Romero, M. and Singh, R. 2012. Critical Review of the International Crash Databases and Proposals for Improvement of the Italian National Database. *Procedia - Social and Behavioral Sciences*. Online. 53, pp.49-61. Available at: <https://www.sciencedirect.com/science/article/pii/S1877042812043212>. Accessed 10 Jan. 2020.

⁴⁴ ITF. 2016. *Road Safety Annual Report 2016*. Online. Available at: <https://www.itf-oecd.org/road-safety-annual-report-2016>.

official statistics still rely on police data.⁴⁵ At the same time, data on minor injuries especially those who do not need hospital care tend to be underreported. A screenshot of STRADA is in the figure below.

Figure 17: Print screen from STRADA database



Police and other Data Collection Entities

In Egypt, crash records are being encoded by the police, hospitals, emergency response teams, fire brigades, and the road administration in a system called the National Accident Management System (PIARC, 2019). The system was intended to be a one-stop-shop for all data needs and for all those who collect crash data. The implementation of the system included the procurement of both hardware and software. It is believed that this arrangement reduced underreporting, but the 30-day definition of fatalities has yet to be adopted.

This is similar to Thailand where there are multiple sources of crash data: from the Royal Thai Police, Ministry of Public Health, Ministry of Transport, Department of Highway, Expressway Authority of Thailand, Department of Disaster Prevention and Mitigation, Emergency Medical Institute of Thailand, Road Accident Victims Protection Company Limited, and Department of Rural Road. While there are multiple sources of data, these are not standardized and integrated with each other. To address the lack of integration and uniformity, the Thai government together with Bloomberg Philanthropies and the Global Road Safety Facility (GRSF) are planning to use DRIVER as a single repository for all these data. DRIVER is discussed more deeply in Attachment 3B.

In Korea, insurance and transport companies also collect crash data but the official data comes from the police who have their own database system called the Traffic Cop Information Management system. The police then share the crash data to other stakeholders through a publicly available platform called the Traffic Accident Analyst System of the Road Traffic Authority and the Transportation Safety Information Management Complex System of the Korea Transportation Safety Authority.⁴⁶ These two authorities are responsible for combining

⁴⁵ roadsafety.piarc.org. (n.d.). *Road Safety Manual - World Road Association (PIARC)*. Online. Available at: <https://roadsafety.piarc.org/en>. Accessed 27 Feb. 2020.

⁴⁶ Knowledge Sharing Program and Inter-American Development Bank Joint Consulting. 2019. *Road Safety Information System and Investigation Tools*, Ecuador.

the crash data with other road safety data and traffic information, sharing these to stakeholders and the public and using these to formulate policies and conduct research.

2 Linking Databases

Linking several datasets will increase the accuracy of data and provide more detail for evidence-based safety measures. Database systems should be linked when the additional data will add important information which is more accurate, accessible, or current than undertaking a separate analytical exercise. Confidentiality (the proper handling of personal information), the linking method, and standardizing data fields and definitions are amongst the list of factors that need to be considered.⁴⁷ Linking should be considered during early stages of database development. For example, as an injury database system is developed, consideration should be given to how it will link automatically with existing database systems – for example, a new record added to a hospital database could be automatically reflected in the crash database.⁴⁸

This section will elaborate more on the kinds of linkages.

Linking Crash Data and Non-Spatial Data

Here, non-spatial data refers to data that are not geo-referenced and do not contain any coordinates. The most crucial of these is hospital data. A number of studies have shown that police data is severely underreported compared to hospital data since hospitals are able to update fatality and injury information. Hospitals are able to record changes in severities occurring even after 24 hours of a crash. Another reason is that hospitals are trained to investigate injuries and will classify serious injuries more accurately. Other non-spatial database systems include licensing and vehicle registration data. Linking these with crash data allow police and enforcement agencies to cross-check the reliability of testimonies (e.g. vehicle owner's name).

To execute a linkage between crash data and a non-spatial dataset will require the matching of identifiers. These identifiers can be (1) unique identifiers, (2) secondary, and (3) customized identifiers.

One of the effective ways to link crash database systems and hospital database systems come from Sweden and Denmark. Those two countries are able to link these database systems by matching records with the same unique personal identifier. Examples of these unique identifiers are identification numbers and names. Even though confidential details are used for matching records, this is all done through computer algorithms therefore there is no human interface and no one is able to view the confidential data.

If using unique identifiers is not possible, secondary identifiers such as gender, birthday, place of crash, date of crash, age, initials are used. If records are able to meet a set number matches for these secondary identifiers then, the two will be linked or merged. The challenge here is defining the appropriate set of secondary identifiers and setting the appropriate number of matches so that the correct amount of data is captured. Another challenge encountered by practitioners is that there are many instances when spelling errors or incorrect details prevent records from matching.

⁴⁷ World Health Organization. 2010. Data systems: a road safety manual for decision-makers and practitioners. Online. Available at: <https://www.who.int/roadsafety/projects/manuals/data/en/>. Accessed 1 Nov. 2019.

⁴⁸ Ibid.

Currently, the Philippines is integrating the injury surveillance system and DRIVER using a matching method for secondary identifiers. These secondary identifiers are the (1) sex, (2) age, (3) location, (4) date of crash, (5) time of crash, (6) severity of crash, (7) name of road where crash happened, and (8) location of crash.

This is also being done in Guaiba, Brazil but includes unique identifiers in the matching such as names.⁴⁹

Finally, it is also possible to create a crash identifier that will facilitate the linkage of the two database systems. This has been done in Spain in their database⁵⁰ along with an introduction of an additional indicator which specifies if a patient has already been admitted previously for the same injury. The latter is to avoid duplication of data.

Linking Crash Data with Spatial Data

Here, spatial data refers to traffic data, road inventory, iRAP assessments, road hazards, street-view photographs and other map-based information. It is fairly easy to integrate these types data because they are all based on a map.

Spatial data linkages can also be used to automate the filling-up of select fields in the recording crashes. A good example of this is data on weather. The crash database can be linked into an international or a local weather database system so that police will no longer have to record that data. When a crash happens, information on the weather will automatically be appended to the record based on time and location. Another good example of spatial data are road attribute data. A map of road surfaces, road types, junction types should be available from the Road Authority. This can be integrated with the crash database system so that police will no longer have to fill these fields when recording crashes.

3 Data Sharing

In light of the Safe Systems Approach, the database system should be made available to all relevant stakeholders in road safety.⁵¹ This needs to be done in a manner which respects personal privacy and confidentiality, but privacy and confidentiality is never an acceptable reason for not sharing data. It may create some technical work to ensure proper handling of data. However, road crash and injury data are vital public safety information, which need to be made available for external analysis and scrutiny if road safety is to be significantly improved. There are many different options for how data can be shared and managed in such a manner to make it easy for road safety practitioners, researchers, and advocates to contribute to road safety.

In New Zealand, access to non-confidential data is given to any person who applies for access, undertakes a simple training program, and have been certified by the database manager. No personal data can be accessed, except for those government agencies with legal access to the full database. A similar situation exists in Sweden.

This is different in the United Kingdom where general crash details are available publicly at crashmap.co.uk. Users can access individual reports by paying a fee. Names and other sensitive data however are not included in these individual reports.

⁴⁹ Ibid.

⁵⁰ Ibid.

⁵¹ roadsafety.piarc.org. (n.d.). *Road Safety Manual - World Road Association (PIARC)*. Online. Available at: <https://roadsafety.piarc.org/en>. Accessed 27 Feb. 2020.

Another function to ensure confidentiality of data is only providing public access to locations which go over a minimum number of crash records (e.g. only showing on a map, locations with more than 5 crash records). This is to eliminate the possibility of the public tracing a specific crash and seeing the findings of the police. This can happen when a specific location will contain only one record and parties involved can access what the police has recorded which can affect the investigation.

Ultimately, crash data are valuable and should be shared to everyone as long as confidentiality and privacy is maintained. This is possible through technology and a robust access policy.

4 Data Entry

Once the sources, storage and sharing of data are clarified, the next step is to determine the manner of data collection addressing questions such as what equipment to use and how quickly a crash is recorded after it has happened. In literature, there are two ways to collect data: the former involves filling up forms at the crash scene and the second is a direct encoding at the crash scene. This usually involves an encoder or administrative officer at the police station who collects paper or electronic forms filled-up by police who responded to the crash scene. There are instances where electronic forms are used because there is a separate database that is being used for crime records. This encoder, who can be the police or an administrative officer, will then input the record into the system. The latter collection method eliminates the additional step of filling-up a paper or electronic form as encoding into the system happens at the crash scene. It can be done by the police through a mobile phone or laptop on the crash site.

The issue with the first collection method is that it is prone to error and misinterpretation. A paper form is usually prone to errors: handwriting can be incomprehensible, forms can be damaged or lost, among others. When there is a separate encoder, then the data can be incorrectly transcribed or misinterpreted especially if original data needs cleaning.⁵² However there are places where this has worked, particularly in the case of the Fatality Analysis Reporting System (FARS) database in the United States where specially-trained encoders are responsible for entering data. Contingent upon this is the regular training of the FARS staff.⁵³ On the opposite end however, this process can cause problems in underreporting and resources as in the earlier case of Ghana and the Philippines.

The ideal scenario is the second option where police are provided with mobile phones or laptops so they can enter records electronically and immediately at the crash site. Here, handwriting will no longer be an issue. Forms can be simplified to remove misinterpretation and quality checks can also be present such as assignment of mandatory fields, automatic filling-up of particular fields, among others.⁵⁴ For example, in Indiana, all police encode

⁵² Jurewicz, C, P.B. (n.d.). *Road Safety Engineering Risk Assessment Part 7: Crash Rates Database*. Online austroads.com.au. Available at: <https://austroads.com.au/publications/road-safety/ap-t152-10>. Accessed 27 Feb. 2020.

⁵³ Ibid.

⁵⁴ Delucia, B., & Scopatz, R. 2005. Crash records systems: A synthesis of practice. national cooperative highway research program synthesis 350. Transportation Research Board, Washington DC.

crashes electronically in the field. These records are then directly sent to the database.⁵⁵ Another example is DRIVER which has a built-in mobile application which allows police to enter records at the crash site. It comes with a built-in GPS coordinates generator which allows crash locations to be accurate. In addition, the mobile application comes with an offline mode which allows encoders to save records even without an internet connection. When internet is already available, the saved records will automatically be uploaded to the main website. This mobile app has already been tested in the Philippines and in Lao PDR.

5 Reporting

Best practice also requires that reporting and data entry deadlines are clear with all encoders. Usually, more severe crashes should be prioritized in terms of reporting. For example, in Spain, preliminary data on fatal and serious crashes should be encoded into the database within 25 hours and for minor crashes within 10 days. The complete and final forms should be completed within 2 months. This is also to follow the WHO definition of road fatalities which is fatality that occurs within 30 days of a crash.

6 Forms and Database Systems

This section provides a review of what is a good database system based on the database itself. In principle, a good database provides the end user with outputs that they need. In road safety, these outputs should enable users to identify high-risk sites and risk factors, conduct cost-benefit analyses for interventions and programs, and monitor road safety performance.⁵⁶

It is in this regard that the database should be easy-to-use in terms of data entry and analysis. This means that data collection forms, whether manual or electronic, can easily be understood and completed, that collating these forms are not prone to error, that records are not vulnerable to loss and that integrating the data with other types of data can be done.

This ease of use also extends to analysis. Such tools are recommended to be included:

- Data in tabular form and reports (e.g. comparing fatality numbers among provinces);
- Visualization such as graphs or charts for analysis (e.g. trend analysis of fatalities);
- Identification of high-risk sites (e.g. filtering data by location);
- Geographic information systems (e.g. generating black spots and heat maps); and
- Collision diagrams.

7 Data Requirements

Crucial to a robust data management system is the type of data requirements that are collected, used, and analyzed. It is important to be able to determine what the minimum data requirements are, their definitions, who will collect these requirements, and how will they be collected.

Minimum Data Requirements

The WHO Data Systems Guide provides the perfect guide on minimum data requirements. Their list is based on the Common Accident Database (CADaS) which is an EU-wide directive for setting minimum indicators. CADaS is a result of extensive consultation and research. The

⁵⁵ Montella, A., Andreassen, D., Tarko, A., Turner, S., Mauriello, F., Imbriani, L., Romero, M. and Singh, R. 2012. Critical Review of the International Crash Databases and Proposals for Improvement of the Italian National Database. *Procedia - Social and Behavioral Sciences*. Online. 53, pp.49-61. Available at: <https://www.sciencedirect.com/science/article/pii/S1877042812043212>. Accessed 10 Jan. 2020.

⁵⁶ Ibid.

WHO Data System Guide uses CADaS as a basis but customizes it to the needs and context of Lower to Middle Income countries.

According to both CADaS and WHO, the criteria for selecting data requirements are as follows: they must be useful for road safety analysis, they must be comprehensive and concise and include a description and scope. Data which are impossible or very difficult to be collected should be removed. These requirements fall under four categories namely Accident, Road, Traffic Unit (Vehicle and Pedestrian), and Person.

Ultimately however, this list should be finalized in consideration with the advantages and disadvantages in collecting each of the indicators. For example, as mentioned previously, some of the indicators can be collected by linking with other database systems.

Defining Crash and Injury Severities

Best practice recommends to define crash fatalities as “*any person killed immediately or dying within 30 days as a result of a road traffic injury accident, excluding suicides.*”⁵⁷

Serious or severe crashes on the other hand are defined as resulting to at least one serious injury while slight or minor crashes do not involve any serious injury or fatality but resulted to at least one minor injury.⁵⁸

Property damage crashes do not involve any injuries or fatalities.⁵⁹

In Netherlands and as recommended by IRTAD, the Maximum Abbreviated Injury Score has the most appropriate and objective set of injury severity (6 levels).⁶⁰ However, the problem with using this definition is that its use is still limited.⁶¹ In EU countries and in most OECD countries, there are only two levels of injury severity which are serious injury and slight injury. Serious injury is defined as a person being admitted to the hospital for more than 24 hours. In the United Kingdom, serious injury is defined as a person being detained in the hospital as an in-patient.⁶² This however is found to be insufficient because the time stayed in the hospital is not the best indicator for the severity of injury. Because of this, the WHO added as an option to this definition the need for having a specialist attention for concussions, fractures, severe shock and lacerations. Slight injury is defined as requiring little or no medical attention.

⁵⁷ World Health Organization. 2010. Data systems: a road safety manual for decision-makers and practitioners. Online. Available at: <https://www.who.int/roadsafety/projects/manuals/data/en/>. Accessed 1 Nov. 2019.

⁵⁸ Ibid.

⁵⁹ Ibid.

⁶⁰ Pérez, K., Weijermars, W., Bos, N., Filtness, A.J., Bauer, R., Johannsen, H., Nuyttens, N., Pascal, L., Thomas, P. and Olabarria, M. (2019). Implications of estimating road traffic serious injuries from hospital data. *Accident Analysis & Prevention*, 130, pp.125–135.

⁶¹ Montella, A., Andreassen, D., Tarko, A., Turner, S., Mauriello, F., Imbriani, L., Romero, M. and Singh, R. 2012. Critical Review of the International Crash Databases and Proposals for Improvement of the Italian National Database. *Procedia - Social and Behavioral Sciences*. Online. 53, pp.49-61. Available at: <https://www.sciencedirect.com/science/article/pii/S1877042812043212>. Accessed 10 Jan. 2020.

⁶² Ibid.

8 Data Management Approaches

There are many different models of institutional responsibility for the management of crash data systems. A few examples are provided in the table below.

Table 8: Examples of Data Management Approaches

Country	Institution managing the database	Integration with other database systems	Availability and access to data
Australia ⁶³	In Australia, road crash data is primarily the responsibility of state governments. For example, in New South Wales, the Centre for Road Safety manages the crash database system. In Victoria, VicRoads and the Transport Accident Commission manages the database.	Not all states have established data linkages with the crash database system. New South Wales integrates crash data with the driver database only on a research project basis. Although crash and hospital data are linked as well as road infrastructure data. Victoria links crash data with the road database.	Again, this varies per state. For the National Database, there is web-based open access. In New South Wales, the database is not open to the public although statistical reports are open to the public. In Victoria, there is web-based open access to the whole system as well as regular statistical reports.
Cambodia ⁶⁴	National Road Safety Committee acts as oversight to the national database system, the Road Crash and Victim Information System (RCVIS) which was developed with the help of three ministries: Ministry of Public Works and Transport, Ministry of Interior, and Ministry of Health.	RCVIS combines data from police and hospitals. There are standard data collection forms for the police and for hospitals. However, data from health facilities is still irregular and will need the contribution of all health facilities.	Regular reports in both soft and hard copies are provided to all relevant stakeholders including non-government organizations.
Sweden ⁶⁵	The Swedish Transport Agency is responsible for the national crash database, the Swedish Traffic Accident Data	The police and hospitals both enter data in the same database. They use a matching method using person identification numbers	Yearly reports are available to the public while the web-based system is open to stakeholders. In order to access the system, a

⁶³ Czapski, R., Giemza, J., Job, S., and Żukowska, J. (2015). Report on Road Safety Information Systems Development for Poland. Global Road Safety Facility.

⁶⁴ roadsafety.piarc.org. (n.d.). Road Safety Manual - World Road Association (PIARC). [online] Available at: <https://roadsafety.piarc.org/en> [Accessed 27 Feb. 2020].

⁶⁵ Ibid.

	Acquisition (STRADA).	to establish a more accurate and reliable number of fatalities and injuries.	registration process is required as well as a one-day training on the use of STRADA.
Netherlands ⁶⁶	Ministry of Transport and Environment – Centre for Transport and Navigation uses the National Road Crash Register.	The crash location is linked to the National Roads Register. Vehicle information is added using the vehicle registration as basis. Crash data is also supplemented with data from the National Medical Register.	Web-Based Open Access
New Zealand ⁶⁷	The New Zealand Crash Analysis System (CAS) is maintained by the NZ Transport Agency.	CAS is not linked with the hospital database system. Road features, traffic operations data, and driver and vehicle data are available from other databases.	The public are given access to coded crash listings, crash grouping reports, and detailed police crash reports including through an application and a certification process.
Malaysia ⁶⁸	The police have their own database system called the Police Reporting System (PRS). The Malaysian Institute of Road Safety Research (MIROS) regularly collects electronic reports from the police and then uploads these into their own database called MIROS Road Accident Analysis and Database System (M-ROADS). The Malaysian Highway Road Accident Analysis and Database System (MHROADS) which is being used by the	Currently, PRS is not linked with M-ROADS. MIROS staff manually uploads electronic reports from PRS to M-ROADS.	Data is shared by request.

⁶⁶ Czapski, R., Giemza, J., Job, S., and Żukowska, J. (2015). Report on Road Safety Information Systems Development for Poland. Global Road Safety Facility.

⁶⁷ Montella, A., Andreassen, D., Tarko, A., Turner, S., Mauriello, F., Imbriani, L., Romero, M. and Singh, R. 2012. Critical Review of the International Crash Databases and Proposals for Improvement of the Italian National Database. *Procedia - Social and Behavioral Sciences*. Online. 53, pp.49-61. Available at: <https://www.sciencedirect.com/science/article/pii/S1877042812043212>. Accessed 10 Jan. 2020.

⁶⁸ MIROS. 2019. *Presentation at the Asia-Pacific Road Safety Observatory Workshop in Singapore*.

	Highway Patrol. National Trauma Registry from Ministry of Health is a secondary source of crash data.		
South Korea ⁶⁹	Official data comes from the police who have their own database system called the Traffic Cop Information Management system. Data from the police is then sent to Traffic Accident Analysis System of the Road Traffic Authority and the Transportation Safety Information Management Complex System of the Korea Transportation Safety Authority.	The Road Transport Authority and the Korea Transportation Safety Authority integrate the crash data from the police with other safety data.	These two agencies then share the data to the stakeholders and the general public.
Philippines	The Department of Transport is the main administrator of the Philippines' road crash system, the Data for Road Incident Visualization Evaluation and Reporting (DRIVER) and the police are the primary collectors of data. More information on DRIVER is found in Attachment 3B.	The government is in the process of integrating DRIVER with the Department of Health's Online National Injury Surveillance System. The linkage will be done through the matching of secondary identifiers.	The public are given access to the whole platform. Only registered government personnel have analyst and admin access and can view confidential data.
Indiana, United States ⁷⁰	The Indiana State Police are the primary collectors of data, and have outsourced management of the crash database to a private entity.	Road datasets are linked to the crash database and are managed by the Indiana Department of Transportation.	Web-based access

⁶⁹ Knowledge Sharing Program and Inter-American Development Bank Joint Consulting. 2019. Road Safety Information System and Investigation Tools, Ecuador.

⁷⁰ Montella, A., Andreassen, D., Tarko, A., Turner, S., Mauriello, F., Imbriani, L., Romero, M. and Singh, R. 2012. Critical Review of the International Crash Databases and Proposals for Improvement of the Italian National Database. *Procedia - Social and Behavioral Sciences*. Online. 53, pp.49-61. Available at: <https://www.sciencedirect.com/science/article/pii/S1877042812043212>. Accessed 10 Jan. 2020.

Attachment 3B: Description of DRIVER

The World Bank has developed and deployed a web-based and open-source system for geo-spatially recording and analyzing road crashes called DRIVER.

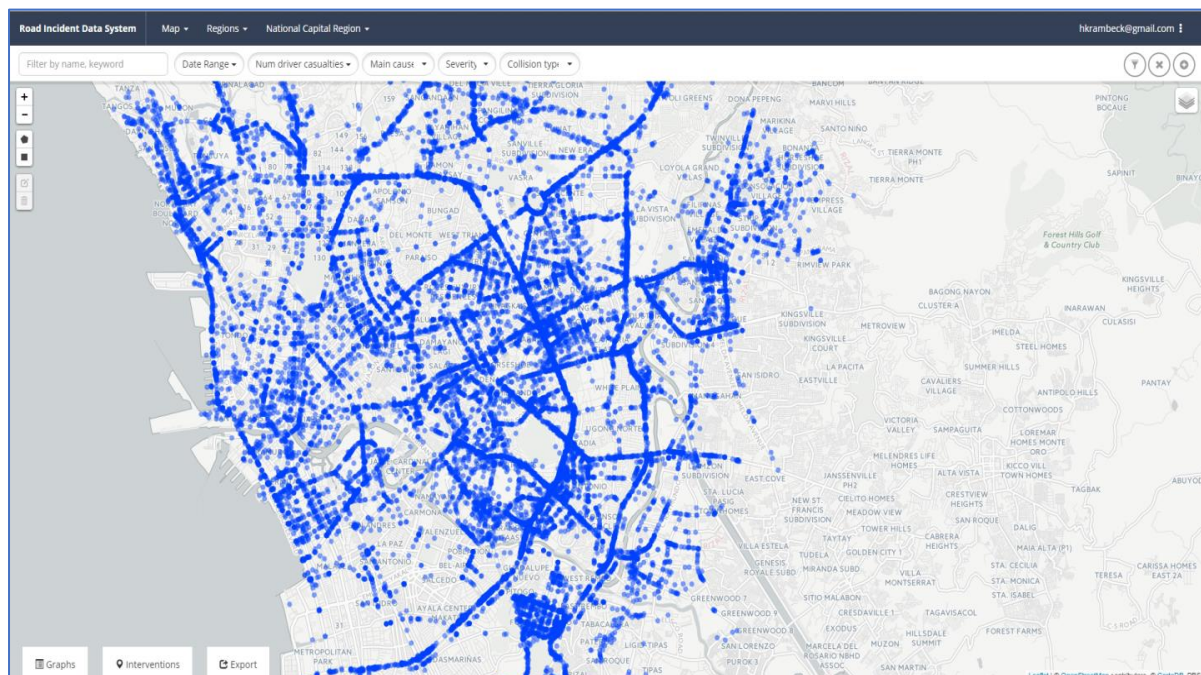
The system links multiple agencies involved in recording road crash data (i.e., local government units, the police, and the health system), standardizes terms and definitions for reporting, and provides analytical tools to support evidence-based investments and policies and monitoring the impact of interventions. Specifically, DRIVER features:

- A web and mobile-device interface for recording and viewing road incidents;
- Standardized data fields and entries to support analyses of historical crash data;
- Robust tabular and map-based filtering and search functions;
- Advanced API and data export and sharing features;
- Black spot, economic cost, and crash prediction analytical tools;
- Intervention tracking functionality; and
- A public-facing website.

Most critically, DRIVER is open-source, which means the code that is the basic structure of DRIVER can be accessed on the internet at <https://github.com/WorldBank-Transport/DRIVER>. This means that software developers can use the code to create and customize portals for different countries. This is cost-effective since governments will not need to build database systems from scratch or buy expensive off-the-shelf products. This is also advantageous since governments and local developers can maintain and improve the platform without being tied to a single company.

DRIVER is currently being implemented in multiple countries and for varying purposes. In the Philippines, it is being scaled-up as the official national crash database system. Below is a screenshot of the DRIVER platform in the Philippines (roadsafety.gov.ph):

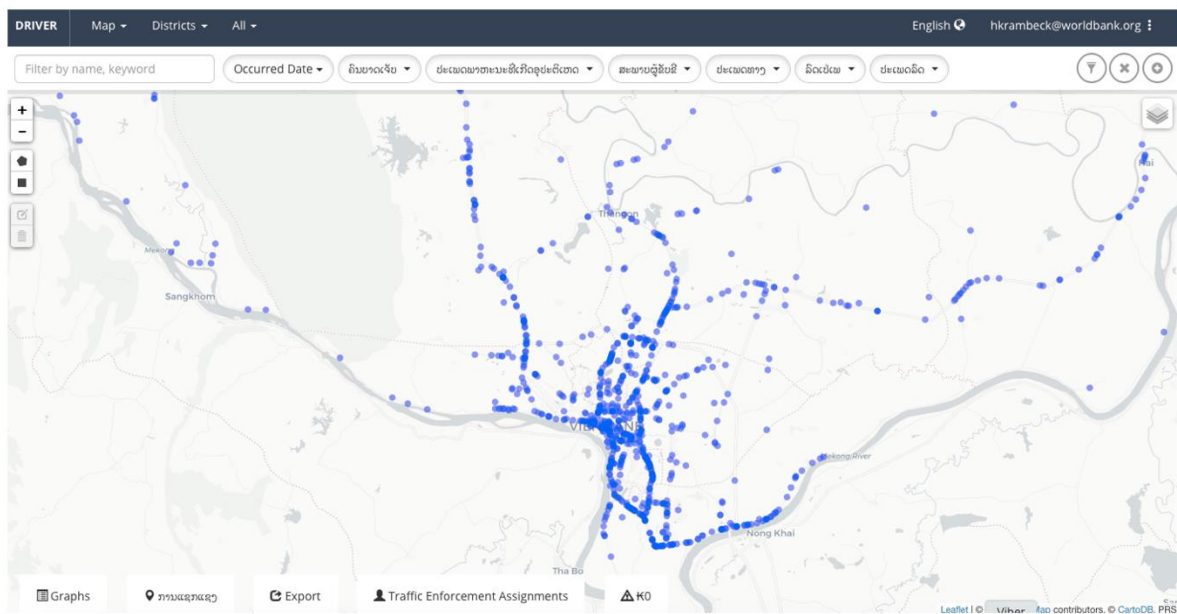
Figure 18: Print screen from Philippines DRIVER instance



Prior to DRIVER, the Department of Public Works and Highways in the Philippines uses their old database called the Traffic Accident Reporting System (TARAS). DPWH Staff will go to each police precinct and get the data either from logbooks or from manually-recorded forms and encode them into TARAS. Because it has been widely believed to be inefficient and at the same time, underreported, TARAS was discontinued last 2012 by the DPWH. Today, DRIVER enables the police to directly encode the data into DRIVER and share it easily to DPWH and other stakeholders.

