

ROAD SAFETY ANNUAL REPORT | 2017







BANDUNG

ROAD SAFETY ANNUAL REPORT | 2017

November 2018

BANDUNG ROAD SAFETY ANNUAL REPORT 2017



JASA RAHARJA

In Collaboration With



Hospital Road Injury Data Supported by



1. RSUP dr Hasan Sadikin Bandung



2. RSU Santosa Central Bandung



RSUD Kota Bandung

3. RSUD Kota Bandung



4. RSU Bhayangkara TK II Sartika Asih Bandung



5. RSU Advent Bandung



6. RSU Immanuel Bandung



7. RSU Santo Borromeus Bandung

RUMAH SAKIT
SANTO BORROMEUS



8. RSU Al Islam Bandung



9. RSU Muhammadiyah Bandung



10. RSU Pindad Bandung

Observational Studies By



FAKULTAS KEDOKTERAN
UNIVERSITAS PADJADJARAN

BANDUNG

ROAD SAFETY ANNUAL REPORT | 2017



Table of Contents	3
Preface : Mayor of Bandung	5
Preface : Head of Planning, Research, and Development Board	6
Preface : Head of Bandung Traffic Police	7
Acknowledgements	8
Executive Summary	9
List of Abbreviations	11

Table of Contents

01 Introduction 13

Bandung at A Glance	15
Purpose of This Report	20
Data Sources and Systems	21

02 Bandung Road Traffic Crashes in 2017 25

Injuries and Deaths by Road User Type	26
Injuries and Deaths by Gender	27
Injuries and Deaths by Age Group	29
Injuries and Deaths by Month	33
Injuries and Deaths by Day of Week	34
Injuries and Deaths by Time of Day	37
Injuries and Deaths by Day - Time Chart	39
Injuries and Deaths by Causal Vehicle Types	40
Injuries and Deaths by Victim Matrix	41
Injuries and Deaths by Causal Factor	43
Bandung Crash Maps	44



03	Hospital Road Injury Data	59
	Severity (AIS) Distribution	65
04	Observational Data Studies	67
	Motorcycle Helmet Use	67
	Speeding	68
	Seat - Belts and Child Restraints	70
	Distracted Driving : Handheld Phone Use	71
05	Intervention to Prevent Road Traffic Injuries and Deaths	73
	Safer Streets and Safer Mobility	73
	Mass Media and Social Marketing	75
	Enforcement	77
	Data Surveillance	78
	References	80

Mayor of Bandung



Oded M Danial
Mayor of Bandung

Alhamdulillah (All praise is due to Allah), the second Bandung Road Safety Annual Report 2017 has been published. This book is the culmination of the prolonged commitment of Bandung City Government to attain Bloomberg Philanthropies Initiative for Global Road Safety's (BIGRS) goals to reduce traffic fatalities and injuries. As one of BIGRS selected cities, alongside nine other cities throughout the world, Bandung is committed to realizing the goals of this program.

Throughout 2017, the number of crashes in Bandung decreased, but the number of road deaths increased significantly and almost doubled after linking to hospital and insurance data. Three-fourths of crash victims are still motorcycle drivers or passengers. These data show us that more improvement is needed to create safer roads, and that we need high-quality data systems to assess the real burden of crashes and improve intervention planning and evaluation.

I would like to thank Bloomberg Philanthropies and all our partners, all related city stakeholders: Planning, Research and Development Board as the technical lead to this road safety project, the Department of Transportation, the Department of Public Works, the Department of Health, the Department of Communication and Information, Bandung Public Relations, and a special acknowledgement to Bandung Traffic Police, selected hospitals, and Jasa Raharja, who have provided the data. Congratulations on the publication of Bandung Road Safety Annual Report 2017, I hope the publishing of this book will further the efforts of Bandung City to create safer roads for all road users.

Head of Planning, Research, and Development Board



Hery Antasari

*BIGRS Bandung Technical Lead
Head of Planning, Research, and
Development Board*

In a commitment to road safety, Bandung joined the Bloomberg Philanthropies Initiative for Global Road Safety (BIGRS) to save lives through interventions proven to reduce traffic fatalities and injuries. As a selected city participating in this second phase between 2015 and 2019, Bandung receives comprehensive technical assistance from the world's leading road safety organizations, training for police officers and other relevant city staff, and support to create hard-hitting mass media campaigns and strengthen the road safety data available to city authorities.

This project is funded by Bloomberg Philanthropies with support from initiative partners including Vital Strategies, the John Hopkins International Injury Research Unit (JH-IIRU), the World Resources Institute (WRI) – EMBARQ, the World Bank – Global Road Safety Facility, the International Road Assessment Programme (iRAP), National Association of City Transportation Officials – Global Designing Cities Initiative (NACTO – GDCI), and the Global Road Safety Partnership (GRSP). BIGRS addresses four main areas: Safer Streets and Safer Mobility; Enforcement; Mass Media and Social Marketing; and Evaluation and Surveillance.

The second Bandung Road Safety Annual Report is a summary of crash, injury, and behavior data for 2017 which describes the magnitude of problem, the trend of crashes in Bandung, the populations, and locations at risk. This book is intended as information and guidance for all city stakeholders in the transport, police, and health sectors to improve intervention planning, evaluation, and the city-road safety plan. I would like to thank Bloomberg Philanthropies for choosing Bandung as the only city in Indonesia to participate in this project; Vital Strategies, who coordinate with city officials; and all other partners who have been mentioned above. I do hope the available data is routinely analyzed by city stakeholders to accelerate development in Bandung City.

Head of Bandung Traffic Police



AKBP Agung Reza Pratidina

*Police Grand Commissioner Adjutant
Head of Bandung Traffic Police*

The traffic police is an implementing element whose task is to carry out police duties including guarding, regulating, escorting, patrolling, doing community education, traffic engineering, conducting registration and identification of road users, conducting road crash investigations and law enforcement in road traffic area, in order to maintain security, safety, and road traffic orders.

Road traffic orders and road safety are responsibilities between road users and state officials who are competent in it. They are also responsible for the procurement and maintenance of infrastructure, super structure and road facilities as well as regulation and law enforcement. It is aimed for maintaining safe and secure road traffic in a targeted way and achieving the expected goals. Active participation of road users towards road ethics, behavior, and compliance with the road traffic laws and regulations are the most important thing for establishing security, safety, orders and smoothness of road traffic.

In order to establish security, safety, orders and smoothness of road traffic in the City of Bandung, Bandung Traffic Police collaborates with related official agencies to carry out Pre-emptive, Preventive and Repressive activities which are expected to reduce traffic congestions, violations, and road traffic crashes in the City of Bandung.

I think that is all what I could explain, hopefully this simple book can give benefits to the readers, and may Allah SWT always protects us. Aamiin yaa rabbal 'alamin.

Acknowledgements

Proceeding from the first report, the second Bandung Road Safety Annual Report 2017 would not be developed without generous support from Bloomberg Philanthropies and its partners to strengthen road safety data available to city authorities, with the aim of improving intervention planning and evaluation in Bandung.

Special acknowledgement is given to all those who contributed and supported the Bloomberg Philanthropies Initiative for Global Road Safety (BIGRS), including: Vital Strategies as the main liaison and assists cities in building mechanisms to monitor and progress on road safety; the John Hopkins International Injury Research Unit (JH-IIRU) who collaborated with Faculty of Medicine of Padjajaran University (UNPAD) as local university in Bandung to provide the observational data studies related to the risk factors; the World Resources Institute (WRI-EMBARQ), the World Bank's Global Road Safety Facility, the International Road Assessment Programme (iRAP), National Association of City Transportation Officials – Global Designing Cities Initiative (NACTO – GDCI) and the Global Road Safety Partnership (GRSP).

The support of local stakeholders is key to actualizing this report. Bandung Traffic Police, selected hospitals, and Jasa Raharja as the insurance company play an important role in providing crash data. The Department of Health and Planning, Research and Development Board had a central role in gathering all data collected. Other departments, including the Department of Public Works and Department of Transportation also provided data needed to complete this report, whilst the Department of Communication and Information and Bandung PR Division helped disseminate the information.

Estiara Ellizar as the surveillance coordinator from BIGRS in Bandung was responsible for data collection and analysis and created the report under the supervision of Sara Whitehead from Vital Strategies, who assisted on technical aspects of this report. The BIGRS team in Bandung provided technical input to make the report more comprehensive, the photo credit belongs to Dudi Sugandi and PikirMikir Design Studio packaged it attractively.

We gratefully acknowledge the financial support received from Bloomberg Philanthropies, which made possible the production of this report.



Executive Summary

Globally, more than 1.2 million people die each year on the world's roads. Road traffic crashes are the leading cause of death among young people and are predicted to become the seventh leading cause of death by 2030. In Indonesia, road crashes are the sixth leading cause of premature death (IHME, 2016). The highest proportion of road traffic fatalities occurs in the younger age group of 15 to 29 years old, which makes up 41 percent of the total 15,492 victims recorded in IRSMS throughout 2016 (Korlantas Polri, 2017). The financial costs of road traffic crashes are estimated to be 2.9 to 3.1 percent of Indonesia's gross domestic product (RUNK, 2010).

Although the number of reported crashes continued to drop in 2017, the number of road traffic deaths increased from 84 in 2016 to 157 in 2017. This represents a change in the road death rate from 3.4 per 100,000 people in 2016 to 6.3 per 100,000 in 2017 — a very concerning rise.

Motorcyclists make up most road injuries and deaths (69 percent of deaths), with pedestrians as the next most affected group (23 percent of deaths). Overall, 93 percent of road deaths are among vulnerable road users — motorcyclists, bicyclists, and pedestrians. This highlights the urgent need to address motorcycle and pedestrian safety in Bandung. Road deaths happen largely among men: There were three times as many deaths and injuries occurred among males as females, with the 15-to-24-year age group making up the highest proportion.


1.2 people
die each
year
on the world's
roads
Million 


The highest
proportion
of road traffic
fatalities
15-29 YEARS OLD

93%

of road deaths
are among
vulnerable road
users



3 out of **4**



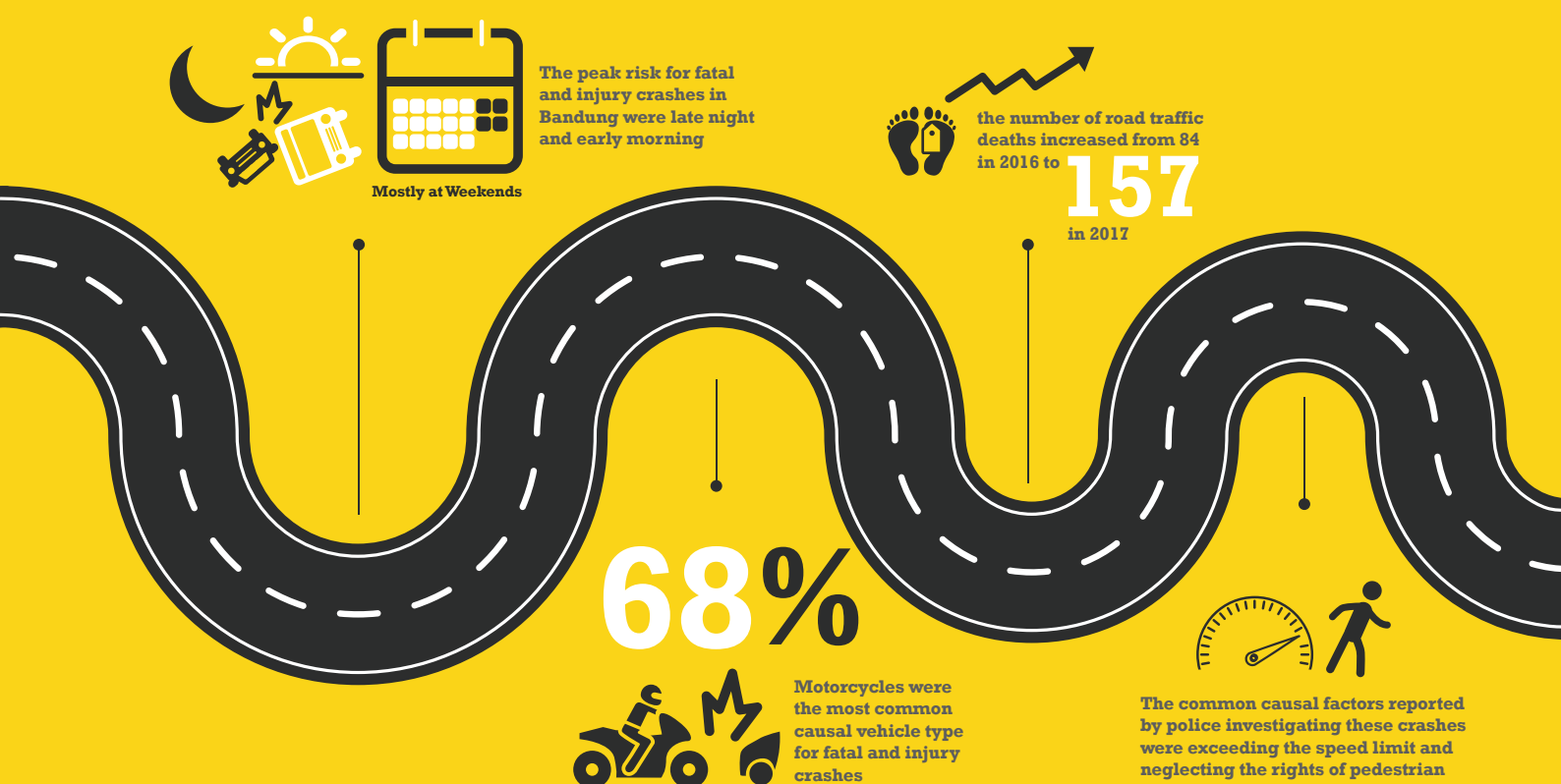
road deaths
are among
men

The peak risk periods for fatal and injury crashes in Bandung were late night and early morning, and mostly at weekends. Motorcycles were the most common causal vehicle type for fatal and injury crashes (around 68 percent), followed by passenger cars and heavy vehicles. The common causal factors reported by police investigating these crashes were exceeding the speed limit and neglecting the rights of pedestrian.

High-risk road segments are classified by road status — national, provincial or city — and ranked by fatality rate per kilometer per year. This ranking shows that certain higher-speed national and provincial road segments have the highest fatality rates. Because these roads are not within the city's authority to address, protecting Bandung residents in these areas requires collaboration with national and provincial authorities. The same is true for the 10 highest-risk intersections, only two of which are on city roads.

The data linkage process among police, hospital and insurance sources shows that some traffic injuries and deaths are not being captured in the police registration system. The cases recorded in insurance records are already included in police data because police reports are required for claim processing; however, insurance records may also capture final outcomes (such as death after injury at the scene). Hospital injury reports include cases not reported by police or insurance, perhaps because some victims choose not to report to the police due to bureaucratic complexity. The difference in reported crash injuries and deaths among data sources emphasizes the importance of linkage among available sources for improving data quality.

Reliable and accurate data are needed to raise awareness about the magnitude of road traffic injuries and to convince policy-makers of the need for action. These data show the need for action on motorcycle helmets, speed, enhanced enforcement during high-risk times, and safer street designs for motorcyclists and pedestrians. This report is intended as information and guidance for all Bandung city stakeholders to improve intervention planning and evaluation, as a description of road safety conditions in Bandung in 2017, and as a tool to raise awareness in the community about the importance of road safety.



List of Abbreviations

AIS	Abbreviated Injury Scale
BIGRS	Bloomberg Philanthropies Initiative for Global Road Safety
BPS	Board of Statistics
BUMP	Bandung Urban Mobility Project
GDCI	Global Designing Cities Initiative
GPS	Global Positioning System
GRSP	Global Road Safety Partnership
ICD-10	International Classification of Diseases 10th
IHME	Institute for Health Metrics and Evaluation
iRAP	International Road Assessment Programme
IRE	Institute of Road Engineering
IRSMS	Integrated Road Safety Management System
ITB	Bandung Institute of Technology
JH-IIRU	John Hopkins International Injury Research Unit
Korlantas Polri	Indonesian Traffic Police
MAIS	Maximum Abbreviated Injury Scale
NACTO	National Association of City Transportation Officials
QGIS	Quantum Geographic Information System
RUNK	General National Plan of Road Safety
Satlantas Polrestabes	Traffic Police
UNPAD	Padjajaran University
WHO	World Health Organization
WRI	World Resources Institute



.bdg

 @dudisugandi



— FUN FACT —

Asia Afrika street is the oldest protocol road in Bandung which was formerly named as *Grote Postweg* (The Great Post Road) during the colonial times. This street was constructed in 1808 by Governor General Daendles, along with Anyer-Panarukan road project which connected inter-city postal line in Java island as far as 1,000 kilometers long.

Introduction

01



Road traffic injuries are a leading cause of preventable death, according to the World Health Organization (WHO) in The Global Status Report on Road Safety 2015. More than 1.2 million people die each year on the world's roads, with millions more sustaining serious injuries and living with long-term health consequences. Globally, road traffic crashes are the leading cause of death among young people aged 15 to 29 years.

In Indonesia, road traffic injuries are the eighth leading cause of death and the sixth leading cause of premature deaths¹ (IHME, 2016). As vehicle ownership grows, many countries face twin increases in traffic congestion and vehicle emissions, resulting in higher rates of respiratory illness. Rising car ownership has also resulted in reduced physical activities such as walking and cycling, with associated negative health consequences (WHO, 2015).

The city of Bandung has engaged with Bloomberg Philanthropies as one of 10 cities participating in the Bloomberg Philanthropies Initiative for Global Road Safety (BIGRS) since 2015. One objective of this five-year initiative is to strengthen the road safety data available to city authorities, in order to improve intervention planning and evaluation.



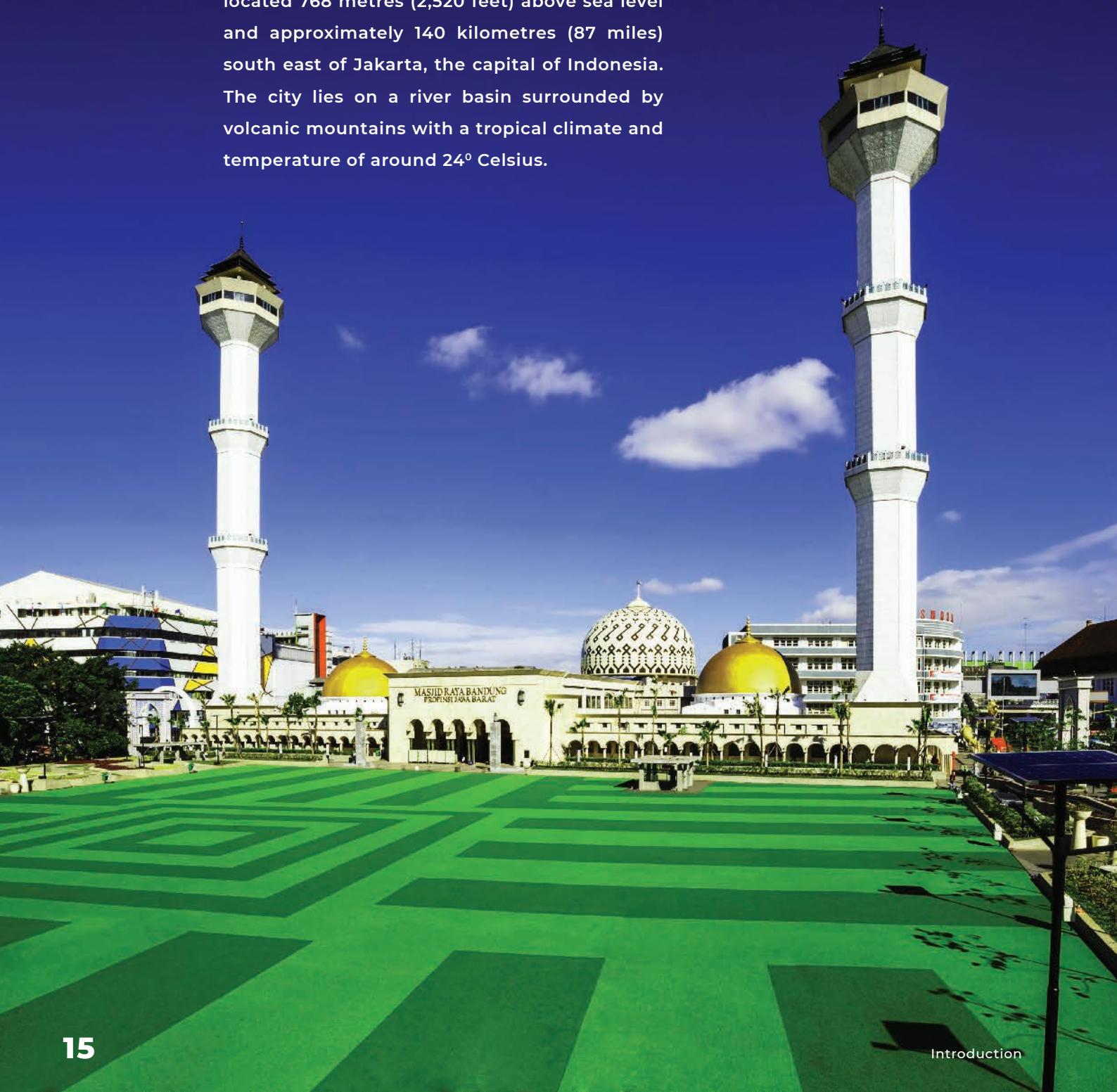
Figure 1. Location of Bandung

Until now, only police (IRSMS, Integrated Road Safety Management System) data on road injuries and deaths have been available for detailed planning; police data are incomplete and may not include updated outcome information for patients who die of their injuries after the initial scene. Systematic collection, review and linkage of hospital and insurance data on road injury admissions and deaths can greatly strengthen the road-safety outcome surveillance system.



Bandung at a Glance

Bandung is the capital of West Java province in Indonesia, covers a total area of about 168 km², represents 0.45 percent of the area of West Java, and comprises 30 districts and 151 subdistricts. Bandung is the nation's third most populous city with almost 2.5 million people, located 768 metres (2,520 feet) above sea level and approximately 140 kilometres (87 miles) south east of Jakarta, the capital of Indonesia. The city lies on a river basin surrounded by volcanic mountains with a tropical climate and temperature of around 24° Celsius.





BANDUNG CITY LANDMARKS



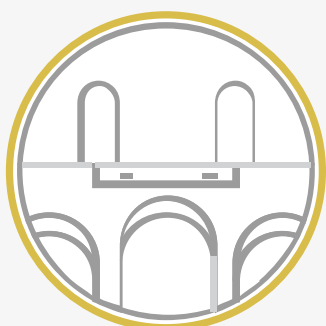
Bandung City Hall



Gedung Sate



Gedung Merdeka



Antapani Bridge



Masjid Raya Bandung



Pasupati Bridge

The growth rate of Bandung's population has resulted in increasing activity and a need for high mobility. It is therefore not surprising that the growth rate of vehicles dramatically increased as well. Until 2010, the number of motorized vehicles was increasing an average of 11 percent per year, with motorcycles making up 69 percent of all registered vehicles. As use of motor vehicles exploded, transportation problems emerged because road lengths (1.29 percent per year) have not increased in proportion to the increase in motorized vehicles (9.34 percent per year) (BUMP, 2015), resulting in higher vehicle density one factor leading to road crashes.