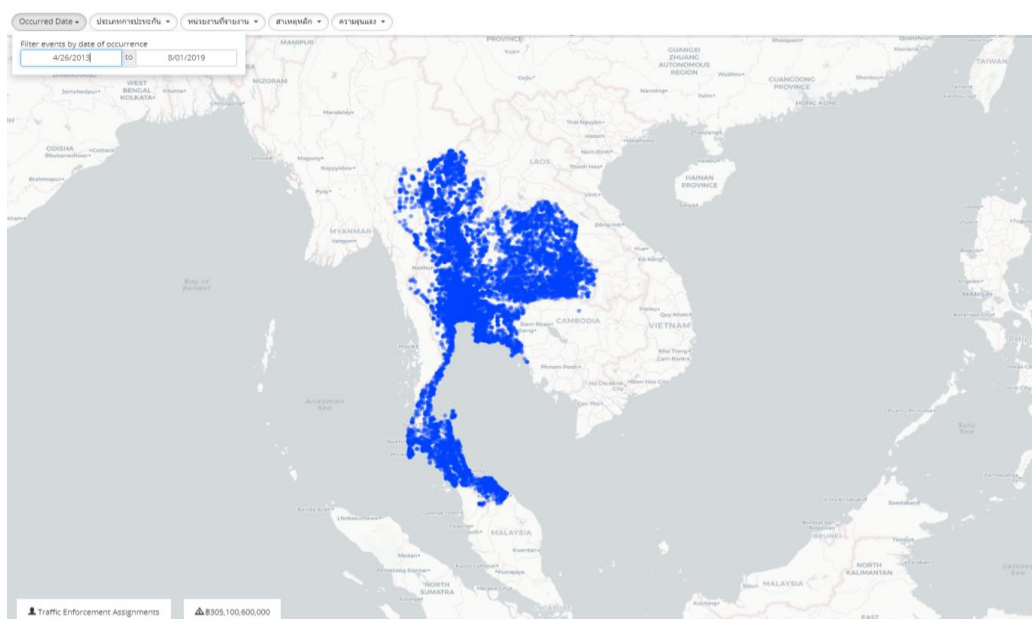
DRIVER is also currently implemented in Lao PDR and being scaled-up as the national crash database system.

Figure 19: Print screen from Lao DRIVER instance



In Thailand, DRIVER aims to integrate and standardize data from different ministries.

Figure 20: Print screen from Thai DRIVER instance



Attachment 3C: Road Crash Data Observational Study

A road crash data observational study was undertaken in January and February 2020 to assess activity at the level of police stations and commune-level health clinics. No criticism of people or institutions is implied in this report. The focus is on the systems which are in place and what improvements can be made.

1 Selection of the study areas

It was decided to conduct the study in three locations:

- A district in Hanoi or Ho Chi Minh City
- A district in a province housing both urban and rural areas, and
- A district in a province which is predominantly rural.

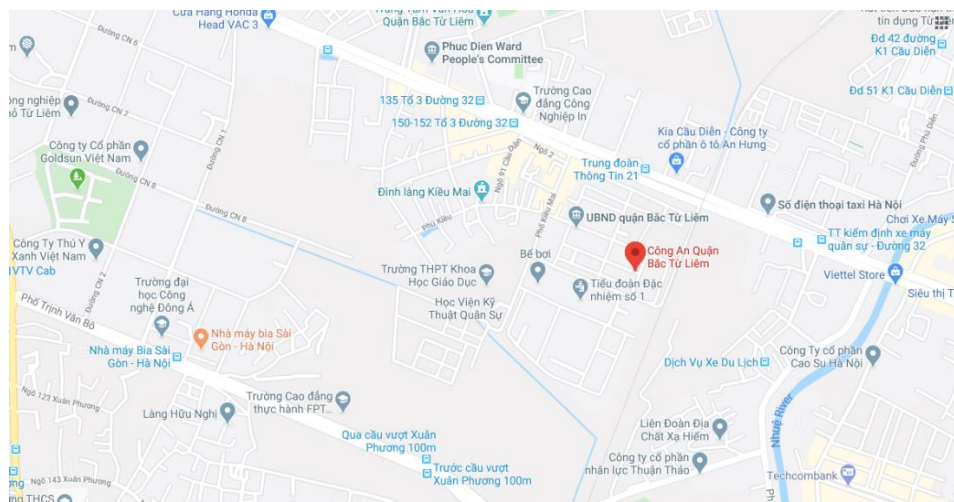
The selected locations are described below.

1. Hanoi, which is located in the Red River Delta region, to the North of Viet Nam. It is the political, economic and cultural center of Viet Nam, and one of the five centrally-administered cities of Viet Nam. Hanoi is classified as a special provincial level administrative unit and a special-grade city. It has 30 district level administrative units, consisting of 12 urban districts, 17 rural districts and 1 town with 584 commune level administrative units, including 386 communes, 177 wards and 21 towns.

The study was conducted in Bac Tu Liem District which is one of 12 urban districts in Hanoi, comprised of 13 affiliated commune level administrative units, including 13 wards:

- Bac Tu Liem District Traffic Police squad serves as a registry agency for motor vehicles and investigator and settler for traffic accidents but does not have the function of patrolling, controlling and handling violations. See map in figure below.

Figure 21: Map Showing Bac Tu Liem District Traffic Police



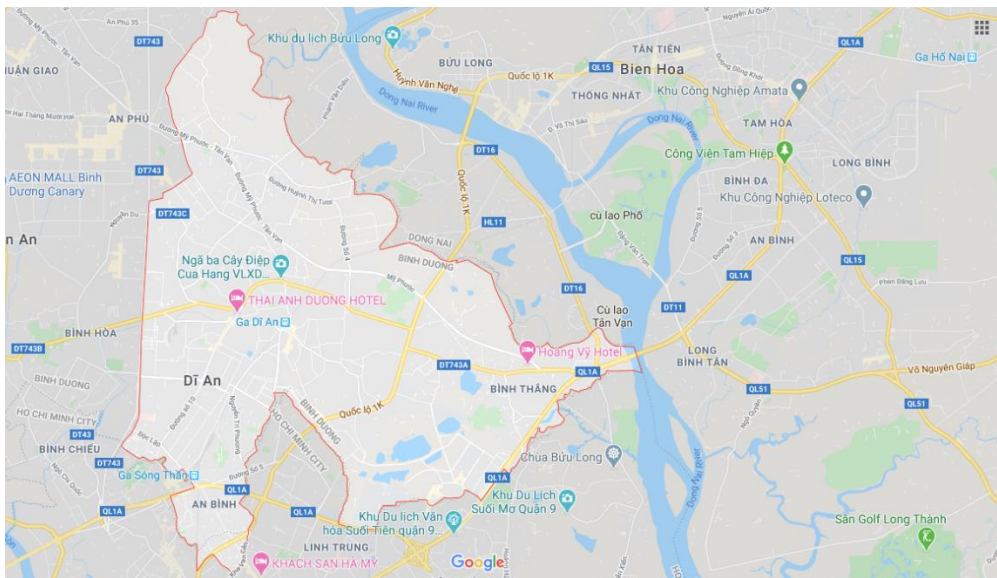
- Phuc Dien ward health station is one of 13 commune level health stations in Bac Tu Liem district. See Map in figure below:

Figure 22: Map Showing Phuc Dien Ward Health Station



2. **Binh Duong** Province, which is located in the Southeast region of Viet Nam. There are 9 district level administrative units, including 3 cities, 2 towns and 4 districts with 91 commune level administrative units, including 45 wards, 4 towns and 42 communes. In 2018, Binh Duong was the administrative unit in Viet Nam with seventh largest population nationwide. See figure below.

Figure 23: Binh Duong Province Map

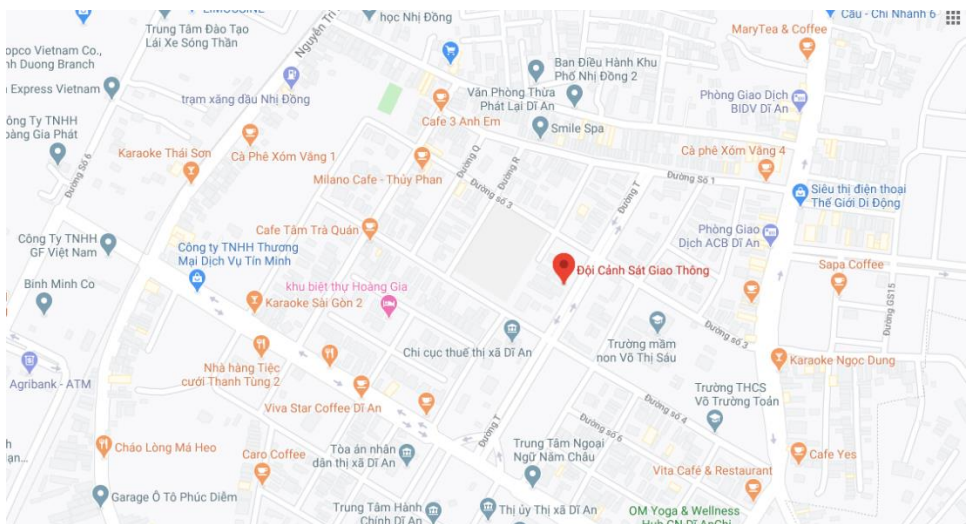
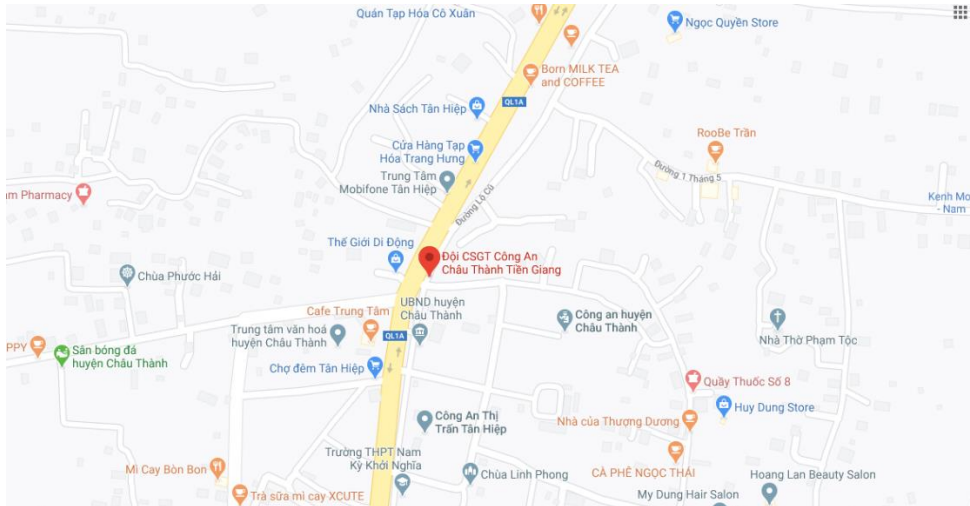


The study was conducted in Di An City (still known as Di An Town at the time of survey), which is a city under Binh Duong province with 7 affiliated commune level administrative units being 7 wards and no affiliated communes.

- Di An City Police is a district level police unit directly under Binh Duong Province Police. Di An Town Traffic Police squad serve as a registry agency for motor vehicles and investigator and settler for traffic accidents and also has the function of patrolling, controlling and handling violations.

- Di An ward health station is one of 7 wards equipped with "Health statistics software" developed by the Medical Data Center - Department of IT. See figure below.

Figure 24: Maps of Police and Ward Stations in Di An





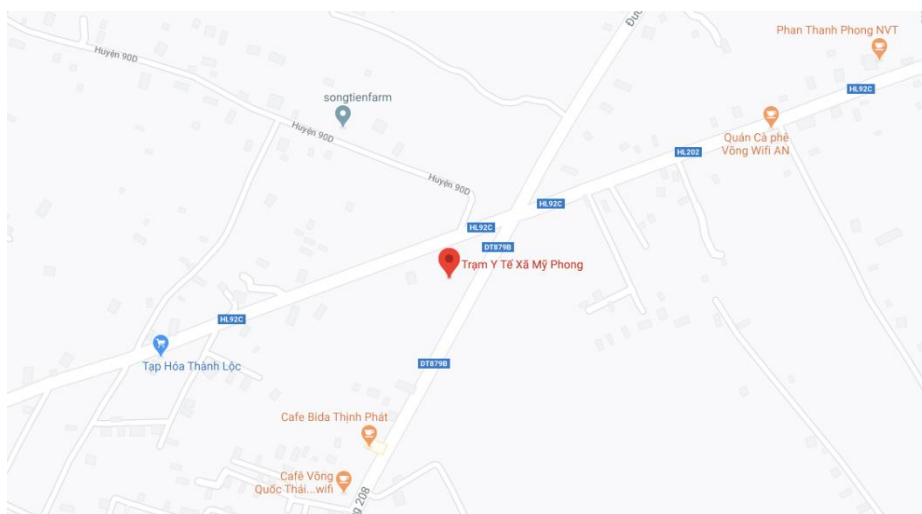
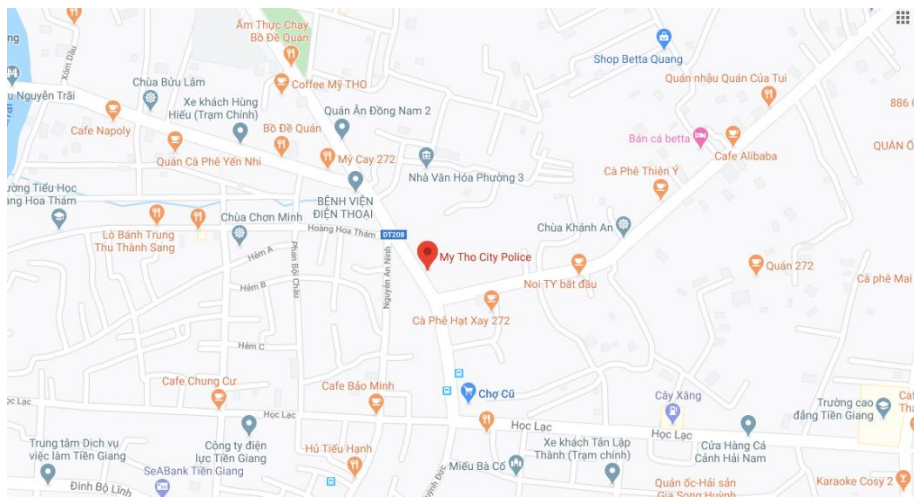
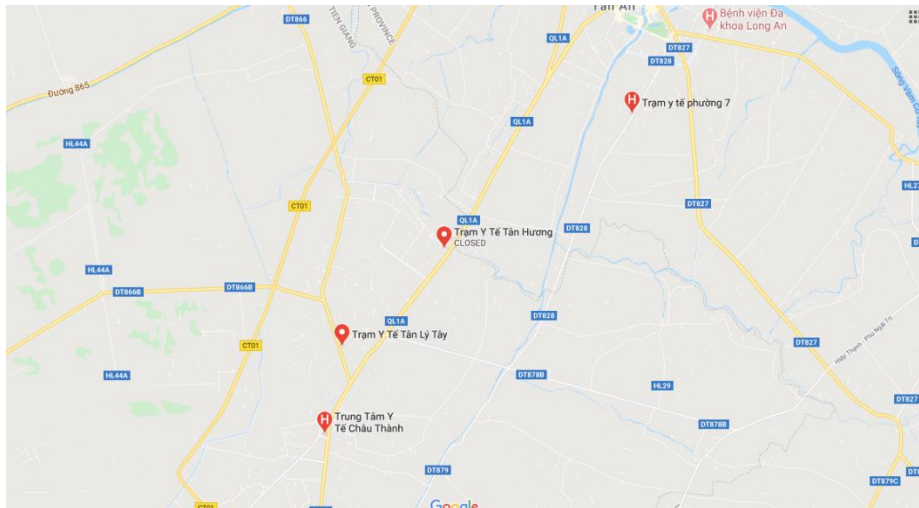
3. **Tien Giang** province, which is a cultural and political center of the Mekong Delta, a pivotal transshipment area linking the Southwest region with the Southern economic region more generally. Tien Giang Province, which consists of 11 administrative units including one city, two towns and eight districts with 173 commune level administrative units [https://vi.wikipedia.org/wiki/Xã_\(Việt_Nam\)](https://vi.wikipedia.org/wiki/Xã_(Việt_Nam)), including seven townlets, 22 wards and 144 communes. This locality is dominantly rural.

The study was undertaken in My Tho City, which is a grade-I city directly affiliated to the province and the second largest urban area after Can Tho city. My Tho City has 17 commune level administrative units, including 11 wards and six communes. This is a mixed area of urban and rural areas. See Figure 25.

- Chau Thanh District, Tien Giang Province, which has 23 affiliated commune level administrative units, including townlet Tan Hiep (capital townlet) and 22 communes.
- Traffic Police squad of Chau Thanh district is the unit responsible for ensuring traffic safety in the district, which involves directly investigating and resettling traffic accidents and compiling statistics and reports on traffic accidents.
- Tan Huong commune Health station, Chau Thanh district, Tien Giang, serves as a commune health center, responsible for statistics and reporting of injuries in Tan Huong commune.

My Phong commune Health Station, My Tho city, Tien Giang, serves as a commune health center, responsible for statistics and reporting of injuries in My Phong commune.

Figure 25: Police and Ward Stations in Tien Giang



2 Survey methodologies

The following methodology was followed.

1. Select survey area, and agree with World Bank project manager before reporting to the Director of the People’s Police Academy (PPA) to discuss with the local police.
2. Formulate the work plan and submit it to the Director of the PPA for approval.
3. Contact local police in survey sites.
4. Visit partnering units’ office to conduct survey:
 - a. Meet leaders of the police agency to present the referral letter and work plan approved by the Director of the PPA;
 - b. Communicate the objectives of the research activity in building a NRSO and identifying gaps in the published data on deaths due to traffic accidents of the Government and WHO, and between Public Security sector and Health sector;
 - c. Request the police to introduce the ward health station for interview, accompany the researcher to the health office (if possible), meet with the leader of the Health Station to discuss the objectives of the research, and propose to work with officials in charge of injury statistics;
 - d. Meet with leaders and officials in charge of injury data and investigation and settling of traffic accidents, as assigned by the traffic police unit commander and the Head of the Health Station;
 - e. Traffic Police officers and health workers of wards and communes are asked and answer interview questions (the questionnaires are not sent in advance) at the office (at the end of the interview, every answer is confirmed);
 - f. Survey staff consolidate responses into a draft report;
 - g. Speak with the interviewed staff via phone to clarify further details, if needed, and finalize the draft English report for sending to the research team.

Table 9: Survey timelines and locations

Time line	Location
December 30, 2019	Traffic Police squad in Bac Tu Liem District, Hanoi
December 31, 2019	Phuc Dien Ward Health Station, Bac Tu Liem, Hanoi
January 04, 2020	Di An Ward Health Station, Di An Town, Binh Duong
January 05, 2020	Di An Town Traffic Police squad, Binh Duong.
January 06, 2020	Chau Thanh District Traffic Police squad, Tien Giang
January 07, 2020	Tan Huong Commune Health Station, Chau Thanh district
January 08, 2020	My Tho City Traffic Police squad, Tien Giang.
January 09, 2020	My Phong Commune Traffic Police squad, My Tho city, Tien Giang.

Table 10: List of officers who participated in the interview

Location	Full name	Phone number
Traffic Police squad of Bac Tu Liem, Hanoi	Mr. Cuong - Head of Traffic Police squad	0936.822.228 0986.952.468

	Mr. Huan - Traffic Accident Investigation Officer	
Phuc Dien Ward Health Station, Bac Tu Liem, Hanoi	Ms. Ha - Person in charge	0969.251.083
Di An Ward Health Station, Di An Town, Binh Duong	Ms. Nguyen Thi Uyen Thi - Person in charge	0945.700.057
Di An Town Traffic Police squad, Binh Duong.	Mr. Ly - Head of Traffic Police squad Mr. Dung - Traffic Accident Investigation Officer	09873.720.272
Chau Thanh District Traffic Police squad, Tien Giang	Mr. Sang - Head of Traffic Police squad Mr. Toan - Deputy Head of Traffic Police squad and traffic accident investigation officers Mr. Thi - Officer at provincial Police Office	0908.755.756 0918.282.787
Tan Huong commune health station, Chau Thanh district	Ms. Phan Thi Kieu - Person in charge	0939.544.917
My Tho City Traffic Police squad, Tien Giang.	Mr. Binh - Traffic Accident Investigation Officer	0948.76.00.77
My Phong commune Traffic Police squad, My Tho city, Tien Giang.	Mr. Thach Nguyen Van Khang - Person in charge	0907.089.069

3 Findings

Units selected to participate in the survey, after understanding the objectives of research activities, offered their full support and enthusiasm. This included commanders and officers in charge who directly discussed and responded to interviews, and provided further clarification via phone. In particular, police forces in Hanoi, Binh Duong and Tien Giang provinces also contacted and discussed with the leaders of the medical center about the survey staff's plan, offered help in arranging appointments for researchers and accompanied the researcher to the Health Station, and attended the interview.

Interview results were discussed, clarified and agreed upon before being incorporated in the report.

4 Comments on the traffic accident database of the district traffic police and health station

Traffic accident statistics of traffic police force and commune and ward health stations are being implemented based on the rules and procedures of the Police and Health Sector.

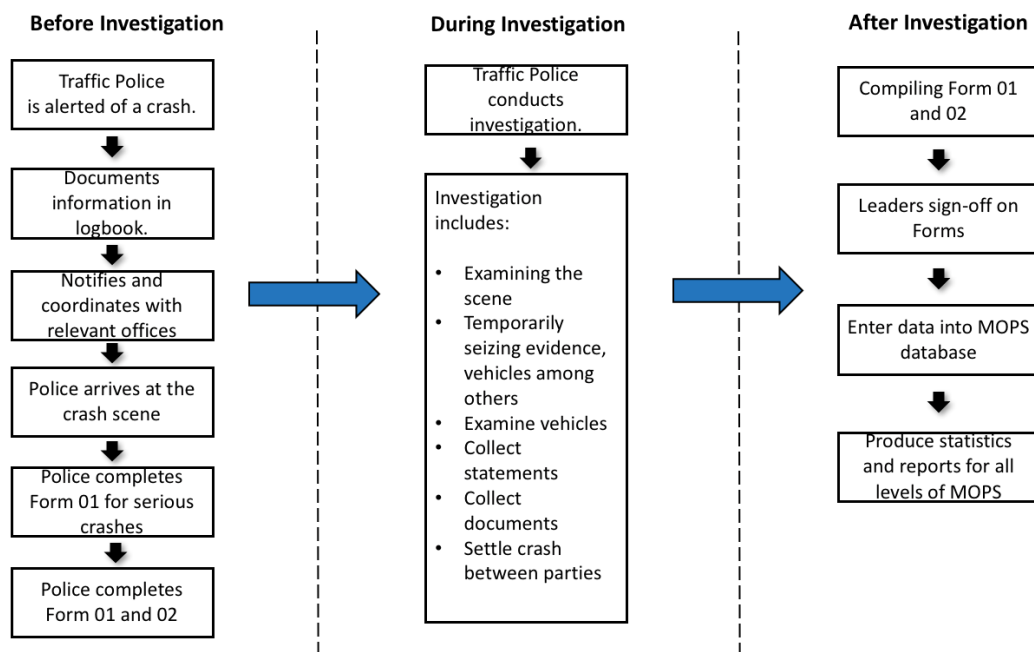
For traffic police squads: Follow Circular No. 58/2008 / TT-BCA dated October 28, 2009 by the Minister of Public Security stipulating and guiding statistics, synthesis and development of databases, information provision on road traffic accidents

For health stations: Follow Circular No. 27/2014 / TT-BYT dated August 14, 2014 by the Minister of Health stipulating health statistics forms applicable to provincial, district and commune health facilities; and Decision No. 25/2006 / QD-BYT dated August 22, 2006 promulgating the issuance of additional forms of injuries to the health sector's form system.

Procedures

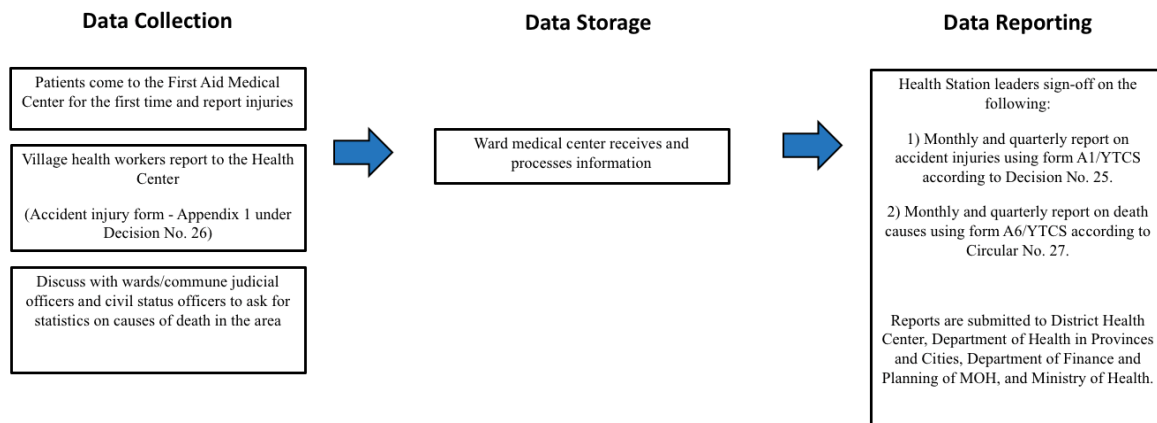
Implementing units must strictly comply with the reporting time and contents as prescribed. A summary of the Police and of the health workflow diagrams is provided below

Figure 26: Summary workflow diagram of traffic police force



The actual survey shows that in locations where traffic accidents database software is still active, collected information and documents on traffic accidents at the scene have been filled in the initial information form by the traffic police officials using the template 02/TNÐB provided under Circular 58 and entered into the database. This electronic report is fully updated when the investigation and settlement of traffic accidents is completed and transmitted to the MoPS' system.