Bandung Nicknames

Bandung Kota Kembang

Bandung City of Flowers

Paris Van Java

The Paris of Java



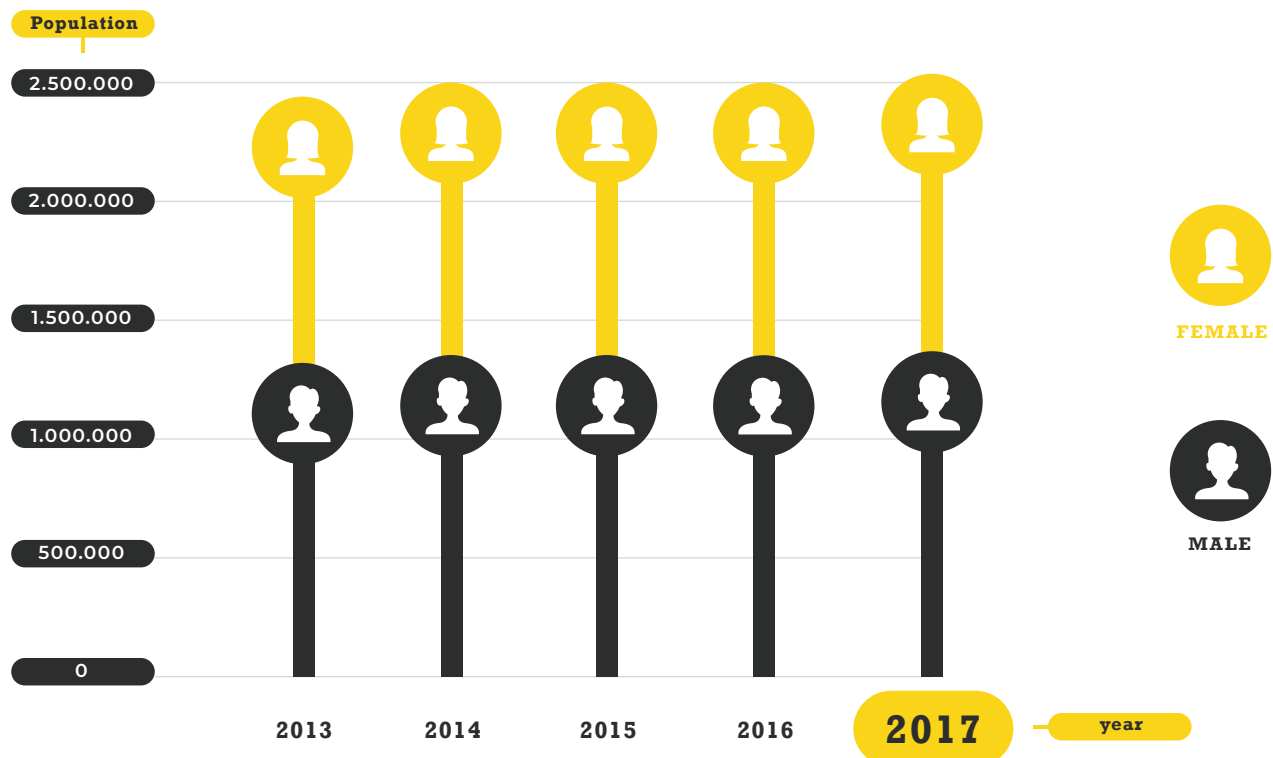
Bandung Motto

" Lanjutkan Bandung Juara "

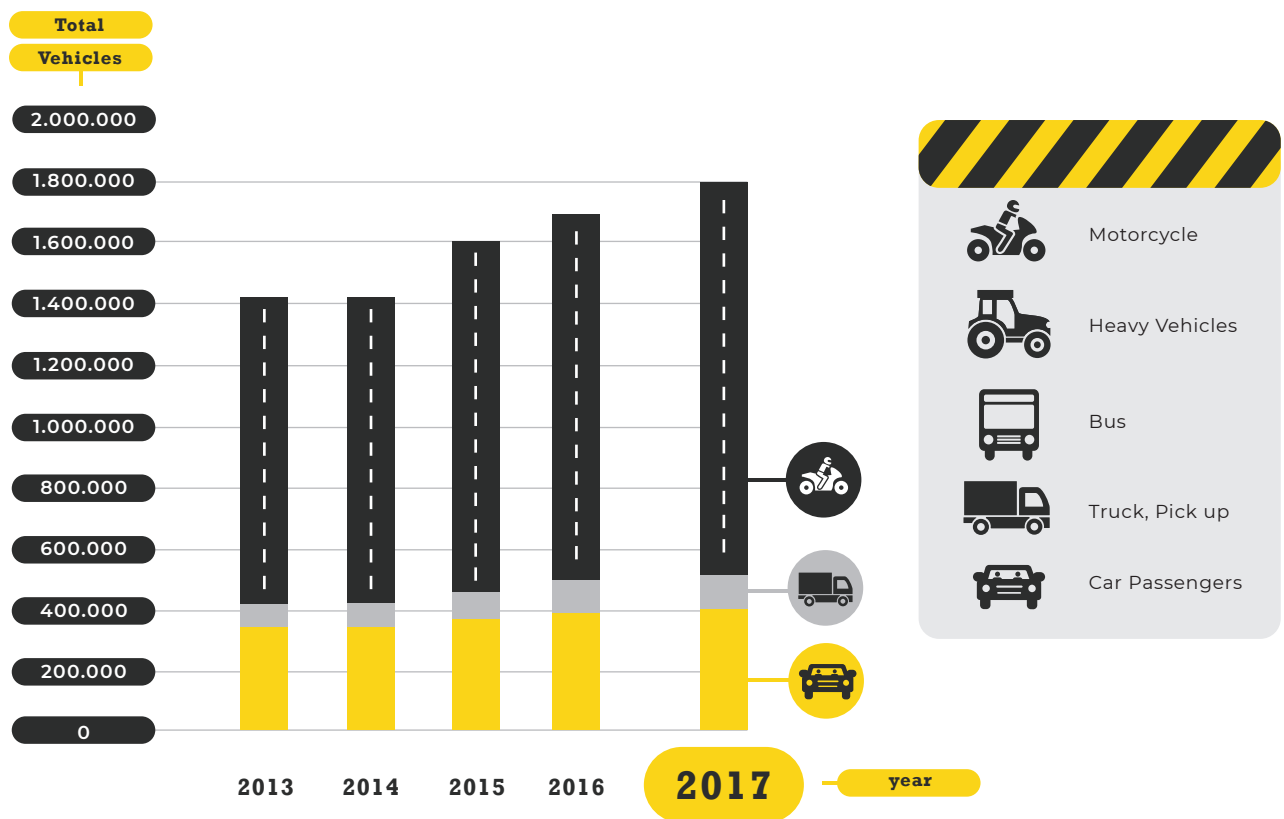
" Move Bandung Forward as Champion "



BANDUNG CITY POPULATION AND REGISTERED VEHICLES



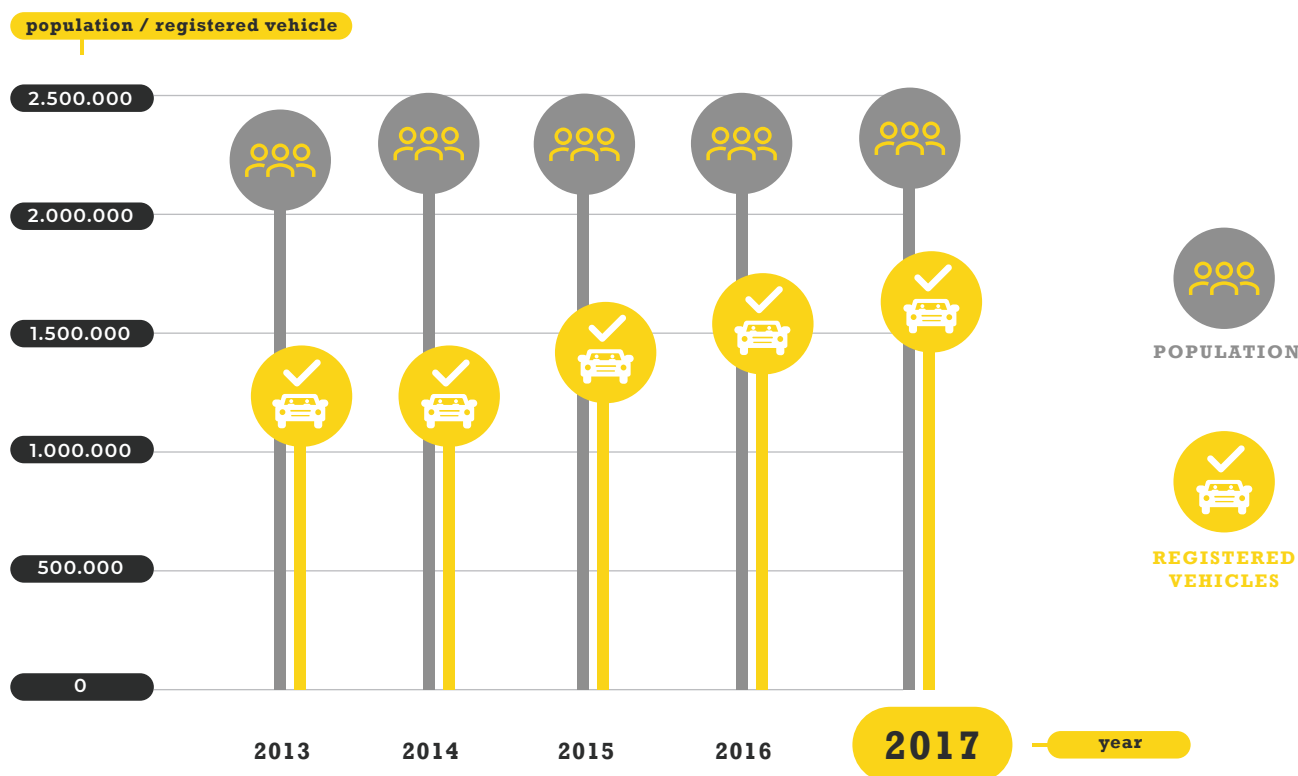
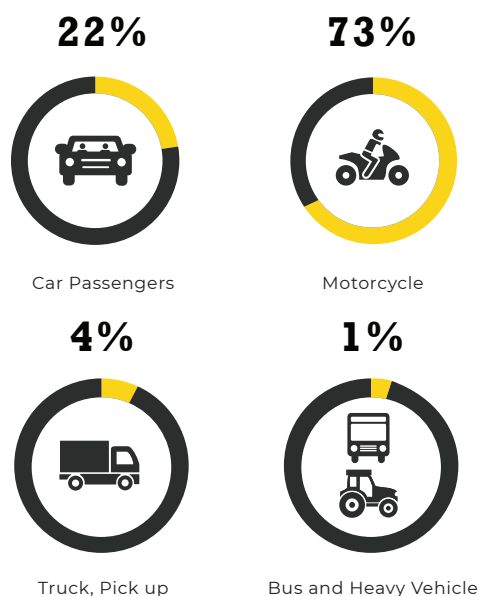
Sources : Board of Statistics, 2013 - 2017
Figure 2. Bandung population



Sources : Board of Statistics, 2013 - 2017
Figure 3. Bandung registered vehicles²

Figure 4 below shows the comparison between the growth rate of Bandung's population and registered vehicles, where the increase in registered vehicles since 2015 seems very significant compared to the population.

REGISTERED VEHICLES IN 2017



Sources : Board of Statistics, 2013 - 2017
Figure 4. City population and registered vehicles³



 @dudisugandi

● DID YOU KNOW ●

The ratio of vehicles to population in 2017 is

3:4



PURPOSE OF THIS REPORT

Data monitoring is critically important to promoting road safety. It provides information on who is most vulnerable, where the hot spots are, and when the risk periods are. Best practices for road-safety data systems include (WHO, 2010):



Identify all deaths and the most serious injuries, and their associated crashes.



Provide enough detail to identify causes and choose responses. This means details about the vehicle, road user, and road and environment.



Include adequate crash location information.



Provide timely information for evidence-based decisions.

Impact of Data

Reliable, accurate data can also help build political will to prioritize road safety by (WHO, 2010):



Documenting the nature and magnitude of the road traffic injury problem.



Demonstrating the effectiveness of interventions that prevent crashes and injuries.



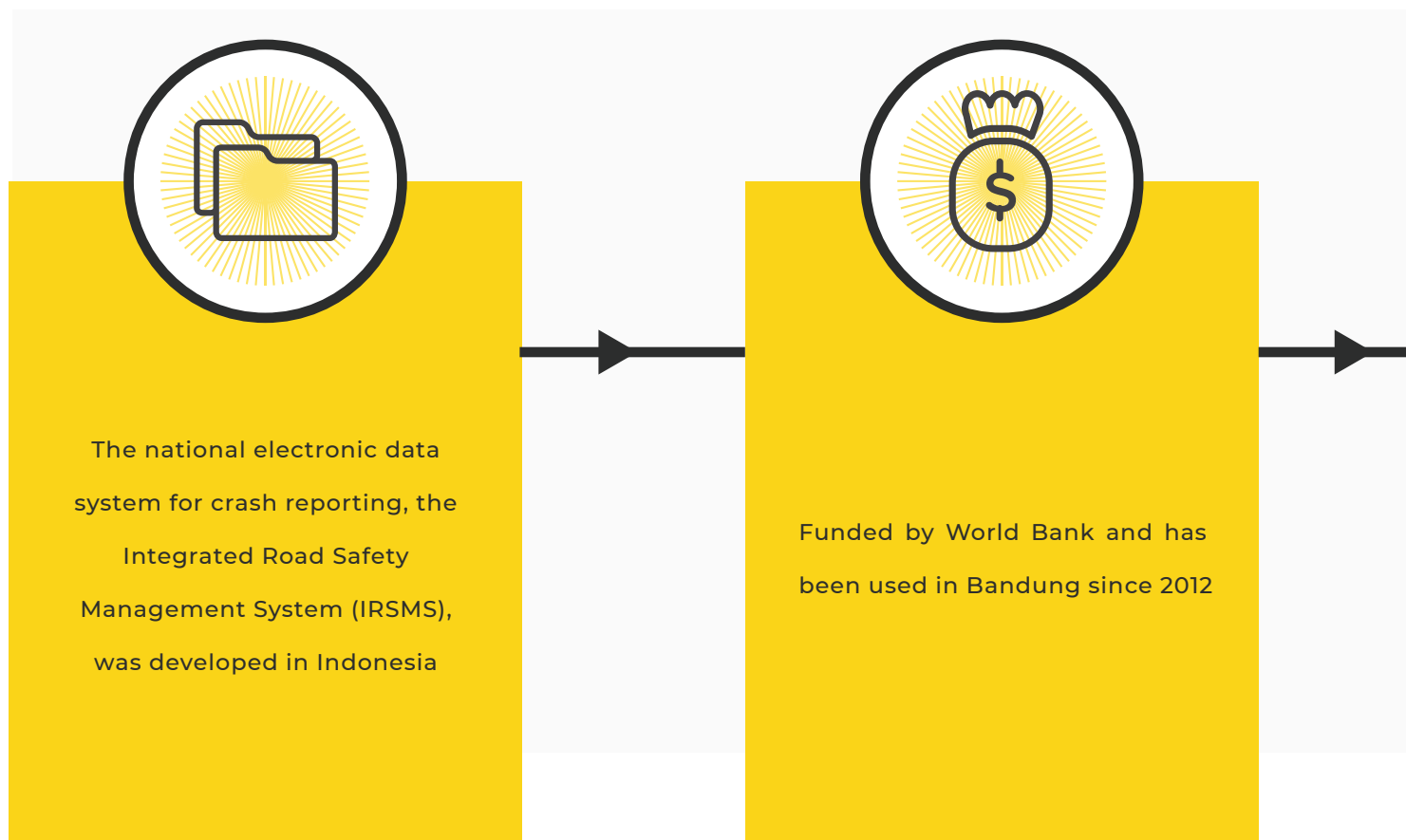
Providing information on reductions in socio-economic costs that effective prevention can achieve.



DATA SOURCES AND SYSTEMS

Crash data reported by police shows unexpectedly low injury and mortality rates in Bandung, with a mortality rate of 4.0 per 100.000 population in 2015 compared to the WHO national estimate for Indonesia of 15,3 per 100.000 (WHO, 2015).

In this year's report, three databases were used as data sources: (i) the police road traffic crash databases reported from Bandung Traffic Police and documented in the Integrated Road Safety Management System (IRSMS) nationally since 2012, which include individual personal data such as name, sex, and age, among others, and which facilitated the record linkage procedure; (ii) hospital road injury data, whose reference document is the authorization for hospital admittance; (iii) Jasa Raharja as the insurance company, whose reference document is the claim form submitted by the victims.



For this report, IRSMS data was exported to Microsoft Excel for analysis. IRSMS can produce selected canned reports and can only export case data records for crash characteristics; individual case data for further analysis of injured or killed persons are not exportable at the city level. These additional details were therefore manually re-entered for this analysis.

The parastatal crash-victim insurance system, Jasa Raharja, maintains records for submitted claims. Since police reports are required for claims, Jasa Raharja does not include any additional records unreported by police. However, they often include additional information about injuries, or deaths that occur after the crash scene, which may be listed as non-fatal injuries in the police data. Jasa Raharja data was linked to police data and final outcomes were updated for this report.

No nationally standardized hospital management information systems exist in Indonesia. Hospitals in Bandung have implemented a wide variety of electronic data systems for hospital information management. In order to systematically identify road injury cases on hospital admission records, ICD-10 coding that includes external cause information (ICD-10, chapter 20) is required. These codes were not used until the Bandung Health Department and BIGRS collaborated to initiate a hospital injury reporting system.



The hospital injury reporting system was started by inviting all hospitals in Bandung to introduce the Bloomberg Philanthropies Initiative for Global Road Safety (BIGRS) project and explain how the public health takes role in this initiative. For the first phase, Bandung Health Department selected 10 hospitals that meet these criteria: (1) volume of trauma admissions; (2) established electronic record system that include multiple ICD diagnostic codes for every admission or death; (3) willingness to participate.



DATA SOURCES AND SYSTEMS



The selected hospitals are:

1. RSUP dr. Hasan Sadikin;
2. RSUD Kota Bandung;
3. RSU Bhayangkara Sartika Asih;
4. RSU Santosa Central;
5. RSU Advent;
6. RSU Santo Borromeus;
7. RSU Immanuel;
8. RSU Al-Islam;
9. RSU Muhammadiyah;
10. RSU Pindad.

The selected hospitals then joined ICD-10 Training for improving the quality of data collection. About 225 persons in selected hospitals have been trained, consisting of 78 emergency department staff, 104 medical records staff and 43 staff from other division.

The hospital injury reporting system was then initiated and monitored for one year, in order to embed the requested variables from Health Department through the hospital's current system. Reporting was requested for inpatient admissions and deaths in order to focus on the most serious injuries. Variables reported include identifiers (patient status, medical record number, patient identity), sociodemographic, duration of stay, and ICD codes (injury + external cause).

Definitions

Road fatality: In keeping with the standard international definition, IRSMS defines a road fatality as a death occurring within 30 days of a road crash.

Serious injury: IRSMS defines a serious injury as a road crash-related injury requiring at least 30 days of medical care, or resulting in permanent disability. This is different from the standard international definition, which is an injury given a score of 3 or higher on the international "Abbreviated Injury Scale", or requiring hospital care for 24 hours or more.



📷 @dudisugandi



— FUN FACT —

Braga street was formerly named *Pedatiweg*, from the Indonesian language horse-drawn carriages (pedati), because it was a narrow street (about 10 m wide) that only carriages could pass through. In 1882, a theater group named *Toneel Braga* was established, and residents flocked into the street to watch the group's performance every night and made it popularly known as the Braga street.

Bandung Road Traffic Crashes in 2017

02

Figure 5 below shows the fatal crash trends over time from 2015 to 2017⁴. Road traffic crashes decreased, but fatalities increased, despite increases in population and number of registered vehicles (see figure 4). This results in death rates rising from 3.4 per 100,000 population in 2016 to 6.3 in 2017; and from 0.5 per 10,000 registered vehicles to 0.9 in 2017.

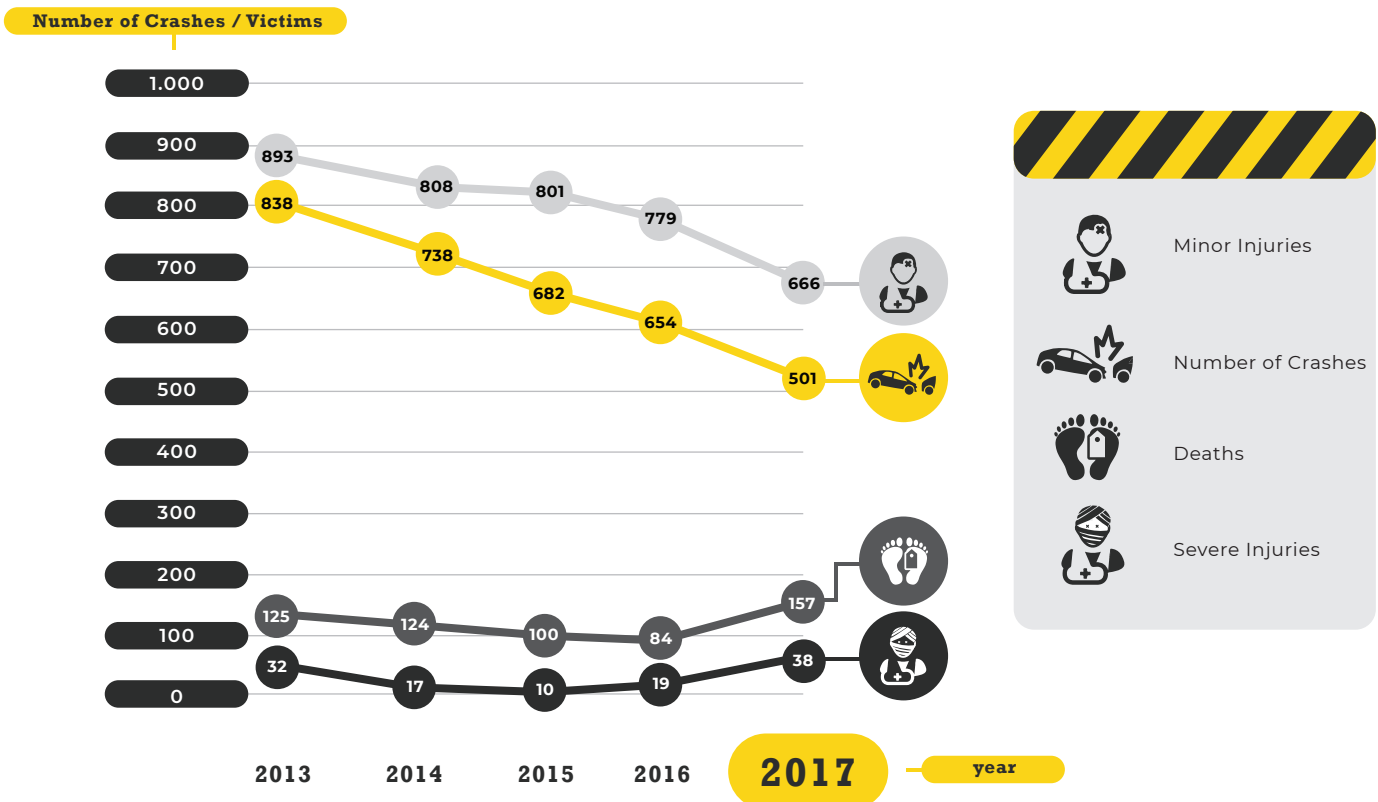


Figure 5. Road traffic crash trends, 2013-2017

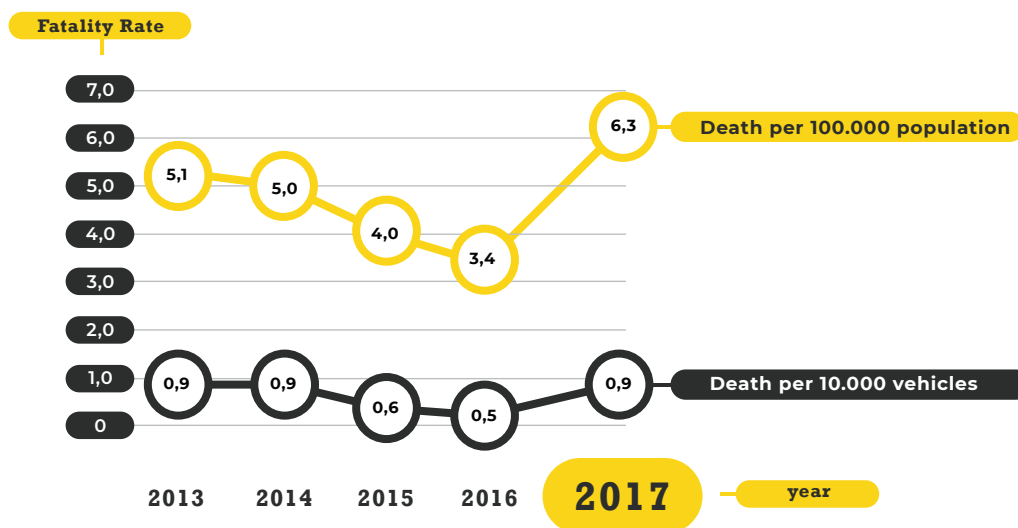


Figure 6. Road traffic fatality trends, 2013-2017



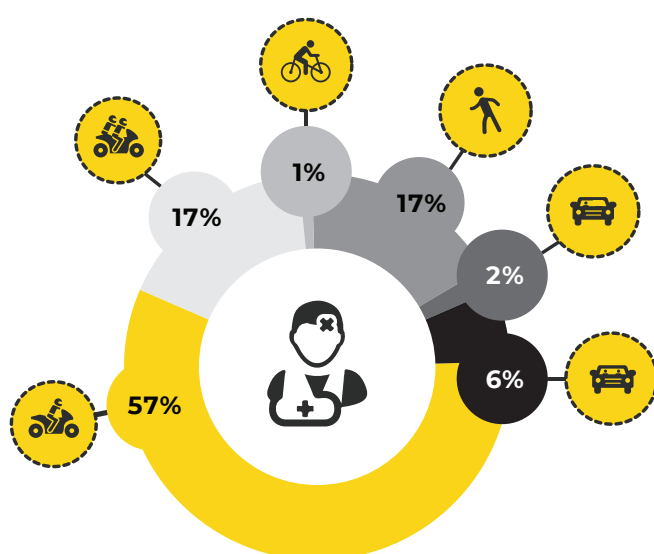
INJURIES AND DEATHS BY ROAD USER TYPE

Motorcyclists are by far the largest group of road users injured and killed, accounting for 74 percent of injuries and 69 percent of deaths. Pedestrians make up 17 percent of injuries and 23 percent of deaths. Overall, 93 percent of deaths are among vulnerable road users — motorcyclists, pedestrians, and bicyclists.

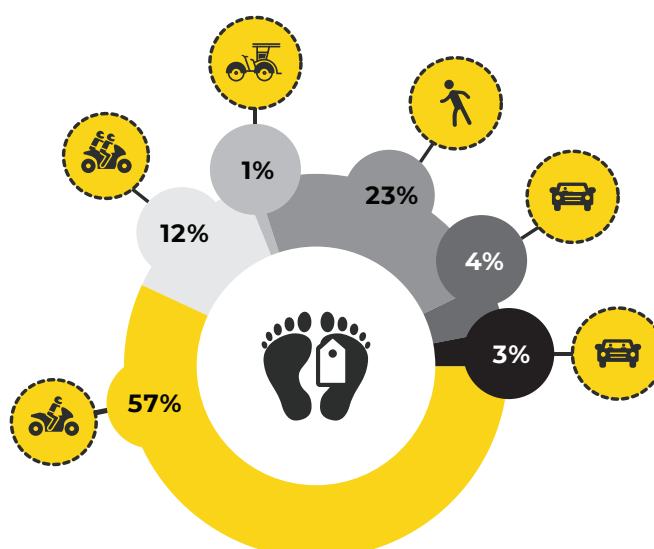
HIGHLIGHT



Motorcyclists contribute the highest number in both, injury diagram and death diagram.