Figure 27: Summary workflow diagram of health



Traffic Accident Database Software

A unified traffic accident database software is already in place for traffic police nationwide. Traffic Police squads in districts, cities, and towns are equipped with computers installed with database software, high-speed internet connection to import traffic accident data and transmit to the system managed by the Central Traffic Police Department affiliated under the Ministry of Public Security. Information about traffic accidents can be updated and revised according to the MoPS' process.

There is software for medical examination and treatment for commune and ward health stations but this is not unified across the whole industry and country. Two of the three surveyed health stations are piloting the system of healthcare software for patients and reporting injuries:

- Di An Ward Health Station, Di An City, Binh Duong is using "*Health statistics software*" developed by the Medical Data Center - Department of IT. The main function is to provide the report forms specified in Circular No. 26 and to enter the report data from paper form into the corresponding electronic form on the software to transmit to Di An City Medical Center.
- My Phong commune Health Station, My Tho city, Tien Giang is using "*Healthcare software*" developed by VNPT. The software is interconnected between medical stations, health centers, hospitals, medical examination and treatment facilities throughout the province. The software has sufficient information about patients to be examined and treated and allows retrieval of information when needed in line with the reporting form of injuries, causes of death under Decision No. 25, Circular. No. 26 by the Ministry of Health. The software enables health care facilities to know who has entered the medical facility for the first time for examination and treatment due to traffic accidents and which health care facilities have already performed statistics so as to avoid overlaps.

5 Quality of traffic accident databases

The traffic accident database of traffic police force is non-biased, updated and highly reliable. Specifically:

- When a traffic accident is reported, traffic police force immediately arrives at the scene to investigate and settle. Initial information about a traffic accident is entered, updated, and stored on the system, then if the investigation process finds out that it is not a traffic accident, it will be removed from the system.

- The severity of injury, the state of death, the extent of property damage in a traffic accident are all concluded by a forensic examination agency and a specialized assessment agency.
- Specialized officials in charge of investigating and handling traffic accidents are designated. The process of investigation and settling of traffic accidents is strictly observed.
- The officers are on-duty to receive information on traffic accidents on a 24/7 basis.

Statistics are collected on traffic accidents and on human damages (number of deaths, injuries) in each traffic accident, and/or property damages. The statistical work is done by a single traffic police unit in charge in the locality, so there is no overlap.

Information about traffic accidents is reported in the unified form mandated by the MoPS. It is stored both in paper and electronic form on the traffic accident database. After being imported onto the software, the database will be transferred to the provincial Traffic Police Department and the Central Traffic Police Department under the MoPS.

However, the traffic accident database of traffic police may be inadequate when traffic accidents are not reported to traffic police.

The traffic accident database of commune and ward health facilities:

- Only contain reported and statistical data on human injuries caused by traffic accidents (i.e. only part of the report); There is no separate database on traffic accidents in general.
- Injuries caused by traffic accidents cover all cases occurring on routes including roads, waterways, railways, airways, etc. (According to Decision No. 26).
- Data on injuries caused by traffic accidents are in the form of aggregate data. Specific reports must be extracted from the system (for localities with software) or must be manually looked up from medical examination and treatment books.
- The reliability in determining the cause of injury due to traffic accidents is not high since it is still based on declaration of the patient or their family members without verification from the competent authorities, including police force.
- Statistics are recorded by the number of people who are victims of traffic accidents and entered into medical station for first aid for the first time. There is no statistics by traffic accidents and the injury related information is only restricted to the location of injuries with no information on the severity of injuries, area of traffic accident, how it happened, what are the characteristics and causes of the traffic accident. However, with the help of the software, the NRSO system can provide valuable information, including: duration of treatment (for hospitalized cases); health insurance card number (for health insurance participants).
- Confirmation of death due to traffic accidents is based on data of the Judicial–Civil Status Management Department of the commune/ward People's Committee when family members complete death registration procedures.
- Commune health workers confirmed that the current statistical process – statistics on the causes of injury – is only applicable to patients who come to the health care facility for the first time, thereby allowing no duplication. However, overlaps may still occur in some cases, such as:
 - At the localities where there is no statistical software interconnected between health care facilities and hospitals. Following the first aid at health station, the victims are referred for emergency treatment at higher level hospital. Because such referral is not accompanied by any documents by the Medical Center, the

victim may still be counted for the second time by the hospital upon being admitted to the hospital.

- If the victim is admitted to an emergency hospital and dies in the hospital, the hospital will perform the statistics for the first time, but when the victim is returned to their locality, their family goes to the ward/commune People's Committee to complete the death registration procedure, and hence create the second statistics. Data are provided by the People's Committee to the Health Center for incorporation in the Cause of death report. Thus, in this case, the MoH has counted a case of death from traffic accidents twice, when synthesizing reports from health care facilities and hospitals.

6 Challenges and recommendations for resolution

For the health sector:

- There is no database for injuries in general and traffic accidents in particular. Listed causes of traffic accidents cover all methods of transport, road, waterway, railway and airway (Decision No. 26).
- The reliability in determining the cause of injury due to traffic accidents is not high since it is still based on declaration of the patient or their family members.
- There may be duplicates in the statistics of injuries and deaths caused by traffic accidents.

For the Public Security sector:

- The database is available but not complete. The reason is that at the district Traffic Police squads, there are some errors with the computer system, transmission lines, and software with no prompt action to resolve.
- Some information fields are missing due to the lack of specialized equipment (for example: detailed coordinates of the location where the traffic accidents occurred; sitemap of the traffic accidents scene).
- Traffic accident database may be incomplete in case road traffic accidents are not reported to the traffic police.

It is recommended:

- The Traffic Police Department should have mechanisms and measures in place to quickly address errors with the database of the district Traffic Police squad when incidents occur, thereby ensuring stable operation of the system. Discussion showed that when the system had a problem, the units report to the provincial police, and the provincial police, in turn, report to the Central Traffic Police Department within the Ministry of Public Security so that the Central Department could send technical staff to resolve. However, this resolution often takes a long time, thus affecting the information entry into the database.
- It is necessary to review, evaluate and equip Traffic Police with a complete and updated computer system and software for district police's traffic accident database.
- It is necessary to equip Traffic Police with computers, transmission lines and software of traffic accidents databases offices in provinces and centrally run cities for the purpose of monitoring, synthesis and statistics. (Proposal by the Office staff who is in charge of monitoring and ensuring traffic safety and security in Tien Giang province).
- Review and supplement GPS equipment and other equipment for traffic police units in charge of investigating and settling traffic accidents.

- The health sector needs to develop a unified traffic statistics software system by separating a number of information fields from the medical examination and treatment database of the health sector (this system also needs to be unified).
- It is necessary to develop a mechanism for sharing and cross-checking information about deaths related to traffic accidents in hospitals and victims' relatives to declare in wards and communes between the judiciary, communes, wards, and Traffic Police.
- Provide regular training for officers in charge of importing road crash and injuries data in the public security and health sectors.
- It is necessary to study solutions to integrate information fields of the health sector and the public security sector into the NRSO system on the basis of the traffic police's traffic accident database.

Attachment 3D: Recommended Crash Data Elements

The NTSC has requested for guidance in developing a minimum list of crash data elements to be collected and used for analyzing road crashes. It is crucial that a workshop is to be held with all concerned ministries to determine and agree on minimum data elements along with their definitions, values, and methods for collection. These crash data elements will be shared by the different ministries to the National Road Safety Portal which is housed under the National Road Safety Observatory.

As a guide, a list of recommended data elements has been identified based on key references such as the WHO Data Systems Guide⁷¹ and the APRSO task force document on indicators.⁷² The recommended data elements have been derived using the following principles:

- 1) While this list is for the Observatory, the primary collector of crash data is still the MoPS, and the list should not create an additional burden to the MoPS. MoPS collects crash data for two reasons: for prosecution purposes and for road safety. The recommended list builds on what the MoPS currently collects and improves on it for sharing to the Observatory.
- 2) To the extent possible, the list leverages health, vehicle, licensing and road database systems as well as the NRSP to automate the recording of particular data elements.
- 3) To the extent possible, all data elements will have definitions and assigned values that should be standardized among ministries. This is to ensure data uniformity and quality assurance.
- 4) The recommended list of crash data elements is aligned with the proposed structure of the NRSP.

Given the above, three categories of crash data elements will be collected by the NRSO and shared by the NRSP:

1. Collected by MoPS
2. Collected by MoT, and
3. Collected by both MoPS and MoH.

The crash elements assigned to MoPS are those that they are currently collecting in their own crash database system with a few improvements such as the introduction of “Contributing Circumstances (Road Environment),” “Movement Code,” and “Seatbelt, Helmet, and Child Restraints,” among others. It is also envisioned that a significant number of these elements will be derived from the integration of the MoPS database with the licensing and vehicle registration database systems.

The crash elements assigned to MoT are also those that they are ideally collecting in their road and bridge database system. In the absence of these data elements or in the absence of the integration between the MoPS and MoT or MoT and VNRSO, then these data can be sourced from the MoPS crash database by manual collection of police. It has to be mentioned that a significant number of these elements are also currently being collected by the MoPS for their crash database system.

⁷¹ World Health Organization. 2010. *Data systems: a road safety manual for decision-makers and practitioners*. [online] Available at: <https://www.who.int/roadsafety/projects/manuals/data/en/> [Accessed 1 July 2020].

⁷² APRSO. *Minimum set of Indicators*. Available at <https://www.unescap.org/sites/default/files/Crash-related%20minimum%20data%20set%20and%20data%20sources.pdf>. Accessed 3 June 2020.

The crash elements assigned to both MoPS and MoH is meant to have reliable and accurate crash and injury severity data. As mentioned in Attachment 3A, one way to link the crash and health database is to use secondary identifiers (e.g. crash identifier, crash date, crash time, crash location, sex, age, and date of birth). This way, privacy and confidentiality is maintained and at the same time, crash and injury severities are updated.

These elements are summarized in Table 11 below. It is recommended that the individual ministries add the following crash data elements (if they are not included) in their current data collection process.

Table 11: List of crash data elements assigned to each ministry

Collected by MoPS in Traffic Accident Database	Collected by MoPS & MoT	Collected by MoPS & MoH
Crash Location (GPS)	Type of Roadway	Reporting Unit
Weather	Road Functional Class	Crash Identifier
Light	Junction Type	Crash Date
Movement Code	Traffic Control at Junction	Crash Time
Hit and Run	Road Curve	Crash Location (City, etc.)
Contributing Circumstances (Road Environment)	Road Segment Grade	Crash Severity
Road Surface Conditions	Speed Limit	Date of Birth
Crash Vehicle Number		Age
Vehicle Type		Sex
Vehicle Make		Injury Severity
Vehicle Model		
Vehicle Special Function		
Occupant's Vehicle Number		
Pedestrian's Linked Vehicle Number		
Type of Road User		
Nationality		
Driver License Status		

Collected by MoPS in Traffic Accident Database	Collected by MoPS & MoT	Collected by MoPS & MoH
Seatbelt, Helmet, Child Restraints Alcohol Use Drug Use Distracted by Device		

Data Definitions

The definitions, assigned values, and mode of collection for the enumerated crash data elements are provided below. While the following is based on the APRSO document on Minimum Indicators, a significant number of crash data elements have been modified and customized for Viet Nam.

1) Crash identifier

Definition: The unique identifier (e.g. a 10-digit number) within a given year that identifies a particular crash. This is a unique identifier applied as the data is entered into the police and health database systems.

Data type: Numeric or character string

Data source: MoPS and MoH

Description: This identifier is implemented across database systems (e.g. MoPS and MoH) and will be used by NRSO to facilitate integration and updating of records. This crash data element also aids MoPS and MoH to monitor and update crash records as well as for duplicate record management.

2) Reporting unit

Definition: Denotes the government unit which encodes the crash record.

Data type: Character string

Data source: MoPS and MoH

Description: This is mainly for the administrative requirements of the MoPS and MoH. This will aid NRSO in reconciling discrepancies between different data sets, monitoring underreporting, among others.

3) Crash date

Definition: The date (day, month, year) on which the crash occurred.

Data type: Numeric (DDMMYYYY)

Data source: MoPS and MoH

Description: The crash date facilitates management and monitoring of individual crash records, analysis of risk based on the day of the week and seasonality. It can be used to integrate the MoPS database with the health, weather, and light database. If one of the elements is unknown (e.g. month), this can be denoted by “99.” For example, if only the year is known, the date will be denoted as 99992020.

4) Crash time

Definition: The time at which the crash occurred, using the 24 hour-clock format (00.00-23:59).

Data type: Numeric (HH:MM)

Data source: MoPS and MoH

Description: Similar to Crash Date, Crash time is used for monitoring and updating of individual records, analysis of time of day patterns (e.g. school opening and closing times), and integration between the MoPS and the health database. The 24-hour clock removes uncertainty between pm and am.

5) Crash location (GPS)

Definition: The exact location at which the first harmful event of a crash occurred.

Data type: Latitude and Longitude or Linear Referencing System

Data source: MoPS

Description: The exact location of the crash is critical in all areas of road safety data management including problem identification and intervention monitoring, among others. In addition, GPS coordinates enable the generation of “City,” “District,” “Municipality,” data elements. They also facilitate the integration of the crash database with other spatial datasets such as weather, light, and road infrastructure data. GPS coordinates also automate the identification of other data such as street and city details. GPS data can be derived in one of three ways: 1) using a GPS equipment that generates latitude and longitude, 2) using a crash data system that enables mapping of crashes, and 3) converting linear referencing system coordinates to latitude and longitude coordinates. It is important that GPS equipment is regularly checked for accuracy.

6) Crash location (city or other geographic boundary)

Definition: The city/municipality/district where the crash occurred.

Data type: Character string

Data source: MoPS and MoH

Description: The geographic location (other than GPS coordinates) is a secondary identifier that enables the integration between the crash and health database. It will be difficult for hospitals to collect GPS coordinates since they are not the ones who primarily respond to the crash scene. Hence, there is a need for other location data such as city, municipality or district.

The collection of these can be automatic. For the police, it will be derived from the GPS coordinates. For the health sector, it will be the location of the hospital.

7) Weather conditions

Definition: Prevailing atmospheric conditions at the crash location, at the time of the crash.

Data type: Numeric/Character String

Data values:

- 1 **Clear** (No possible hindrance from weather)
- 2 **Rain** (Whether heavy or light)
- 3 **Fog, mist or smoke**
- 4 **Sleet, hail**
- 5 **Severe winds** (Presence of winds deemed to have an adverse effect on driving conditions)
- 6 **Other weather condition**
- 7 **Unknown weather condition**

Data source: MoPS

Description: Weather data can be recorded by the police at the crash scene but it can also be automated by integrating the crash database with an international online weather database. This data is particularly important to analyze the effect of weather in road safety which will inform the development of appropriate road infrastructure.

8) Light conditions

Definition: The presence or absence of natural and street lights at the crash scene.

Data type: Numeric/Character String

Data values:

- 1 **Daylight:** Daytime light.
- 2 **Dawn/Dusk:** Natural lighting during dusk or dawn.
- 3 **Darkness:** No natural and street lighting
- 4 **Dark with streetlights unlit:** Streetlights exist at the crash location but are unlit.
- 5 **Dark with streetlights lit:** Streetlights exist at the crash location and are lit.
- 6 **Unknown:** Light conditions at time of crash are unknown.

Data source: MoPS

Description: This type of data is important for network analysis as well as implementing street lighting.

9) Crash severity

Definition: The severity of the road crash, based on the most severe injury of any person involved.

Data type: Numeric/Character String

Data values:

1 Fatal: At least one person was killed immediately or died within 30 days because of the road crash.

2 Serious/severe injury: No fatalities but at least one person was injured which resulted in one or more of the following:

- Severe laceration resulting in exposure of tissues, organs, muscles or massive loss of blood;
- Broken or distorted extremity (arm or leg);
- Suspected skull, chest or abdominal injury other than bruises or minor lacerations;
- Significant burns (second and third degree burns over 10% or more of the body);
- Unconsciousness; and
- Paralysis.

3 Slight/minor injury: No fatalities and serious injuries but at least one person was injured which resulted to minor injuries such as lump on the head, abrasions, bruises, minor cuts on the skin with minimal bleeding and no exposure of tissue/muscle.

4 Property Damage Only: No fatalities and injuries.

Data source: MoPS and MoH

Description:

On fatality, police must be able to record a fatality at the crash scene. In the absence of a health database which is integrated with the crash database, the police must update the severities of crashes by coordinating with the hospital within 30 days of the crash. There are multiple instances when serious injuries become fatalities and the police must be able to record these updates.

On injuries, whereas there are other methods for identifying injuries such as using the Abbreviated Injury Scale or defining injuries such as days of hospitalization, the above definitions will enable police to objectively classify injuries on their own at the crash scene. Similar to fatality, this must be verified and updated by data from the health sector which can expertly identify the severity of injury using methods such as the Abbreviated Injury Scale.

Crash severity data is crucial for properly classifying crashes, for identifying road blackspots, for both nationwide and localized monitoring of road safety performance.

10) Movement codes

Definition: Manner in which crash types are classified.

Data type: Numeric/Character String/Image

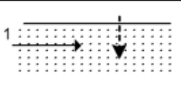
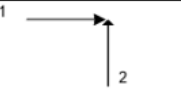

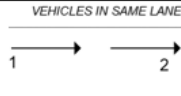
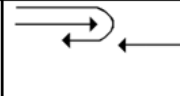


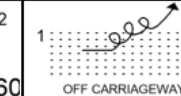
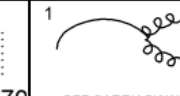

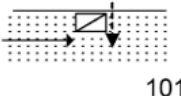
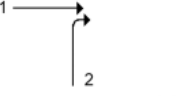

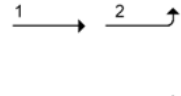
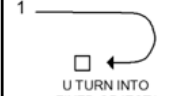


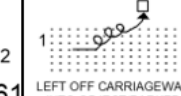
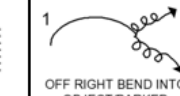

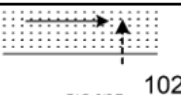

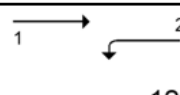
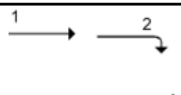
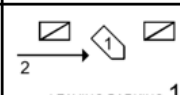
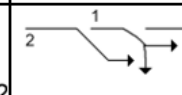
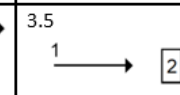
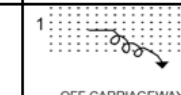
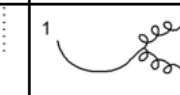
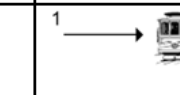



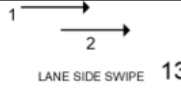

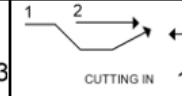
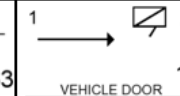
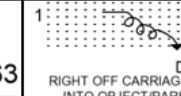


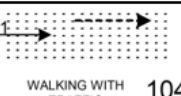
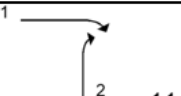

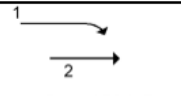
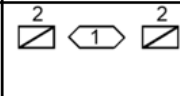
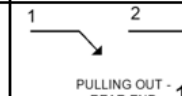
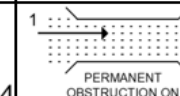
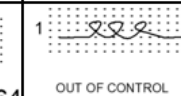
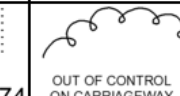

Data source: MoPS

Description: As discussed in the main body of the report, it is recommended that a more detailed system of effectively classifying crash types is implemented. This system can be most appropriately illustrated in the form of movement codes. A Movement Code is a system of classifying crashes using standard and predefined diagrams based on road users and their movements and activities leading to a crash. It is also referred to as Definition for Coding

Accidents (DCA) in Australia.⁷³ There are code systems which are sophisticated and detailed and consist of primary crash types which are further sub-divided into secondary and more specific types. Movement codes can provide a more detailed description of the crash which are crucial for the development of effective road treatments while making data collection simpler for the police. Movement codes can replace crash data elements such as crash and impact type and vehicle and pedestrian maneuver. Visual pictorials are generally easier for data gathers to assign a crash type than prepare a text description and this can significantly result in better quality and consistent data.

⁷³ Turner, B., Tziotis, M., Hillier, P., Beck, D., and Makwasha, T. 2015. *Guide to Road Safety Part 8: Treatment of Crash Locations*. Australia: Austroads.

Table 12: Movement codes

Pedestrian on foot	Vehicle from adjacent direction (Intersection Only)	Vehicle from Opposing direction	Vehicle from Same direction	Manoeuvring	Overtaking	On Path	Off Path Straight	Off Path Curve	Passenger and Miscellaneous
 NEAR SIDE 100	 CROSS TRAFFIC 110	 HEAD ON (NOT OVERTAKING) 120	 VEHICLES IN SAME LANES REAR END 130	 U TURN 140	 HEAD ON (INCL SIDE SWIPE) 150	 PARKED 160	 OFF CARRIAGEWAY TO LEFT 170	 OFF CARRIAGEWAY RIGHT BEND 180	 FELL IN/FROM VEHICLE 190
 EMERGING 101	 RIGHT FAR 111	 RIGHT THRU 121	 LEFT REAR 131	 U TURN INTO FIXED OBJECT/PARKED VEHICLE 141	 OUT OF CONTROL 151	 DOUBLE PARKED 161	 LEFT OFF CARRIAGEWAY INTO OBJECT/PARKED VEHICLE 171	 OFF RIGHT BEND INTO OBJECT/PARKED VEHICLE 181	 LOAD OR MISSILE STRUCK VEHICLE 191
 FAR SIDE 102	 LEFT FAR 112	 LEFT THRU 122	 RIGHT END 132	 LEAVING PARKING 142	 PULLING OUT 152	 ACCIDENT OR BROKEN DOWN 162	 OFF CARRIAGEWAY TO RIGHT 172	 OFF CARRIAGEWAY LEFT BEND 182	 STRUCK TRAIN 192
 Playing, working, lying, standing on carriageway 103	 RIGHT NEAR 113	 RIGHT LEFT 123	 LANE SIDE SWIPE 133	 ENTERING PARKING 143	 CUTTING IN 153	 VEHICLE DOOR 163	 RIGHT OFF CARRIAGEWAY INTO OBJECT/PARKED VEHICLE 173	 OFF LEFT BEND INTO OBJECT/PARKED VEHICLE 183	 STRUCK RAILWAY CROSSING FURNITURE 193
 WALKING WITH TRAFFIC 104	 TWO RIGHT TURNING 114	 RIGHT RIGHT 124	 LANE CHANGE RIGHT (NOT OVERTAKING) 134	 PARKING VEHICLES ONLY 144	 PULLING OUT - REAR END 154	 PERMANENT OBSTRUCTION ON CARRIAGEWAY 164	 OUT OF CONTROL ON CARRIAGEWAY 174	 OUT OF CONTROL ON CARRIAGEWAY 184	 PARKED CAR RUN AWAY 194

11) Hit and run

Definition: Refers to crashes where the driver of a vehicle who is involved in a collision with another vehicle, property or human being, deliberately leaves the crash scene without helping the parties involved or reporting the crash.

Data type: *Yes or No*

Data source: MoPS

Description: Hit and run crashes often result to lack of data because cases remain unresolved. These records are only able to capture data of the reporting party involved in the crash. This type of data is used more for data quality assurance purposes.

12) Type of Roadway

Definition: Describes the type of road, whether the road has two directions of travel, and whether the carriageway is physically divided. For crashes occurring at junctions, where the crash cannot be clearly allocated in one road, the road where the vehicle with priority was moving is indicated.

Data type: Numeric/Character String

Data source: MoPS and MoT

Description: Data values for this field depend on road type descriptions that are specific to Viet Nam. This data can be manually recorded by the MoPS or if an MoT road database is available, this can automatically be filled by integrating the crash database with the road database. This is possible if the GPS location of the crash is also recorded. This type of data is important to assess crash rates of specific types of road infrastructure.

13) Road Functional Class

Definition: Describes the character of service or function of the road where the first harmful event took place. For crashes occurring at junctions, where the crash cannot be clearly allocated in one road, the road where the vehicle with priority was moving is indicated.

Data type: Numeric/Character String

Data source: MoPS and MoT

Description: Similar to Type of Roadway, the data values for Road Functional Class should match road classes that are specific to Viet Nam. In addition, if these data are available in a road database, this can be integrated with the crash database so that this data field can be automatically generated.

14) Speed Limit

Definition: The legal speed limit at the location of the crash.

Data type: Numeric

Data values: Value of Speed Limit or Unknown

Data source: MoPS and MoT

Description: For crashes occurring at junctions, where the crash cannot be clearly allocated in one road, the speed limit for the road where the vehicle with priority was moving is indicated. If a map of speed limits is available (speed limits in national and local roads as well as school and pedestrian zones), this can be linked to the National Road Safety Portal and this field can be automatically completed.

15) Junction type

Definition: Indicates whether the crash occurred at a junction (two or more roads intersecting) and defines the type of the junction. In at-grade junctions, all roads intersect at the same level. In not-at-grade junctions, roads do not intersect at the same level.

Data type: Numeric/Character String

Data values:

- 1 **At-grade, crossroad:** Road intersection with four arms.
- 2 **At-grade, roundabout:** Circular road.
- 3 **At-grade, T or staggered junction:** Road intersection with three arms. Includes T intersections and intersections with an acute angle.
- 4 **At-grade, multiple junction:** A junction with more than four arms (excluding roundabouts).
- 5 **At-grade, other:** Other at-grade junction type not described above.
- 6 **Not at grade:** The junction includes roads that do not intersect at the same level.
- 7 **Railway:** Road intersecting with railway
- 8 **Not at junction:** The crash has occurred at a distance greater than 20 meters from a junction.
- 9 **Unknown:** The crash location relative to a junction is unknown.