Sources : Bandung Traffic Police and Jasa Raharja, 2017
Figure 7. Injuries by road user type, 2017



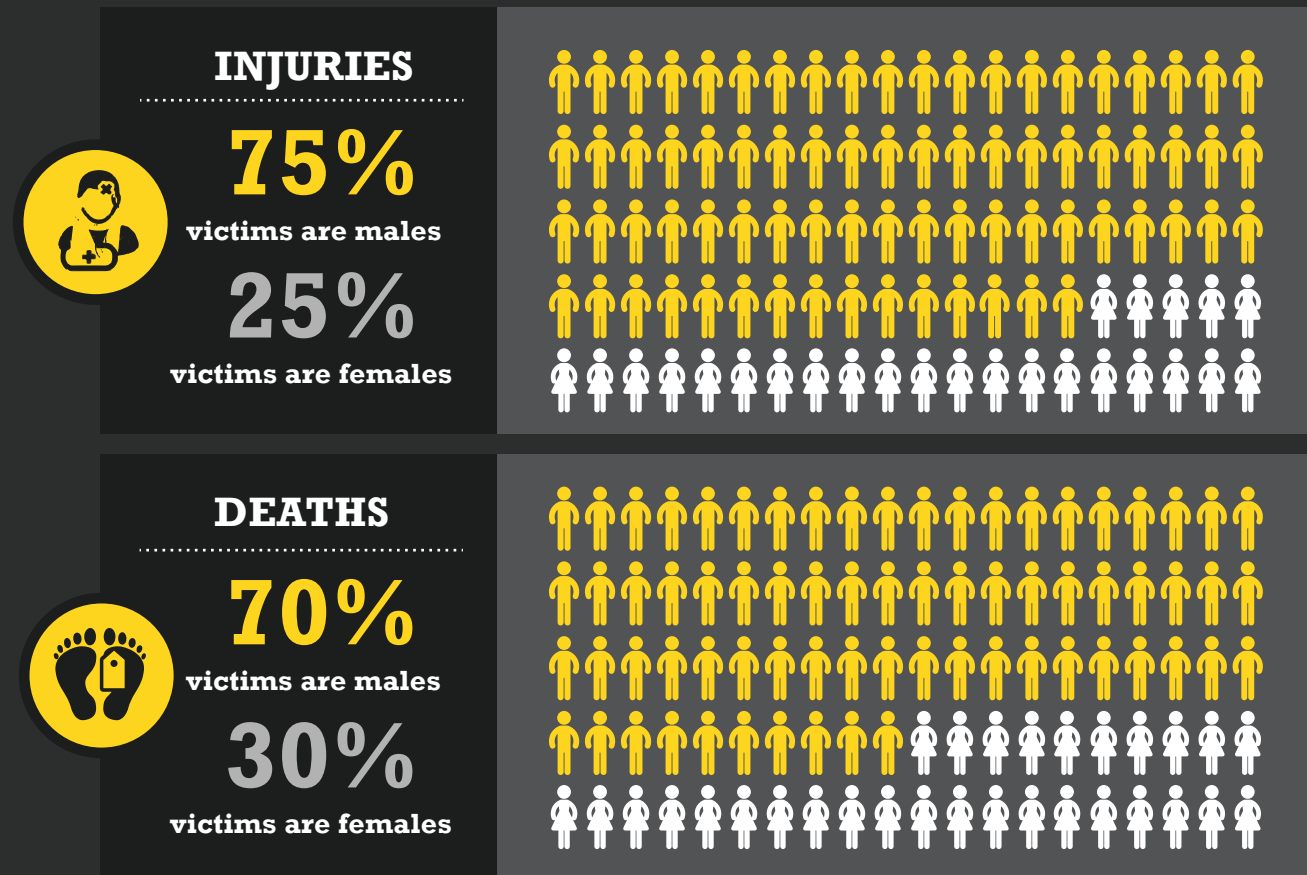
Sources : Bandung Traffic Police and Jasa Raharja, 2017
Figure 8. Deaths by road user type, 2017

	Motorcycle Driver
	Motorcycle Passenger
	Bicyclist
	3 - Wheeler
	Pedestrian
	Car/Bus/Truck Driver
	Car/Bus/Truck Passenger



INJURIES AND DEATHS BY GENDER

Males are the most affected victims, accounting for 71 percent compared to 29 percent female in 2017. The proportion of registered drivers by gender shows that 67 percent are male drivers and 33 percent female drivers. Far more males died in crashes than females, with 118 male and 39 female deaths. Three times as many males were killed or injured than females.



Sources : Bandung Traffic Police and Jasa Raharja, 2017
Figure 9. Percentages of injuries and deaths by gender, 2017

HIGHLIGHT





.bdg

 @dudisugandi



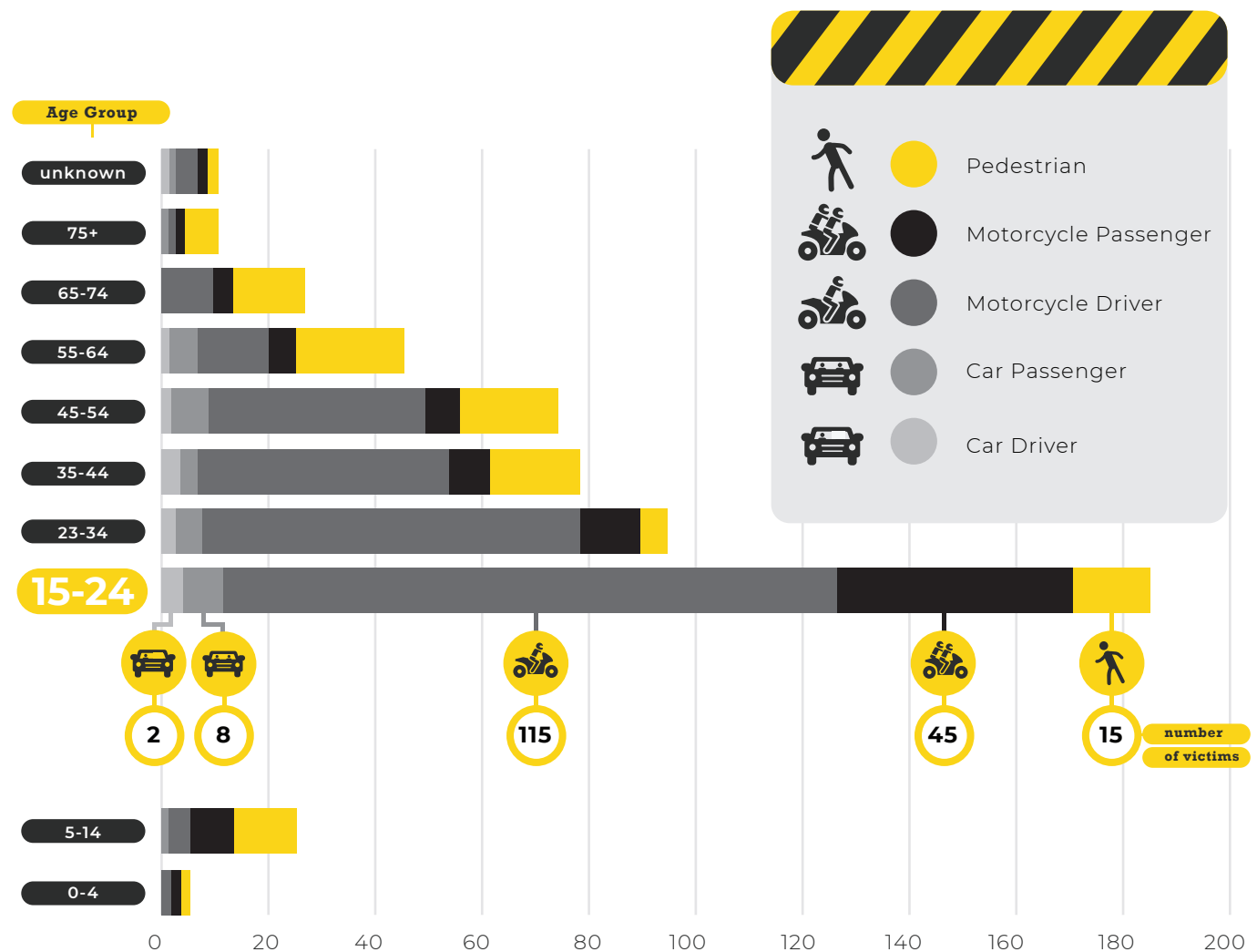
— FUN FACT —

Antapani's Rainbow Bridge was constructed using the technology of *Corrugated Mortarbusa Pusjatan* (CMP) which is a technology development of *Corrugated Steel Arch*. This technology was used for the first time in Antapani intersection as the solution for road traffic congestion in Bandung

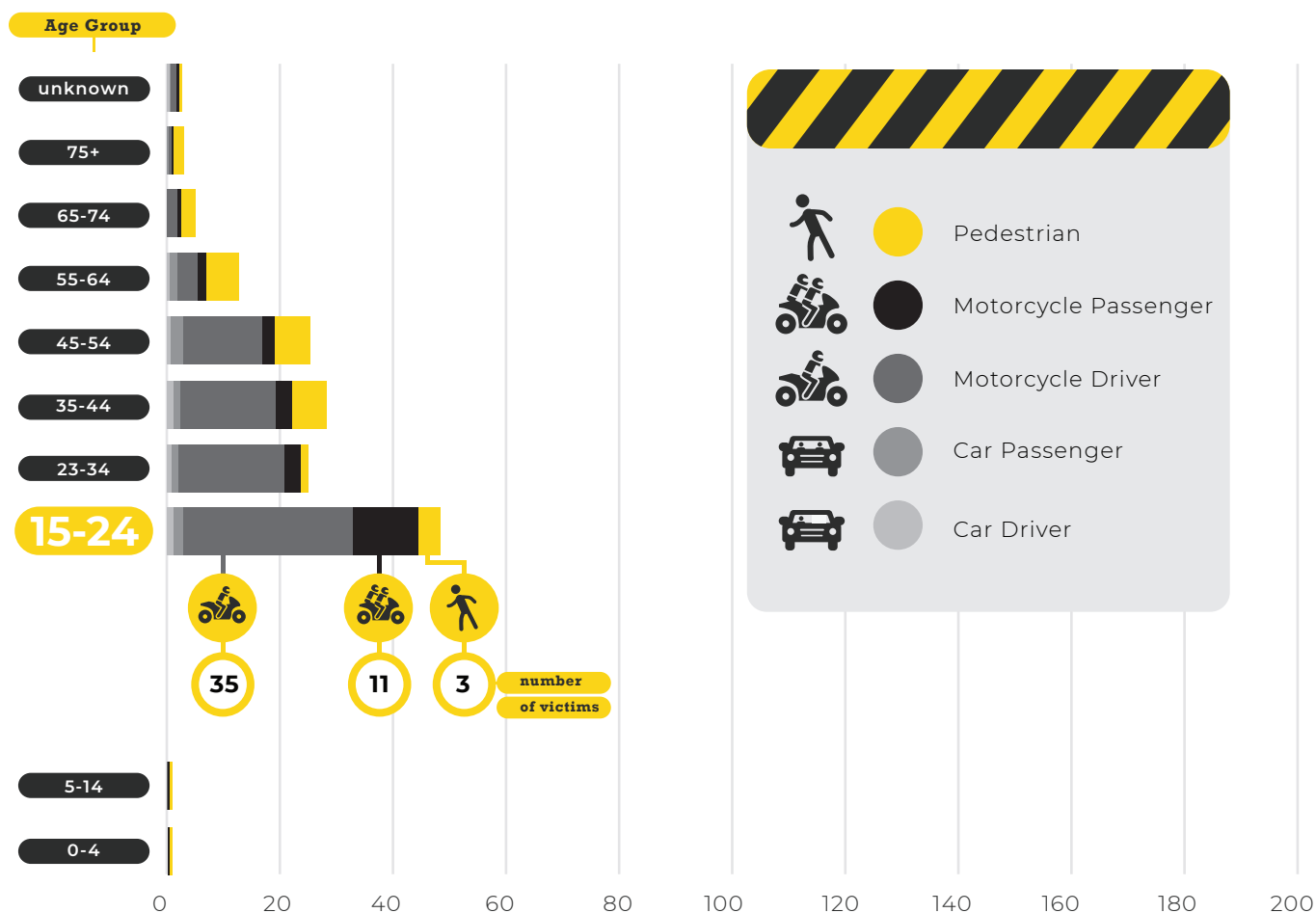


INJURIES AND DEATHS BY AGE GROUP

Those 15 to 24 years old are the age group with the highest proportion of injuries and deaths. Drivers and passengers of motorcycles comprised the highest proportion of this age group — as well as the highest proportion of deaths and injuries overall. Second place is composed of non-motorized transportation, including pedestrians, bicycles and three-wheelers. The dominant group using these modes were 15 to 24 years old.

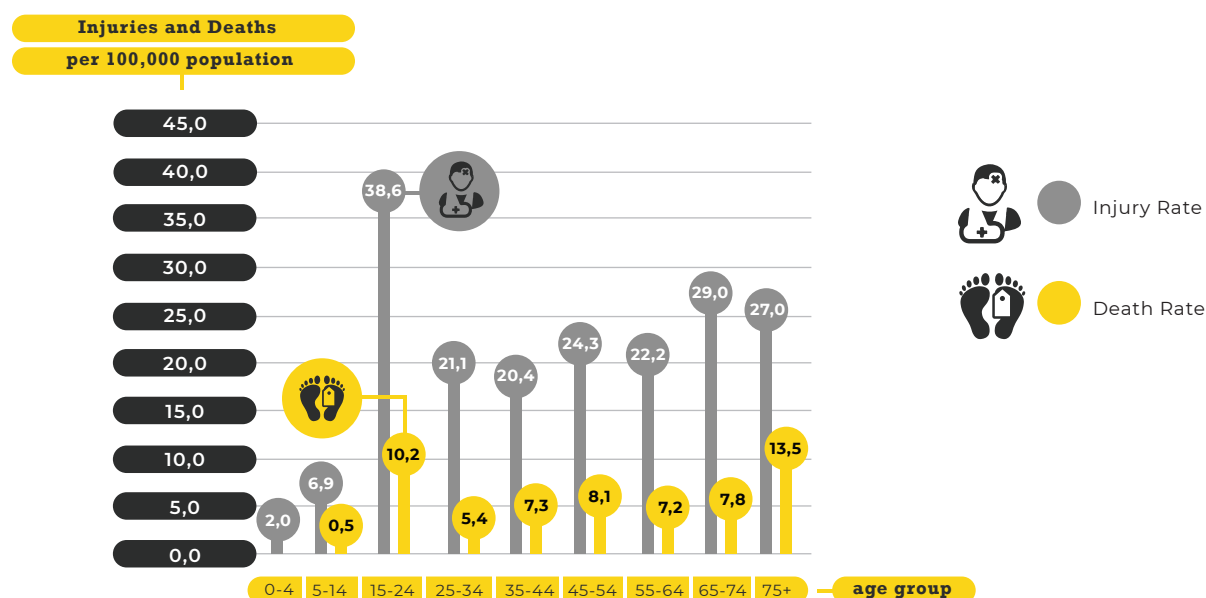


Sources : Bandung Traffic Police and Jasa Raharja, 2017
Figure 10. Injuries by age group, 2017



Sources : Bandung Traffic Police and Jasa Raharja, 2017
Figure 11. Deaths by age group, 2017

The highest injury and death rates are both among 15 – 24 years old at 38.6 per 100,000 population for injury rates and 10.2 per 100,000 population for death rates.

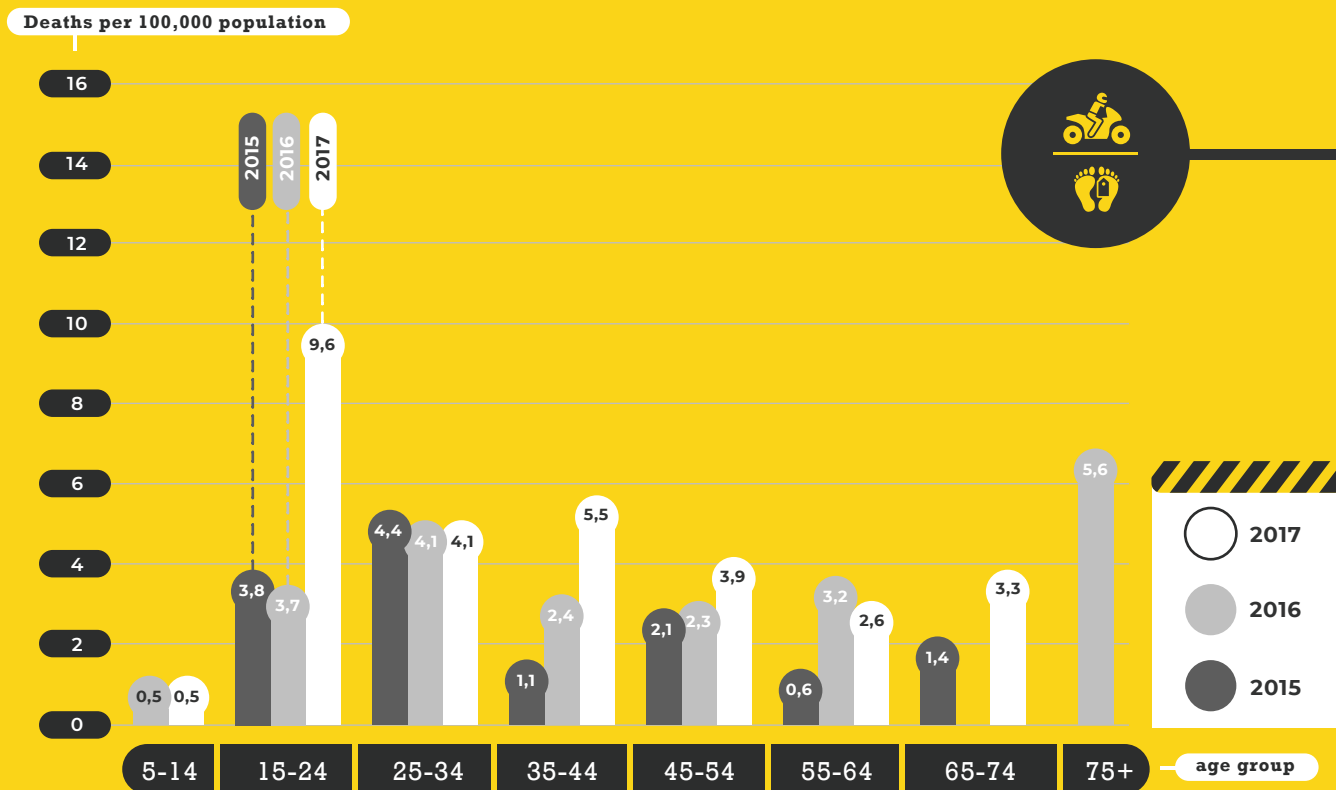


Sources : BIGRS Surveillance Analyses, 2018
Figure 12. Injury and death rate by age group, 2017



INJURIES AND DEATHS BY AGE GROUP

The figures below show age-specific death rates for motorcyclists and pedestrians. The motorcyclist death rate is highest among 15- to 24-year-olds, while for pedestrians the highest rate is for those more than 75 years old. This high pedestrian risk among the elderly is a critical consideration for improving intervention design and planning.



Sources : BIGRS Surveillance Analyses, 2018
Figure 13. Motorcyclist death rate by age group, 2015 - 2017

HIGHLIGHTS



15-24

The motorcyclist death rate is the highest among 15 to 24 years old



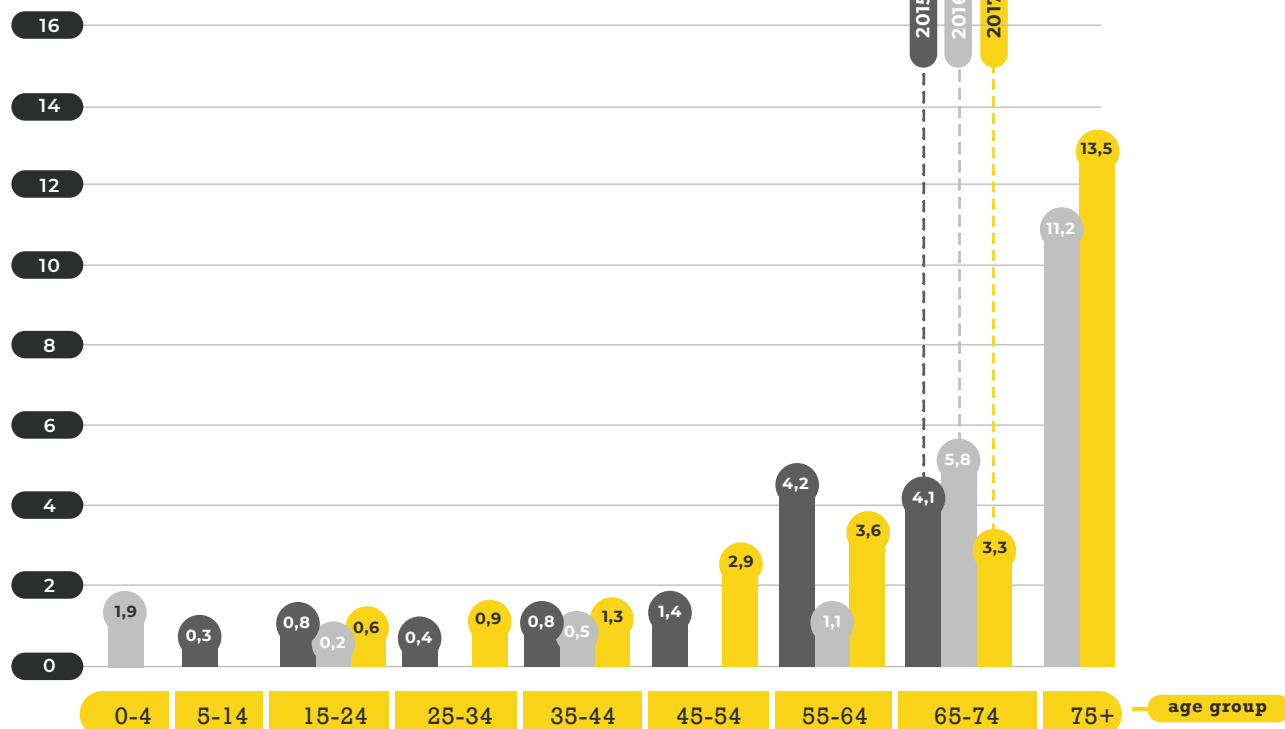
75+

While for pedestrian, the higher rate is for those more than 75 years old.



2015 2016 2017

Deaths per 100,000 population



Sources : BIGRS Surveillance Analyses, 2018
Figure 14. Pedestrian death rate by age group, 2015 - 2017



DID YOU KNOW

Road traffic injuries are the leading cause of death globally among people aged

15-29 years old

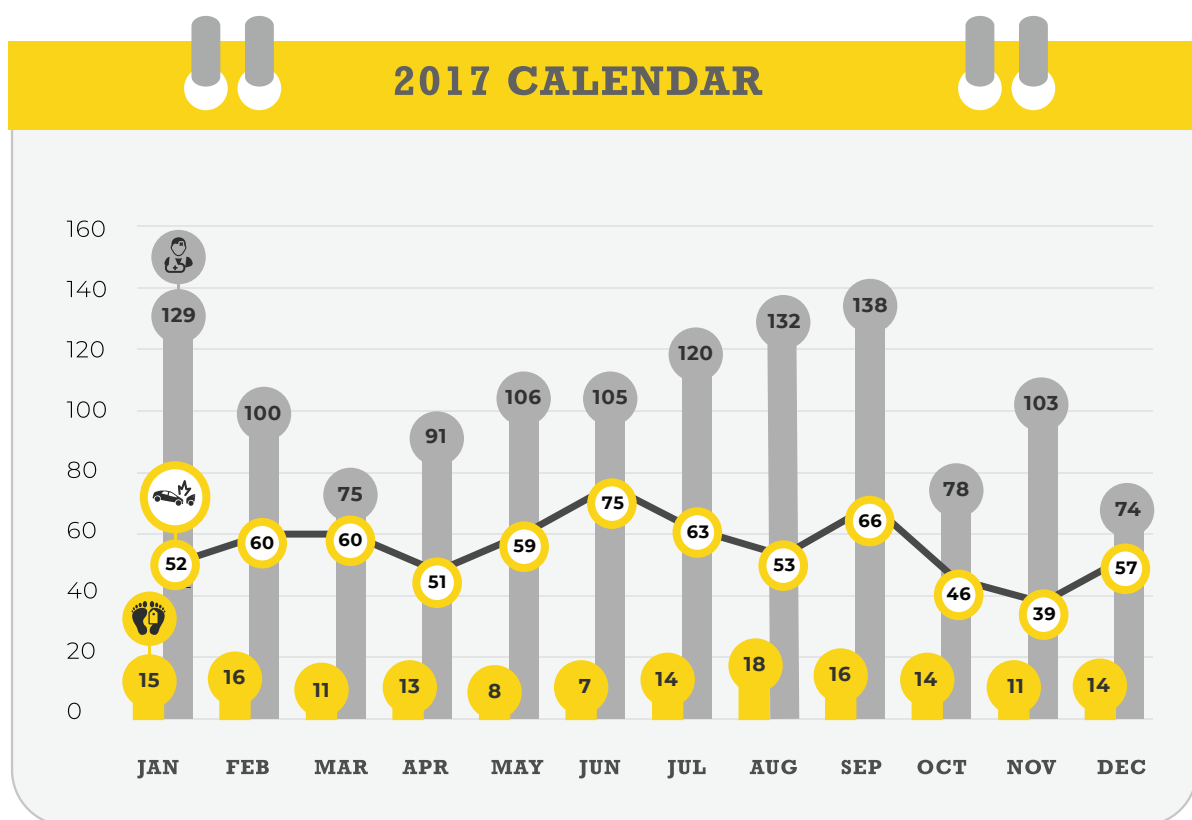
(WHO, 2015)





INJURIES AND DEATHS BY MONTH

January, August and September were the months in 2017 with the highest number of injuries and crashes. These numbers have been integrated from Jasa Raharja data, which shows that 66 crashes occurred in September, resulting in 138 injuries. The greatest number of deaths occurred in August with 18 fatalities. The 2017 graph below shows no clear seasonal or peak pattern of crashes, deaths, or injuries.