Data source: MoPS and MoT

Description: Crashes occurring within 20 meters of a junction are considered as crashes at a junction. This data is important for site-specific studies and identification of appropriate engineering countermeasures. If a road database contains this type of data, then this can be automatically filled up by integrating the National Road Safety Portal with the road database.

16) Traffic Control at Junction

Definition: Type of traffic control at the junction where crash occurred. Applies only to crashes that occur at a junction.

Data type: Numeric/Character String/Multiple Options Possible

Data values:

- 1 **Authorized person:** Police or traffic officer controls traffic. Applicable even if traffic signals or other junction control systems are present.
- 2 **Stop sign:** Priority is determined by stop sign(s).
- 3 **Give-way sign or markings:** give-way sign or markings determine priority.

4 Other traffic signs: Priority is determined by traffic sign(s) other than ‘stop’, ‘give way’ or markings.

5 Automatic traffic signal (working): Priority is determined by a traffic signal that was working at the time of the crash.

6 Automatic traffic signal (out of order): A traffic signal is present but out of order at time of crash.

7 No Controls: The junction is not controlled by an authorized person, traffic signs, markings, automatic traffic signals or other means.

8 Other: The junction is controlled by means other than an authorized person, signs, markings or automatic traffic signals.

Data source: MoPS and MoT

Description: Primarily collected by police, if more than one value is applicable, (e.g. traffic signs and automatic traffic signals) record all that apply. If this is available in a road database, then this can be automatically filled up by integrating the National Road Safety Portal and the road database.

17) Contributing Circumstances – Roadway Environment

Definition: Types of obstructions or obstacles that might have contributed to the crash.

Data type: Numeric/Character String

Data values:

- 1 Animal(s)**
- 2 Debris**
- 3 Non-Highway Work**
- 4 Obstructed Crosswalk**
- 5 Obstruction in Roadway**
- 6 Prior Crash**
- 7 Regular Congestion**
- 9 Ruts, Holes, Bumps**
- 10 Shoulders (none, low, soft, high)**
- 11 Visual Obstruction**
- 12 Work Zone**
- 13 Other**
- 14 Not Applicable**

Data source: MoPS

Description: Initially, this data field is named “Road Obstacles” and is answerable by presence or absence of obstacles. While “Road Obstacles” has also been cited as a data element in other literature, merely indicating presence of obstacles is not informative enough to identify problems and corresponding solutions. To address this, “Road Obstacles” is

modified to “Contributing Circumstances – Road Environment” which enumerates all possible obstacles that might have led to the crash. MoPS based on their observation can choose all valid answers from the list during their investigation. Because of this, identification of problems and solutions is possible.

18) Road surface conditions

Definition: The condition of the road surface at the time and place of the crash.

Data type: Numeric/Character String

Data values:

1 Dry: Dry and clean road surface.

2 Snow, frost, ice: Snow, frost or ice on the road.

3 Slippery: Slippery road surface due to existence of sand, gravel, mud, leaves, oil on the road. Does not include snow, frost, ice or wet road surface.

4 Wet, damp: Wet road surface. Does not include flooding.

5 Flood: Still or moving water on the road.

6 Other: Other road surface conditions not mentioned above.

9 Unknown: The road surface conditions were unknown.

Data Source: MoPS

Description: Road surface condition is important for identification of high wet-surface crash locations and for engineering evaluation and prevention measures.

19) Road curve

Definition: Indicates whether the crash occurred inside a curve, and what type of curve.

Data type: Numeric/Character String

Data values:

1 Tight curve: The crash occurred inside a road curve that was tight (based on the judgment of the police officer).

2 Open curve: The crash occurred inside a road curve that was open (based on the judgment of the police officer).

3 No curve: The crash did not occur inside a road curve.

9 Unknown: It is not defined whether the crash occurred inside a road curve.

Data Source: MoPS and MoT

Description: Can be derived from road database or manually collected by police. Useful for identification and diagnosis of high-crash locations, and for guiding changes to road design, speed limits, etc.

20) Road segment grade

Definition: Indicates whether the crash occurred on a road segment with a steep gradient.

Data type: Numeric/Character String

Data values:

1 Yes: The crash occurred at a road segment with a high grade.

2 No: The crash did not occur at a road segment with a high grade.

9 Unknown: It is not defined whether the crash occurred at a road segment with a high grade.

Data source: MoPS and MoT

Description: Can be derived from road database or manually collected by police. Useful for identification and diagnosis of high-crash locations, and for guiding changes to road design, speed limits, etc..

21) Crash vehicle number

Definition: Unique reference number generated by the encoder to identify each vehicle involved in the crash. Not the same as vehicle plate number.

Data type: Numeric

Data source: MoPS

Description: Allows the vehicle record to be cross-referenced to the crash record and person records.

22) Vehicle type

Definition: The type of vehicle involved in the crash.

Data type: Numeric/Character String

Data source: MoPS

Description: Data values for Vehicle Type must completely capture all types of vehicles in Viet Nam. This data is collected by police and allows for analysis of crash risk by vehicle type and road user type. Important for evaluation of countermeasures designed for specific vehicles or to protect specific road users.

23) Vehicle make

Definition: Indicate the make (distinctive name) assigned by motor vehicle manufacturer.

Data type: Character string

Data source: MoPS

Description: This type of data can be derived through the integration of the police crash database and the vehicle registration system or can be manually collected by police. Allows for crash analyses related to the various motor vehicle makes.

24) Vehicle model

Definition: The code assigned by the manufacturer to denote a family of motor vehicles (within a make) that have a degree of similarity in construction.

Data type: Character string

Data source: MoPS

Comments: This type of data can be derived through the integration of the police crash database and the vehicle registration system or can be manually collected by police. Allows for crash analyses related to the various motor vehicle models.

25) Vehicle special function

Definition: The type of special function being served by this vehicle regardless of whether the function is marked on the vehicle.

Data type: Numeric/Character String

Data values:

- 1 No special function:** No special function of the vehicle.
- 2 Taxi:** Licensed passenger car for hire with driver, without predetermined routes.
- 3 Vehicle used as bus:** Passenger road motor vehicle used for the transport of people.
- 4 Police / military:** Motor vehicle used for police / military purposes.
- 5 Emergency vehicle:** Motor vehicle used for emergency purposes (includes ambulances, fire service vehicles etc.).
- 8 Other:** Other special functions, not mentioned above.
- 9 Unknown:** It was not possible to record a special function.

Data source: MoPS

Description: This used to evaluate safety performance of vehicles used for special uses. The assigned data values can be adjusted based on other identified special use vehicles in Viet Nam.

26) Occupant's vehicle number

Definition: The unique reference number assigned for this crash to the motor vehicle in which the person was an occupant. Not the same as vehicle plate number.

Data type: Numeric

Data source: MoPS

Description: Allows the person record to be cross-referenced to the vehicle details, linking the persons to the motor vehicle in which they were travelling.

27) Pedestrian's linked vehicle number

Definition: The unique reference number assigned for this crash to the motor vehicle that collided with this person. The vehicle number assigned under to the motor vehicle that collided with this person. Not the same as vehicle plate number.

Data type: Numeric

Data source: MoPS

Description: Allows the person record to be cross-referenced to the vehicle records, linking the person to the motor vehicle that struck them.

28) Type of road user

Definition: This variable indicates the role of each person at the time of the crash.

Data type: Numeric/Character String

Data values:

1 Driver: Driver or operator of motorized or non-motorized vehicle. Includes cyclists, persons pulling a rickshaw or riding an animal.

2 Passenger: Person riding on or in a vehicle, who is not the driver. Includes person in the act of boarding, alighting from a vehicle or sitting/stranding.

3 Pedestrian: Person on foot, pushing or holding a bicycle, pram or a pushchair, leading or herding an animal, riding a toy cycle, on roller skates, skateboard or skis. Excludes persons in the act of boarding or alighting from a vehicle.

8 Other: Person involved in the crash who is not of any type listed above.

9 Unknown: It is not known what role the person played in the crash.

Data source: MoPS

Description: This data is collected by police and allows for analysis of crash risk by road user type (in combination with Vehicle type). Important for evaluation of countermeasures designed to protect specific road users.

29) Date of birth

Definition: Indicates the date of birth of the person involved in the crash.

Data type: Numeric (date format – dd/mm/yyyy, 99/99/9999 if birth date unknown)

Data source: MoPS and MoH

Description: Manually collected by the police or can be derived from the integration between licensing and personal ID database and the police crash database. Can be used to compute for age and to integrate National Road Safety Portal and health database.

30) Age

Definition: The age in years of the person involved in the crash.

Data type: Numeric

Data source: MoPS and MoH

Description: Manually collected by the police or can be derived from the integration between licensing and personal ID database and the police crash database. Age is important for analysis

of crash risk by age group, and assessing effectiveness of countermeasures by age group. Can be used to compute for age and to integrate National Road Safety Portal and health database.

31) Sex

Definition: Indicates the sex of the person involved in the crash.

Data type: Numeric/Character String

Data values:

1 Male.

2 Female

9 Unknown: Sex could not be determined (police unable to trace person, not specified).

Data source: MoPS and MoH

Description: Manually collected by the police or can be derived from the integration between licensing and personal ID database and the police crash database. Important for analysis of crash risk by sex. Important for evaluation of the effect of sex of the person involved on occupant protection systems and motor vehicle design characteristics. Can be used to compute for age and to integrate MoPS Traffic Accident Database and health database.

32) Injury severity

Definition: The injury severity level for a person involved in the crash.

Data type: Numeric/Character string

Data values:

1 Fatal injury: Person was killed immediately or died within 30 days, as a result of the crash.

2 Serious/severe injury: Injury resulted in one or more of the following:

- Severe laceration resulting in exposure of tissues, organs, muscles or massive loss of blood;
- Broken or distorted extremity (arm or leg);
- Suspected skull, chest or abdominal injury other than bruises or minor lacerations;
- Significant burns (second and third degree burns over 10% or more of the body);
- Unconsciousness; and
- Paralysis.

3 Slight/minor injury: Injury resulted to minor injuries such as lump on the head, abrasions, bruises, minor cuts on the skin with minimal bleeding and no exposure of tissue/muscle.

4 No injury: Person was not injured.

9 Unknown: Injury severity was not recorded or is unknown.

Data source: MoPS and MoH

Description: As mentioned in the description of crash severity, while there are other methods for identifying injuries such as using the Abbreviated Injury Scale or defining injuries such as days of hospitalization, the above definitions will enable police to objectively classify injuries on their own in the crash scene. This data must be updated however by data from the health sector especially since they can expertly identify the severity of injury.

33) Nationality of road user

Definition: The nationality of the road user.

Data type: Character string

Data source: MoPS

Description: This type of data can be used to determine licensing regulation for foreigners.

34) Driver license status

Definition: The status of driver's license at the time of crash.

Data type: Numeric/Character string

Data values:

1 Not Licensed

2 Expired

3 Valid License

Data source: MoPS

Description: This type of data can be used to determine effectivity of licensing regulations and enforcement in relation to road safety.

35) Seatbelt

Definition: Describes seatbelt use by persons involved in the crash.

Data type: *Yes, No, or Not Applicable*

Data source: MoPS

Description: This data is collected by the police. Information on the use of seatbelts is important for evaluating the effect of such safety equipment on injury outcomes. This can also be used to evaluate enforcement of existing regulations.

36) Helmet

Definition: Describes helmet use by persons involved in the crash.

Data type: *Yes, No, or Not Applicable*

Data source: MoPS

Description: This data is collected by the police. Similar to seatbelts, information on the use of seatbelts is important for evaluating the effect of such safety equipment on injury outcomes. This can also be used to evaluate enforcement of existing regulations.

37) Child Restraints

Definition: Describes child restraints use by persons involved in the crash.

Data type: *Yes, No, or Not Applicable*

Data source: MoPS

Description: This data is collected by the police. Similar to seatbelts, information on the use of child restraints is important for evaluating the effect of such safety equipment on injury outcomes. This can also be used to evaluate enforcement of existing regulations.

38) Alcohol use

Definition: Indication of suspicion or evidence that person involved in the crash has used alcohol.

Data type: *Yes, No, Not Applicable* (if person is not a driver or pedestrian), or *Unknown*

Data source: MoPS

39) Drug use

Definition: Indication of suspicion or evidence that person involved in the crash has used illicit drugs.

Data type: Numeric

Data values:

1 No suspicion or evidence of drug use

2 Suspicion of drug use

3 Evidence of drug use (further subfields can specify test type and values)

4 Not applicable

9 Unknown

Data source: MoPS

Description: This is often used to monitor and evaluate enforcement and policies on driving under the influence of drugs.

40) Distracted by Device

Definition: If crash is a result of distracted driving.

Data type: *Yes, No, Not Applicable* (if person is not a driver or pedestrian), or *Unknown*

Description: Based on police investigation.

Attachment 4: Implementation Resources

Resources are provided here to support the implementation of the recommendations from this report:

Attachment 4A	Legislative Instruments
Attachment 4B	Staffing and Training
Attachment 4C	National Road Safety Observatory Handbook
Attachment 4D	Workplan and Budget
Attachment 4E	ICT Terms of Reference

Attachment 4A: Legal Instruments

Legal instruments need to be prepared and/or amended to give effect to the establishment of the National Road Safety Observatory and the National Road Safety Portal.

1 National Road Safety Observatory

It is recommended that Decision No.34/2007/TTg dated March 12, 2007 which established the NTSC is amended or replaced, on the institutional management framework set out in body of the report. The body of the report includes reference to three key elements of the legislation:

1. The strengthening of the NTSC's functions and powers – to lead the national road safety effort, in support of the Government of Viet Nam's leadership of road safety. The recommended functions and powers set out in Section 3.3.2 address road safety management generally, and road safety data specifically. This text is more comprehensive than the existing functions set out in Decision No.34/2007/TTg.
2. The establishment of the National Road Safety Observatory and its Secretariat, and the National Road Safety Forum – to support and give greater effect to the NTSC's road safety leadership role. The recommended appointments to the NRSO, and the establishment of the NRSO Secretariat are set out in Sections 3.4.4 and 3.5. This includes an option for integration into the current NTSC structure, and an option for establishing an inter-sectoral agency, as a component of the NTSC.
3. The appointment of the National Road Safety Observatory members.

The elements of the amended or replaced Decision relating to the NTSC are referred to in the Handbook. Once the final Decision is made, some amendment may be required to the Handbook to ensure that it reflects the law.

The tasks of NTSC-members stipulated in the Decision No. 354/QD-UBATGTQG (7 September 2017) on Working Regulations of NTSC may also be rearranged accordingly.

2 National Road Safety Portal

The following enumerates the recommended policy and legal instruments that should be amended and executed to implement the NRSP.

Amendments to Law on Statistics 2015

Currently, the Law on Statistics only prescribes three types of data that can be shared by the MoPS to the other ministries and to the public, namely: number of cases, number of fatalities, and number of injuries in a traffic crash. This is only summary and aggregate data and cannot be used by the different ministries to come up with meaningful decisions in road safety. Because of this, it is recommended that the Law on Statistics 2015 be amended to allow MoPS to share the data elements enumerated in Attachment 3D to the NRSO and to the public. This should be shared automatically and electronically to the NRSO via an Application Programming Interface (API) and will be composed of individual records without confidential data such as personal details. The current summary reports of MoPS are not useful for analysis and for the development of road safety interventions.

In addition, the MoPS has committed that they will be integrating their Traffic Accident Database to the MoH Health Database. This linkage will be done through an API that will allow automatic updating of injury and fatality data in the Traffic Accident Database. Depending on the preferences of MoPS and MoH, this integration can either be done through primary indicators (using personal data) or secondary indicators (using time and date of crash, location, and age, birthday, and sex of person involved.) If the MoPS and MoH prefer to use

primary indicators, then the Law on Statistics 2015 should be amended to reflect the sharing of personal data between MoPS and MoH. If secondary indicators are to be used, then there will be no need to amend the law to include personal data. This is also the case with the integration of data between MoPS and DRVN on licensing.

Clarifications to State Secrets Law 2018

The State Secrets Law of 2018 says that the MoPS TAD and their legal documents are confidential and cannot be shared to anyone. Under the data structure of the NRSP, this is still valid and the MoPS TAD and accompanying reports will not be opened or shared to anyone. It only needs to be clarified whether the electronic integration of the TAD with other database systems and its electronic sharing of non-confidential data (not the actual report) counts as “opening” and “sharing” of the TAD and legal documents themselves. If the integration and individual data elements are still considered confidential under the law, then it is recommended that the law be modified to clarify this.

Prime Minister Decision to Declassify Data Elements Enumerated in Attachment 3D

If 1 and 2 are difficult legal instruments to pursue, another possibility is to request the Prime Minister to issue a Decision that enumerates the indicators that will be declassified and thus can be shared by the MoPS to the other ministries. These indicators are enumerated in Attachment 3D. In addition, the MoH will also need to declassify non-confidential injury and fatality data of individual hospital records which will then be shared to MoPS and later on will be sent to NRSO.

Amendments to MoPS Circular 58

Circular 58 would be amended to reflect the following changes:

- Improved and updated crash data elements and definitions to include data and align with data needs of the NRSO (see Attachment 3D for data needs of the NRSO);
- Redesigning the forms to include improved and updated crash data elements;
- Establish data linkages with MoH on health and injury data;
- Establish data linkages with insurance and civil registration systems;
- Establish data linkages with the MoT on licensing data;
- Establish sharing of data with the National Road Safety Observatory and the NRSP especially in line with the prescribed crash data elements; and
- Emphasize the procurement of GPS equipment, computers, and mobile phones for electronic recording of crashes.

With the establishment of the Observatory and the NRSP, there will be a need to revisit the protocol for statistical analysis and reports within the MoPS.

Amendment to Decree No. 47/2020/ND-CP dated 9th April 2020

A crucial amendment to this Decree is to change the manner on how the data will be integrated and shared between MoPS and the NRSO. Data will be shared electronically through an API and not through a USB or any portable drive. What this means is that there is an algorithm that links the database systems together so that individual, geo-referenced, non-confidential data from MoPS will feed directly to the NRSO.

Data Sharing Agreement between MoPS and Ministry Hosting the NRSO

This Data Sharing Agreement would include the following provisions:

- Duties and responsibilities of the NRSO such as ensuring sustained operations of the NRSP, formulating data and information management policies (e.g. defining crash data elements, quality assurance standards of data), formulating system guidelines for optimum performance of the NRSP, formulating rules and regulations for the operation and maintenance of the NRSP, ensuring privacy of MoPS confidential data, providing training to the MoPS on the use of the NRSP, among others.
- Duties and responsibilities of the MoPS such as sharing road crash data to the NRSO (crash data elements are defined in Attachment 3D, ensure timely collection of road crash data, ensure data linkages between the TAD and other sources of crash data, ensure that quality assurance measures on road crash data are undertaken.

Data Sharing Agreement between MoPS and MoH

Once the health database is set-up, this Data Sharing Agreement between the MoPS and the MoH would be executed with the following principles:

- Duties and responsibilities of the MoPS such as ensuring sustained operations and maintenance of the TAD, working regularly with MoH to integrate the TAD with the health database, evaluating and approving potential record matches between the health database and the Portal, formulating data and information management policies, procedures, and other guidance relative to the data integration, sharing data on crash risk factors to MoH, ensuring the privacy of MoH confidential data, among others.
- Duties and responsibilities of the MoH such as providing available updates of health database, providing data updates to the TAD with most recently available health data on road crash fatalities and injuries, providing staffing arrangements to support continued automated transfer of data between the two systems, among others.
- Collaboration of the MoPS and MoH to ensure the maintenance of a coordinated, non-duplicated dataset of crashes. In practice, this means that the MoH will be responsible for downloading relevant data using the TAD API and ensuring that the TAD can download relevant data from MoH database.
- The matching of records will use secondary identifiers such as location, time, date, sex, age, and birthday. If three of the six data elements are the same in the TAD and MoH, then the two records will be considered as a potential match. The MoPS will then have to update the record in the TAD to reflect the fatality and injury outcome data from MoH. Definitions of these elements are identified in Attachment 3D. Another possibility is to use primary indicators to perform the matching method such as name of person involved and personal ID but this will need a more significant change in legislation as indicated above.

Data Sharing Agreement between MoT and Ministry Hosting the NRSO

This Data Sharing Agreement would include the following provisions:

- Duties and responsibilities of the NRSO such as ensuring sustained operations and maintenance of the NRSP, working regularly with MoT to integrate the NRSP with road and bridges database, and formulating data and information management policies, procedures, and other guidance relative to the data integration.
- Duties and responsibilities of MoT such as providing geo-referenced road and bridges data to the NRSO, ensuring the continued operations and maintenance of the road and bridges database, among others.

Data Sharing Agreement between MoT and MoPS

This Data Sharing Agreement would include the following provisions:

- Duties and responsibilities of MoPS such as collecting personal ID number for each crash, ensuring sustained operations of the MoPS database, ensuring sustained linkage of MoPS database with the MoT licensing database system.
- Duties and responsibilities of MoT such as sustained operations and maintenance of the licensing database system and sharing of licensing data to the MoPS.
- MoT will be responsible for downloading relevant data using the MoPS API and ensuring that the MoPS can download relevant data from the licensing database.

The matching of records will use primary identifiers such as the personal ID number. If this data element matches between the two database systems, then the MoPS is responsible to confirming the match and downloading the data from the licensing database system.

Authorization and Certification from Government Electronic Data Center

The Ministry hosting the NRSO must coordinate with the GIDC to enable the NRSP as the official road safety database. This is recommended because the Government Integrated Data Center does not have the capacity and expertise to store, organize, integrate individual records. If they were to develop another database to fulfil this role, it will be a duplication of the NRSP. Because of this, the recommendation is to seek certification from the Office of the Government that the NRSP is the official road safety database.

Attachment 4B: Staffing Requirements

This document provides a high-level breakdown of the staffing and training requirements for the Secretariat of the National Road Safety Observatory.

1 Staffing

It is proposed that a dedicated professional Secretariat is established to support the National Road Safety Observatory.

The NRSO would provide immediate inter-agency oversight of the NRSO Secretariat. The Head of the Secretariat – Chief Officer, National Road Safety Observatory – would report to the Executive Vice Chairman of the NTSC.

The Chief Officer NRSO would have three direct reports:

- Deputy Chief Officer, Road Safety Management: leads the development, and oversees implementation, of national road safety strategies and plans for Viet Nam. Responsible for:
 - Strategy and coordination;
 - Legislation and standards;
 - Funding and resource allocation.
- Deputy Chief Officer, Road Safety Partnerships: secretariat support for meetings of NTSC, NRSO and NRSF; stakeholder management; capacity building; and public engagement and communication.
- Deputy Chief Officer, Road Safety Data: oversees data sharing between agencies, and oversees the specification, procurement and implementation of the National Road Safety Portal. Responsible for:
 - National Road Safety Portal;
 - Monitoring and evaluation;
 - Research and development;
 - Road safety data advice to the NRSO.

2 Secretariat Positions and Descriptions

Positions and responsibilities are provided here for the three work groups comprising the National Road Safety Observatory. Additional descriptions for the three Deputy Chief Officer positions reporting to the Chief Officer and further detail on the staff working on the National Road Safety Portal are provided in this section.

Table 13: Staffing Requirements – Road Safety Management

#	Position	Functional Responsibility
1.	Deputy Chief Officer – Road Safety Management	Overall responsibility to lead development, and coordinate implementation, of road safety strategies and plans for Viet Nam; review legislation and advise on improvements in safety standards and compliance which are required; promotion of road safety to decision makers and influencers; capacity building within government ministries and key professions; analyzing road safety funding and resource allocation requirements.
Strategic Development		
2.	Strategy and Planning	Ongoing analysis, preparation and oversight of national road safety strategies (eg motorcycle safety, child safety); ongoing analysis, preparation and oversight of annual road safety action plans.
3.	Legislation and Policy (x3)	Ongoing legal and policy analysis of regulatory frameworks associated with: implementation of National Road Safety Observatory and Portal; setting and achieving safety standards for safety of road networks and motor vehicles; regulating the safe entry and exit of vehicles and drivers, and commercial transport operators, to the road traffic system.
4.	Funding and Investing	Ongoing economic and fiscal analysis of safety investment required to achieve national road safety targets, and (in consultation with Ministry of Finance) preparation and oversight of allocation rules for safety investment across ministries and provinces.
Road Safety Programs		
5.	Program Management	Developing and overseeing implementation of high impact, targeted, and cost effective interventions to achieve Viet Nam’s road safety goals.
6.	Safety Compliance and Enforcement	Working with national and provincial police and transport authorities to shape and facilitate the implementation of high impact legislative, compliance and enforcement interventions.
7.	Safe Roads and Vehicles	Working with national and provincial road and transport authorities to shape and facilitate the implementation of high impact road and vehicle safety engineering interventions.
8.	Driver / Vehicle / Commercial transport regulation	Developing detailed programs to improve safety results from driver licensing system (including graduated licensing), vehicle

#	Position	Functional Responsibility
		safety regulation (including international safety standards), and transport regulation (including safety management systems).
9.	Road Safety Engineering Programs	Identify blackspots, conduct complementary and follow up survey work, develop national programs to implement high value infrastructure safety treatments, including funding, delivery and evaluation.
10.	Traffic Safety Enforcement Programs	Develop general deterrence enforcement strategies to focus Traffic Police officers on enforcing key safety behaviors (drink driving, speeding, helmet/ seatbelt/phone use), including development and oversight of operational performance, and use of promotion to increase perceived risk of detection.
11.	Post-Crash Programs	Develop and improve programs to improve alert of emergency medical to road traffic crash victims, transport systems to medical services, strengthening of trauma centers through equipment and professional development.
Research and Evaluation		
12.	Analysis (x3)	Undertaking regular and special crash data analyses on issues for NRSO, including trends in key aspects of crash and injury data, exposure data and performance data, preparation of estimates on impacts of different interventions on road trauma.
13.	Reporting	Preparing regular and special published reports on road traffic safety, including the preparation of monthly-quarterly-annual reports addressing injury, exposure and performance data.
14.	Evaluation	Developing and overseeing implementation of results management framework, and an ongoing and systematic work program to collect, analyze and report on performance data relating to safe roads, vehicles, speeds, users and post-crash response.
15.	Research and Development	Developing a multi-year road safety research program in collaboration with universities; Initiating, managing, reviewing and finalizing research and development projects; overseeing dissemination and knowledge transfer of Viet Nam and international road safety research.

Deputy Chief Officer – Road Safety Management

Objective

The Deputy Chief Officer – Road Safety Management will bear the overall responsibility, within the bounds of the NTSC functions, to develop and oversee implementation of national road safety strategies and plans. The Deputy Chief Officer – Road Safety Management leads a team of ten professional staff which includes teams on Strategic Development, Road Safety Programmes, and Research and Evaluation. The Deputy Chief Officer – Road Safety Management will report directly to the Chief Officer of the National Road Safety Observatory.

Duties

The Deputy Chief Officer – Road Safety Management shall:

- Lead the development and implementation of the National Road Safety Strategy and National Road Safety Action Plan;
- Lead the drafting of implementation work plans, budget, and institutional and operational protocols for the NRSO;
- Coordinate with ministries such as the MoPS, MoH, and MoT with regards to strategy and planning data sharing and data quality assurance;
- Lead the review and updating of road safety legislation and advise on improvements in safety standards and compliance which are required;
- Lead the design and development of programmes to significantly improve the safety of roads, vehicles, and users, and victim response;
- Lead the analysis of road safety funding and resource allocation requirements to achieve Government of Viet Nam road safety goals;
- Lead the preparation of a road safety research and evaluation program.

Skills / Experience

- Master's degree in relevant discipline such as law, commerce, social sciences, engineering. Minimum of five (5) years of relevant experience;
- Previous leadership and management experience, and demonstrated ability to motivate a team;
- Prior experience coordinating analysis and programmes with government ministries and provincial governments;
- Excellent communications and organizational skills;
- Familiarity with road safety or public health issues.

Table 14: Staffing Requirements – Road Safety Partnerships

#	Position	Functional Responsibility
16.	Deputy Chief Officer – Road Safety Partnerships	Overall responsibility for secretariat support for meetings of NTSC, NRSO and NRSF; stakeholder management; public engagement; professional development and capacity building; communications.
Engagement		
17.	Secretariat support	Ongoing preparation and Secretariat support for NTSC, NRSO and NRSF meetings, including preparing meeting agenda and meeting papers, meeting schedules.
18.	External Partners	Engaging with external road safety development partners; encouraging greater support and organizational commitment (including internal capacity building) to road safety by all Government and non-Government stakeholders.
Capacity Building		
19.	Capacity Building	Designing and implementing an ongoing national road safety capacity building program covering three key Ministries, key stakeholders and professions – needs analysis, planning, budgeting, scheduling, third party contracting, evaluation etc..
20.	NTSC Training Program Coordination	Designing and implementing an ongoing Portal training program including planning, budgeting, materials dissemination, live workshops, follow-up clinics, web-based workshops, etc..
21.	MoPS Training Program Coordination	Designing and implementing a national training program to improve road crash data collection within the Traffic Police Department, focusing on increasing the quality and quantity of crash reports.
Communications		
22.	Tactical Communications	Facilitating all Portal related inter-ministerial communications – maintaining point-person roster, policy updates, workshop coordination, etc – and providing point of contact for media requests, report requests, data requests, press releases, report publishing, etc..
23.	Strategic Promotion	Developing and implementing road safety promotion activity to increase awareness of key road safety issues and promote understanding of effective interventions to address these issues amongst stakeholders in a position to improve the safety of others.

Deputy Chief Officer – Road Safety Partnerships

Objective

The Deputy Chief Officer – Road Safety Partnerships will bear the overall secretariat responsibility for the NRSO, and engage partner agencies to promote delivery of a safe road traffic system. The Deputy Chief Officer – Road Safety Partnerships leads a team of six professional staff focusing on secretariat, promotion and capacity building functions. The Deputy Chief Officer – Road Safety Partnerships will report directly to the Chief Officer of the National Road Safety Observatory.

Duties

The Deputy Chief Officer – Road Safety Partnerships shall:

- Lead the provision of secretariat services to the National Traffic Safety Committee, the National Road Safety Observatory and the National Road Safety Forum, including preparation of agendas, minutes of decisions, scheduling of meetings etc.;
- Develop and manage an annual engagement calendar to ensure partner agencies and organizations understand their roles and responsibilities, and opportunities to support achievement of the Government of Viet Nam's road safety goals;
- Develop and oversee implementation of a road safety capacity building program within the NTSC structure and in collaboration with partner agencies;
- Develop and oversee implementation of a road safety promotion program within the NTSC structure and in collaboration with partner agencies to ensure that professionals and decision makers understand and act upon their responsibilities to improve road safety.

Skills / Experience

- Master's degree in relevant discipline such as law, commerce, social sciences, engineering. Minimum of five (5) years of relevant experience;
- Previous leadership and management experience, and demonstrated ability to motivate a team;
- Prior experience in roles requiring governance, partnerships, and multi-sectoral, institutional and professional capacity building and promotion;
- Excellent communications and organizational skills;
- Familiarity with road safety or public health issues.

Table 15: Staffing Requirements - Road Safety Data

#	Position	Functional Responsibility
24.	Deputy Chief Officer – Road Safety Data	Overall responsibility for the development and implementation of the Portal, managing technical, communications, policy, and data analysis staff, reporting to the Chief Officer of the Observatory, ensuring seamless coordination between different government ministries and offices.
System Management (Technical)		
25.	Portal Development Project	Responsible for all technical project management aspects of developing and implementing the National Road Safety Portal project, including project design, contracting, and oversight.
26.	Server and System Maintenance	Responsible for server set up, system monitoring, establishing and using back-up systems, providing summary analytics reports to and responding to server and database-related inquiries.
27.	Application Support	Responsible for software updates (e.g., updates to the code or front-end platform) and advises users of the updates. Also, tests and implements the updates.
28.	Data Management	Responsible for monitoring data quality and resolving duplicate entries responding to user inquiries related to data; implementing new data linkages; preparing regular reports on data quality and usage; approving record matches between MoPS database and external databases (MoH database); etc.
29.	User Management	User Management staff responsible for vetting and approving user applications and maintaining registry of users. Registry includes user name, contact details, agency affiliation, position, read/write privileges, admin privileges, etc. Also, responsible for adding users, per government requirements.
30.	Support Hotline / E-mail	Operator to receive user questions and refer users to appropriate point-person.
Data Entry		
31.	Road Incident Data Entry	Traffic enforcer and police units responsible for recording all road incidents in the MoPS database system. Responsible for ensuring API for linking the MoPS database with the Portal is kept up to date, and that any relevant changes to the MoPS database are reported to NTSC.
32.	Road Traffic Injuries Data Entry	Hospitals responsible for recording all road traffic injuries in the MoH database system. Responsible for ensuring API for linking the MoH database with the Portal is kept up to date, and that any relevant changes to the MoH database are reported to NTSC.

Deputy Chief Officer – Road Safety Data

Objective

The Deputy Chief Officer – Road Safety Data will bear the overall responsibility for the development and implementation of the Portal, managing technical, communications, and policy of the Portal. The Deputy Chief Officer – Road Safety Data leads a team of nine personnel which includes teams on System Management and Data Analysis and Reporting. The Deputy Chief Officer – Road Safety Data will report directly to the Chief Officer of the National Road Safety Observatory.

Duties

The Deputy Chief Officer – Road Safety Data shall:

- Lead the development and implementation of the NRSP;
- Lead the drafting of implementation work plans, budget, and institutional and operational protocols for the NRSP;
- Coordinate with ministries such as the MoPS, MoH, and MoT with regards to data sharing and data quality assurance;
- Lead the review and updating of institutional and operational policies and protocols regarding data. This includes evaluating and monitoring of implementation milestones and identification of opportunities and initiatives and possible collaborative work;
- Identify and lead the request for funding for the NRSP;
- Manage day-to-day functions of the NRSP.

Skills / Experience

- Master's degree relevant to the job. Minimum of five (5) years of relevant experience;
- Previous leadership and management experience, and demonstrated ability to motivate a team;
- Prior experience coordinating with an array of government ministries, local and national level;
- Excellent communications and organizational skills;
- Familiarity with road safety issues specifically Road Safety Data Management.

Portal Development Project Manager

Objective

The Portal Development Project Manager shall support the Deputy Chief Officer in implementing and managing the NRSP. Specifically, the Portal Development Project Manager is responsible for all technical project management aspects of the NRSP and shall ensure that the NRSP is developed, operated, and maintained according to agreed plans and standards.

Duties

The Portal Development Project Manager shall:

- Organize and arrange meetings and consultations with ministries;
- Conduct assessments in data improvement programs specifically on on data collection processes, institutional arrangements, capacity and resource needs;
- Together with the Deputy Chief Officer, lead the institutionalization and deployment of the NRSP such as drafting project design plans, terms of references for technical specifications of the NRSP and staffing, among others;
- Coordinate and liase with other ministries to ensure institutional and operational data protocols are followed and are consistent;
- Provide training activities on the use of the NRSP;
- Prepare reports regarding the implementation of the NRSP;
- Assist day-to-day functions of the NRSP.

Skills / Experience

- Bachelor's degree relevant to the job. Minimum of three (3) years of relevant experience;
- Excellent project management skills;
- Hardworking, organized, efficient.

IT Specialist/Application Support

Objective

The IT Specialist/Application Support personnel is primarily responsible for working together with the developer of NRSP, implementing improvements to the NRSP including developing APIs for integration, fixing bugs, troubleshooting as well as migration and deployment.

Duties

The Application support personnel shall:

- Coordinate with the software developer of the NRSP to ensure that all functional and technical specifications are implemented;
- Ensure that the NRSP undergoes a series of tests and that issues and bugs are resolved before the acceptance of the platform;
- Conduct user, performance, and functional testing of the NRSP;
- Implement future enhancements to the NRSP such as integration with other database systems, uploading of maps and datasets, developing new analytical tools and reporting capabilities, among others;
- Provide support in troubleshooting and addressing bugs and technical issues of the NRSP;
- Provide timely and regular support to in response to technical queries and concerns.

Skills / Experience

- Master's degree in ICT with three (3) years of relevant experience in developing similar platform;
- Proficient in a Linux environment, including shell scripting;
- Knowledge of infrastructure tooling such as Vagrant, Ansible, and Docker;
- Web development experience, specifically Python/Django and Javascript/Angular, including knowledge of HTML/CSS;
- Experience with a relational database system;
- Experience with:
 - PostgreSQL;
 - Redis;
 - Nginx;
 - Gunicorn;
 - Celery;
 - GIS experience, specifically using Windshaft;
 - Knowledge of statistics and R;
- Knowledge of these additional technologies is also beneficial:
 - NFS;
 - OAuth2;
 - Javascript package/build tools (Grunt and Bower);
 - Monit;
 - Ufw.

Server and System Maintenance

Objective

The overall objective of the Server and System Maintenance personnel is to provide technical support in the areas of server and system maintenance and ensure that the NRSP remains operational.

Duties

The Server and System Maintenance personnel shall:

- Coordinate with the Project Manager and the Deputy Chief Officer to prepare the NRSP deployment and implementation plan whether through local government servers or cloud;
- Lead server set up, system monitoring, establishing and using back-up servers;
- Troubleshoot server and system issues;
- Provide summary analytics reports on site usage and platform traffic and respond to server and NRSP-related inquiries;
- Inform users of the NRSP of scheduled server and network maintenance.

Skills / Experience

- Bachelor's degree in a related field and minimum of three (3) years of job experience in server set-up, maintenance and software deployment;
- Experience with firewall configuration, logging, and certificates;
- Comfortable running commands in the terminal in a Unix-like environment;
- Basic knowledge of networking/DNS;
- Knowledge of Ansible and Docker;
- Experience writing shell scripts;
- Knowledge of:
 - Django;
 - PostgreSQL;
 - Nginx;
 - Redis;
 - Gunicorn;
 - Celery;
 - Gradle;
 - Windshaft;
 - Monit;
 - Ufw;
- Knowledge of a cloud computing platform such as AWS;
- Specific services such as:
 - EC2;
 - S3;
 - CloudFormation.

Data Management

Objective

The Data Management Personnel shall regularly monitor data quality, liaise with owners of external databases that are linked to the NRSP (e.g., MoPS, MoT, among others), regularly monitor data being imported into the NRSP from these databases.

Duties

The Data Management personnel shall:

- Monitor quality of data being uploaded into the NRSP and liaising with MoPS when data quality is not up to standards (or when data not being entered in the MoPS Crash Database in a regular basis);
- Establishing and maintaining relationships with the owners / managers of all external databases linked to the NRSP;
- Provide recommendations on new data elements and definitions which will be raised to the external stakeholders.

Skills / Experience

- Bachelor's degree relevant to the job, minimum of one (1) year job experience;
- Strong computer literacy and experience with data analysis;
- Strong communications and organizational skills.

User Management

Objective

The User Management personnel is mainly responsible for developing and implementing the NRSP user access policies.

Duties

The User Management personnel shall:

- Prepare and draft a detailed user access policy document which includes enumeration of levels of access as well as registration forms;
- Maintain an accessible table of system users with back-up to monitor system usage;
- Receive, vet, process, and approve system user requests for addition to the NRSP;
- Follow-up with users directly to respond to questions related to user privileges and passwords, among others;
- Regularly review active and inactive users, ensuring list of users is up to date;
- Propose and prepare user management policy amendments, as needed.

Skills / Experience

- Bachelor's degree relevant to the job, minimum of one (1) year job experience;
- Strong computer literacy and experience with data analysis;
- Strong communications and organizational skills.

Support Hotline

Objective

The Support Hotline personnel is the focal point for all queries and concerns regarding the NRSP.

Duties

The Support Hotline personnel shall:

- Respond to inquiries from different channels (e-mail, phone, social media) on the use of the NRSP and road safety data in general;
- Receive and record recommendations for improvement or identification of bugs;
- Prepare reports on received inquiries, suggestions for improvement, and any available platform updates.

Skills / Experience

- Bachelor's degree relevant to the job, minimum of one (1) year job experience;
- Strong computer literacy and experience with data analysis;
- Strong communications and organizational skills.

Data Analysis and Reporting (3)

Objective

The Data Analysis personnel is responsible for developing regular and special reports on road safety issues for the NRSO, detailed statistical analysis of trends in key aspects of crash and injury data, exposure data and performance data, and preparation of estimates and projections on impacts of different interventions on road trauma.

Duties

The Data Analysis personnel shall:

- Support the development and implementation of road safety studies and projects in the NRSO by conducting analytical work on road safety data and crash data;
- Prepare and draft regular and special reports for the NRSO and conduct related detailed statistical analysis for road safety project planning and investment prioritization;
- Conduct collection of road safety data and road safety studies including collection of traffic data, traffic conflicts, among others for uploading to the NRSP.
- Prepare maps of high-risk locations for blackspot identification.

Skills / Experience

- Master's degree in Transport and/or Data Science;
- Have 3 years of relevant work experience in road safety engineering and/or urban planning;
- Good knowledge on iRAP, geographic information systems, and road safety data;
- Practical experience in transport projects and road crash data collection and analysis is a requirement.

3 National Road Safety Training Curriculum

This note sets out a framework for a national road safety management curriculum to support the establishment of a National Road Safety Observatory and National Road Safety Portal in Viet Nam.

The curriculum seeks to be comprehensive in nature, spanning all aspects of road safety management. However, it is weighted towards road safety data, which is a defining feature of the Observatory, within which the Portal is intended to be established.

The curriculum is developed within a framework comprising four elements:

<i>Participant Capabilities</i>	The generic knowledge, skills, attributes and practices that participants are required to develop and evidence during and on completion of all programs.
<i>Program Learning Outcomes</i>	The specific knowledge, skills, attributes and practices that students need to demonstrate in completing a particular program.
<i>Course Learning Outcomes</i>	The specific knowledge, skills, attributes and practices that students need to demonstrate to complete a particular course or courses within a designated program.
<i>Courses & Course Components</i>	The combination of trainings, activities, assessment etc required to achieve the course and program learning outcomes.

This document sets out Participant Capabilities for the entire curriculum, and Program Learning Outcomes for four programs:

Program 1 Road Safety Management

Program 2 Road Safety Interventions

Program 3 Road Safety Knowledge and Results

Program 4 Collection, Analysis and Use of Road Safety Data

These programs are described below. Further work is required to specify the courses and programs through which the program is delivered, for which learning outcomes and components need to be specified.

This is intended to establish an overall philosophy and approach to professional road safety education in Viet Nam. It will require consideration, adjustment and fitment to Viet Nam's own education and/or qualifications framework, and require development of specific training and courses of varying types to be delivered.

It is envisaged that implementation of this curriculum is focused initially on a practical, rapid knowledge transfer approach for participants who are working in the area. Given the relative scarcity of road safety knowledge, specialist trainers need to be engaged. However, given the scale of the capacity building task in Viet Nam, it is important that a sustainable train the trainer approach is also adopted. It is considered that each of the four programs can be delivered within 5 intensive training days.

Initial implementation needs to focus on training and development for professionals and organizations with road safety responsibilities. However, over time, the curriculum can be further developed in a variety of ways, depending upon the best fit or opportunity within the Viet Nam education/qualification context. All four programs can incorporate multiple separate courses for example. There is also significant academic research in the program areas that all four programs could be combined into a post-graduate degree program.

Participant Capabilities

Participant capabilities are the generic knowledge, skills, attributes and practices that students are required to develop and evidence during and on completion of their studies.

There are four participant capabilities for this national road safety management curriculum:

- Leadership Demonstrates leadership through a variety of formal and informal techniques at whatever level or type of road safety work they perform.
- Analysis Understands and explains underpinning research and evidence relevant. To their work specifically, and the road traffic system generally.
- Quality Focuses on continually improving the safety of the road traffic system in order to eliminate road traffic deaths and serious injuries.
- Safety Plays an active role in making the road traffic system safe.

Program 1: Road Safety Management

Good quality road safety management systems are essential to shape high quality interventions and achieve significant reductions in serious road trauma.

<i>Program Learning Outcome 1</i>	Understands and assumes responsibility for explaining key safety management principles.
<i>Program Learning Outcome 2</i>	Understands and can explain the difference between modern safety management practices which seek to eliminate serious road trauma and traditional practices.
<i>Program Learning Outcome 3</i>	Can apply modern safety management principles to investigation of safety issues and development of safety programs.

1.1 Concepts <ul style="list-style-type: none"> • Transformational public health leadership • Results focused management • Safety management models • Sustainable mobility • Safety hazards and risks 	1.4 Management <ul style="list-style-type: none"> • Leadership and coordination • Target setting • Safety promotion • Safety regulation • Safety funding • Capacity building
1.2 Results <ul style="list-style-type: none"> • Setting and working towards a vision • Defining targets and indicators • Developing a results framework 	1.5 Intervention <ul style="list-style-type: none"> • Strengthening standards and increasing compliance • Key concepts and options: road, speed, vehicle, user, response • Designing and implementing interventions • Establishing, managing and improving safety systems
1.3 Governance <ul style="list-style-type: none"> • Institutional arrangements • Strategy and planning • Implementation and review 	1.6 Knowledge <ul style="list-style-type: none"> • Collecting and using data • Monitoring and evaluation • Undertaking and applying research • Transfer and communication

Program 2: Road Safety Interventions

Well designed and delivered road safety interventions improve key safety performance indicators and reduce serious road trauma.

<i>Program Learning Outcome 1</i>	Understands how to apply safety management principles to the design and delivery of interventions
<i>Program Learning Outcome 2</i>	Gathers and uses the best available and most appropriate data to inform decision makers, advise on options and implement agreed decisions
<i>Program Learning Outcome 3</i>	Understands and can explain the differences between interventions which are likely to be more effective, less effective, and ineffective

<p>2.1 Essentials</p> <ul style="list-style-type: none"> • Using evidence and data to define the problem • Selecting the best type and mix of interventions • Targeting interventions to achieve best results • Launch, roll-out and delivery • Monitoring, evaluating and improving interventions 	<p>2.4 Vehicle</p> <ul style="list-style-type: none"> • Safety technology and automation • Global and national vehicle markets • New Car Assessment Programs and consumer information • UN vehicle standards and national regulation • Vehicle fleet selection • Roadworthiness and maintenance
<p>2.2 Speed</p> <ul style="list-style-type: none"> • Requirements for safe road traffic systems • Aligning speed limits to road design and function • Communicating and enforcing safe speed limits • Automatic speed enforcement • Technologies to manage vehicle speed • Leading change in the community 	<p>2.5 User</p> <ul style="list-style-type: none"> • Behavioral change • General deterrence enforcement strategies • Effective communications • Key safety behaviors • Driver licensing • Human machine interface
<p>2.3 Road</p> <ul style="list-style-type: none"> • Essentials of road safety engineering • Integrating safety into new road design • Road Safety Inspection, Audits, and Blackspot programs • International Road Assessment Program • Road and traffic engineering within safe speed thresholds 	<p>2.6 Post-Crash Response</p> <ul style="list-style-type: none"> • Emergency alert • First responder systems and transport • Secondary and primary care • Integrating health sector within road safety • Injury insurance and loss reduction

Program 3: Road Safety Knowledge & Results

Road safety data, research, and knowledge are essential to nourishing professional understanding and capacity to deliver reductions in serious road trauma.

<i>Program Learning Outcome 1</i>	Understands and can explain different types of road safety related data, and high quality processes and systems for collecting, analyzing and reporting on road safety related data
<i>Program Learning Outcome 2</i>	Understands and can explain techniques for using data to design and evaluate the effectiveness of road safety programs, and improve road safety knowledge
<i>Program Learning Outcome 3</i>	Can apply understanding of road safety knowledge and results in their own work

3.1 Fundamentals of Road Safety <ul style="list-style-type: none"> • Introduction to Road Safety Situation (World/Asia/Viet Nam) • Introduction to Data • Different types of Road Safety Data • Viet Nam National Road Safety Observatory & Portal 	3.5 Data Management Systems <ul style="list-style-type: none"> • Introduction to Data Systems • Introduction to Viet Nam National Road Safety Portal • Data institutional arrangement • Road crash data elements • Technical specifications • Collecting and analyzing data
3.2 Events, Exposure, and Risk Factors <ul style="list-style-type: none"> • Describing and counting crash injury and fatality events • Measuring exposure data • Identifying and quantifying risk factors 	3.6 Road Crash Investigation <ul style="list-style-type: none"> • Reporting versus Investigation • Evidence capture, identification, interpretation • Scene measurement, sketch and scale plans • Distance-Time calculations • Speed estimates from skid mark
3.3 Fatality Data <ul style="list-style-type: none"> • Current data, data sources, and systems in Viet Nam • Collecting fatality data • Data Analysis 	3.7 Road Safety Evaluation <ul style="list-style-type: none"> • Designing an evaluation and monitoring framework • Designing a research program • Process, impact and outcome evaluations • Statistical and quantitative studies • Observational Studies • Traffic conflict studies • Geographic Information Systems • Technologies in road safety data collection • Integrating data and tools
3.4 Injury Data <ul style="list-style-type: none"> • Current data, data sources, and systems in Viet Nam • Collecting and measuring injury data • Injury severity coding systems • Data Analysis 	

3.8 Using Data for Evidence-Based Measures

- Transforming data to policy and infrastructure interventions
- Economic Cost of crash fatalities and injuries
- Communicating Data to Policymakers

3.9 Special Topics and Case Studies for Road Safety in Viet Nam

- Alcohol and Drink-driving
 - Background and statistics
 - Collecting alcohol data and conducting research
 - Using data to develop drink driving interventions
- Motorcycle fatalities and injuries
 - Background and statistics
 - Collecting motorcycle data and conducting research
 - Using data to develop motorcycle interventions
- Speed Management
 - Background and statistics
 - Collecting speed data and conducting research
 - Using data to develop speed related interventions
- Non-motorized users
 - Pedestrian and cyclist safety
 - Child safety and school zones
 - Collecting and using data to develop non-motorized user interventions

Program 3: Targeted Training on Road Safety Data

Understanding and analyzing data is crucial to implement a safe systems approach to road safety. These targeting trainings are designed for high level officials and managers of ministries which have road safety responsibilities, technical staff, and the police.

<i>Program Learning Outcome 1</i>	Understands and can explain the role that the participant plays in regard to road safety data, and how that relates to the roles played by different participants
<i>Program Learning Outcome 2</i>	Understands and can explain techniques used by different participants for collecting, analyzing and using road safety data to improve road safety results
<i>Program Learning Outcome 3</i>	Can apply understanding of road safety data in their own work

Targeted Training 1: High-level Officials and Managers

- This training is specifically for high-level officials and managers of ministries which have road safety responsibilities.
- 1 day training of importance of road safety data, data and the safe systems approach, and analyzing data to inform policy and investment decisions.

Targeted Training 2: Technical Staff

- This training is specifically for technical staff of ministries which have road safety responsibilities.
- 3-day training comprising of lecture and presentations, hands-on training, and fieldwork.
- Topics include: Data and safe systems approach, blackspot and blacklength identification and management, creating crash matrices and collision diagrams, integrating iRAP assessments and crash data, conducting road-side surveys and observational studies to collect key safety performance indicators, developing evidence-based interventions.

Targeted Training 3: Police

- This training is specifically for police who collect and encode data into the crash database system.
- 5-day training comprising of lecture and presentations, hands-on training, and fieldwork.
- Topics include: Basic principles of crash investigation, collecting and analyzing road and vehicle evidence, conducting scene photography and measurements, mathematical techniques in speed estimation, and collecting and encoding crash data into the crash database system.

Attachment 4C: National Road Safety Observatory Handbook

**NATIONAL ROAD SAFETY MANAGEMENT
HANDBOOK**

National Road Safety Observatory of Viet Nam

November 2020

1. INTRODUCTION

Viet Nam is one of the fastest growing countries in the world. The human population increased by 50% over the previous 30 years, the road network increased by 86% in the ten years to 2015, and there was a six-fold increase in motor vehicles between 2000 and 2015, mostly motorcycles. These pressures have massively increased exposure to road traffic injury.

Official Viet Nam data records that road traffic fatalities have been decreasing since the establishment of the country's first national road safety strategy and action plan to 2020. However, World Health Organization (WHO) estimates suggest fatalities are increasing and road fatalities are considered to be widely underreported. The Government of Viet Nam continues to take steps to address this, following the successful establishment of the National Road Crash Data System.