Sources : Bandung Traffic Police and Jasa Raharja, 2017
Figure 15. Injuries and deaths by month, 2017

Highlight on Injuries and Deaths By Months

In 2017, crashes mostly happened in September, but the number of death is at its peak in June 2017.



Deaths



Injuries

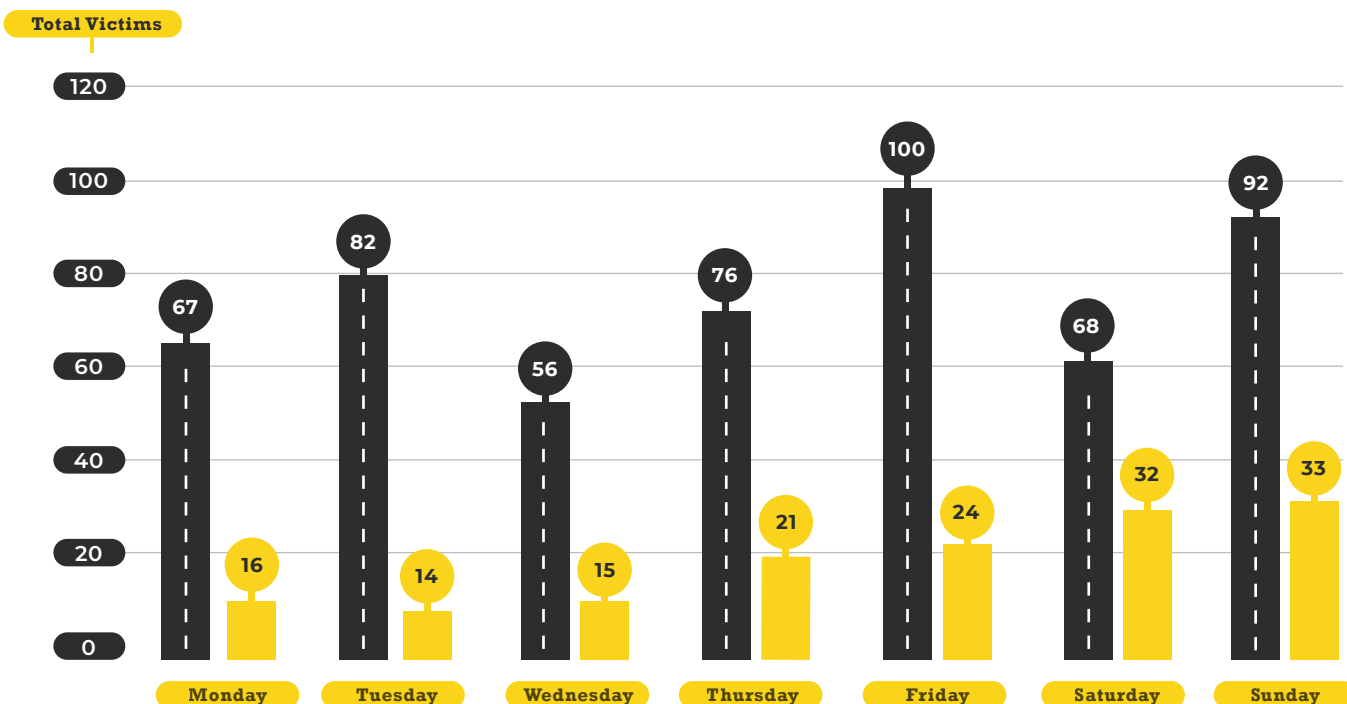


Total Crashes



INJURIES AND DEATHS BY DAY OF WEEK

The highest proportion of injuries occurred on Friday and Sunday, while deaths occurred most often on weekends (Saturday and Sunday) and were dominated by motorcycles. Wednesdays had fewer crashes than other days.



Sources : Bandung Traffic Police and Jasa Raharja, 2017
Figure 16. Injuries and deaths by day of week, 2017

myth

Road safety statistics and facts are not needed for news reporting on crashes, because crashes are just isolated episodes caused by human error.

”

fact

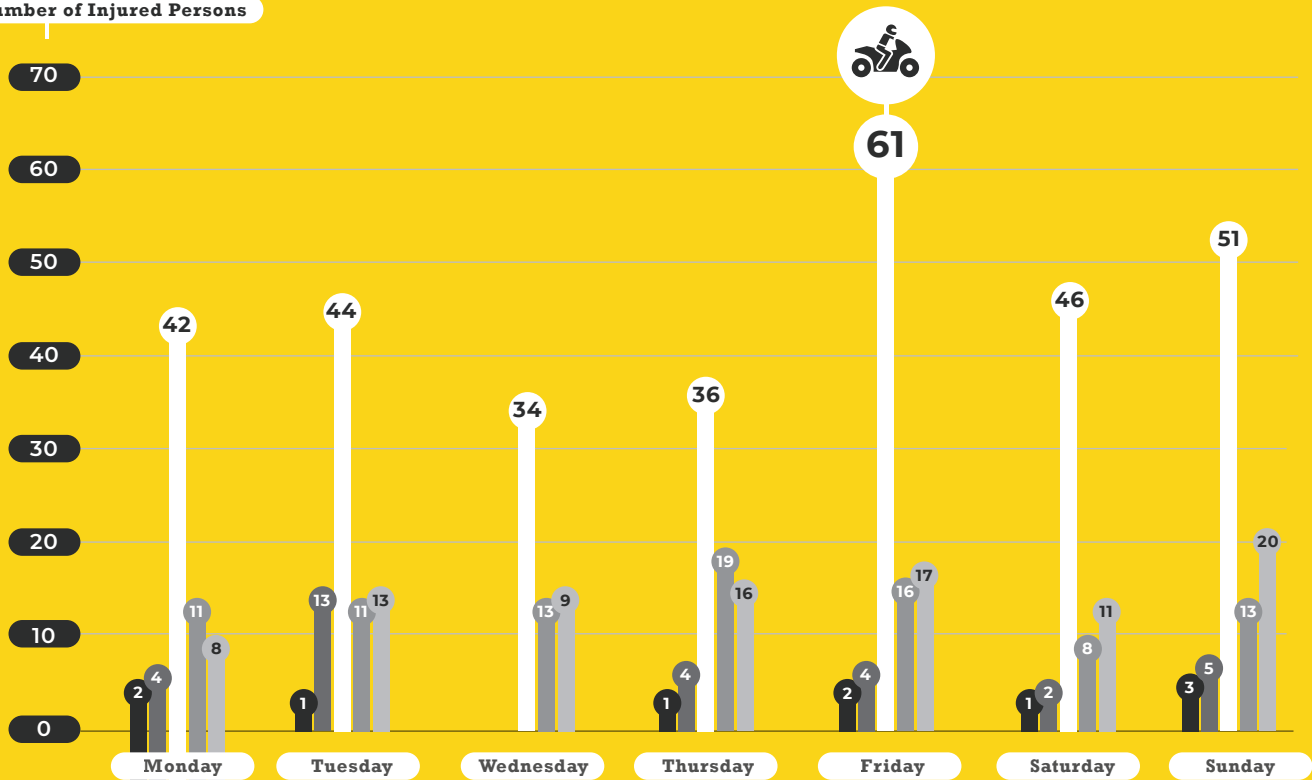
Fatal crashes are not simply the result of wrong behaviour. More commonly, they result from gaps and faults in road traffic systems that fail to take into account and minimize the possibility of human error. When stories about crashes are reported without accurate data, they are indeed just stories about a single episode. When they are reported with data, crashes that result in injuries can manifest a broader concern in public health and development that requires urgent attention.

Sources : World Health Organization

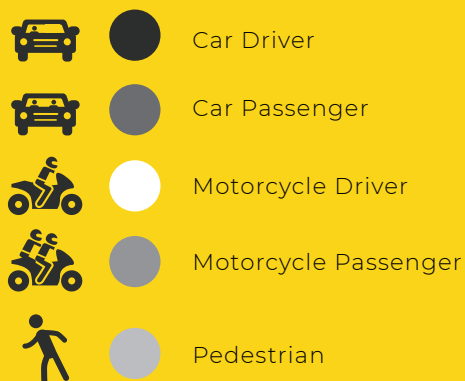


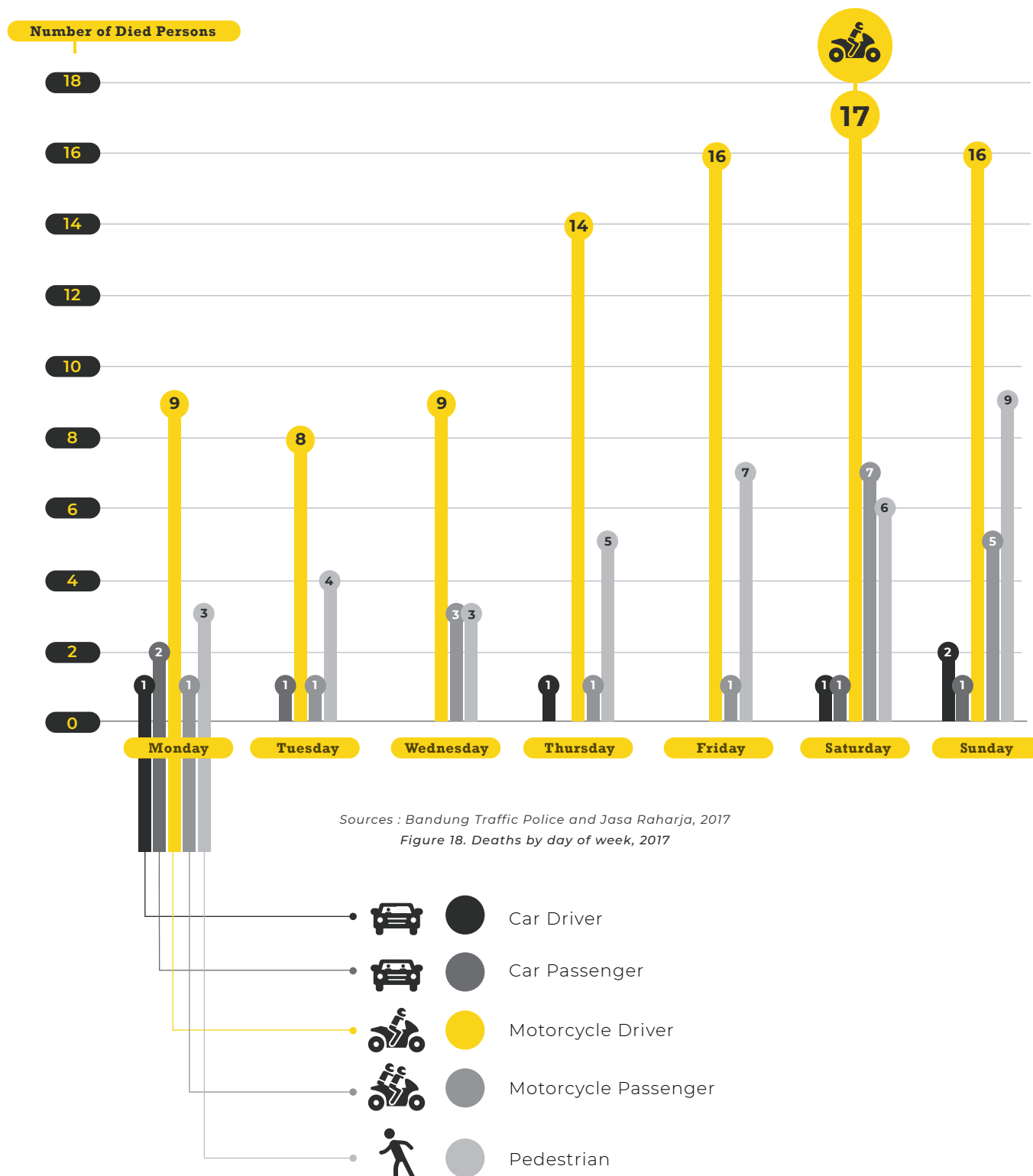
INJURIES AND DEATHS BY DAY OF WEEK

Number of Injured Persons



Sources : Bandung Traffic Police and Jasa Raharja, 2017
Figure 17. Injuries by day of week, 2017

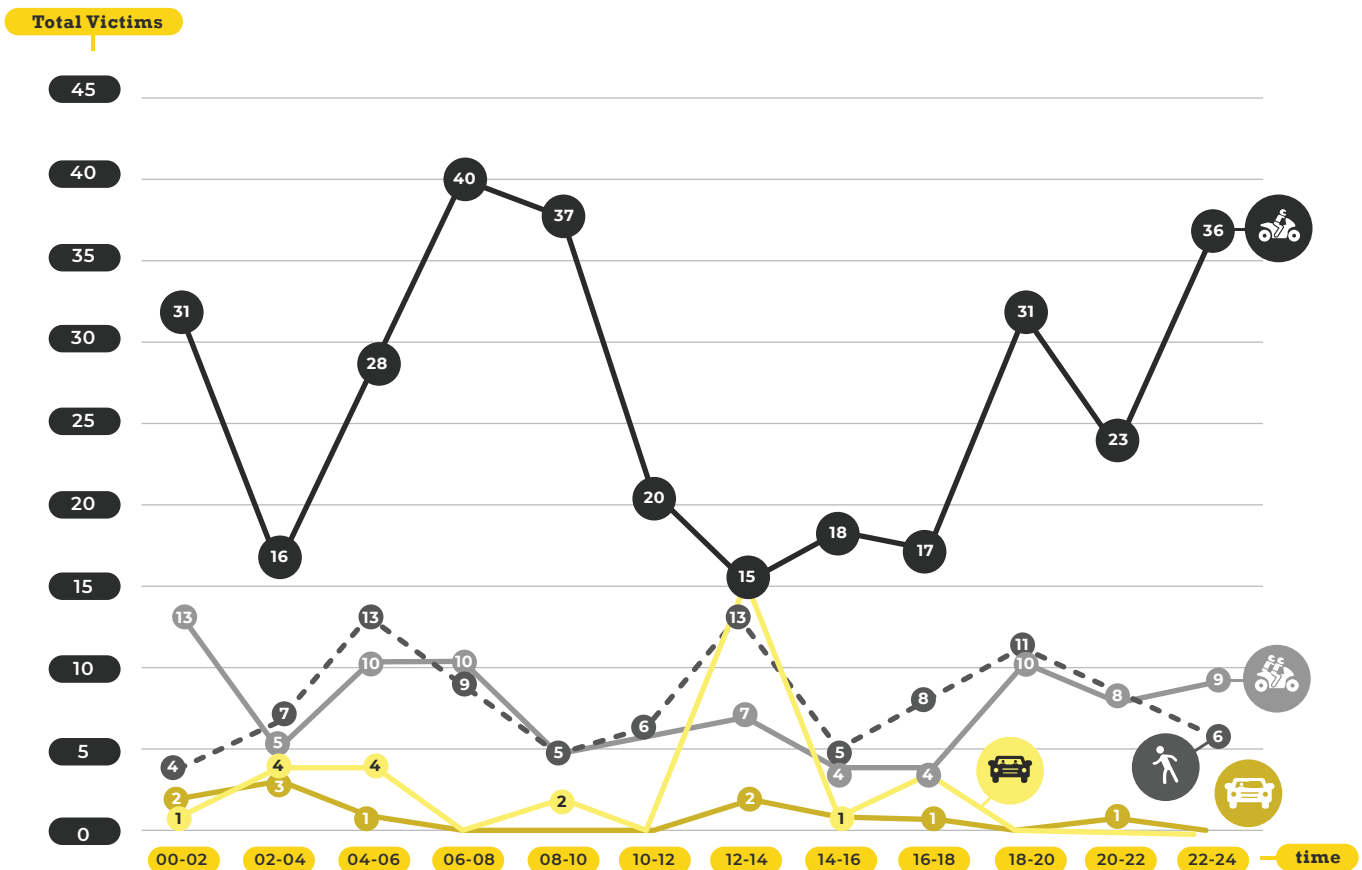






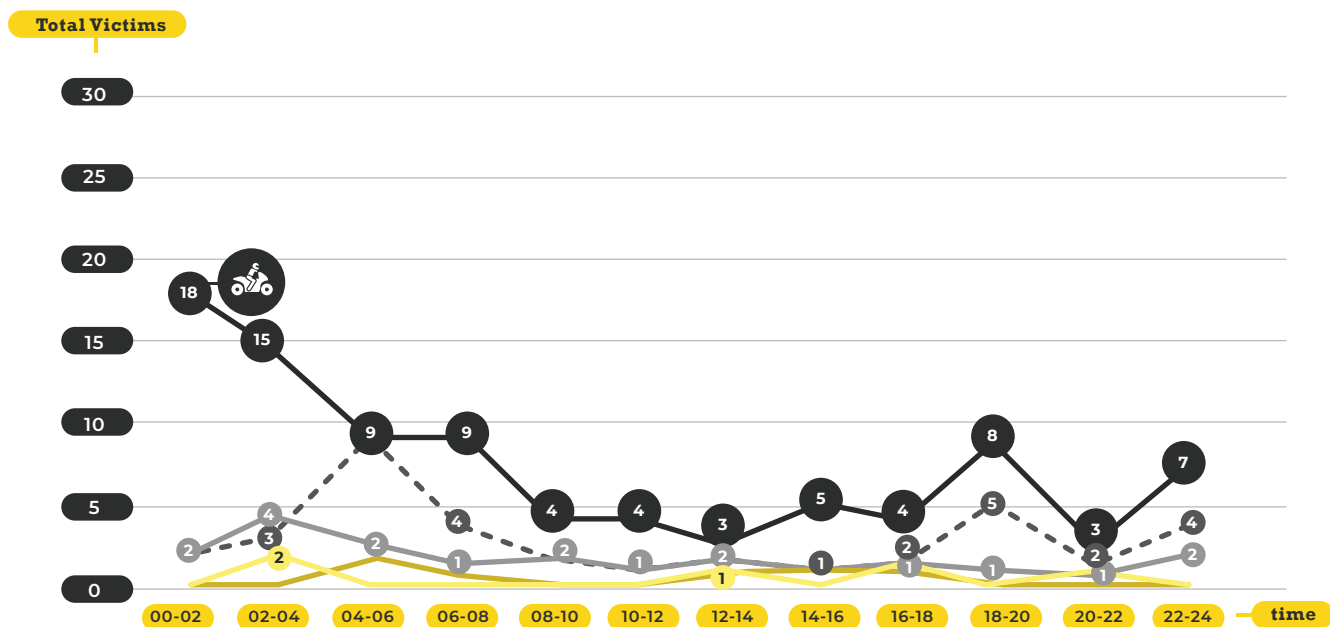
INJURIES AND DEATHS BY TIME OF DAY

Overall, injuries and deaths were more frequent late at night and early in the morning. The peak was at 6 to 8 a.m. for injuries and midnight to 4 a.m. for deaths. Pedestrians and drivers of motorcycles had the highest number of injuries and deaths, again with the most injuries occurring at 6 to 8 a.m. and the most deaths occurring at late night to 4 a.m.

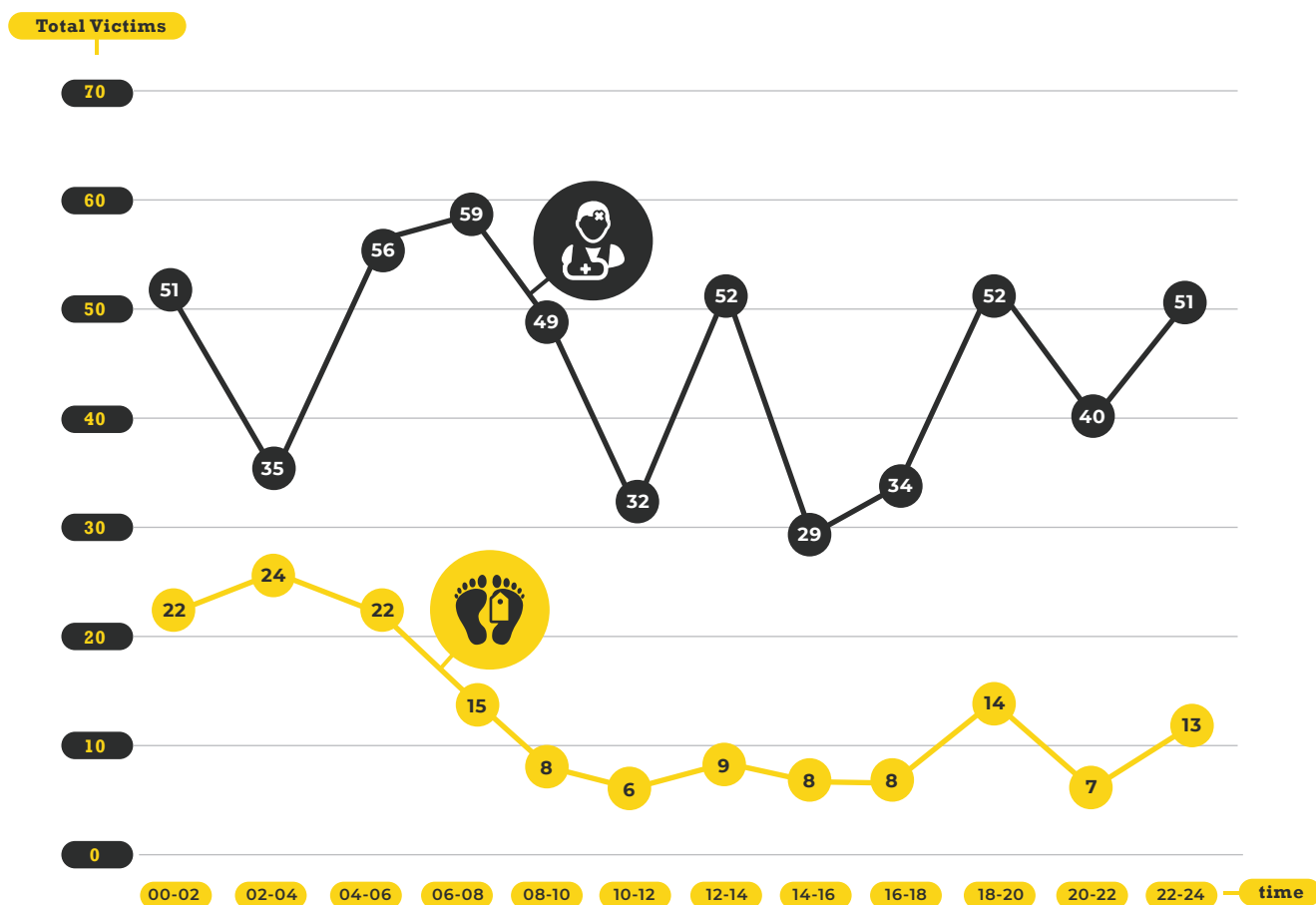


Sources : Bandung Traffic Police and Jasa Raharja, 2017
Figure 19. Injuries by time of day, 2017

- Car Driver
- Car Passenger
- Motorcycle Driver
- Motorcycle Passenger
- Pedestrian



Sources : Bandung Traffic Police and Jasa Raharja, 2017
Figure 20. Deaths by time of day, 2017



Sources : Bandung Traffic Police and Jasa Raharja, 2017
Figure 21. Deaths and injuries by time of day integrated, 2017



INJURIES AND DEATHS BY DAY - TIME CHART

This chart describes the correlation between day and time. The morning rush hour pattern is again visible both at weekdays and weekends. The highest number of crashes occurred on Saturdays at 4 to 6 a.m.

Table 1. Injuries and deaths by day - time chart, 2017

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total
00:01 - 02:00	5	7	4	4	10	9	8	47
02:01 - 04:00	2	2	3	4	6	8	9	34
04:01 - 06:00	7	9	7	8	8	13	6	58
06:01 - 08:00	6	9	5	9	11	9	9	58
08:01 - 10:00	6	6	7	6	5	6	7	43
10:01 - 12:00	6	3	3	6	8	4	3	33
12:01 - 14:00	4	4	6	5	11	3	9	42
14:01 - 16:00	2	4	5	2	7	5	7	32
16:01 - 18:00	6	7	2	4	4	3	8	34
18:01 - 20:00	7	7	4	10	5	5	10	48
20:01 - 22:00	5	1	4	9	4	5	7	35
22:01 - 24:00	8	4	5	2	9	10	3	41
Total	64	63	55	69	88	80	86	505

Sources : Bandung Traffic Police and Jasa Raharja, 2017



● DID YOU KNOW ●

Walk to school is a program of the Bandung City Government that is supported by Department of Transportation, Department of Education, Bandung Traffic Police and volunteers as the priority concern to the public, especially students to avoid congestion problems around schools which are caused by vehicles.





INJURIES AND DEATHS BY CAUSAL VEHICLE TYPES

The most common causal vehicle type was motorcycles (68 percent), followed by passenger cars (Jeep or mini bus) at 23 percent. According to this data, 18 percent of deaths are associated with cargo vehicles, while 10 percent of deaths are associated with public transport.