Road traffic injury is estimated to be the second highest cause of death for 5-14 year olds in Viet Nam, and the highest cause of death and of disability for 15-49 year olds in Viet Nam.⁷⁴ The World Bank estimates that the annual economic cost of road traffic injury in Viet Nam is USD 18 Billion.⁷⁵

The United Nations (UN) 2030 Sustainable Development Agenda includes an intermediate target of halving road traffic fatalities by 2030. A 2020 UN General Assembly resolution recognized progress made and challenges ahead in many countries. The UN General Assembly declared a second Decade of Action on Road Safety for the period to 2030. Twelve voluntary road safety performance targets have been prepared under the auspices of the Sustainable Development Agenda to guide Member Countries in tackling their road safety problems.

Viet Nam is developing its second national road safety strategy and action plan for 2030, in alignment with global efforts and good practices. A National Road Safety Observatory has been established in Viet Nam to strengthen the country's national road safety management system. This handbook provides:

- Institutional information about the national road safety management system;
- Operational guidance and direction on key road safety management tasks;
- A reference point for how road safety is managed and led in Viet Nam.

This handbook needs to be regularly reviewed and continually improved for use by the National Road Safety Observatory and its Secretariat in support of the Government of Viet Nam's leadership of road safety, through the National Traffic Safety Committee.

Decision No. 22/2017/QĐ-TTg dated 22nd June 2017, made under the Law on Organization of the Government 2015, prescribes the organization and operation of the NTSC.

This handbook is a living document. It has been prepared in advance of the functions of the NTSC being strengthened and of the NRSO being established. Its first amendment may need to be undertaken to fully align with these actions.

⁷⁴ Institute for Health Metrics and Evaluation (IHME). GBD Compare Data Visualization. Seattle, WA: IHME, University of Washington, 2016. Available from <http://vizhub.healthdata.org/gbd-compare>. Accessed October 2019.

⁷⁵ World Bank (2019). Guide for Road Safety Opportunities and Challenges: Low- and Middle-Income Countries Country Profiles. Washington DC, USA: World Bank.

2. INSTITUTIONAL RESPONSIBILITIES FOR ROAD SAFETY

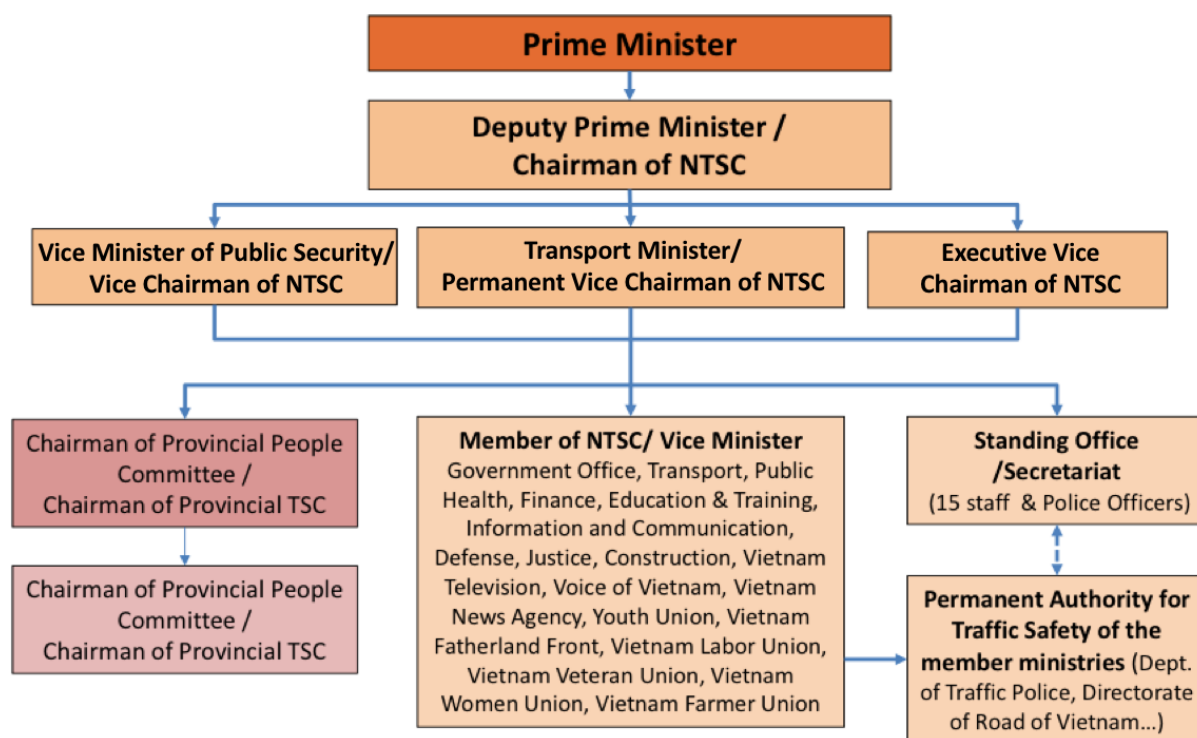
This handbook addresses the institutional responsibilities of four entities.

National Traffic Safety Committee

The National Traffic Safety Committee (NTSC) is responsible for all aspects of transportation safety. It is predominantly focused on road traffic safety, which is by far the least safe transportation mode.

The Deputy Prime Minister is the Chairman, and the Minister of Transport is the Permanent Vice Chairman.

Figure 28: National Traffic Safety Committee⁷⁶



The Executive Vice Chairman is appointed by the Prime Minister and is the head of the Office of the NTSC. The Vice Minister of Public Security is the NTSC Vice Chairman. Vice Ministers of Transport, Health, Finance, and Information and Communications, National Defense, Education and Training, Justice, Construction are members. The standing agency is the Ministry of Transport.

The NTSC is an interdisciplinary organization. It supports the Prime Minister to direct Government Ministries to implement national strategies, programs and interdisciplinary tasks

⁷⁶ Dr. Ing. Khuat Viet Hung “For an effective National Road Safety Observatory” Presentation at Asian Road Safety Observatory Workshop, Bangkok, December 2019.

to ensure traffic order and safety nationwide. This handbook refers to the NTSC, but can be applied to any interagency coordination organization with road safety responsibilities.

Functions and powers

The functions of the NTSC are to:

- Develop and oversee implementation of Government of Viet Nam national road safety strategies and plans, critical actions to deliver on those plans, and investment to achieve the targets set out in those plans.
- Coordinate the contributions of Government of Viet Nam Ministries, Departments and Agencies, and stakeholders outside Government, to support implementation of national road safety strategies and plans through regular meetings of senior government executives, and engagement with stakeholders outside of government.
- Guide the Traffic Safety Committees of provinces and municipalities in developing and implementing effective road safety strategies and plans.
- Regularly review, develop and maintain a legislative program which is focused on the safety standards applying to roads, vehicles and road users, the management of road safety, and post-crash response.
- Promote a safe system response to road safety issues in Viet Nam from amongst those people and institutions within government, and within wider business and community sectors, who are in a position to significantly improve the safety of others.
- Ensure that medium and long term investment plans for road safety are developed, which are consistent with government targets for road safety, and provide advice to the Ministry of Finance on resourcing requirements to achieve these targets.
- Develop and oversee implementation of a monitoring and evaluation framework, focused on the safety performance factors agreed in the national road safety strategy and deliverables agreed in national road safety action plans.
- Promote long term investment in road safety research and development; direct Ministries, provinces and municipalities to implement pilot projects to improve road safety; direct the study and application of scientific and technological advances on road safety; and support road safety capacity building programs across government agencies and within particular professions.

The NTSC also has specific road safety data management functions to:

- Develop and manage a National Road Safety Portal for the purposes of providing approved external access to road safety data held by the MoPS, MoH and MoT, and ensuring data is shared between Ministries in pursuit of the Government of Viet Nam's road safety goals.
- Lead the oversight of this portal between the three contributing Ministries, and the conditions associated with open access to the data which is brought together within the portal.
- Establish a regular set of processes and procedures to establish and monitor key indicators for road safety, and report publicly on those key indicators.
- Develop plans and programs to strengthen the quality and quantity of road safety data available through the portal, including the establishment of safety performance data.
- Analyze all available data sets and other relevant studies to build understanding amongst all stakeholders of critical road safety issues in Viet Nam and evidence-based responses.

The NRSO functions complement and do not alter the legal functions of each Ministry. The powers of the NTSC include the powers to seek information from and provide direction to Government Ministries, in line with its prescribed functions.

Operation

A National Road Safety Observatory (NRSO) has been established to strengthen cross-government leadership of road safety. The NRSO is supported by a professional dedicated Secretariat, housed within the Office of the NTSC, and engages stakeholders through a National Road Safety Forum.

The NTSC shall meet 4 times a year, and more often if required. The NRSO Secretariat will perform the Secretariat role for the NTSC.

National Road Safety Observatory

The NRSO is a sub-committee of the NTSC.

Purpose

The NRSO acts on behalf of the NTSC, under delegated functions and powers. Key activities include the development, implementation and evaluation of a National Road Safety Strategy, and the development, implementation and continual improvement of a National Road Safety Portal.

Composition

Ex-officio members of the NRSO are:

- Executive Vice Chairman of the NTSC (Chair);
- Director of Traffic Police Department (MoPS);
- Director of Medical Examination and Treatment Management Department (MoH);
- Director of Vietnam Registry (MoT);
- Director of Transport Safety Department (MoT).

The NTSC appoints the Executive Vice Chairman of the NTSC, who is the Chair of the NRSO. The Chair of the NRSO:

- Reports to the NTSC on all matters relating to the NRSO;
- Is responsible for a dedicated NRSO Secretariat within the Office of the NTSC, and appoints a head of that Secretariat;
- Convenes a regular meeting of a National Road Safety Forum.

The NTSC may appoint two further members of the NRSO.

Operation

The NRSO shall meet 8 times a year, and more often if required. Under the direction of the NRSO Chair, the NRSO Secretariat shall prepare an agenda and papers for the meetings, prepare minutes which record decisions made and actions agreed, and track progress against the delivery of the agreed workplan. The NRSO Secretariat shall also provide meeting support for the NTSC.

The NRSO may establish such technical working groups as may be necessary to give full effect to its responsibilities, and nominate a convenor of the working group. Any such technical working groups which are established shall have specific tasks and timeframes for reporting back to the NRSO.

Agency responsibilities for road safety

The formal responsibilities of the member agencies of the NRSO are legally defined in various instruments. Their road safety responsibilities are described below.

The **MoT** is responsible for formulating road safety strategies and policies, and through their respective authorities to ensure that specified activities, functions and duties are implemented. The MoT includes several relevant departments and agencies:

- The **Office of the NTSC** reports to the NTSC (the lead agency for road safety in Viet Nam), and supports the NRSO through a dedicated professional Secretariat.
- The **Transport Safety Department** is the advisory organization to support the Minister of Transport in state management for road traffic safety within the MoT, and organizes the implementation of regulations on roads, railways, inland waterways, maritimes and civil aviation traffic safety
- The **Directorate for Roads of Viet Nam (DRVN)** holds responsibility for advising and assisting the Minister of Transport in state management and organizing the enforcement of road transport law in nationwide, and organizing the implementation of public services in road transport following legal regulations
- The **Viet Nam Register** holds responsibility for state registry of transport operations throughout the country, and for vehicle safety standards and inspections.
- The **Viet Nam Expressway Corporation** is responsible for the safety of the national expressway network.

Responsibility for safe roads and transport operations in cities and provinces lies with the **Municipal/Provincial Department of Transport**.

The **MoPS** holds state management responsibilities for:

- Enforcement of road traffic law
- Detecting and punishing administrative violations of road traffic safety law
- Traffic control and VIP escort
- Preventing and combating crimes and violations on traffic routes
- Registering and issuing motor vehicle number plates
- Road traffic crash investigation and prosecution
- Road traffic crash data management (as set out in regulations).

Responsibility for these functions within the MoPS are held by the **Department of Traffic Police**, and are discharged by Public Security Departments of municipalities and provinces, Public Security Offices of rural districts, urban districts, cities and provincial capital cities and Public Security Posts of communes, wards and towns.

The **MoH** has an **Accident Injury Prevention Department** and is responsible for the emergency treatment of people injured in traffic accidents. The health sector collects road traffic crash data as part of its National Injury Surveillance System.

National Road Safety Forum

The National Road Safety Forum (NRSF) is a meeting of government and non-government stakeholders.

Purpose

The purpose of the NRSF is to:

- Appraise stakeholders of major road safety initiatives and programs which are being developed and/or being implemented;
- Seek input from stakeholders on future road safety initiatives and programs;
- Encourage stakeholders to take significant actions to improve the safety of the road transport system through their own road traffic operations.

Composition

Membership of the NRSF is also open to all organizations which are committed to the goals of the National Road Safety Strategy. The Reference Group will be convened by the Chair of the NRSO.

The Chair shall invite membership from organizations outside of government. These may include organizations which are representative of:

- The transport industry carrying large volumes of passengers and goods;
- Major industrial corporations which commission the transport industry to carry their goods and which have large volumes of people travelling to and from work each day;
- Road user or community representatives who have a strong interest in the safe movement of people on the road;
- Academia and transport consultancies.

A senior representative will be nominated by each member organization of the NTSC to be a member of the NRSF.

Operation

The National Road Safety Forum shall:

- Meet at least twice each calendar year;
- Review the most recent data regarding fatalities and serious injuries on the road;
- Exchange information on the actions taken by all members to improve road safety;
- Receive advice from government agencies regarding measures which are under development to improve road safety management systems, to strengthen road safety standards, or to increase compliance with road safety standards;
- Provide feedback to government agencies on measures which are under development, and consider what contributions each member can make to support or complement the measures.

The NRSO Secretariat will perform the Secretariat role for the NRSF.

NRSO Secretariat

The NRSO Secretariat is a dedicated interdisciplinary work group of road safety professionals.

Under the direction of the NTSC and NRSO, it supports Government of Viet Nam leadership of road safety. As the dedicated multi-sectoral body for road safety in Viet Nam, the Secretariat requires sustained political support and adequate funding to perform its role.

The NRSO Secretariat may develop in the future as an autonomous multi-sectoral agency within the Government of Viet Nam.

Structure

The NRSO Secretariat is established as a work group within the NTSC Office. The Secretariat is led by the Chief Officer, National Road Safety Observatory. In line with the delegated functions of the NRSO, the Chief Officer has three direct reports:

- Deputy Chief Officer, Road Safety Management: leads the development, and oversees implementation, of national road safety strategies and plans for Viet Nam.
- Deputy Chief Officer, Road Safety Data: oversees data sharing between agencies, and oversees the specification, procurement and implementation of the National Road Safety Portal.
- Deputy Chief Officer, Road Safety Partnerships: secretariat support for meetings of NTSC, NRSO and NRSF; stakeholder management; and public engagement and communication.

Operation

The NRSO provides advice to and receives direction from the NTSC and the NRSO regarding an annual work program, consistent with the functions and powers of the NTSC. Key activities within the work program include the development, implementation and evaluation of a National Road Safety Strategy, and the development, implementation and continual improvement of a National Road Safety Portal.

3. NATIONAL ROAD SAFETY MANAGEMENT FRAMEWORK

This handbook is focused on the national road safety management systems and processes which will be established, operated and strengthened through until the end of the decade.

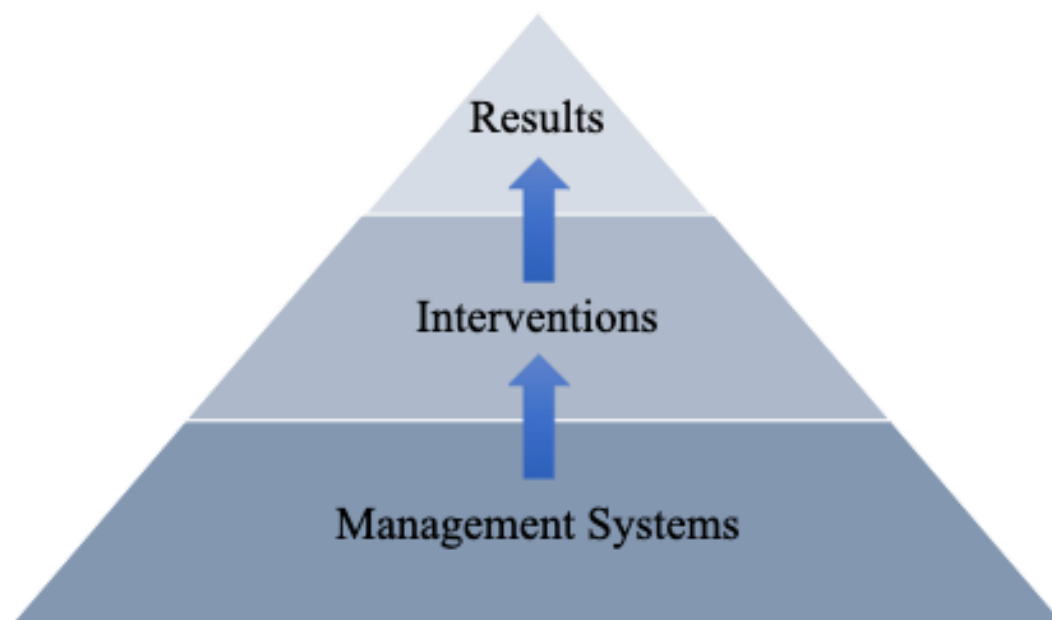
Road Safety Management Systems

National road safety management systems and processes are needed in order to tackle Viet Nam’s road traffic safety problems. This handbook addresses seven key systems and processes:

- Results Management
- Leadership and Coordination
- Legislation
- Funding and Resource Allocation
- Promotion
- Monitoring and Evaluation
- Research and Development and Knowledge Transfer

These systems and processes reflect the functions of the NTSC. When they are working effectively, these systems and processes will significantly improve the quality of road safety interventions within Viet Nam, which will significantly improve road safety results.

Figure 29: Road safety management systems, interventions and results



Road Safety Interventions

Individual government agencies are held accountable through public management processes for delivering interventions to improve road safety in Viet Nam.

The NTSC and the NRSO (and Secretariat) are not responsible for delivering interventions. They are responsible for identifying and prioritizing the key interventions which are to be delivered by member agencies, in pursuit of the Government of Viet Nam's road safety goals and targets.

Intervention options are broadly described below:

- Investing significant resources into infrastructure treatments that protect road users from fatal and serious injury arising from intersection, cross-median, roadside or midblock crashes involving motor vehicles.
- Setting, advising and enforcing safe speed limits which match the level of infrastructure protection provided to motorized traffic in rural areas and non-motorized traffic in urban areas.
- Setting, advising and enforcing standards and rules associated with the level of driver alcohol, the speed of motor vehicles, the safety of commercial operators, the licensing of motor vehicle drivers, and the safety of motor vehicles which are imported or constructed in Viet Nam.
- Promoting road safety as a major issue of public health concern for Viet Nam, and these road safety intervention options, to reinforce the expected behavior and actions from decision makers, organizations which are both inside and outside government, and road users.
- Supporting improved mobility systems which reduce motor vehicle traffic, and ensuring those mobility systems are safe to access and use.
- Providing recovery, treatment and rehabilitation services for injured victims of road crashes.

Interventions should be specified in a multi-year National Road Safety Action Plan, and be targeted towards achieving intermediate safety outcomes specified in a long term (for example, ten year) National Road Safety Strategy.

Road Safety Results

Road safety performance indicators need to be specified, covering final safety outcomes, intermediate safety outcomes, and outputs. Final safety and intermediate safety outcome targets should be specified in a National Road Safety Strategy, and output targets should be specified in a National Road Safety Action Plan.

Performance indicators are described below:

Final Safety Outcomes

Final safety outcomes are the highest-level results being sought, and comprise three main areas:

1. Reduced fatalities;
2. Reduced serious injuries;
3. Reduced social cost of road trauma.

Final safety outcome indicators should be:

- Disaggregated by location, gender, age, user type, crash type, and road type
- Supported by critical exposure information – population, network length, kilometers travelled, and registered vehicles.

Road safety performance can be compared within Viet Nam, and with other countries by the number of fatalities per 100,000 people.

Final safety outcome indicators, including disaggregated data should be published and made publicly available at least quarterly (see section on Monitoring and Evaluation).

Intermediate Safety Outcomes

Intermediate safety outcome indicators help assess safety progress over time, for particular parts of the road traffic system. Indicators which form the basis of UN voluntary road safety targets are:

- Vehicles exceeding the posted speed limit;
- Drivers testing above the legal alcohol limit;
- Adult motor vehicle occupants correctly using seatbelts;
- Motorcycle riders correctly using helmets;
- International Road Assessment Program (iRAP) safety star rating for Highway network;
- Travel on main roads that meet a three-star safety rating or better;
- Country regulates at least 7 of the 8 priority UN vehicle safety standards;
- Time between crash and first professional emergency care.

These indicators typically require scientifically designed observational surveys to be conducted, and the results published regularly alongside quarterly reports of final safety outcome indicators. These surveys require external research resources (see sections on Monitoring and Evaluation, and on Research and Development) with oversight and management from the NRSO Secretariat.

Outputs

Output indicators should logically connect with agreed intermediate safety outcome indicators, and focus the attention of delivery agencies on achieving the best overall road safety results. Examples are:

- Kilometers of footpath and number of pedestrian crossing points constructed;
- Number of intersections and other road sites (including blackspots) treated for safety improvements;
- Number of driver licenses issued/renewed, and number of license sanctions applied to restrict the legal opportunity for offenders to drive;
- Number of vehicles inspected, and number of vehicle sanctions applied to remove unsafe vehicles from the road network;
- Number of commercial operator licenses issued/renewed, number of operator sanctions applied to restrict the legal opportunity for offenders to offer services;
- Number of breath alcohol tests administered, and legal actions taken;
- Number of speeding tickets issued or other legal actions taken;
- Number of legal actions taken regarding use of mobile phones;
- Number of legal actions taken regarding unrestrained motor vehicle occupants.

Increased quantity and quality of outputs will impact positively on intermediate safety outcomes and, therefore, final safety outcomes. Output quality and quantity should be specified in a National Road Safety Action Plan.

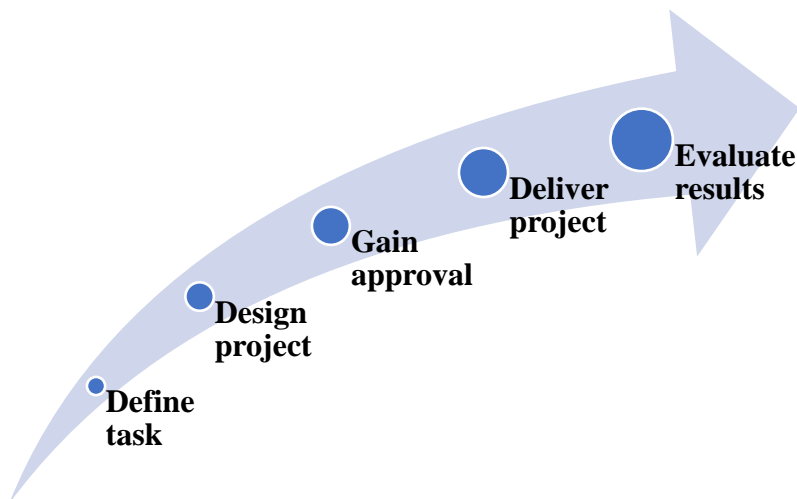
4. MANAGEMENT SYSTEMS

The NTSC, the NRSO and the NRSO Secretariat need to perform a number of regular and programmed tasks to lead road safety improvement in Viet Nam.

Establishing and improving systems

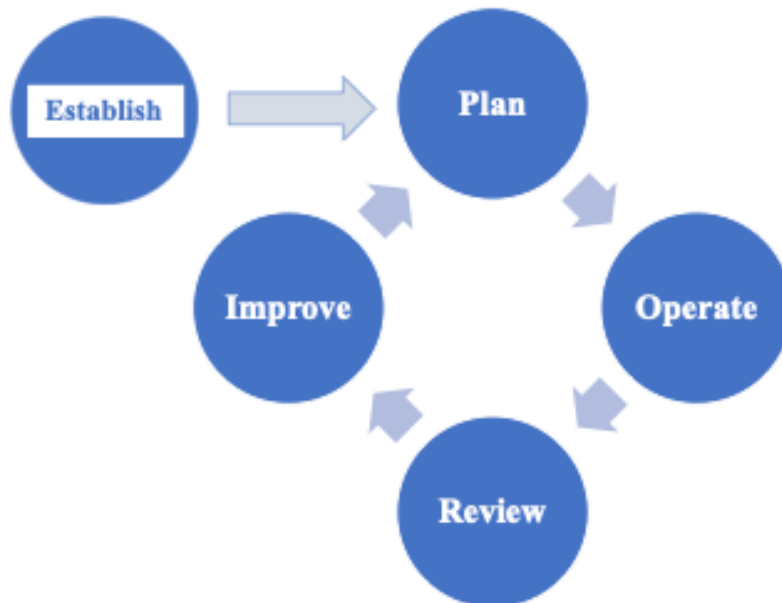
Many tasks need to be undertaken for the first time, and need to be put onto a project footing to deliver. A simple project management process is undertaken for this.

Figure 30: Project management system process



Once tasks are delivered, a management system is established to maintain and improve performance. A simple management system is developed for this.

Figure 31: Stages in a management system



The delivery of tasks and the management of systems should improve over time. Any changes which the Government of Viet Nam makes to institutional structures or responsibilities may result in changes to which organization performs the tasks. However, the systems which are discussed here remain the road safety management building blocks for success.

The tasks, their purpose, and the regularity with which they need to be performed are set out below. Each task requires follow up, monitoring, and improvement mechanisms to be put in place as part of an overall management system.

Seven core systems are described here, aligned with the functions of the NTSC. They should be regularly reviewed and improved in order to achieve the Government of Viet Nam’s road safety goals and targets. Continuous improvement is necessary until the ultimate goal of eliminating fatal and serious injury on the road is achieved.

Results Management

A function of the NTSC is to develop and oversee implementation of national road safety strategies and plans, critical actions to deliver on those plans, and investment to achieve the targets set out in those plans

The NRSO shall work collaboratively across government agencies to prepare a National Road Safety Strategy, a National Road Safety Action Plan, and a workplan for the NRSO. A road safety outcomes framework will also be prepared.