68%
Crashes involving
motorcycle



2%
Crashes
involving
pick up



23%
Crashes involving
car passenger



2%
Crashes
involving
bus



4%
Crashes involving
heavy vehicle



1%
Crashes involving
bicycle

Sources : Bandung Traffic Police and Jasa Raharja, 2017
Figure 22. Injuries and deaths by vehicle types, 2017



18%
deaths are
associated with
cargo vehicles

10%
deaths are
associated with
public transport





INJURIES AND DEATHS BY VICTIM MATRIX

Table 2. Injuries by victim matrix, 2017

Victim Matrix	Pedestrian	Bicycle	Motorcycle	Car	Bus	Pick-up	Heavy Vehicles	Single Accident	Unknown	Total
Pedestrian	0%	0%	13%	3%	0%	0%	1%	0%	0%	17%
Bicycle	0%	0%	0%	1%	0%	0%	0%	0%	0%	1%
MC Driver	3%	0%	29%	19%	1%	1%	3%	0%	0%	57%
MC Passenger	0%	0%	6%	8%	0%	0%	1%	1%	0%	17%
Car Driver	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Car Passenger	0%	0%	0%	1%	0%	0%	0%	0%	0%	1%
Bus Driver	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Bus Passenger	0%	0%	0%	2%	0%	0%	1%	0%	0%	3%
Pick-up Driver	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Pick-up Passenger	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%
HV Driver	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
HV Passenger	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3 - Wheeler	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Total	4%	0%	49%	34%	2%	2%	6%	3%	0%	100%

This matrix shows correlation between victims and offenders who caused the injuries and deaths to the victims. Injuries most frequently involved motorcycle driver vs. motorcycle crashes, whereas deaths most frequently involved motorcycle driver vs. motorcycle and car crashes.

Sources : Bandung Traffic Police and Jasa Raharja, 2017

Table 3. Deaths by victim matrix, 2017

Victim Matrix	 Pedestrian	 Bicycle	 Motorcycle	 Car	 Bus	 Pick-up	 Heavy Vehicles	 Single Accident	 Unknown	Total
Pedestrian	0%	0%	15%	6%	1%	2%	0%	0%	0%	24%
Bicycle	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%
MC Driver	1%	1%	17%	18%	3%	2%	10%	3%	1%	55%
MC Passenger	0%	0%	6%	3%	1%	0%	3%	1%	0%	13%
Car Driver	0%	0%	0%	2%	0%	0%	0%	1%	0%	3%
Car Passenger	0%	0%	0%	1%	0%	0%	0%	0%	0%	1%
Bus Driver	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Bus Passenger	0%	0%	0%	1%	0%	0%	1%	0%	0%	2%
Pick-up Driver	0%	0%	0%	1%	0%	0%	0%	0%	0%	1%
Pick-up Passenger	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%
HV Driver	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%
HV Passenger	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3 - Wheeler	0%	0%	0%	0%	1%	0%	0%	0%	0%	1%
Total	1%	1%	38%	31%	5%	4%	14%	6%	1%	100%

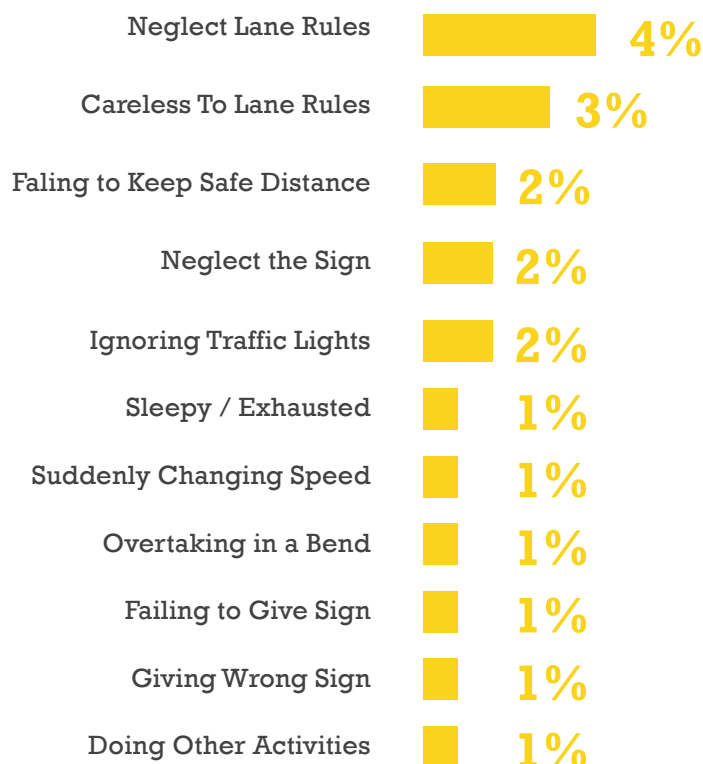
Sources : Bandung Traffic Police and Jasa Raharja, 2017



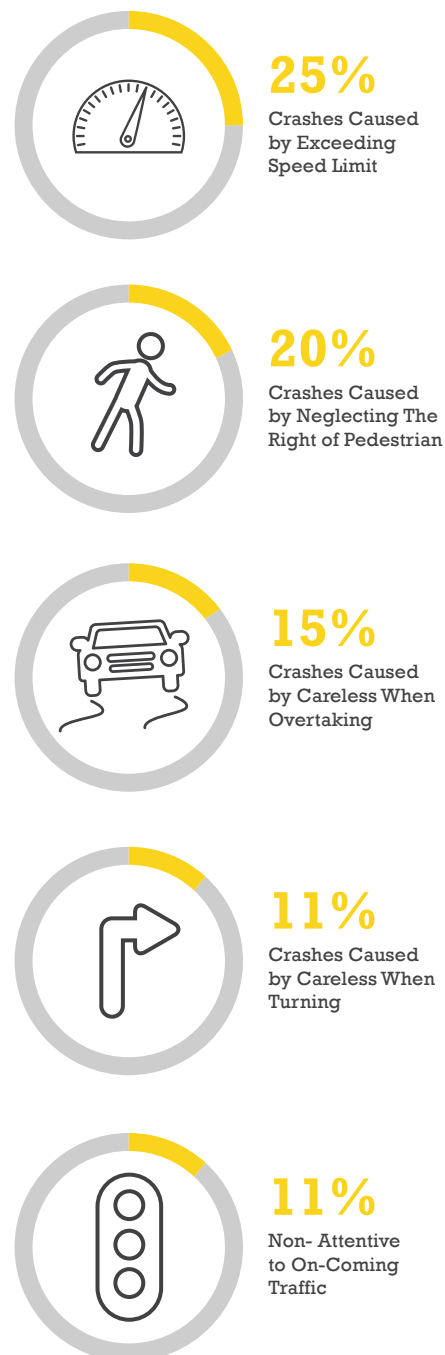
INJURIES AND DEATHS BY CAUSAL FACTOR

The Bandung Traffic Police have recorded the causal factors for crashes involving injury or death. Exceeding the speed limit (speeding) was the causal factor for as much as 25 percent of crashes followed by neglecting the rights of pedestrians among 20 percent⁵.

Other activities that might be leading to crashes are listed below;



Sources : Bandung Traffic Police, 2017
Figure 23. Deaths and injuries by causal factor, 2017



When the causal factors are compared to prevalence risk factors like speeding, helmet use, seat-belt use and drink driving, results are mixed. Speeding caused 25 percent of deaths — the same proportion as was reported to be the causal factor in a crash. Wearing proper helmet was still contributed to the crash in which resulted of 27 percent of deaths, 1 percent because of not wearing helmet, and as much as 40 percent for unknown reasons. There's no information on the up to 7 percent of victims who died from non-use or improper use of seatbelts. Drink driving occupied the last place with contribution only 1 percent of total deaths.



BANDUNG CRASH MAPS

Two kinds of crash maps are presented in this report: point maps and heat maps. Point maps pinpoint the exact location of the crash with a dot. This kind of maps are useful to show the distribution of the crashes in a city. Heat maps are one of the best visualization tools for dense point data and are used to easily identify clusters with a high concentration of activity.

This report generated maps for 2017 data, focusing on pedestrian and motorcycle fatal crashes. The coordinates are obtained from IRSMS which can export the GPS (Global Positioning System) coordinates for each crash, and then analysed by using QGIS (Quantum Geographic Information System).



myth

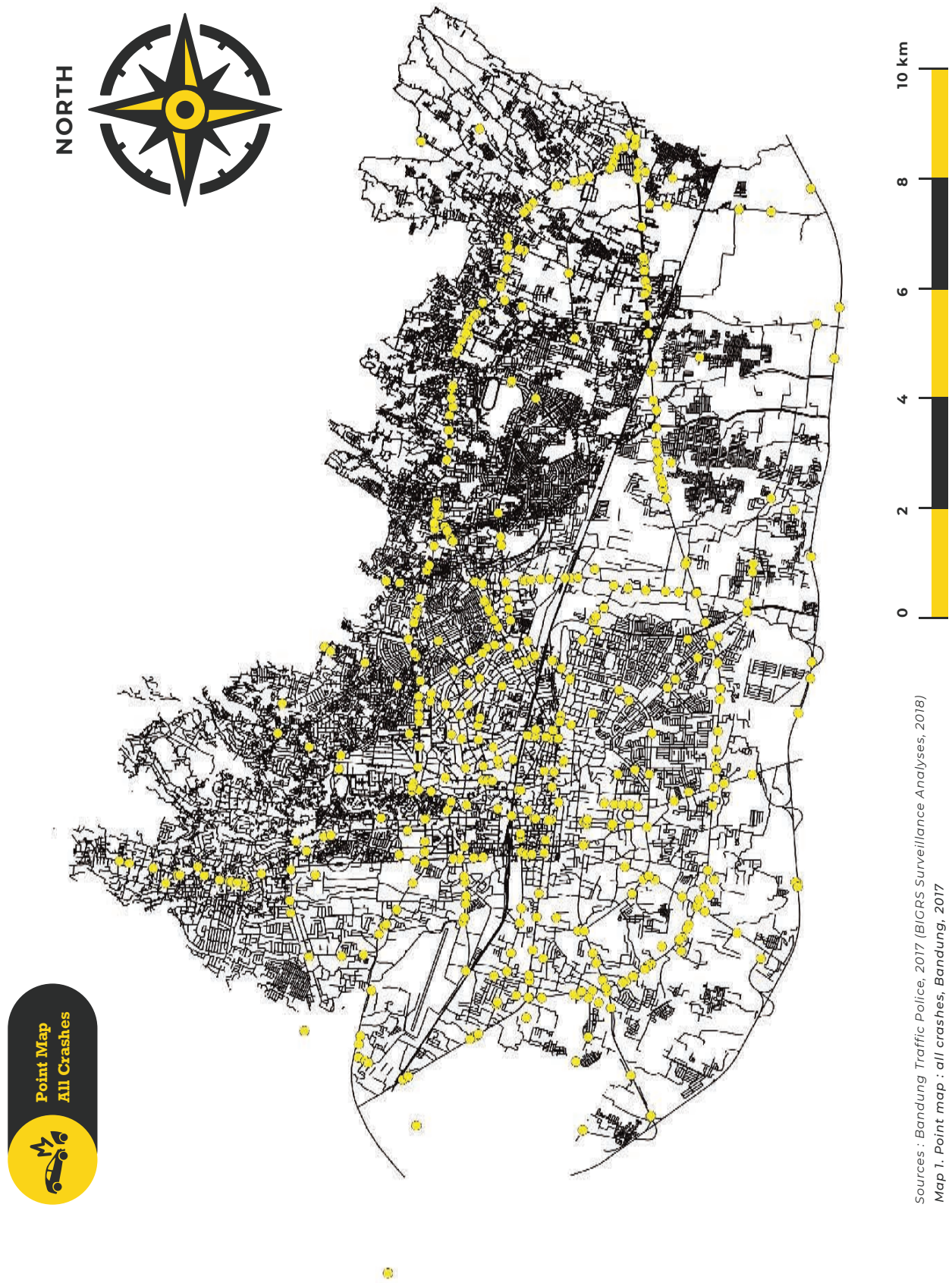
One country, one set of road traffic data

”

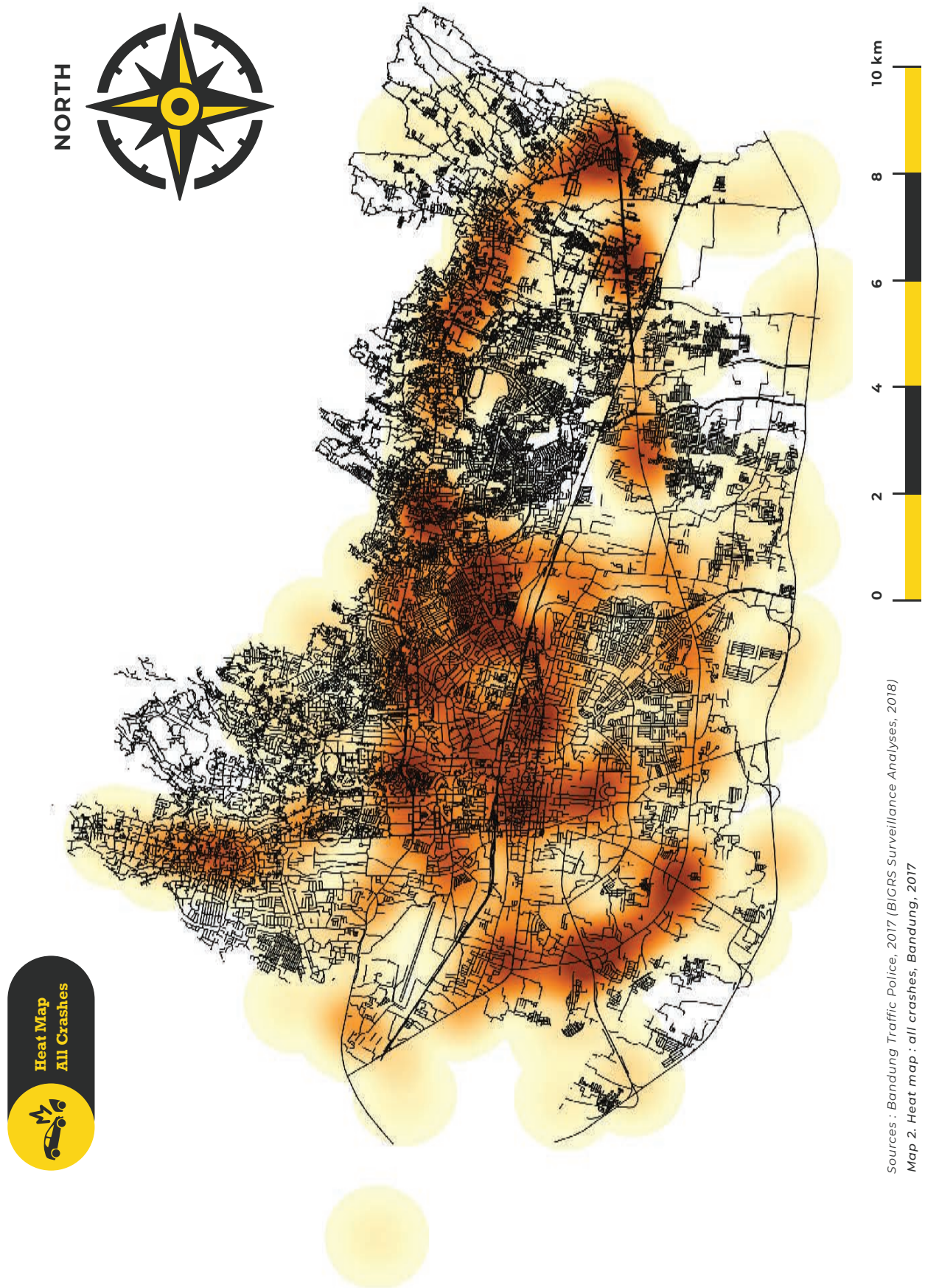


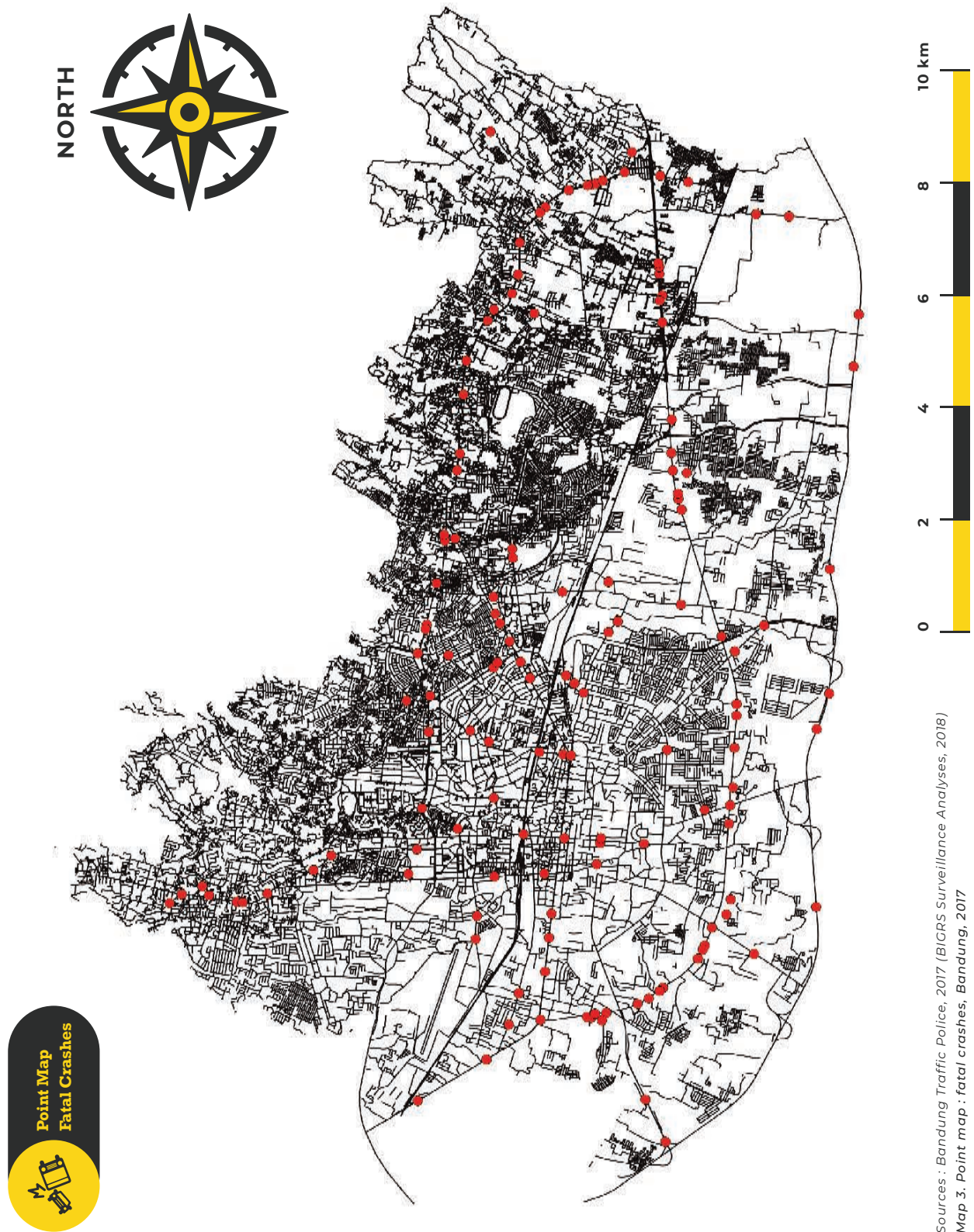
fact

Unfortunately not. In any given country, road traffic data can come from a number of sources (e.g. the health sector, police, nongovernmental organizations, academia). Ideally, data systems should be linked and provide the same numbers; in practice, good coordination is difficult to achieve. In addition to data available from the different national sources, WHO's Global Status report on road safety also provides estimates of traffic fatalities. The report includes data from each country's official sources – which can be underreported – as well as WHO's estimates for each country. These two sets of figures are often different.

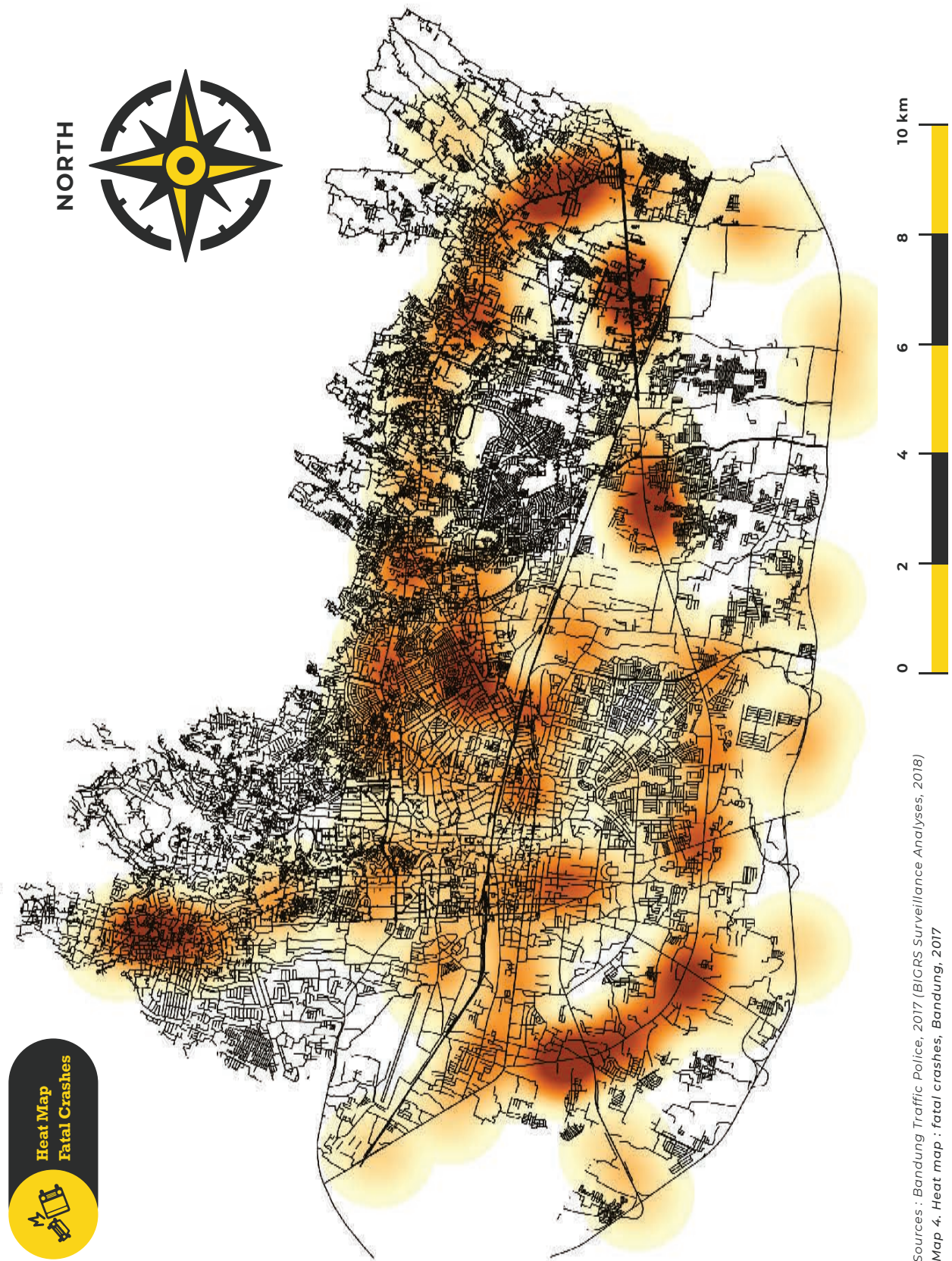


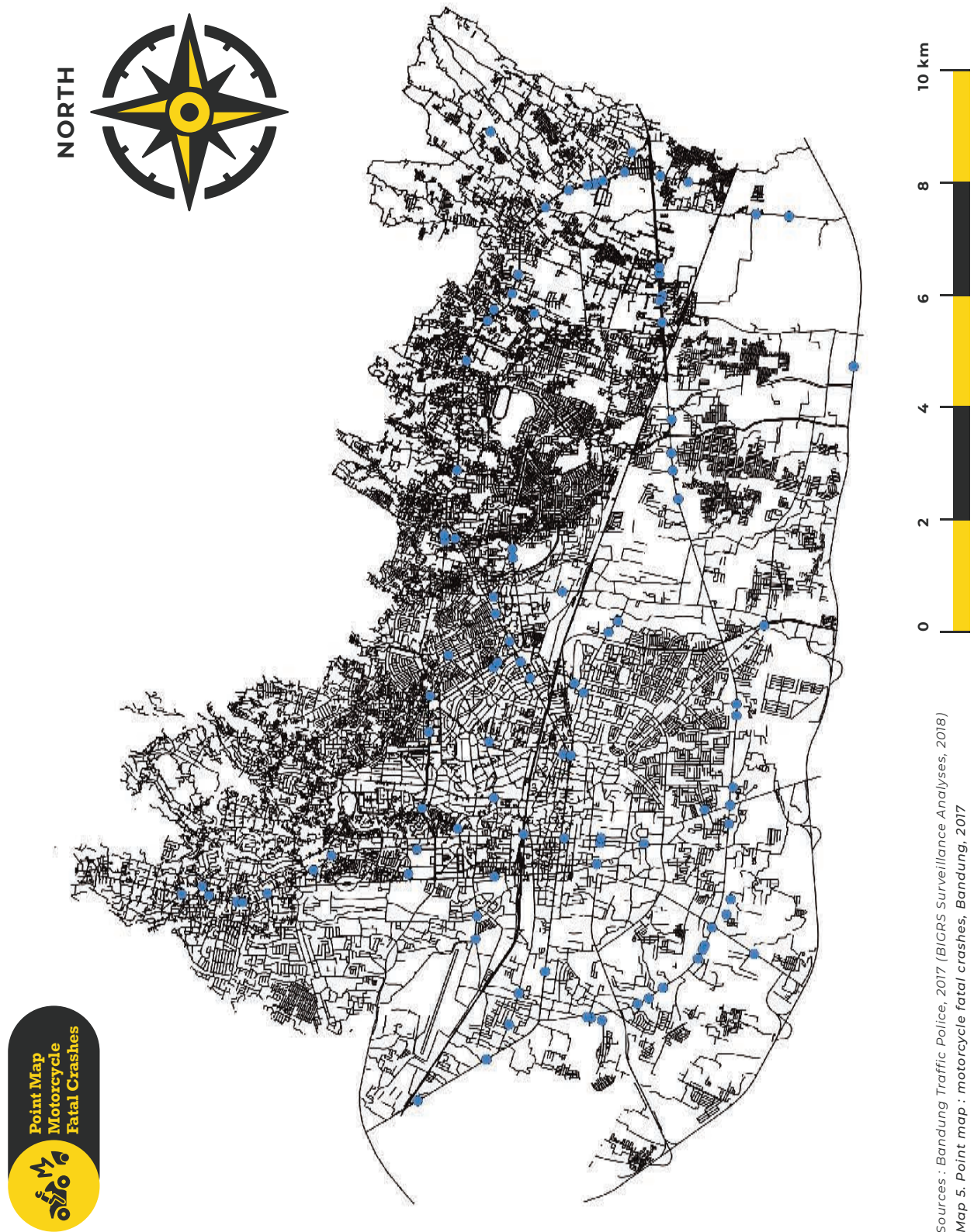
Sources : Bandung Traffic Police, 2017 (BIGRS Surveillance Analyses, 2018)
Map 1. Point map : all crashes, Bandung, 2017

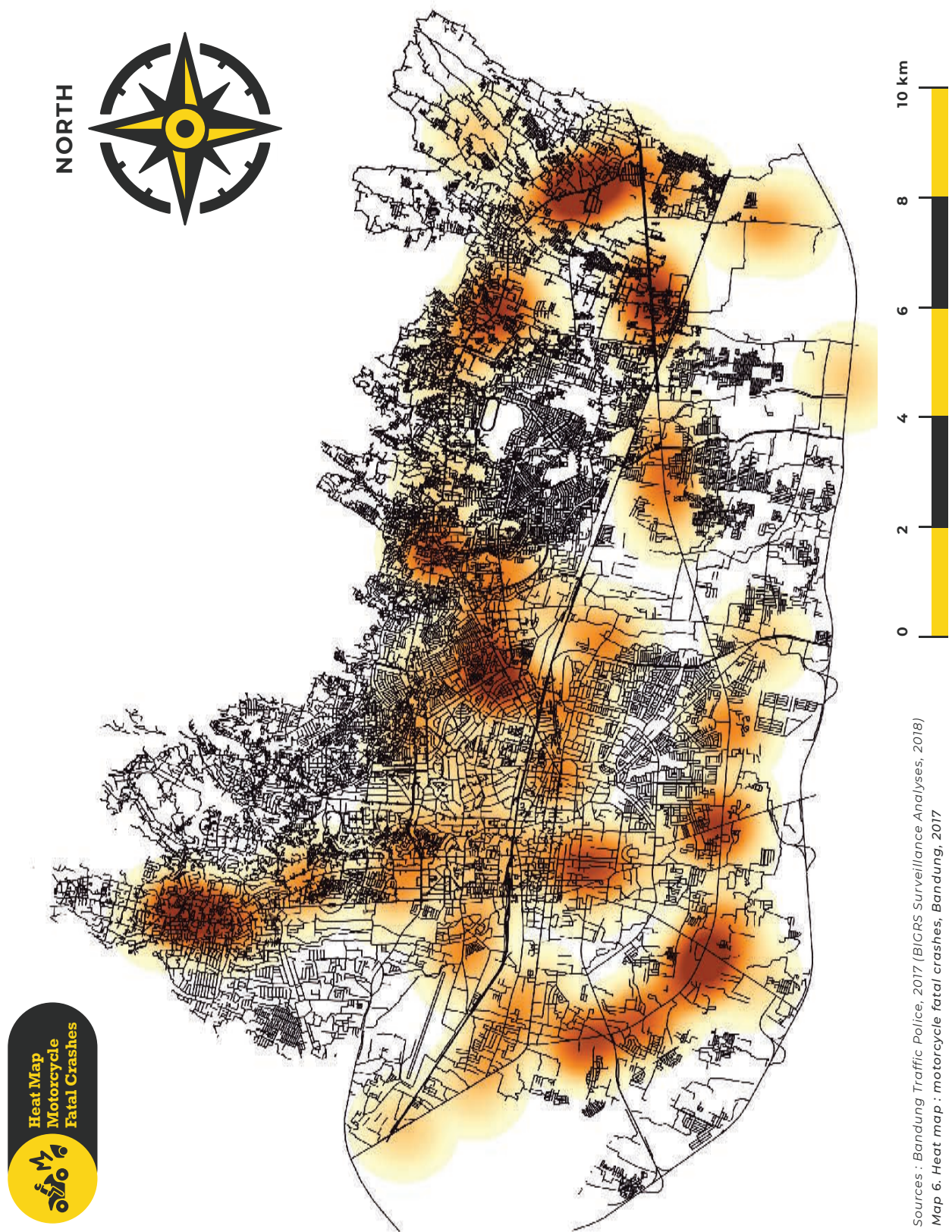


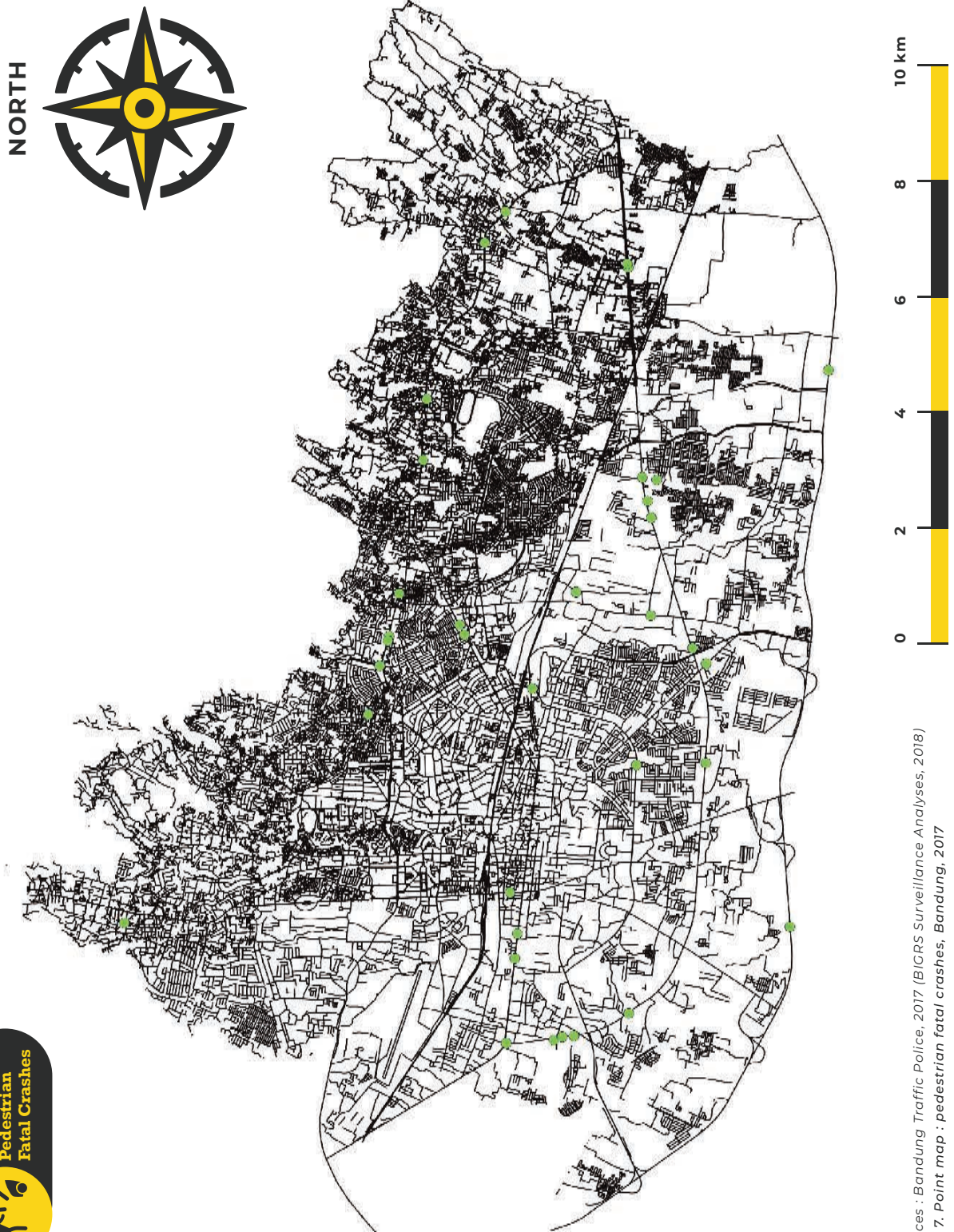


Sources : Bandung Traffic Police, 2017 (BIGPS Surveillance Analyses, 2018)
Map 3. Point map : fatal crashes, Bandung, 2017

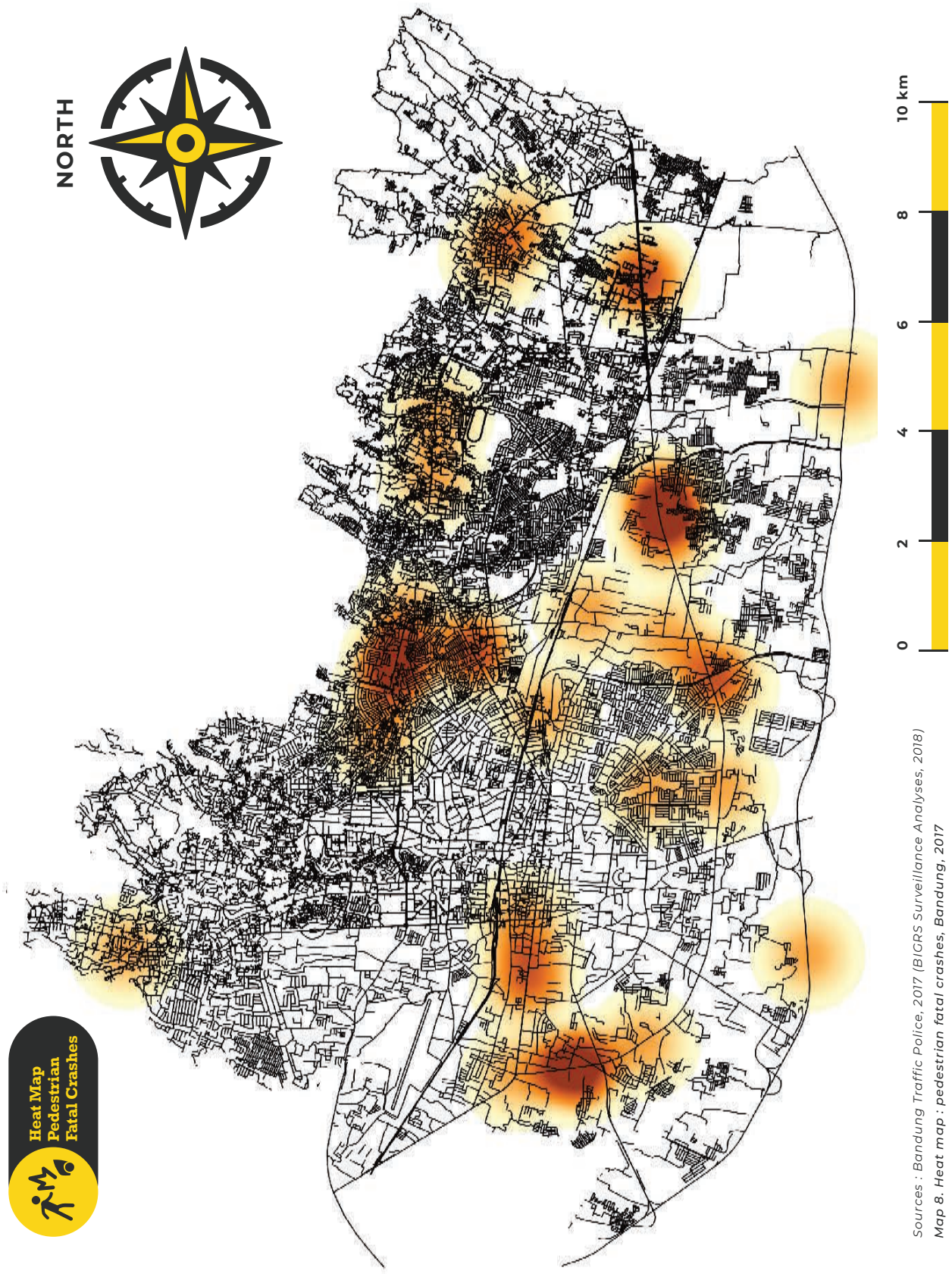




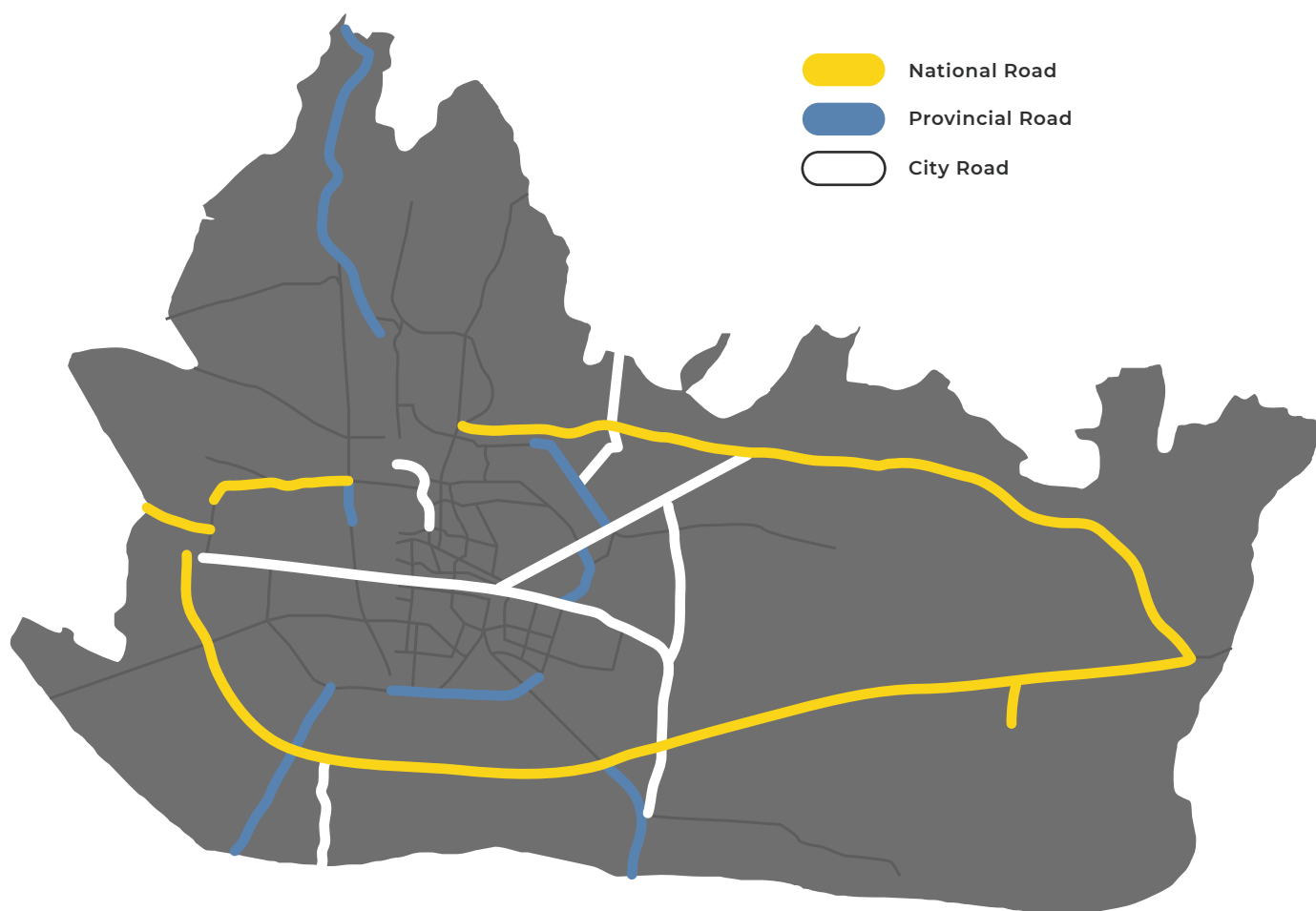




Sources : Bandung Traffic Police, 2017 (BIGPS Surveillance Analyses, 2018)
Map 7. Point map : pedestrian fatal crashes, Bandung, 2017



This report also identifies high-risk segments and intersections based on crash history at these locations. High-risk segments are classified by road status — national, province and city roads — which are then ranked by fatality rate per kilometer per year.



Sources : Bandung Traffic Police and Department of Public Works, 2017 (BIGRS Surveillance Analyses, 2018)
Map 9. Map of high risk segments, Bandung 2017

Here is the summary for average of number of fatalities/km during 2015 to 2017.

Table 4. Average of fatality rate/Km

Road Status	Length of Road Network (Km)	Deaths			Avg.of Fatality Rate / Km
		2015	2016	2017	
National	45,63	37	25	56	2,59
Provincial	38,498	9	10	19	0,99
City	959,688	54	49	82	0,19
Total	1,043,816	100	84	157	0,33

Sources : Bandung Traffic Police and Department of Public Works, 2017 (BIGRS Surveillance Analyses, 2018)

Below is a summary of the top ten high-risk segments for each road classification.

Table 5. High risk segments on national roads

No.	Road Name	Length (Km)	Total Deaths	Fatality Rate/Km
1.	Raya Sindanglaya / A.H Nasution	4,13	11	2,63
2.	Gedebage	0,46	1	2,17
3.	Raya Cipadung	1,45	3	2,07
4.	Rajawali Barat	0,97	2	2,06
5.	Raya Ujungberung	2,88	5	1,74
6.	P.H.H.Mustofa/Suci	2,37	4	1,69
7.	Soekarno Hatta	18,35	24	1,31
8.	Surapati	1,8	2	1,11
9.	Abdul Rahman Saleh	1,04	1	0,96
10.	Pajajaran	1,06	1	0,94

Sources : Bandung Traffic Police and Department of Public Works, 2017 (BIGRS Surveillance Analyses, 2018)

Table 6. High risk segments on provincial roads

No.	Road Name	Length (Km)	Total Deaths	Fatality Rate/Km
1.	Ahmad Yani	0,535	2	3,74
2.	Laswi	1,171	2	1,71
3.	Setiabudi	4,98	8	1,61
4.	Pasirkaliki (Kbn. Kawung - Pajajaran)	0,68	1	1,47
5.	W.R. Supratman	1,676	2	1,19
6.	Terusan Buah Batu	2,26	2	0,88
7.	BKR	2,187	1	0,46
8.	Kopo	3,12	1	0,32

* Only available for 8 segments where the fatal crashes occurred

Sources : Bandung Traffic Police and Department of Public Works, 2017 (BIGRS Surveillance Analyses, 2018)

Table 7. High risk segments on city roads

No.	Road Name	Length (Km)	Total Deaths	Fatality Rate/Km
1.	Jend. Sudirman (Asia Afrika)	1,96	3	1,53
2.	Cibaduyut	1,75	2	1,14
3.	Ahmad Yani	4,24	4	0,94
4.	Pahlawan	1,066	1	0,94
5.	Jend. Sudirman(Simpang Jamika)	1,1	1	0,91
6.	Gatot Subroto	3,391	3	0,88
7.	Ibrahim Adjie	4,584	4	0,87
8.	Jend. Katamso	1,242	1	0,81
9.	Wastukencana	1,4	1	0,71
10.	Asia Afrika	1,487	1	0,67

Sources : Bandung Traffic Police and Department of Public Works, 2017 (BIGRS Surveillance Analyses, 2018)

Approximately 80 intersections have been further analyzed using a weighting score with fatal crashes weighted as 12, injury crashes weighted as 3, and damage-only crashes weighted as 1 (Pd. T-09-2004-B). Six of the 10 highest risk intersections are on national roads, two are on provincial roads, and two on city roads (Table 8).

Table 8. High risk intersections

No.	Road Name	2017				Total Score
		Deaths	Severe	Minor	PDO	
1.	Soekarno Hatta - Gedebage	2	0	3	0	33
2.	Otto Iskandar Dinata - Pungkur	2	0	2	0	30
3.	Pelajar Pejuang - Gatot Subroto	1	0	5	0	27
4.	Soekarno Hatta - Cijagra & Waas	1	0	4	0	24
5.	Soekarno Hatta - Kopo	1	0	2	0	18
6.	Surapati - PHH. Mustofa	1	0	2	0	18
7.	Soekarno Hatta - Pasir Koja	0	0	5	0	15
8.	Abdurrahman Saleh - Pajajaran	1	0	1	0	15
9.	Astana Anyar - Pasir Koja	1	0	1	0	15
10.	Laswi - Ahmad Yani	1	0	1	0	15

Sources : Bandung Traffic Police and Department of Public Works, 2017 (BIGRS Surveillance Analyses, 2018)



Sources : Bandung Traffic Police and Department of Public Works, 2017 (BIGRS Surveillance Analyses, 2018)

Map 10. Map of high risk intersections, Bandung 2017



.bdg



— FUN FACT —

Bandros (Bandung Tour on Bus) is a tourist bus in Bandung that has 12 colourful fleets and 5 routes.

BANDUNG

SPOTLIGHTS



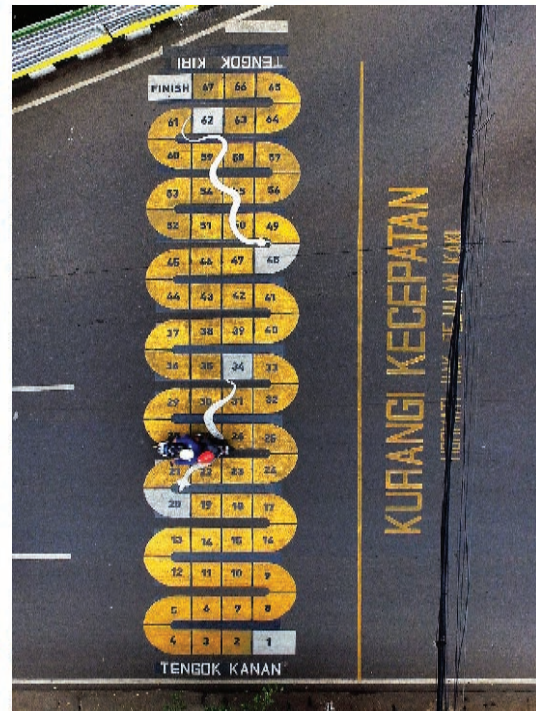
Bandung Bike Sharing : Bike on Street Everybody Happy (BOSEH)



Bird Eye View of Pasupati Bridge



Signs Around Bandung Street



Bandung Pedestrian Crossing



Pedestrian Crosswalk Button in Asia Afrika Street



Bandung City Road



Bandros (Bandung Tour on Bus)

Hospital Road Injury Data

03

A new system for reporting hospital road injury data was initiated in 2017. Ten hospitals were invited to participate in routine monthly reporting to the city Health Department of serious road traffic injuries (admissions) and deaths. Reported below are the findings from participating hospitals. Note that since not all hospitals in the city participated, and only admissions and deaths were reported, the figures are lower than police-reported crash injury figures. Additionally, many cases from outside Bandung are referred for care in Bandung hospitals; these cases are not included except in the first table below.

Table 9. Road traffic injury admissions and deaths reported from 10 Bandung hospitals

No.	Hospital Name	Reported Cases	%	Cases in Bandung	%
1.	Hasan Sadikin	320	45%	77	24%
2.	RSUD Kota Bandung	67	9%	61	91%
3.	Advent	41	6%	24	59%
4.	Santo Borromeus	157	22%	148	94%
5.	Immanuel	29	4%	29	100%
6.	Al-Islam	72	10%	48	67%
7.	Muhammadiyah	7	1%	7	100%
8.	Pindad	9	1%	9	100%
9.	Sartika Asih	1	0%	1	100%
10.	Santosa Central	11	2%	10	91%
Total		714	100%	414	58%

Sources : 10 selected hospitals in Bandung, 2017

There were 714 admissions and deaths reported by 10 hospitals, of which 414 (58 percent) were due to crashes occurring in Bandung. Hasan Sadikin hospital, the largest tertiary-care hospital in the city, accounted for 45 percent of total cases, only 24 percent of which were from crashes occurring in Bandung. Among all reported cases from Bandung crashes, there were 379 (92 percent) serious injuries and 35 (8 percent) deaths.