Table 16: Results management

Task	Purpose	Regularity
National Road Safety Strategy	Prepare comprehensive strategy to guide road safety policy, planning and activity to 2030, including ultimate road safety vision and interim outcome targets	Once every ten years, with an implementation review after two years, and a mid-term outcomes review after five years
National Road Safety Action Plan	Develop, fund, publish and monitor delivery of a multi-sectoral action plan to achieve intermediate and final outcomes	At least once every three years, fully aligned with government planning and budgeting processes for each Ministry
National Road Safety Observatory Workplan	Identify and fund specific tasks to be undertaken by the NRSO, according to agreed quality and timeliness	Annually, for approval by NTSC, with quarterly reports
Develop a Road Safety Results Framework	Develop and publish a logical framework linking delivery of outputs to intermediate safety outcomes and final safety outcomes	Developed as part of National Road Safety Strategy, and reviewed each year to include additional data sets

Some further work is required on the strategic policy direction for road safety in Viet Nam. The National Road Safety Strategy should contain at least four elements:

1. **Vision & Targets:** An ultimate vision of road safety for the country, and quantitative targets covering at least final and intermediate safety outcomes.
2. **Critical Analysis:** A description of the critical road safety issues, and the strategic approach that will be taken to address these issues.
3. **Strategic Direction:** A set of strategic directions to guide decision making over the lifetime of the strategy, and link the vision, the targets and the critical analysis.
4. **Implementation:** The management arrangements for implementing the strategy, including: accountability, funding, and monitoring and evaluation.

Each National Road Safety Action Plan, and NRSO Workplan is an opportunity to strengthen and improve the response to Viet Nam's road safety problem.

National road safety plans should contain four design elements:

1. Actions are well aligned to major safety issues and research evidence that action will significantly improve safety;
2. Specific activity or policy goals are documented;
3. Specific institutional accountability and timeframe for delivery;
4. Agreed reporting and evaluation framework.

As part of, or ahead of, developing a National Road Safety Strategy, particular attention should be given to developing a road safety results framework which supports better decision making.⁷⁷ It will take some time to develop a full set of indicators. Most indicators should be defined as the strategy is developed, but other indicators may be the initial focus of a research strategy. The goal over time is for a complete set of data that can be reported, even if some indicators (such as a safety star rating for infrastructure) are only revised periodically, such as every three years.

⁷⁷ See sections below on Monitoring and Evaluation and on Road Safety Results. Robust data sets are required for the NTSC to monitor progress in performance and to set realistic performance targets.

Coordination

A function of the NTSC is to coordinate the contributions of stakeholders to support implementation of national road safety strategies and plans through regular meetings of senior government executives, and engagement with stakeholders outside of government.

This requires the NRSO and its Secretariat to organize regular meetings of the NTSC, the NRSO itself, and the NRSF. These meetings allow all parties to discuss strategic road safety issues, and the best strategic safety response to the range of immediate issues that arise.

Table 17: Coordination of road safety stakeholders

<i>Task</i>	<i>Purpose</i>	<i>Regularity</i>
NTSC Meeting	To review progress in achievement of Viet Nam’s road safety goals and targets, and to receive advice and make decisions regarding key road safety policy and investment requirements	At least four times a year
NRSO Meeting	To review delivery of National Road Safety Action Plans, and the NRSO Workplan, and to develop advice to the NTSC regarding key road safety policy and investment requirements	At least eight times a year
National Road Safety Forum	To engage effectively with partners outside government on significant road safety issues, and encourage greater involvement in effective road safety programs	Twice a year
Provincial Government Meeting	To receive input from city and regional government administrations regarding road safety issues, to brief them on national road safety programs, and consult on significant changes to road safety policy and operations	Twice a year

A calendar of meetings should be set before the end of the year for each following year, but may be varied at the discretion of the Chair. The Secretariat shall prepare an action-oriented agenda, minutes, and follow up decisions made with responsible organizations or persons. Additional technical meetings and discussion may be needed between the NRSO Secretariat and key NRSO member agencies, and stakeholders outside government.

NRSO member agency collaboration with Provincial Governments, and with businesses and organizations outside government, is also important. This collaboration complements, but does not replace, the decision making and management functions of the NTSC and the delivery responsibilities of the NRSO member agencies.

Legislation

A function of the NTSC is to regularly review, develop and maintain a legislative program which is focused on the safety standards applying to roads, vehicles and road users, the management of road safety, and post-crash response.

This requires the NRSO to regularly commission and prepare advice on studies of current legislation and the compliance and enforcement activities associated with the legislation.

Table 18: Legislation

<i>Task</i>	<i>Purpose</i>	<i>Regularity</i>
Regulatory Reform Program	To ensure a rolling program of safety regulatory reform across the road safety spectrum	Ten-year program identified, and renewed every three years, aligned with National Road Safety Action Plan
Major legislative reviews	To ensure major legislative reforms are initiated and progressed	At least one major review commissioned by, and presented to, the NTSC for decision each year

A rolling regulatory reform program should accommodate the likelihood that some reviews may take more than a year to complete, and that some support minor legislative amendment and maintenance may be required.

Major legislative reviews could address the effectiveness of:

- The institutional management responsibilities for road safety held by various government agencies;
- Safety standards and rules set in legislation for roads, vehicles, drivers and operators, as well as emergency response;
- The business systems within government agencies for assessing risk, funding safety and managing safety programs, and regulating activity;
- Testing/inspection/audit/enforcement services delivered either by government or the private sector;
- Activity to achieve compliance with safety standards and rules.

A process should be established to prioritize the legislative review that will be undertaken, taking into account the effort required to review the particular activity compared with the potential benefit. It is currently recognized for example that vehicle importation and construction safety standards requires significant attention, and regulatory reform in this area has the potential to provide substantial safety benefits over the medium term.

Funding and Resource Allocation

A function of the NTSC is to ensure that medium and long-term investment plans for road safety are developed, which are consistent with government targets for road safety, and provide advice to the Ministry of Finance on resourcing requirements to achieve these targets. Once this function is fully developed, it will require regular attention throughout the government budget cycle.

Table 19: Funding and resource allocation

Task	Purpose	Regularity
NRSO Budget and Funding	To develop an annual budget to fund the establishment of the NRSO, and the NRSO Secretariat, with operating/capital funding for internal/external expenditures on staff and projects`	One-off, then ongoing/annual administration
Estimate Road Safety Investment Needs	To analyse what additional investment is required through NTSC agencies to meet Government of Viet Nam targets for road safety over the next decade, and the funding sources which will be used	Major decade long analysis, revised every three years
Develop and administer Annual Road Safety Investment Program	To develop and gain approval of an annual funded program to invest in road safety, through NTSC agencies, including resource allocation and project evaluation processes, as part of the annual government budgeting process	One-off, then ongoing/annual administration of program

The human and financial resources of the NRSO at the point of establishment should:

- Be commensurate with the large scale of the road trauma problem in Viet Nam;
- Recognize the development of the National Road Safety Portal is a major development, and ongoing, project in its own right;
- Provide for the strengthening of the road safety leadership functions within the NTSC to lead national road safety strategies and plans;
- Account for the significant secretariat responsibilities associated with coordinating road safety data and road safety management functions.

Some of the resources within the Office of the NTSC should be re-assigned to establish the NRSO Secretariat. Significant additional investment is warranted, based on the additional functions and activities which are required.

On an annual cycle, the NTSC should provide advice to government on the road safety investment needs through each of the NTSC agencies. These investment needs should be aligned to the National Road Safety Strategy and the National Road Safety Action Plan. The NTSC does not have jurisdiction over NTSC agency budgets, but should provide advice on the best use of additional road safety investment across NTSC agencies.

Promotion

A function of the NTSC is to promote a safe system response to road safety issues in Viet Nam from amongst those people and institutions within government, and within wider business and community sectors, who are in a position to significantly improve the safety of others.

Table 20: Promotion

<i>Task</i>	<i>Purpose</i>	<i>Regularity</i>
Road Safety Promotion Strategy	To set priorities for promotion and communication programs to increase awareness of key road safety issues in Viet Nam, and to build support specific actions to improve safety	Once, and then possibly revised as part of mid-Decade review
Road Safety Promotion Calendar	To set and deliver an annual program of road safety promotion activity based on the annual National Road Safety Action Plan, the release of key reports and quarterly Road Safety Progress Reports and the programmed operations of key partner agencies	Annually, completed alongside the annual National Road Safety Action Plan

Promotional activity should be carefully targeted at first to decision makers, partner organizations (those organizations in a position to take significant road safety action) and key influencers. This activity should promote consistent road safety messages which are well aligned to the Government's National Road Safety Strategy and National Road Safety Action Plan.

This activity should be oriented at a strategic level, with the target audience provided with specific actions which they can take to improve the safety of others. Over time, promotional activity may be extended to other target populations, in line with specific programs. This could include for example legislative initiatives (informing the community of changes in law which must be complied with), or enforcement campaigns (informing the community of specific campaigns targeting specific behaviours).

All activity shall be subject to evaluation and review, and then adjusted as necessary to make best use of promotion and communication resources.

A website may be developed to bring all key road safety information together in a single place for stakeholders and eventually the wider community to access.

Monitoring and Evaluation

A function of the NTSC is to develop and oversee implementation of a monitoring and evaluation framework, focused on the safety performance factors agreed in the national road safety strategy and deliverables agreed in national road safety action plans.

Table 21: Monitoring and evaluation

<i>Task</i>	<i>Purpose</i>	<i>Regularity</i>
Reporting Template	To develop a reporting template, based on the results framework, which allows regular and consistent reporting of road safety data and issues	Once, and then developed further as data processes and quality are improved
Road Safety Progress Report	To collate road safety output and outcome data and relevant operational data (including delivery of National Road Safety Action Plans), report to government, and disseminate key information to partners and media	Quarterly (within 4 weeks of the end of the March, June, September and December quarters)
Mid-Decade Road Safety Outcome Review	To undertake a full outcomes based review of road safety performance and institutional management to inform decisions on achievement of 2030 targets	Complete during 2024/25 financial year

The compilation and publication of a quarterly Road Safety Progress Report is an essential ongoing task, which supports two significant objectives:

- It allows the NTSC to assess operational and outcome progress and determine whether adjustments are needed to current plans;
- It promotes transparency between NTSC agencies and within the wider community about road safety progress in Viet Nam.

There are significant road safety data collection and management issues in Viet Nam. These issues shall not delay publication of available information. These issues should be addressed as a matter of priority, in a manner which addresses the needs of roading, policing and regulatory agencies. The report should be aligned with the results management framework which is agreed. Initial reports may be adjusted until a consistent format and data set is determined which provides important road safety information.

The mid-decade review of the National Road Safety Strategy should review progress in the development and implementation of the National Road Safety Strategy and National Road Safety Action Plans, and the road safety management capacity within the Government of Viet Nam to achieve its road safety goals and targets. It should provide the basis from which further policy and investment decisions can be made towards achieving the Government's road safety goals and targets.

Research and Development and Knowledge Transfer

A function of the NTSC is to promote long term investment in road safety research and development, and support road safety capacity building programs across government agencies and within particular professions.

Table 22: Research and development of knowledge transfer

<i>Task</i>	<i>Purpose</i>	<i>Regularity</i>
Research and Knowledge Strategy	To set priorities for research and development, and knowledge transfer, programs which will improve understanding of key road safety issues in Viet Nam and the implementation of effective solutions	Once, and then possibly revised as part of mid-Decade review
Road Safety Research Program	To develop and implement a program of work to support future decision making in areas of strategic road safety importance in Viet Nam, and to develop over time the road safety capability of the research community	Annually, in collaboration with key road safety partner agencies and the research community
Road Safety Capacity Building Program	To develop and deliver an ongoing capacity building program for all NTSC agencies, and other organizations and persons working in road safety addressing key road safety management and intervention issues	Ongoing, with at least one major activity per quarter which addresses key road safety subjects

Research should be conducted in such a way that allows follow up actions to occur. For example, a sustained program of research activity should be undertaken to develop understanding on the level of compliance with safety belt laws, speed limits, mobile phone laws or drink driving laws. Specific traffic speed surveys may also need to be conducted. The results of each of these should be consistent with the results framework, and may be used to direct interventions by NTSC agencies. The research program may include research into specific areas of policy concern, to facilitate better informed consideration of policy issues, policy options, and the implementation of better policy decisions.

There are many ways in which capacity building programs can be undertaken. These should be focused on persons working in road safety fields, and aim to both improve their specific technical knowledge of the field which they are working in, and their general understanding of the road safety field. Opportunities should be taken to seek contributions from visiting experts, or more formally organized capacity building programs developed by individual agencies.

5. DATA SYSTEMS

The NTSC has the following road safety data management functions:

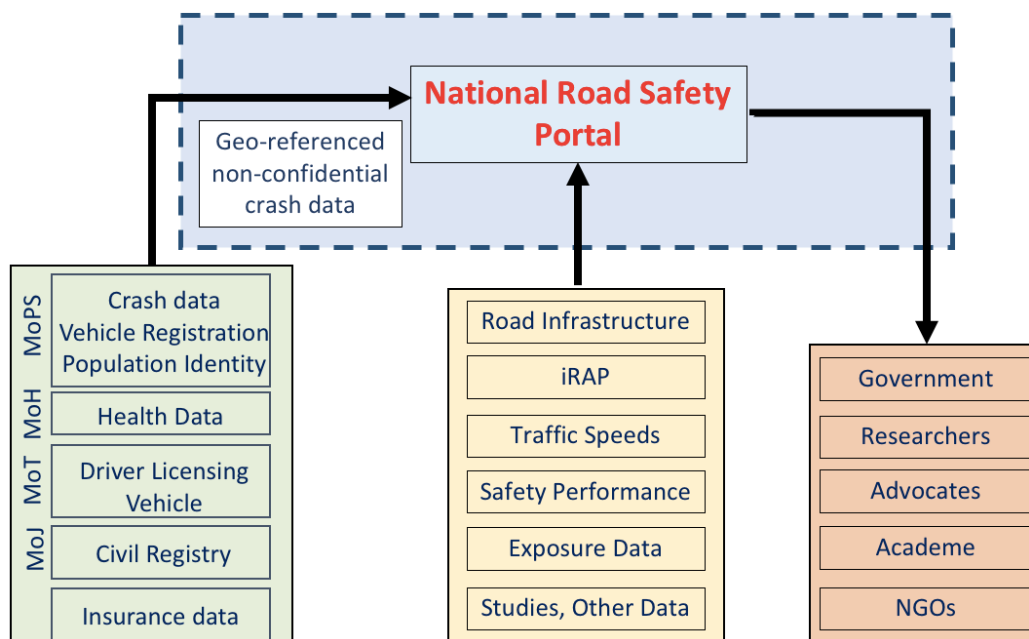
- Develop and manage a National Road Safety Portal for the purposes of providing approved external access to road safety data held by the MoPS, MoH and MoT;
- Lead the oversight of this portal between the three contributing Ministries, and the conditions associated with open access to the data which is brought together within the portal;
- Establish a regular set of processes and procedures to establish and monitor key indicators for road safety, and report publicly on those key indicators;
- Develop plans and programs to strengthen the quality and quantity of road safety data available through the portal, including the establishment of safety performance data;
- Analyze all available data sets and other relevant studies to build understanding amongst all stakeholders of critical road safety issues in Viet Nam and evidence-based responses.

Road safety data systems are managed by the National Road Safety Observatory on the following principles:

- Data must be used for the development of comprehensive and evidence-based road safety programs;
- Data improvements need to address technology and institutional arrangements, and be sustainable;
- Data must be shared online with and easily accessible by stakeholders;
- Data collection and analysis process must be easy-to-follow.

The data framework that governs the National Road Safety Portal (NRSP) has two main components, the Traffic Accident Database of MoPS (TAD) and the NRSP itself.

Figure 32: National road safety portal



The TAD is the responsibility of the MoPS, and is the primary collector of crash data. An application programming interface (API, a set of rules that allow programs to talk to each other and will be the primary method to integrate different database systems) can be used to share crash data to the NRSP without exposing personal data and, at the same time, integrate the TAD with other sources of crash data.

The NRSP is the responsibility of the NTSC, and is the primary road safety platform that integrates crash data with other types of road safety data. The NRSP shall be authorized and certified as the official road safety data portal of the country by the E-Data Center of the Government. This integrated data shall then be shared with all stakeholders in road safety whether from government, academia, or the general public.

The overall management and operations of road safety data in Viet Nam is described in two parts. Firstly, how the MoPS shall collect crash data, integrate this with other sources of crash data, and share this with the NRSP. Secondly, the day-to-day processes to manage the National Road Safety Portal.

Crash Database of MoPS

For the MoPS to maintain a reliable and accurate dataset of crashes, they shall integrate their current crash database system with other sources of crash data. Specifically, the TAD through APIs will integrate MoPS crash data with MoH health data, the civil registry system, and insurance data. In addition, the MoPS TAD will also integrate with the driver licensing and motor vehicle data systems so that driver and vehicle details of each crash are reliable. The ministries who manage these other database systems are responsible for ensuring that they implement data improvement and data quality assurance programs for their own database systems.

Database Management

1. Granting of User Access – The MoPS shall have an internal user access policy, including at least three levels:
 - a. Analyst access – to enable users to add, edit, update, and delete records;
 - b. Police Station Administrator – to allow users to manage duplicate records and download audit logs;
 - c. Head Office Administrator access – to allow users to manage access, edit the reporting form, update administrative and geographic boundaries, and implement substantial changes to the platform.
2. Updating of Form and Crash Data Elements – The MoPS shall develop their own data dictionary of all the data fields that they are collecting, their definitions and assigned values. This data dictionary shall be agreed with MoH and MoT. MoPS shall conduct an annual review of this data dictionary together with MoH and MoT to ensure that fields and definitions remain standardized with all the ministries. This review includes applicability of fields, comprehensiveness of assigned data values and definitions, and frequency of collection. Changes to the data dictionary and the form will then be implemented by the MoPS in their database system and must be communicated to all Traffic Police. A preliminary set of crash data elements is included at attachment 3D to the main body of the report. Specific data needs of each ministry can be added on to this preliminary set (e.g. personal details of those involved in the crash for MoPS' investigation).
3. Troubleshooting, System Downtimes, and Hotline – When the MoPS National Crash Database is experiencing issues or server downtimes, a notice shall be sent to all Traffic Police and to the National Road Safety Observatory. If issues have been resolved, a new notice shall be provided again to all users. A hotline must be set-up within MoPS which can regularly receive queries and resolve issues.

Data Collection

The following steps shall govern the actions to be undertaken by MoPS in terms of collecting crash data:

1. The Traffic Police shall record the information into an updated manual form, or an electronic form using a mobile application. If an electronic form is used, then the form will automatically be uploaded into the MoPS TAD. If a manual form is used, then it should be sent to the police station to be encoded into the MoPS TAD. A Road Safety Officer may need to be hired for police stations which report more crashes, who will be the dedicated encoder and manager of the MoPS TAD.

2. Once uploaded into the system, this report will have to be confirmed and approved by the Police Station Administrator before the day ends. This is in line with the current approval process of incident report forms in the police station.
3. The MoPS database will then communicate with the motor vehicle and driver licensing registers through an Application Program Interface (API).

Licensing Data

4. MoPS and DRVN will both have access to the driver license number data field in each of the database systems. If the records between the two database systems contain the same driver license number, then the TAD will be able to download licensing data from the DRVN database. Specifically, DRVN will push the name, birthday, age of driver, sex of driver, driver license type, and license expiry date to the TAD.
5. To complete the uploading of licensing data to the MoPS TAD, the assigned Traffic Police shall confirm through the system that the license numbers from both of the database systems match and that the download of the licensing data can proceed. Specifically, the assigned Traffic Police should be able to confirm these matches whenever they are available.

Motor vehicle data

6. The TAD and MoPS vehicle registration database will be integrated and will communicate through the vehicle identification number data field. If the records between the two database systems contain the same vehicle identification number, then the MoPS crash database will be able to download vehicle registration data. Specifically, the vehicle registration database will push the vehicle owner, class of vehicle, vehicle engine number, vehicle age, vehicle registration date and other relevant fields as decided by MoPS.
7. To complete the uploading of vehicle registration data to the TAD, the assigned Traffic Police shall confirm through the system that the vehicle identification number from both of the database systems match and that the download of the vehicle registration data can proceed. Specifically, the assigned Traffic Police should be able to confirm these matches whenever they are available.

Health data

8. The assigned Traffic Police will need to update the electronic record as details of the investigation are collected. In the event that the MoH Health Data System does not yet cover the hospitals within the province where the crash occurred, the Traffic Police must update the number of deaths and injuries within thirty (30) days from the date of the incident.
9. If the MoH Health Data System is already integrated with the TAD, then MoPS can download fatality and injury data from MoH through an API. To facilitate the integration, MoPS and MOH will both have access to the name and national ID number data field in each of the database systems. If the records between the two database systems contain the same national ID number or the same name, then the TAD will be able to download the injury severity data from the MoH database.
10. To complete the uploading of fatality and injury data from MoH to the TAD, the assigned Traffic Police shall confirm through the system that the national ID number or name of involved in the crash from both of the database systems match and that the

download of fatality and injury data can proceed. Specifically, the assigned Traffic Police should be able to confirm these matches whenever they are available.

11. Fatality and injury records in the MoH Data which do not have a match in the TAD will also be sent to the TAD through the API. Fields such as time and date of injury or fatality, age, gender, and crash/injury severity data will be automatically uploaded into the TAD from the MoH Health Database.

Other data

12. Future integrations between the TAD and the Civil registration system as well as the Insurance database system will follow the same procedure as the integration between the MoPS and the MoH.
13. In the event that there is no internet connectivity or there are technical issues in the police station, the assigned Traffic Police or Road Safety Officer should bring a soft copy of the report to the nearest police station with internet connection for encoding into the crash database.
14. Records that have been encoded into the TAD will be uploaded to the NRSP except for confidential data such as names, personal identity number, vehicle registration and identity number, among others. This will be done automatically through an API. Any edit or update will also be reflected in the National Road Safety Portal.

Data Quality Assurance

1. Duplicate Record Management – The Police Station Administrator is in charge of managing duplicate records within their jurisdiction. This should be done once a week. Duplicate records must be resolved to maintain the accuracy and reliability of data.
2. Audit Logs – The Police Station Administrator must also regularly check audit logs to see that all traffic police in their station are regularly encoding data into the system and that no tampering of reports are being done.
3. Random Inspection- The Police Station Administrator will have to conduct a random inspection of records that were encoded into the system and check for completeness and reliability.
4. Training – Training on Crash Recording and Crash Investigation for Traffic Police and Road Safety Officers must be conducted every 3 years.

National Road Safety Portal

The TAD will automatically send non-confidential raw crash datasets to the NRSP through an API. The recommended crash data elements that the TAD will push to the NRSP is enumerated in Attachment 3D of the main body of the report. These crash datasets will then be integrated with other types of road safety data such as road infrastructure data, iRAP assessments, and traffic speed data from the MoT, and safety performance and exposure data collected by relevant ministries. These integrated datasets will then be made available to everyone for road safety programs and research.

Database Management

1. Operational and Institutional Protocols – The NTSC shall implement and scale-up the NRSP over time. In doing so, it shall:
 - a. Establish operational and institutional protocols on how different ministries collect, share, and analyze data;
 - b. Assist in determining specific capacity and resource needed by each ministry to collect reliable and accurate crash data;
 - c. Establish data sharing agreements with each of the ministries and assure itself that the TAD is able to integrate the identified crash datasets.
2. Consultation and Assessment – The NTSC shall then organize consultations and assessments to continually improve data. In doing so, it shall publish standard definitions for crash data elements; set clear and specific work plans for data collection improvement, financing, and training; identify detailed steps for collecting, managing, analyzing, using, evaluating, and reporting; and provide annual reporting and evaluation of tasks for all stakeholders.
3. Granting of User Access – The NTSC will have three levels of access to the NRSP:
 - a. Public access – those with public access can view, analyze, and download data from the NRSP;
 - b. Analyst access – analysts are able to add, upload, edit, or delete data in the NRSP;
 - c. Administrator access – can manage users and implement substantial changes to the platform.
4. Updating of Analytical Modules and Methodologies – The NTSC shall lead the development and standardization of analytical modules and methodologies particularly on computation of economic costs of crash fatalities and injuries, and definitions of blackspots or high-risk locations. Changes to the methods will be implemented in the NRSP and must be communicated to all relevant ministries. Over time, with more data and more understanding of road safety, these analytical modules can be adjusted in agreement with the MoPS, MoT, and MoH.
5. Uploading Road Infrastructure Data – The DRVN will need to provide road and bridge maps and datasets in Comma Separated Value (CSV) files that can be uploaded to the NRSP. These maps allow integration of road infrastructure data with crash data. New and updated datasets must be sent to the NTSC for uploading into the NRSP.
6. Integrating iRAP Assessments Data – Whenever available, the MoT must provide access to the NTSC to iRAP assessment datasets which can then be uploaded through the NRSP using an API.

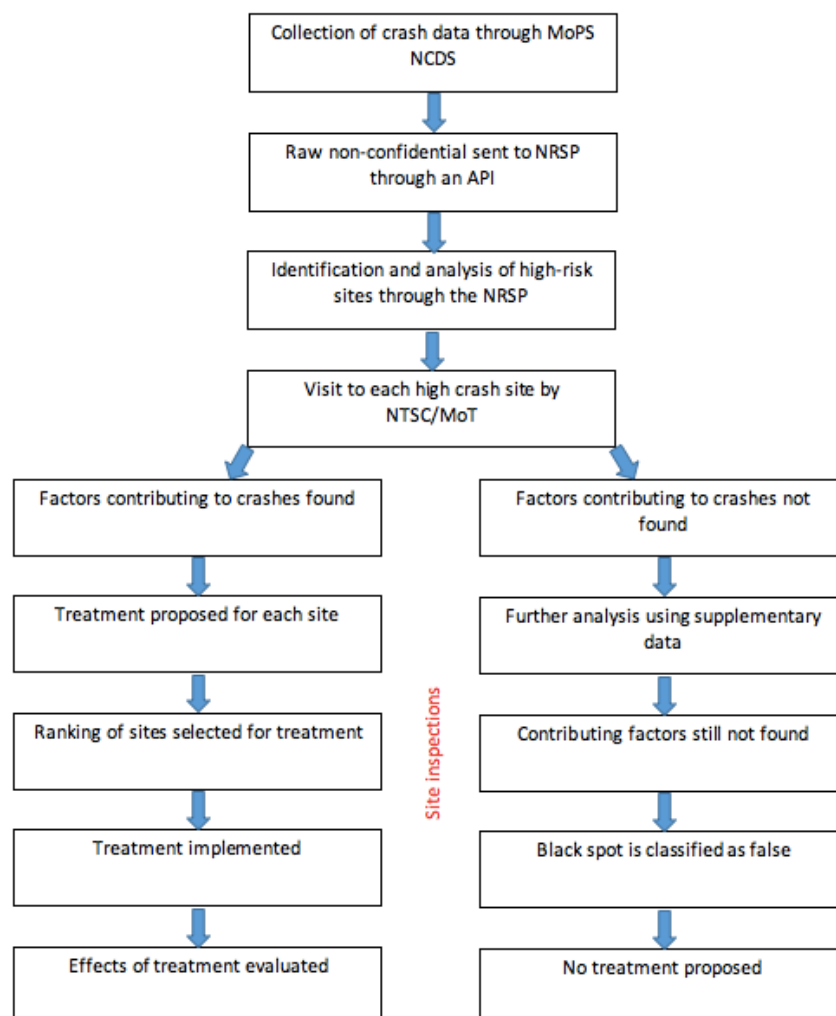
7. Integrating Traffic Speed Data – Traffic speed data will mainly come from two sources. The first one is from MoT which currently has traffic speed data of buses. Depending on the format of the traffic speed data from MoT, it can be explored if this speed platform can be fully integrated with NRSP (and the speed data can be uploaded through an API) or, like road infrastructure data, CSV files can be provided by the MoT (for the NTSC to upload to the NRSP). The other possible source of traffic speed data is from private companies, like the taxi ride hailing application Grab which has anonymized traffic speed data which can be uploaded to NRSP.
8. Uploading Other Datasets – Other datasets such as annual average daily traffic, maps of schools, safety performance data, exposure data, or road safety studies can be uploaded by the NTSC to the NRSP. This may use a CSV format if georeferenced data is available, or documents or reports that can be made available to the public.
9. Troubleshooting, System Downtimes, and Hotline – When the NRSP is experiencing issues or server downtimes, a notice shall be sent to all users. If issues have been resolved, a new notice shall be provided again. A hotline must be set-up within NTSC which can regularly receive queries and resolve issues.