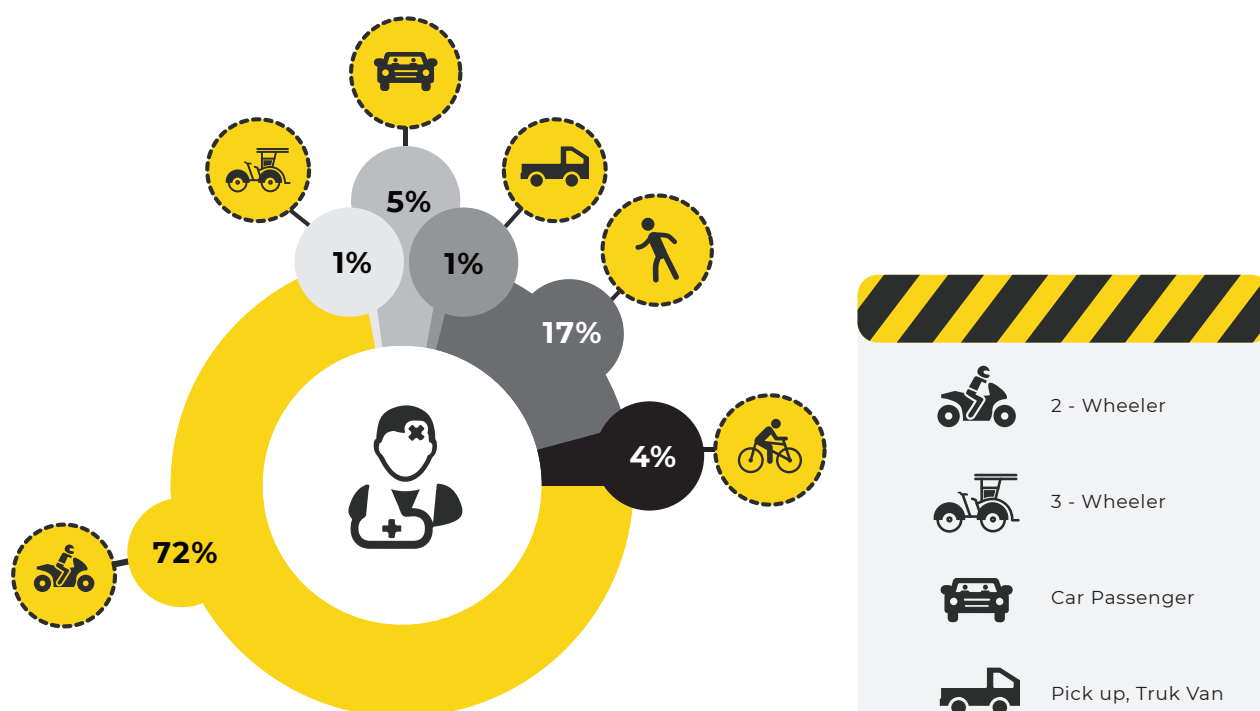
Table 10. Hospital - reported injuries and deaths due to crashes in Bandung

			
1.	Hasan Sadikin	61	16
2.	RSUD Kota Bandung	55	6
3.	Advent	21	3
4.	Santo Borromeus	144	4
5.	Immanuel	27	2
6.	Al-Islam	45	3
7.	Muhammadiyah	7	0
8.	Pindad	9	0
9.	Sartika Asih	0	1
10.	Santosa Central	10	0
Total		379	35

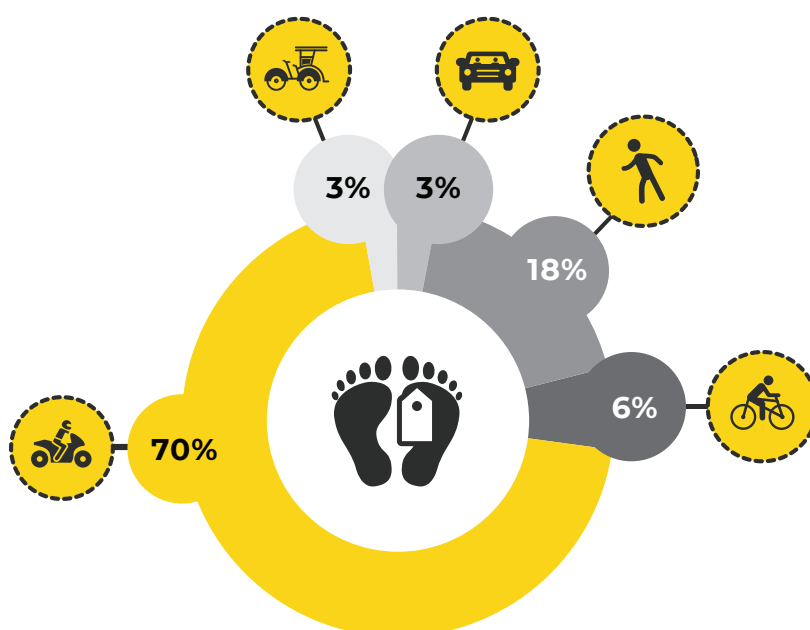
 Injuries
 Deaths

Sources : 10 selected hospitals in Bandung, 2017

Hospital road injury data by road user type was generated based on ICD-10 external cause codes that show the mechanism of the crash. Hospital data include a higher proportion of crashes that involve vulnerable road users like bicyclists and 3-wheelers, which occur very rarely in police records (with none reported in 2017). The number of deaths among vulnerable road users (motorcyclists, pedestrians, bicyclists, and 3-wheelers) account for 97 percent of deaths compared to 93 percent from police records, and 94 percent of injuries compared to 92 percent from police records.

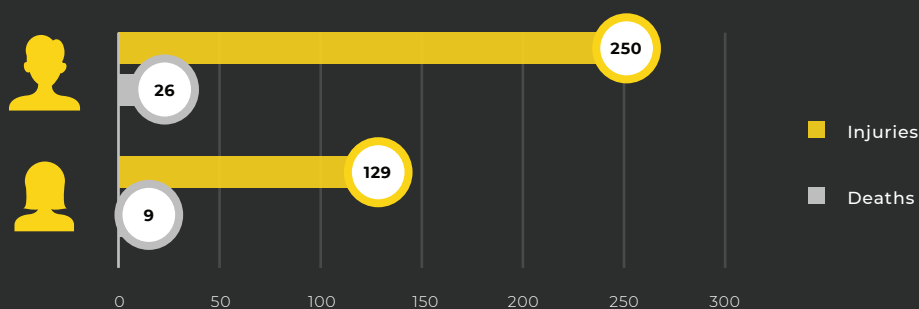
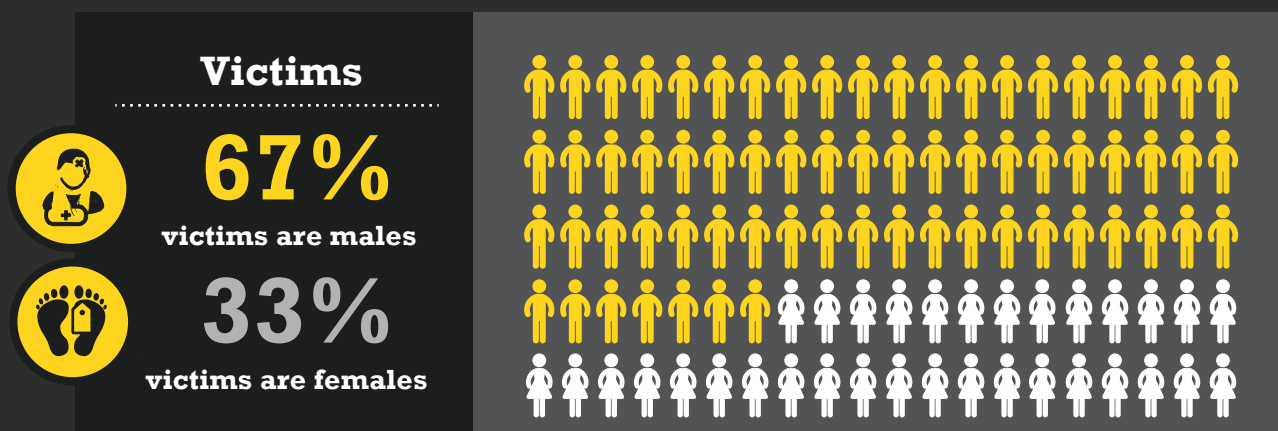


Sources : 10 selected hospitals in Bandung, 2017
Figure 24. Hospital injuries by road user type, Bandung 2017



Sources : 10 selected hospitals in Bandung, 2017
Figure 25. Hospital deaths by road user type, Bandung 2017

Consistent with police records, males are the most affected victims, accounting for 67 percent compared to 33 percent female



Sources : 10 selected hospitals in Bandung, 2017
Figure 26. Hospital injuries and deaths by gender, Bandung 2017

Similar to police crash data, the 15-to-24-years-old age group sustains the highest proportion of injuries (32 percent) and deaths (40 percent) of total cases.

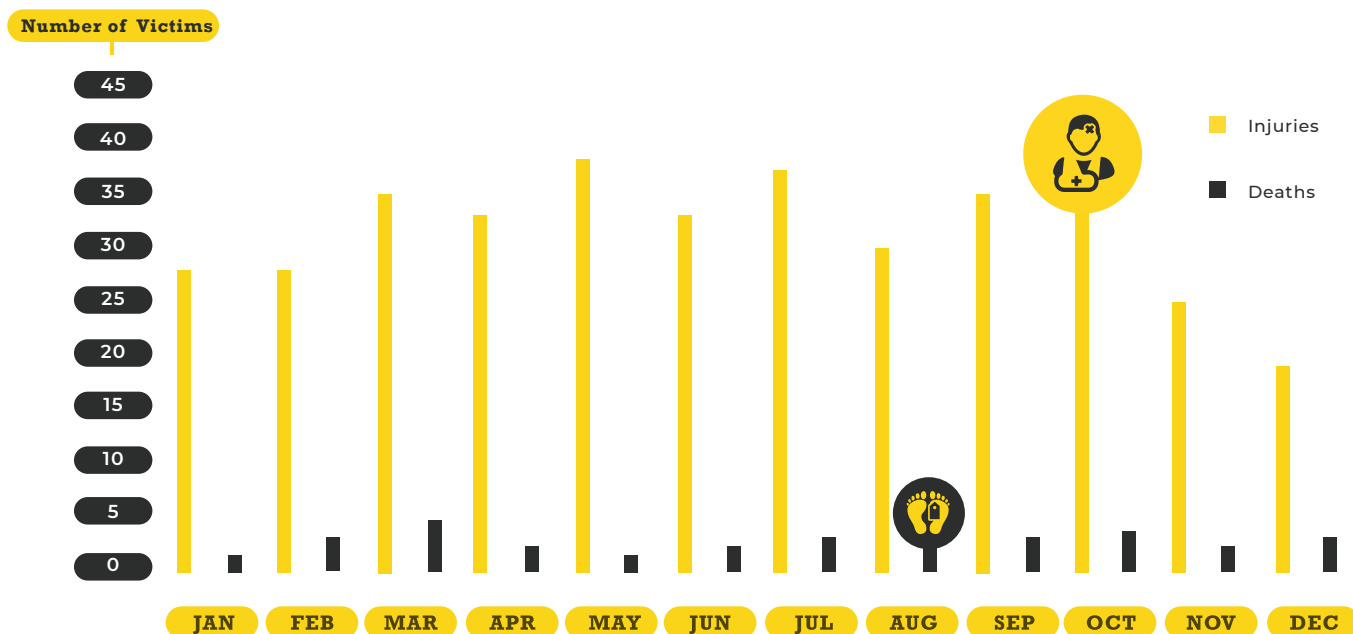
Table 11. Hospital injuries and deaths by age group, Bandung 2017

Age Group				
0-14	6	2%	0	0%
5-14	24	6%	0	0%
15-24	122	32%	14	40%
25-34	52	14%	6	17%
35-44	55	15%	4	11%
45-54	54	14%	3	9%
55-64	32	8%	2	6%
65-74	25	7%	3	9%
75+	7	2%	2	6%
Unknown	2	1%	1	3%
Total	379	100	35	100%

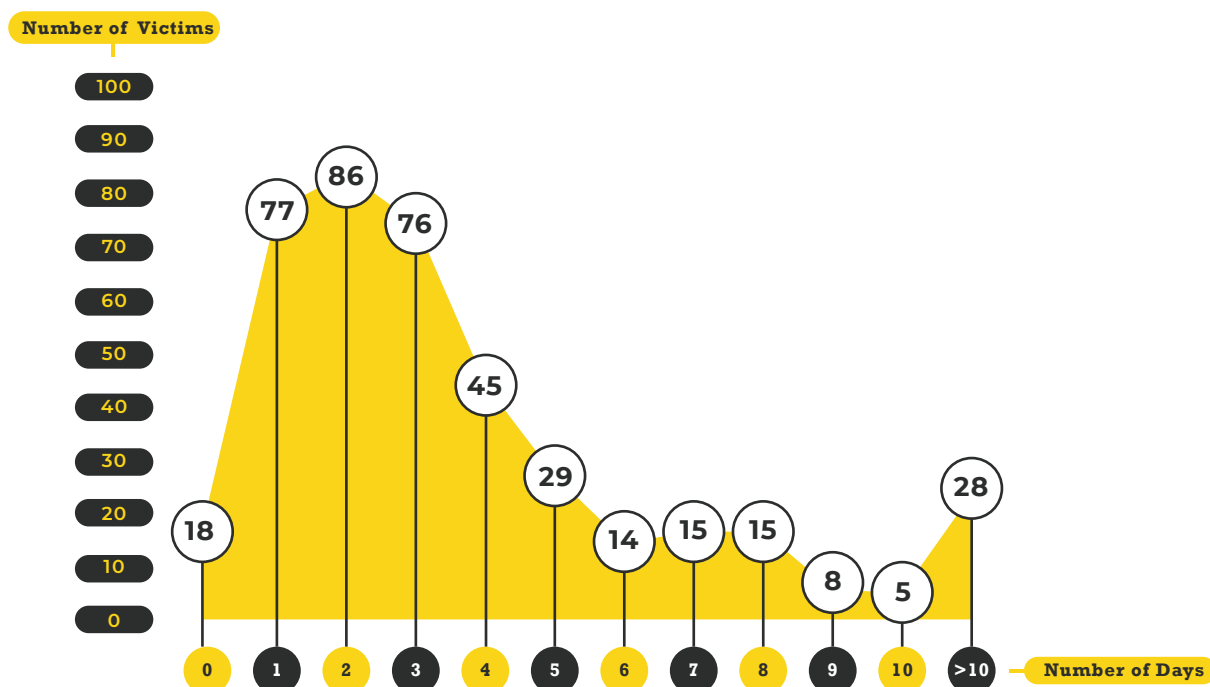
 Injuries
 Deaths

Sources : 10 selected hospitals in Bandung, 2017

Injuries fluctuated by month without a clear seasonal pattern, and the months with the highest number of injuries (October) and deaths (August) did not match police data. Length of stay ranged from <1 to 61 days, with most between two and four days. Median length of stay was 3,34 days.



Sources : 10 selected hospitals in Bandung, 2017
Figure 27. Road traffic injuries and deaths by month



Sources : 10 selected hospitals in Bandung, 2017
Figure 28. Length of stays

The tables below show the hospital road injury data by victim matrix based on standard external cause codes in the ICD-10 coding system. These codes classify based on both the road user type of the victim and the vehicle colliding with them.

Table 12. Hospital injuries matrix based on external cause codes (ICD-10 chapter 20)

Victims	Pedestrian or animal	Bicycle	2 - Wheeler or 3 - Wheeler	Car passenger, Pick up, Van	Heavy Vehicles, Bus	Train	Unmotorized Vehicles	Immovable Object	Noncollision Transport Accident	Undefined Vehicles	Total
Pedestrian		0	48	10	0	0	0			2	60
Bicycle	0	0	1	0	0	0	0	0	8	5	14
2 - Wheeler	5	1	44	56	2	0	0	17	83	49	257
3 - Wheeler	0	0	1	0	0	0	0	0	2	1	4
Car Passenger	0	0	2	11	0	0	0	3	2	1	19
Pick up, Truk Van	0	0	0	0	0	0	0	0	1	1	2
Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0
Bus	0	0	0	0	0	0	0	0	1	0	1
Total	5	1	96	77	2	0	0	20	97	59	357

Sources : 10 selected hospitals in Bandung, 2017

Table 13. Hospital deaths matrix based on external cause codes (ICD-10 chapter 20)

Victims	Pedestrian or animal	Bicycle	2 - Wheeler or 3 - Wheeler	Car passenger, Pick up, Van	Heavy Vehicles, Bus	Train	Unmotorized Vehicles	Immovable Object	Noncollision Transport Accident	Undefined Vehicles	Total
Pedestrian		0	2	2	0	0	0			2	6
Bicycle	0	0	0	1	0	0	0	1	0	0	2
2 - Wheeler	1	0	5	5	0	0	0	2	5	5	23
3 - Wheeler	0	0	0	0	0	0	0	1	0	0	1
Car Passenger	0	0	0	0	0	0	0	1	0	0	1
Pick up, Truk Van	0	0	0	0	0	0	0	0	0	0	0
Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0
Bus	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	7	8	0	0	0	5	5	7	33

Sources : 10 selected hospitals in Bandung, 2017



SEVERITY (AIS) DISTRIBUTION

The Abbreviated Injury Scale (AIS) is a coding system for injuries in use since 1971 and employed globally in trauma centres. The original objective was to classify vehicle injuries by location and severity. It has been broadened to all injuries and trauma since the early 1980s. AIS is simple method for ranking injuries by severity (1=minor, 6=most severe). The severity score is mainly based on likelihood of death, but also includes complexity/long-term disability, especially at lower scores. It is not directly mappable to ICD-10, but mapping schemes have been developed. The maximum AIS (MAIS) score of ≥ 3 is global standard definition of “severe” road injury. The table below is the MAIS distribution based on mapping of ICD-10 injury codes among hospital reported cases in 2017 in Bandung.

Table 14. MAIS distribution, 2017

Score	Severity	%
6	Unsurvivable	0%
5	Critical	0%
4	Severe	1%
3	Serious	14%
2	Moderate	34%
1	Minor	13%
0	N/A	38%
Total		100%

Sources : BIGRS Surveillance Analyses, 2018

These findings suggest that a substantial proportion of admissions (47 percent) are for relatively minor injuries (score 1 and 2). Use of hospital admission as a proxy for severity in Bandung may therefore overestimate the severity of injuries. Ongoing opportunities exist to improve the quality of injury coding, given that 38 percent of cases did not have mappable codes.



● DID YOU KNOW ●

Ambulance patrol is a routine program from Department of Health Bandung as an effort to bring the services closer, to detect emergency cases including road traffic crashes earlier, and to promote to the public about the service. Patrols are conducted at least 3 (three) times with a priority on peak hours (morning and afternoon/afternoon and night).



.bdg



— FUN FACT —

“Layad Rawat” and Motorcycle Ambulance are the innovations of Bandung City Government in health service and they have officially been operated since July 26, 2017 as an effort to support the Integrated Emergency Management System program. People can contact 119 to get emergency medical aid including road traffic crashes.

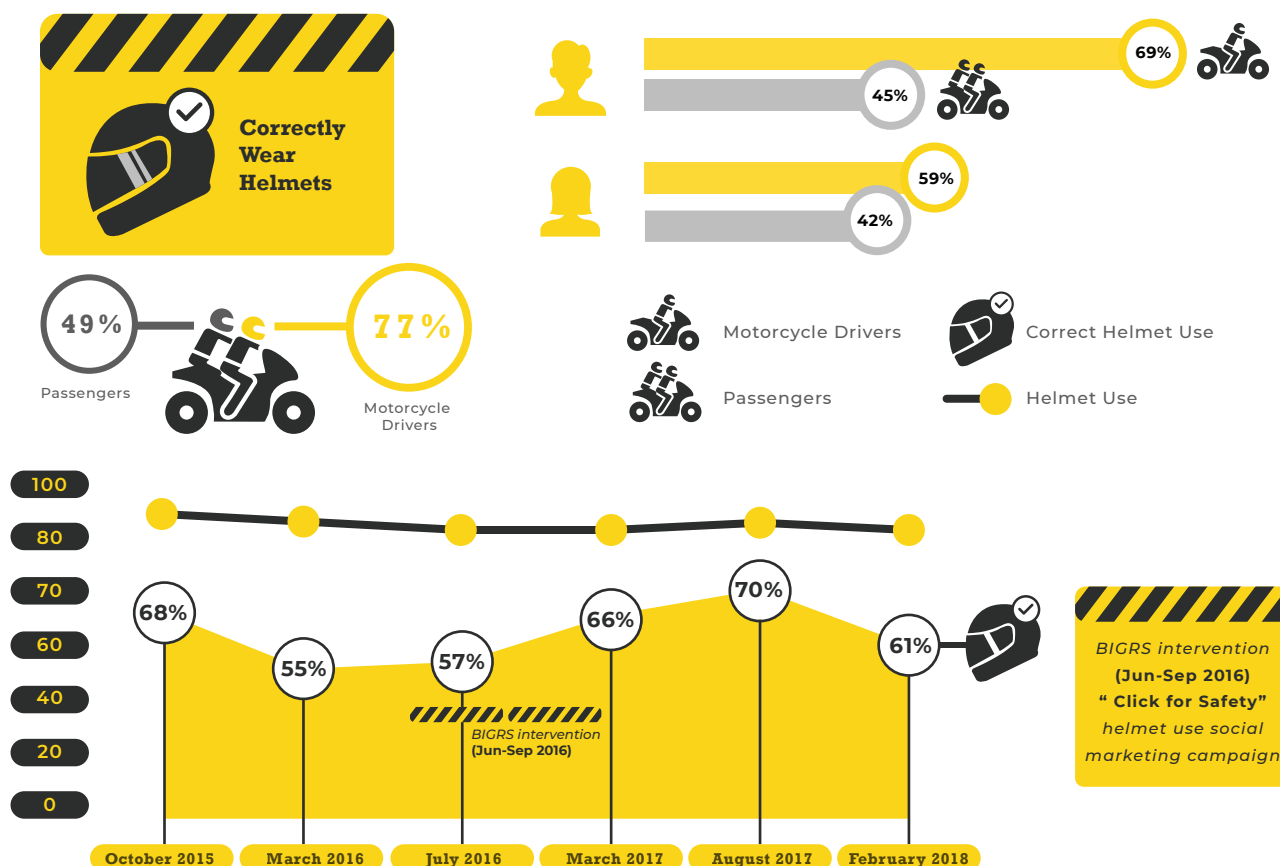
Observational Data Studies

04

The Johns Hopkins International Injury Unit (JH-IIRU) worked with the Padjadjaran University (UNPAD) to conduct observational surveys on the prevalence of key risk factors: drink driving, speeding, helmet use, seat-belt, and child restraint use. Handheld phone use was also measured in the more recent rounds. These observations are done twice a year using standardized procedures for direct observations at roadside locations across Bandung. Six rounds of surveys have been completed from October 2015 through February 2018. Results of these six rounds are summarized below.

1. Motorcycle helmet use

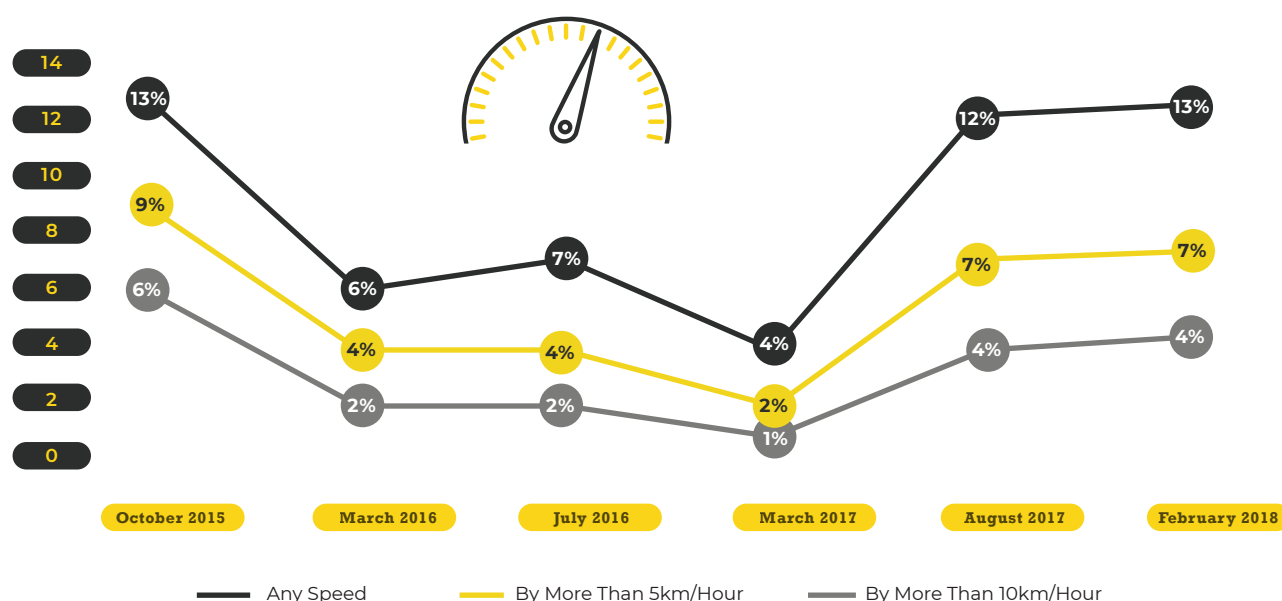
Overall, about 61 percent of motorcyclists wore helmets correctly in the most recent set of observations in early 2018. Although correct helmet use increased to 70 percent after a media campaign in 2016, it dropped again to 61 percent in 2018, below the starting point in 2015. Drivers wore helmets correctly (77 percent) more frequently than passengers (49 percent). Male motorcycle drivers (69 percent) and passengers (45 percent) were more likely to correctly wear helmets than female motorcycle drivers (59 percent) and passengers (42 percent).



Sources : JH-IIRU and UNPAD, 2015-2018
Figure 29. Percentage of motorcycle riders using helmet

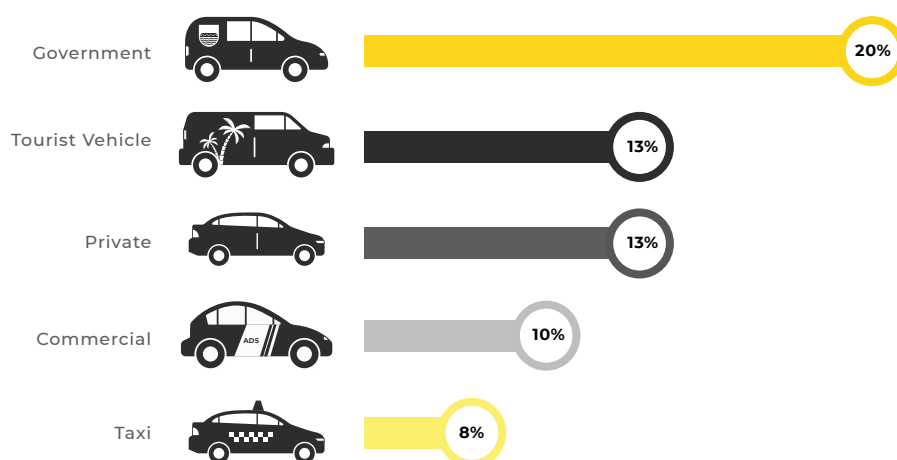
2. Speeding

Approximately 12.5 percent of vehicles drove faster than the speed limit in Bandung in early 2018 observations. Speeding rates decreased after October 2015 but increased again in 2017 and have remained higher. Speeding was much more common on national roads (41 percent of vehicles) than on provincial (8 percent) or city roads (3 percent).