Data Analysis and Reporting

1. Road Safety Reports – The NRSO will use the NRSP to prepare reports on various aspects of road safety. These will include:
 - a. Quarterly and annual road safety status reports which are regularly published in a consistent manner, and allow public stakeholders to assess road safety progress, including the implementation of national strategies and plans;
 - b. Periodic reports on the status of major topics of interest such as the safety of children or motorcyclists;
 - c. Other data reports which are required to support Government of Viet Nam leadership of road safety.
2. Road Safety Evaluations – The NRSO will use the NRSP to undertake or provide information for external stakeholders to undertake evaluations of road safety issues – examples of studies include before-after studies, empirical Bayes analyses, comparative or cross-sectional studies. Evaluation studies will be focused on the Road Safety Results Framework, and so may include, for example, evaluation studies regarding:
 - a. The proportion of motorcycle riders wearing helmets;
 - b. Average urban and rural traffic speed;
 - c. Alcohol related road crashes;
 - d. Infrastructure safety star ratings.
3. Program Support Analysis – The NRSO will use the NRSP to support the preparation, monitoring and evaluation of safety programs. An example of this is the preparation of blackspot or high-risk location programs. Through the NRSP, high-risk locations throughout the country can be identified. Once these high-risk locations are identified, the NTSC with the MoT and the local agencies should conduct site inspections to conduct further study, collect data on contributory factors and collect supplementary data such as traffic conflicts or data on road user behavior. The findings will then be used to recommend treatments for these high-risk locations which will be then ranked

according to priority and budget. A sample blackspot management process is illustrated below.

Figure 33: Data collection, reporting and analysis process



Training

The NTSC will lead capacity-building activities in relation to the NRSP. These trainings include using data and transforming them to meaningful decisions in road safety, conducting road safety studies, among others. There will be customized training for MoPS for optimizing traffic enforcement assignments, MoT for blackspot management, MoH for optimizing emergency response and academe and researchers for using the NRSP. Training initiatives should be a collaborative effort between government, international, and local experts.

Attachment 4D: Workplan and Budget

This workplan has been prepared to implement recommendations on:

- The establishment of a National Road Safety Observatory
- The establishment of a National Road Safety Portal.

It recognizes that this represents significant change which needs to be appropriately sequenced and delivered over time. The workplan has therefore been sequenced into four phases.

Phase 1	Approve	Year 1
Phase 2	Initiate	Years 1 & 2
Phase 3	Demonstrate	Year 3 →
Phase 4	Strengthen	Year 4 →

In order to promote the earliest and easiest implementation, the establishment of the NRSO requires use of the simplest administrative mechanism, as set out in Phase 1. As the functionality of the NRSO is initiated and demonstrated, a stronger mechanism requiring greater consideration will be used to strengthen the NRSO as the national lead agency for road safety in Viet Nam.

This workplan is focused on establishment tasks and activities. These lead to ongoing tasks and activities which are shaded in blue. Significant additional human and financial resources need to be built up over time within the Office of the NTSC.

Phases 1-3 assume the use of third-party contractors to assist existing staff within the Office of the NTSC to deliver the establishment tasks and activities, and begin delivery of the ongoing tasks and activities. Indicative budgets have been prepared accordingly.

Decisions made to strengthen the NRSO in Phase 4 mark the point where the ongoing tasks of the NRSO are delivered by NRSO staff, and the use of external contractors is focused on specialized development projects. A separate, full staffing and budgeting exercise is required to support this phase and decision.

An estimated budget has been prepared, based on a number of assumptions set out below.

Year 1	Year 2	Year 3	Year 4	Total
\$310,000	\$375,000	\$545,000	\$755,000	\$1,985,000

Phase 1: Approve

Year 1

Focus: Transforming recommendations and analysis into formal decisions to establish the National Road Safety Observatory and National Road Safety Portal, and finalising the national road safety strategy and action plan

Task	Activity
Governance	Prepare legal and policy documentation and gain formal Prime Ministerial approval to: <ul style="list-style-type: none">• Integrate the functions of the NRSO (and Secretariat) into the functions of the Office of the NTSC• Integrate the functions of the National Road Safety Forum into the functions of the current Traffic Safety Forum• Add the functions of the NRSP as a technical requirement of the NTSC• Amend working regulations of NTSC accordingly
NRSO Workplan & Budget	<ul style="list-style-type: none">• Prepare and gain formal approval for NRSO work program and budget to deliver Phases 1-3 (Decide/Initiate/Demonstrate) of this Workplan• Nominate the NRSO Chief Officer, and procure three senior contractors to support delivery of this Workplan, based on three Deputy Chief Officer positions
Strategy & Planning	<ul style="list-style-type: none">• Finalize national strategy to guide road safety policy, planning and activity to 2030, including ultimate road safety vision and interim outcome targets, and strong mandates for NRSO and NRSP• Develop, fund, publish and monitor delivery of a multi-sectoral action plan to achieve intermediate and final outcomes, and ensure effective establishment of well-resourced NRSO and NRSP
NRSO Handbook	Finalize NRSO Handbook (Version 1) based on formal decisions to establish NRSO and NRSP, and deliver NRSO work program

Phase 2: Initiate

Years 1 & 2

Focus: Initiating the National Road Safety Observatory work program, developing the National Road Safety Portal, and building professional road safety management capacity.

Task	Activity
Governance	<ul style="list-style-type: none"> • Appoint members of the NRSO • Establish and deliver calendar of meetings for NRSO to support the NTSC • Establish deliver calendar of meetings for National Road Safety Forum to support wider government and non-government safety partnerships
Strategy & Planning	Oversee coordination of national road safety action plan, including reporting, follow-up and problem solving
Legislative Reform Program	<p>Initiate revision of existing legislative instruments and develop new legislative instruments to give effect to NRSP decisions, specifically:</p> <ul style="list-style-type: none"> • Law on Statistics 2015 • State Secrets Law 2018 • Declassification of Data Elements (PM Decision) • MoPS Circular 58 • Decree No. 47/2020/ND-CP • Data Sharing Agreements
National Road Safety Portal	<p>Procure major information and communications technology project to develop NRSP, through:</p> <ul style="list-style-type: none"> • Initial Data Assessment • Development of NRSP platform • Platform Deployment and Testing • Manuals and Training Activities • Program Monitoring and Support
MoPS and MoH Data Improvement Programs	<p>Improve road safety data collection across ministries through:</p> <ul style="list-style-type: none"> • Preparation of a single crash data form with well-defined and standardized crash data elements (e.g. definition of fatality and injury) • MoH to implement and scale-up Injury Surveillance System • Procurement of equipment and technology such as GPS devices, computers, and internet for MoPS police stations • MoPS to ensure integration of Traffic Accident Database (TAD) with health data from MoH, licensing data from DRVN, vehicle registration data from MoPS, and other sources of crash data (e.g. insurance, civil registry)
Professional Capacity Building	Develop and deliver multi-sectoral courses across leadership of Government Ministries for Road Safety Management Program

Phase 3: Demonstrate

Year 3 

Focus: Demonstrating the full scope of the NRSO and its Secretariat to lead strategic change across key parts of the national road safety management system, and deliver significantly safer Viet Nam roads.

Task	Activity
Governance	<ul style="list-style-type: none"> • Deliver strategic secretariat support services for NTSC, NRSO, and NRSF • Initiate reform of interactions between National and Provincial/ Municipality Governments to ensure achievement of national road safety strategic goals and objectives throughout Viet Nam
Strategy & Planning	Oversee coordination of national road safety action plan, including reporting, follow-up and problem solving
Legislative Reform Program	<ul style="list-style-type: none"> • Undertake a comprehensive first principles analysis of legislative gaps in delivery of safe roads, vehicles, users and post-crash interventions, and set legislative priorities to 2030
National Road Safety Portal	Scale-up use of the NRSP through: <ul style="list-style-type: none"> • Integration of NRSP with the TAD of MoPS, road infrastructure and traffic data from MoT, iRAP assessments • Delivery of training for users (e.g. road health specialists police, researchers, academe, advocacy groups) • Initiate road safety studies and reports using data from the NRSP (e.g. map of blackspots)
Professional Capacity Building Program	<ul style="list-style-type: none"> • Continue delivery of multi-sectoral Road Safety Management Program • Develop and deliver multi-sectoral courses across leadership of Government Ministries for Road Safety Intervention Program, and Road Safety Knowledge and Results Program
Road Safety Investment Program	<ul style="list-style-type: none"> • Undertake economic and financial analysis of investment required across all institutional and intervention programs to achieve national trauma reduction targets to 2030 • Establish ongoing safety funding process, and allocation rules, to maximize safety returns from available resources
Road Safety Promotion Program	<ul style="list-style-type: none"> • Set priorities for promotion and communication programs to increase awareness of key road safety issues in Viet Nam, and build support for high value interventions • Set and deliver an annual program of road safety promotion activity based on the National Road Safety Action Plan
Road Safety Results	<ul style="list-style-type: none"> • Develop and publish a logical framework linking delivery of outputs to intermediate safety outcomes and final safety outcomes • Develop a reporting template, and publish quarterly report on national road safety output and outcome data (including delivery of National Road Safety Action Plan) • Initiate observational survey program on key behaviours – eg, speed, helmets, alcohol
Research & Knowledge Program	Establish priorities for research and development, and knowledge transfer, programs which will improve understanding of key road safety issues in Viet Nam and the implementation of effective solutions

Phase 4: Strengthen

Year 4 

Focus: Delivering the ongoing work program of the NRSO, strengthening the institutional form (and human and financial resource capacity) of the NRSO, and initiating analyses of current and future performance

Task	Activity
Governance	Deliver strategic secretariat support services for NTSC, NRSO, NRSF, and Provincial/Municipality Government engagement
Strategy & Planning	Oversee coordination of national road safety action plan, including reporting, follow-up and problem solving
Legislative Reform Program	Initiate one major area of legislative reform based on established 2030 priorities
National Road Safety Portal	<ul style="list-style-type: none"> Continued scale-up and use of the NRSP through training, integration of data, and analysis Evaluate the performance of NRSP implementation and data improvement programs by the MoPS and MoH and determine gaps or points for improvement Review, assess, and update road safety data and crash data definitions and collection methods
Professional Capacity Building Program	Continue delivery of Road Safety Management Program, Road Safety Intervention Program, and Road Safety Knowledge and Results Program
Road Safety Investment Program	Oversee annual multi-sectoral resource allocation program, reviewing bids against good practice, and monitoring delivery against agreed results
Road Safety Promotion Program	Deliver annual program of road safety promotion based on the National Road Safety Action Plan
Road Safety Results	<ul style="list-style-type: none"> Prepare and publish quarterly national road safety progress reports Continue observational survey program on key behaviours
Research & Knowledge Program	Develop and implement a program of work to support future decision making in areas of strategic road safety importance in Viet Nam, and to develop over time the road safety capability of the research community
Prime Ministerial Approvals	Prepare full “Establishment Schema” document to establish the NRSO as an inter-sectoral agency, as a component of the NTSC, including all consideration and review processes within the Ministry of Internal Affairs and the Government Office, ahead of submission to the Prime Minister
Outcome Evaluation	Undertake a full outcomes based review of road safety performance and institutional management to inform decisions on achievement of 2030 targets

Estimated Budget

An estimated budget of \$1,985,000 is put forward for the first four years. The core assumptions of this estimate are:

- No additional permanent staffing positions will be created within the NTSC Office during this period
- Three long term contract staff will be engaged at a Deputy Chief Officer level at a total annual cost (salary and overhead) of (proposed, for budgeting purposes) \$1500 per month
- This additional capacity within the NTSC Office will:
 - deliver additional governance, strategy and planning tasks required of this workplan
 - oversee procurement and management of the various development and implementation programs required of this workplan, delivered by consultants
- The workplan will be delivered primarily by national consultants costed at (proposed, for budgeting purposes) \$3000 per month, with a separate budget line for specialist road safety consultants
- The National Road Safety Portal will be developed using the open-source DRIVER system, provided through the World Bank, rather than a commercial proprietary system
- The budget relates only to the NTSC Office, within which the National Road Safety Observatory is established, and does not relate to activity of any other agency.

An important element of the workplan is an analysis of the longer-term road safety investment needs for Viet Nam, addressing all interventions and institutional management functions. The estimated budget provided here assumes that in Year 4 this analysis will be used to prepare and present a comprehensive case for strengthening the NRSO.

Task	Year 1 \$,000	Year 2 \$,000	Year 3 \$,000	Year 4 \$,000	Total \$,000
Governance, Strategy & Planning	55	55	55	55	220
NRS Portal	100	75	75	75	325
Legislative Reform	25	25	25	25	100
Capacity Building	30	45	90	100	265
Investment		25	25	25	75
Promotion			25	75	100
Results & Monitoring		25	75	125	225
Research & Knowledge		25	75	125	225
Specialist Road Safety Consultants	100	100	100	100	400
Outcome Evaluation				50	50
Total \$,000	310	375	545	755	1985

Attachment 4E: Terms of Reference for Viet Nam National Road Safety Portal

A. PROJECT BACKGROUND AND OBJECTIVES

Road Safety in Viet Nam

Road traffic fatalities and injuries is having a devastating effect on the people of Viet Nam where at least 22 road fatalities and 41 injuries have been recorded per day in 2018 (National Transport Safety Committee, 2018). Road traffic injury is the second highest cause of death for 5-14 year olds in Viet Nam, the most vulnerable population, and the highest cause of death and of disability for 15-49 year olds in Viet Nam, the most productive population. According to a recent study by the World Bank (2019), road traffic injuries in Viet Nam amount to an economic cost of USD 18.02 Billion. These crashes however do not only cost the economy but also has wide social costs, affecting the most vulnerable segments of the country.

Road Safety Data Collection

While this is the case, road crash data is believed to be underreported and road safety data remains to be underutilized in developing interventions and programs for road safety. Currently different types of data are collected but are not integrated, standardized, nor shared among ministries and stakeholders who will need the data to effectively perform their responsibilities in road safety. For example:

- The Ministry of Transport (MoT) will need data to determine high-risk infrastructure, design roads with appropriate speeds, and remove road hazards;
- The Ministry of Public Security (MoPS) will need data to be able to deliver effective road traffic safety enforcement operations;
- The Ministry of Health (MoH) will use the data to optimize emergency response and develop targeted public health campaigns; and
- The academe and researchers will need the data to innovate and conduct in-depth road safety studies.

Because the data is not shared or integrated, decisions to prioritize issues in road safety and develop interventions are rarely evidence-based and systems to monitor and evaluate programs do not exist.

National Road Safety Observatory (NRSO) and National Road Safety Portal (NRSP)

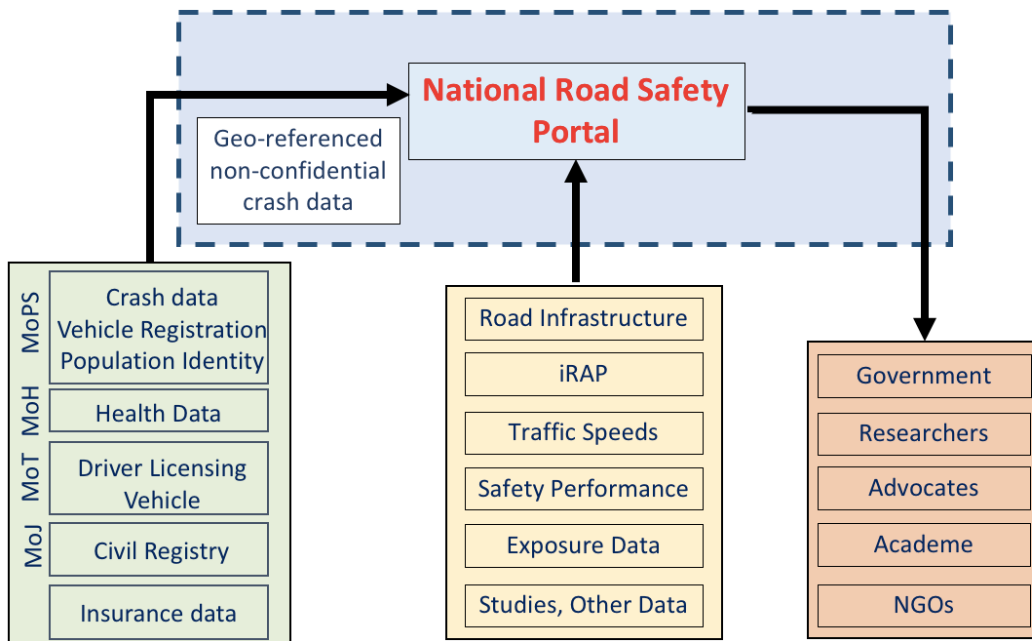
In response to this, the Viet Nam government has established the NRSO which will lead the development, implementation, and evaluation of road safety strategies and plans in Viet Nam. Part of their mandate is to manage, collate, and integrate different types of road safety data including crash data from MoPS, infrastructure data from MoT, other types of data from different ministries and entities. They will then make these available to all ministries and stakeholders in road safety through the NRSP.

B. SCOPE OF WORK

The Firm/Consultants will be expected to develop the NRSP and undertake all steps from initial data assessments and consultations with stakeholders, the actual development of the platform to training and supporting the implementation of the platform. All project deliverables will be reviewed and approved by the NRSO.

The following diagram shows how the NRSP will integrate the database systems together:

Figure 34: National road safety portal



C. DELIVERABLES/SPECIFIC OUTPUTS EXPECTED FROM THE FIRM/CONSULTANTS

The project will include the following tasks:

- Task 1: Inception Report and Kick-off
- Task 2: Initial Data Assessment and Consultation with Ministries
- Task 3: Development of NRSP
- Task 4: Platform Deployment and Testing
- Task 5: Manuals and Training Activities
- Task 6: Program Monitoring and Support

Task 1: Inception Report and Kick-off

The Firm/Consultants shall discuss with the NRSO the following details:

- Review of the Report on the Establishment of the National Road Safety Observatory along with attachments;
- Ministries and database systems to integrate for this phase;
- Introduction to Point Persons for Reviewing and Approving Deliverables.

The Inception Report will be prepared shortly after this initial meeting and shall include an overall project implementation plan and timeline, as well as identification of risks and challenges that will need to be addressed through project preparation.

The NRSO is encouraged to create a Project Team composed of members from the NRSO, MoPS, MoH, and MoT who will work together with the Firm/Consultants in developing and implementing the NRSP. The Project Team should develop their own detailed work plan that will outline how they will improve their own database systems and how they will work with the Firm/Consultants to integrate their database system with the NRSP.

Task 2: Initial Data Assessment and Consultation with Ministries

- Initiate. In consultation with the MoPS, MoH, MoT, and other relevant Ministries and stakeholders, the Firm/Consultants shall prepare a report on actual data improvement programs (in terms of data collection processes, upgrading of technology, budgeted programs) that are being done by each of the Ministries. This report also consolidates the detailed work plan and timeline prepared by each of the members of the Project Team. This report serves as an update to the original report on the Establishment of the NRSO.
- Technical Assessment. The Firm/Consultants shall conduct a detailed technical assessment of existing database systems and plan how to integrate them with the NRSP. It is expected that the Firm/Consultants will be able to view the database systems and see how the data is stored.
- Workshops. The Firm/Consultants shall organize inter-ministerial workshops to finalize among the ministries the data that shall be collected by each ministry and the data that will be shared to the NRSP. This will include finalizing the definitions of each data element, method of collection and sharing, and over-all NRSP institutional arrangement.
- Technical and Implementation Options. Based on the initial assessments and consultations, the Firm/Consultants shall prepare a report and cost-benefit analysis for different implementation options for the NRSP based on procurement cost as well as operations and maintenances. Technical and implementation considerations include (but not necessarily limited to):
 - Computer hardware options;
 - Coding and software options (e.g. to use existing software such as the Data for Road Incident Visualization Evaluation and Reporting (DRIVER) platform code or procure a proprietary software);
 - Database design options including hardware needs, analytical tools that will be incorporated into the NRSP;
 - Data security arrangements;
 - Database systems that will be initially integrated to the NRSP;
 - Server hosting and maintenance (cloud or physical servers);
 - Data monitoring and verification options.
- The Firm/Consultants in consultation with the NRSO and the Project Team shall choose the most appropriate technical and implementation option.

Task 3: Development of NRSP

All activities under this task will be fully documented, such that the program will be fully self-sustaining after the implementation period.

- Based on the Report on the Establishment of the National Road Safety Observatory and inputs from Task 2, the Firm/Consultants shall prepare a functional specification report for the NRSP which details out each and every function that will be implemented in the platform. This includes (but is not limited to):
 - User interface;
 - Access privileges;
 - Data analysis and visualization Functionalities;
 - Data entry and upload functions;
 - Data integration and linkages;
 - Reporting capabilities;

- Data quality assurance.
- Upon approval of the NRSO of the functional specifications, the Firm/Consultants shall prepare a first draft of “wireframes” -- examples of how the software would look to the user – for final approval before proceeding with software development.
- The Firm/Consultants shall work closely with the NRSO and Project Team to determine data hosting and server arrangements.
- It is expected that the Project software development will utilize a collaborative software design approach, where project stakeholders are encouraged to interact directly with the development team and ask questions, provide challenges, and expect the software developers to respond quickly to their evolving needs throughout the design process (with the understanding, though, that once the functional specifications are approved, there will be no expected additional changes made to these specifications, unless these are approved by the Firm/Consultants).
- The software development team shall establish a regular schedule of project coordination meetings regarding each software iteration through e-mail, phone, and/or web conference to support the project’s needs and timeframe. As the software is developed, the Firm/Consultant will periodically send completed features for review by the NRSO and the entire Project Team, and new tasks will be prioritized and assigned to team members for the following iteration.
- Members of the Project Team shall also regularly update the Firm/Consultants regarding the progress of their own data improvement programs. This is to ensure that the data integration will be implemented.

Task 4: Platform Deployment and Testing

The Firm/Consultants together with the NRSO and Project Team shall ensure that the NRSP undergo a series of tests (e.g. functionality, usability, interface, performance, security testing) and that issues and bugs are resolved before deployment. After testing, the Firm/Consultant shall deploy the NRSP to the chosen server or cloud platform by the NRSO.

Task 5: Manuals and Training Activities

The Firm/Consultants will prepare a downloadable training curriculum and materials to support implementation of the NRSP. The Firm/Consultant shall prepare a manual that includes step-by-step directions for using all of the functions built into the NRSP.

- The Firm/Consultants shall also conduct hands-on training for the NRSO and participants from relevant ministries on how to use the NRSP.
- A separate technical manual and training for IT professionals and local developers must also be provided to ensure that developers in Viet Nam have the capacity to implement future enhancements or upgrades or address issues and bugs.

Task 6: Program Monitoring and Support

This task is for an allocation of hours for the Firm/Consultants to support the NRSO in implementing the NRSP. This is a pool of hours that the Firm/Consultants can draw from to fix bugs, troubleshoot, answer questions, provide training, among others.

C. SELECTION CRITERIA

The firm should have at least two key-specialists that are required to have the necessary knowledge to setup, develop and maintain the NRSP. These are for:

- 1. Development (software developer)** who is responsible for developing the NRSP, building features and troubleshooting bugs
 - Core competencies for Development (software developer):
 - Proficient in a Linux environment, including shell scripting;
 - Knowledge of infrastructure tooling such as Vagrant, Ansible, and Docker;
 - Web development experience, specifically Python/Django and Javascript/Angular, including knowledge of HTML/CSS;
 - Experience with a relational database system.
 - Preferred competencies:
 - Experience with:
 - PostgreSQL;
 - Redis;
 - Nginx;
 - Gunicorn;
 - Celery;
 - GIS experience, specifically using Windshaft;
 - Knowledge of statistics and R;
 - Knowledge of these additional technologies is also beneficial:
 - NFS;
 - OAuth2;
 - Javascript package/build tools (Grunt and Bower);
 - Monit;
 - Ufw.
- 2. Deployment/Maintenance (devops engineer)** who is responsible for deploying the NRSP to a server (e.g. in cloud) and making sure the system stays up and running.
 - Core competencies Deployment/Maintenance (devops engineer):
 - Comfortable running commands in the terminal in a Unix-like environment;
 - Configuring remote servers;
 - Experience with firewall configuration, logging, and certificates;
 - Ability to troubleshoot;
 - Basic knowledge of networking/DNS;
 - Knowledge of Ansible and Docker.
 - Preferred competencies:
 - Experience writing shell scripts
 - Knowledge of:
 - Django;
 - PostgreSQL;
 - Nginx;
 - Redis;
 - Gunicorn;
 - Celery;
 - Gradle;
 - Windshaft;
 - Monit;

- Ufw.
- Knowledge of major cloud computing platforms (e.g. AWS, Azure, Google, Aliyun) including experience of cloud solutions utilized by governments
- Specific services such as:
 - EC2;
 - S3;
 - CloudFormation.
- Other preferred competencies are:
 - Experience in knowledge transfer/capacity building;
 - Familiarity with the iRAP tool will be considered a plus.

With support from:



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