Sources : JH-IIRU and UNPAD, 2015-2018
Figure 30. Percentage of vehicles observed exceeding the speed limit

Government-owned vehicles were most likely to speed (20 percent) and taxis were the least likely to speed (8 percent). Sedans and SUVs exceeded the speed limit more often than other vehicle types. Speeding was more likely to occur in the early (7:00 am) and late (11:30 am) morning.



Sources : JH-IIRU and UNPAD, 2015-2018
Figure 31. Percentage vehicles speeding by ownership



16%
Sedan



16%
SUV / 4WD



14%
Truck/ Large
Truck



13%
Minibus/
Minivan



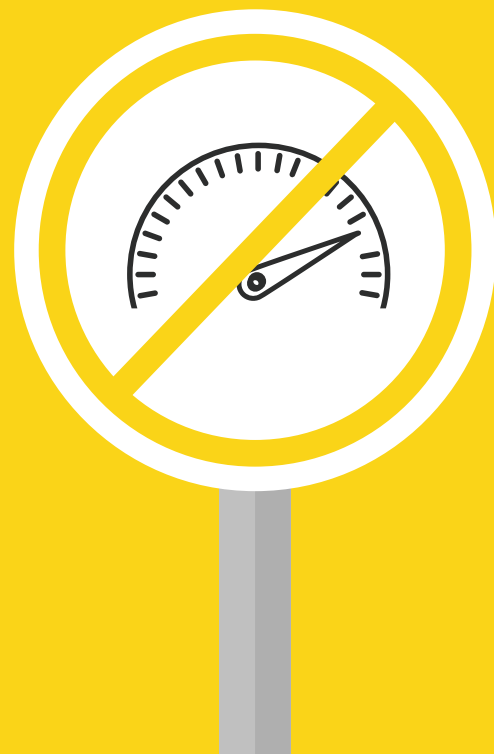
12%
Pickup/ Light
Truck



11%
Motorcycle



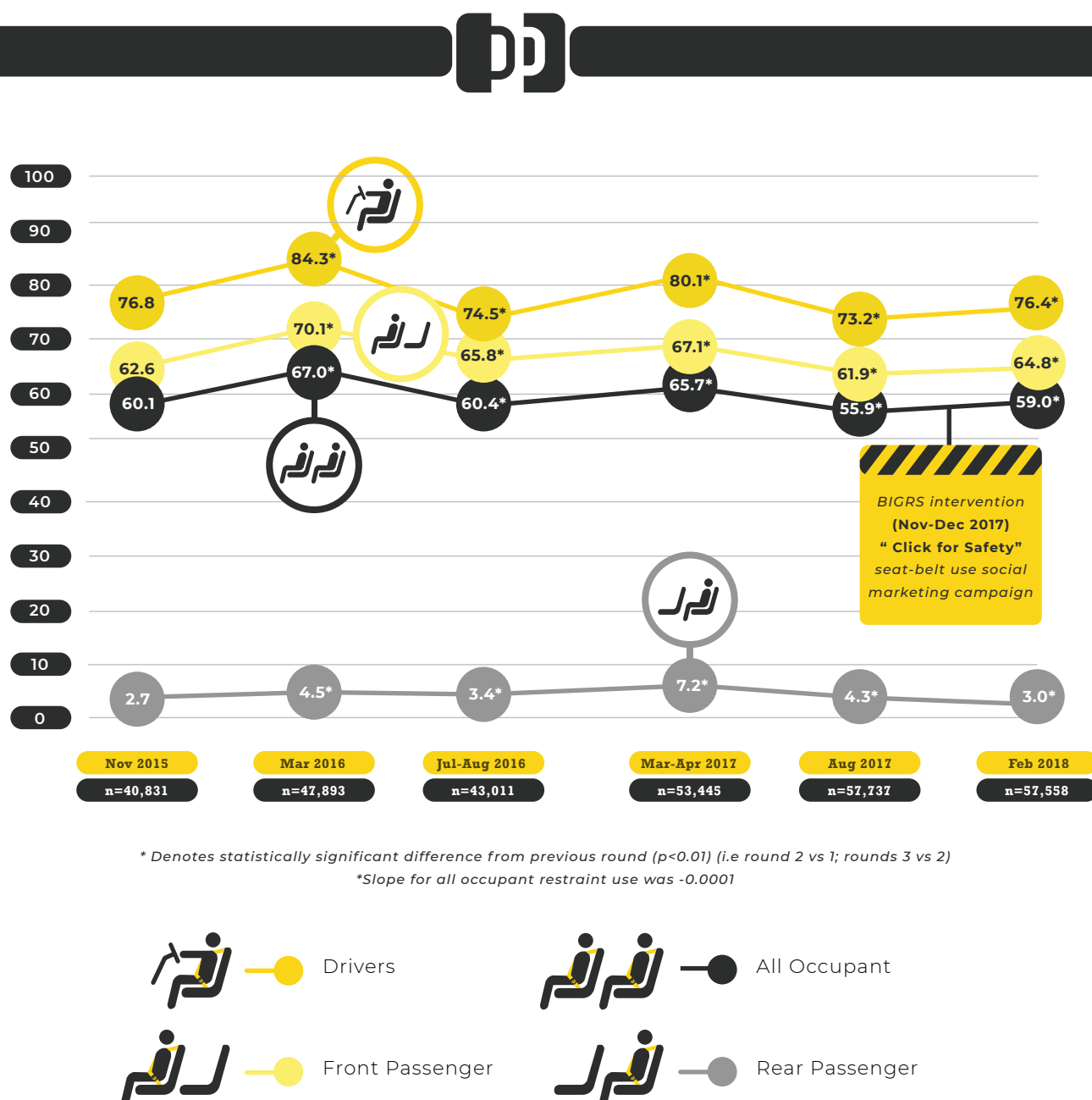
11%
Bus



Sources : JH-IIRU and UNPAD, 2015-2018
Figure 32. Percentage of vehicles speeding

3. Seat-belts and child restraints

Almost 65 percent of vehicle occupants wore a seat-belt in 2018 observations, with no significant change in rates since the 2015 baseline. Drivers were most likely to wear seat-belts (76 percent), but only 59 percent of front seat passengers did so, and rear seat passengers almost never (3 percent) used one (3 percent).

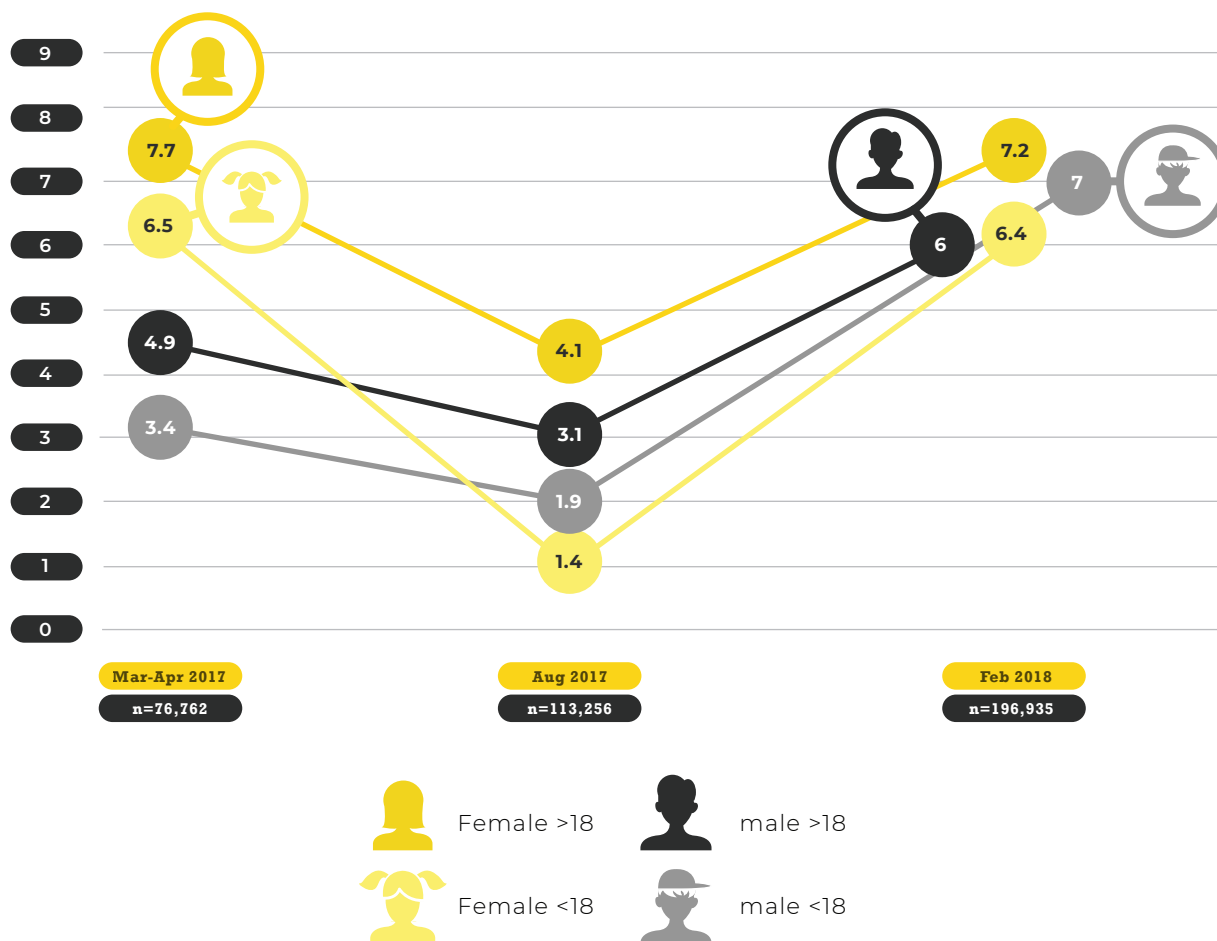


Sources : JH-IIRU and UNPAD, 2015-2018
Figure 33. Proportion of seat-belt use : overall and by occupant position

Female drivers (85 percent) were somewhat more likely to wear seat-belts than male drivers (75 percent). Very few children are protected by child restraints in Bandung. Among children aged 5 to 11 years old, 7 percent had a child restraint, and only 1 percent of 0 to 5 year olds were protected.

4. Distracted driving: Handheld phone use

The use of a handheld phone while driving was measured alongside helmet use among motorcycles drivers and alongside seat-belt use among four-wheel drivers in rounds four and five of survey observations, and alongside speed observations as well for round six. Among drivers, 5.3 percent in round 4, 3.2 percent in round 5 and 4.1 percent in round 6 were found to be using a handheld phone while operating a vehicle.

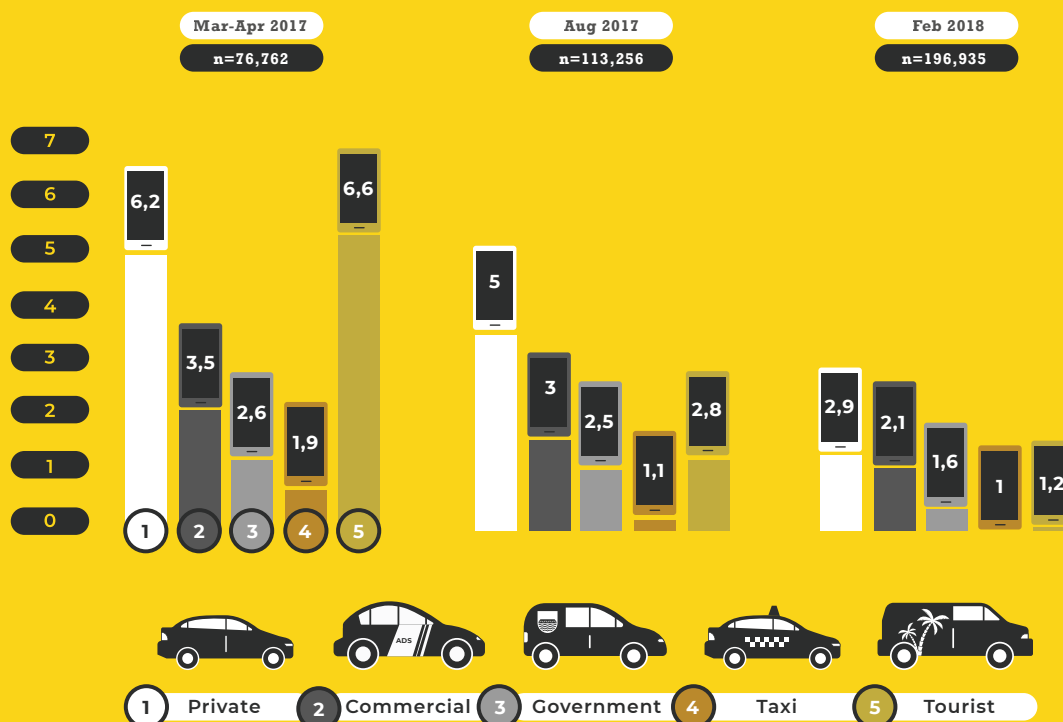


Sources : JH-IIRU and UNPAD, 2017-2018

Figure 34. Prevalence of driver handheld phone use by age and gender

Females used handheld phones while driving more frequently than males overall, but not among motorcycle drivers. Female drivers over age 18 were more likely to drive using a handheld phone, but among males there was no difference by age. Large truck drivers (1 percent) and bus drivers (2 percent) were less likely to be driving while using a handheld phone. Among 4-wheeled vehicles, drivers of private vehicles were more likely to use a handheld phone while driving than commercial, government, or taxi vehicles.





Sources : JH-IIRU and UNPAD, 2017-2018
Figure 35. Proportion of four-wheeled vehicle drivers using handheld phone by vehicle ownership

The Facts



Motorcycle Helmet The Facts

Wearing a motorcycle helmet correctly can result in

40%



reduction to risk of death

70%



reduction to risk of severe injury

98

countries

apply a national or international motorcycle helmet standard



Seat - Belt The Facts

Wearing a seat-belt reduces the risk of a fatal injury by



up to

50%

for front seat occupants

up to

75%

for rear seat occupants

while child restraints reduce the likelihood of a fatal crash by

approximately

70%

among infants



between

54-80%

among young children



Speeding The Facts

A 5% cut in average speed can result in



30%

reduction in the number of fatal crashes



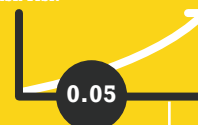
Sources : World Health Organization

Drink - Driving The Facts

Drinking alcohol and driving increases the risk of a road traffic crash



Road crash risk



Blood - alcohol concentration (BAC) g/dl where above a blood-alcohol concentration (BAC) of 0,05 g/dl can increase the risk of road traffic crash dramatically



Intervention to Prevent Road Traffic Injuries and Deaths

05

SAFER STREETS AND SAFER MOBILITY

A. World Resources Institute (WRI)

Bandung has implemented WRI recommendations and begun construction at the Asia-Afrika - Alun-Alun Timur intersection to ease safe pedestrian movement and reduce speeds around the city center square. Additionally, trial interventions were carried out at Cikudapateuh intersection, and Bandung is using observations to refine the final design. The city's design consultant is developing detailed engineering designs for Cikudapateuh based on WRI's concept design. The design for Balubur intersection is underway. Bandung has accepted WRI's safe intersection design and earmarked budget for the construction of Baltos, Balubur, and Cikudapateuh intersections in 2018. These changes are based on results from WRI's road safety inspections and concept designs. WRI also worked on capacity-building among the city stakeholders on "Safer Mobility: Improvements to Public Transport" in November 2017. About 100 participated in this workshop.



Before



Before



After

Widened medians (from 0.6 m to 4 m) on Jl. Alun-Alun Timur and reduced vehicle lane widths to provide safer space for pedestrians in city center.



After

A 63m refuge island and reduced vehicle lane widths installed on Jl. Alun-Alun Timur.

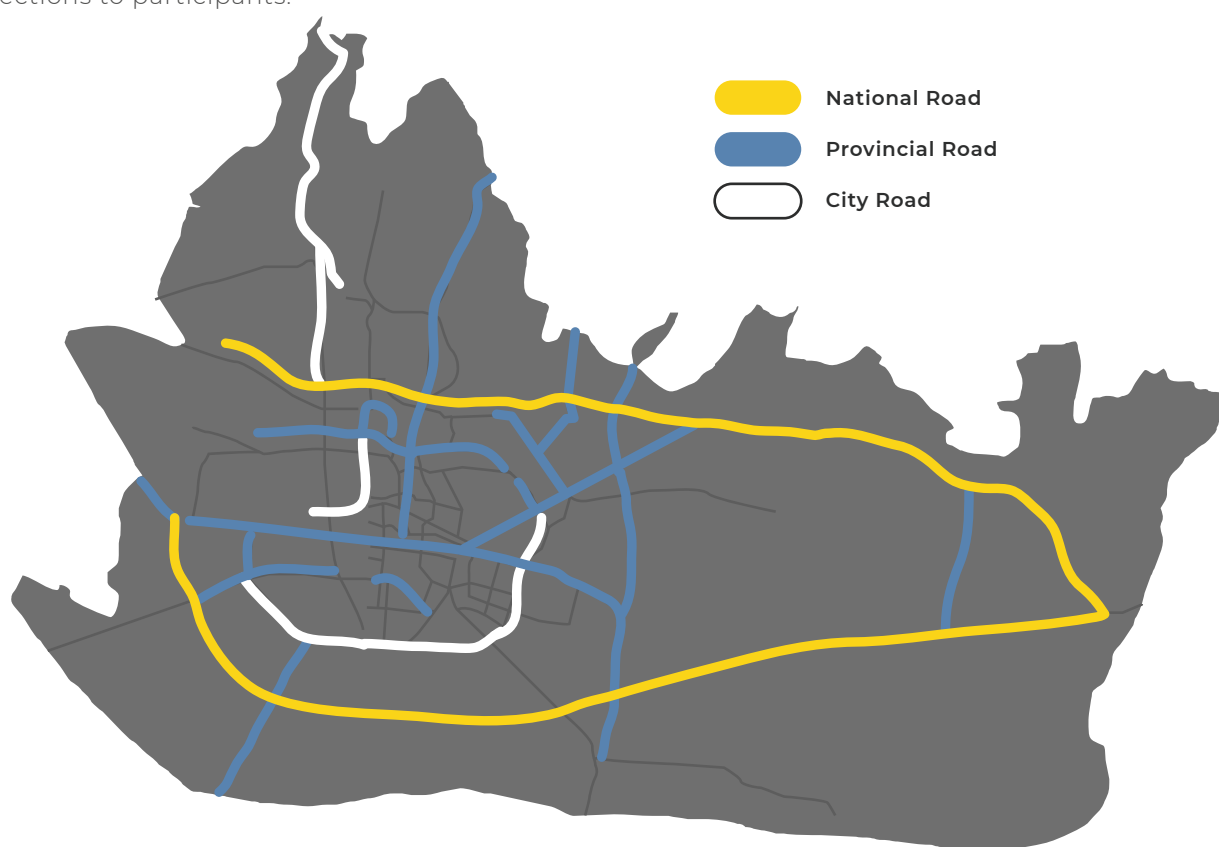
Courtesy of World Resources Institute (WRI)
Figure 36. Implementation at Asia Afrika - Alun-Alun Timur intersection

B. World Bank – Global Road Safety Facility

Starting 2017, the World Bank – Global Road Safety Facility engaged iRAP (International Road Assessment Programme) under the Bloomberg Philanthropies' Initiative for Global Road Safety (BIGRS) to support the city of Bandung in improving road safety. Among the activities undertaken, late 2017 iRAP conducted an initial baseline assessment of 50.4km of 22 priority roads in Bandung, producing star ratings and recommending countermeasures (Safer Roads Investment Plan). This assessment contains details of the 3 high risk priority streets (Cikutra, Ibrahim Adjie and Leuwipanjang) identified for further investigation and upgrade.

iRAP also conducted a desktop review of 7.5 km of sidewalk proposed upgrades in the city of Bandung. The aim was to improve the safety of future designs by identifying areas of road user risk and making recommendations to ensure that upgrades are designed and built to the highest safety standards. Further on, engaging local consultants, Institut Teknologi Bandung (ITB) and the Institute of Road Engineering (IRE), a bigger scale network assessment was undertaken and draft results of iRAP star ratings were produced for 171.5 km of city roads.

Local capacity building efforts in Bandung are ongoing. Overall, under BIGRS more than 100 specialists were trained during a series of capacity building events, such as iRAP trainings, technical meetings and an extensive 4,5-days workshop in August 2017, on "Fundamentals of Road Safety Planning, Design and Engineering", engaged Philip Jordan from Road Safety International and National Association of City Transportation Officials – Global Designing Cities Initiative (NACTO – GDCI) as the speakers. The latest workshop conducted field studies at Pet Park Intersection to give the real experience on designing safer intersections to participants.



Courtesy of Institute of Road Engineering (IRE)
Map 11. Map of selected high crash network for iRAP assessments in Bandung



MASS MEDIA AND SOCIAL MARKETING

In 2017, the City of Bandung Government collaborated with the Bloomberg Philanthropies Initiative for Global Road Safety (BIGRS) to plan and develop a seat-belt wearing campaign (<http://klikbiarselamat.com/seatbelt/index.html#>), which launched in November. This campaign was widely distributed through government and local society media platforms, including radio (Sonata Radio, Rase FM, and KLCBS Radio) and social media (@humasbdg, @infobandungcom, and @budayadisiplin). Additional communication activities were held to increase awareness of road safety issues and the important role of media in spreading accurate news based on data.

Road Safety Communication Trainings

In anticipation of the seat-belt campaign, BIGRS Bandung held two communication trainings, one with journalists and one with city officials. In July, BIGRS, together with initiative partner Global Health Advocacy Incubator (GHAi) held a full-day road safety journalist training with 23 participants from local, regional, and national media, along with road safety experts from various backgrounds, including infrastructure, enforcement, data, communication and health services, who presented and answered questions. In August, representatives from governmental sectors, media, and the community came together for a two-day strategic communication workshop to shape the seat-belt campaign.



Courtesy of Vital Strategies
Figure 37. Road safety communication trainings

Seat-Belt Wearing Campaign

In October, the “KlikBiarSelamat” social media campaign began, gaining support for proper seat-belt use ahead of the campaign’s public service announcement (PSA) launch on Nov 7. At Bandung City Hall, representatives from each city department supported the launch, with the Bandung Traffic Police, local community stakeholders, member of the public and journalists in attendance. The PSA showed the deadly consequences of not wearing a seat-belt. The seat-belt wearing campaign was supported by the City Government and Bandung Traffic Police, along with the largest car club in Indonesia, Axic van Bandung (AvB).



Instagram @klikbiarselamat



TV Interview by CNN Indonesia



Website www.klikbiarselamat.com

Courtesy of Vital Strategies
Figure 38. Seat-belt wearing campaign

AvB held a convoy through the city to support the “Click for Safety” campaign, sharing stickers and reminding drivers to properly wear seat-belts. The “KlikBiarSelamat” campaign ran through the end of 2017 on TV, radio and social media. A total of 13 percent of respondents, equivalent to 236,360 people in Bandung, recalled seeing or hearing the campaign. The social media posts promoted to Bandung drivers were viewed 3 million times. The “KlikBiarSelamat” PSA was effective: 100 percent respondents who recalled the campaign reported that the campaign made them more concerned about the importance of wearing seat-belts while driving. 89 percent of respondents who were aware of the campaign agreed that wearing seat-belts can reduce the risk of serious injury for both drivers and passengers, compared to 72 percent of those unaware of the campaign. Meanwhile, 95 percent of respondents mentioned that they persuaded other passengers and drivers to always wear seat-belts while traveling. Through this campaign, 52 percent of the total respondents said that seat-belt enforcement had increased and 92 percent of respondents who recalled the campaign said that the presence of the police on the roads had visibly increased in Bandung during the two months of the campaign.

The “KlikBiarSelamat” seat-belt campaign gave positive and encouraging results for the City of Bandung, but sustainable enforcement of seat-belts with adequate media exposure on television, radio, social media, and out-of-home resources is needed to boost the effectiveness of the campaign and change behavior.



ENFORCEMENT

Over the past 12 months, the Global Road Safety Partnership's Road Policing Capacity Building Team has worked closely with embedded Vital Strategies staff to deliver a series of theme-based workshops focusing on speed management and speed enforcement, seat belts and child restraint wearing, helmet enforcement and procedural justice. The primary aim of the training has been to improve and enhance road safety knowledge and to strengthen capability of the Bandung Traffic Police to enforce laws relating to these primary risk factors. Strengthening the capability of the road traffic police to enforce traffic laws is fundamental to deterring road users from violating the laws, reducing harm, and curbing inappropriate and unsafe road behaviours.

Bandung's road policing capacity-building work program is also designed to enhance cooperation and collaboration with key government and non-government road safety stakeholder organisations and to build and sustain high-quality policing for the improvement of road safety in Bandung.



Members of the Bandung Traffic Police participate in one of GRSP's speed enforcement workshops



Members of the Bandung Traffic Police participate in GRSP's procedural justice workshop



Bandung Traffic Police training-of-trainers workshop for helmet wearing and seat-belt enforcement

Courtesy of Global Road Safety Partnership
Figure 39. Road safety enforcement training



DATA SURVEILLANCE

To complement police crash reporting, the Bandung Health Department initiated hospital road injury reporting in 2017. After consultation and procedure development with participating hospitals, training was conducted on coding external causes of injuries (ICD-10 chapter 20). This was critical both to identify road traffic injuries and to properly classify road user types for the persons injured. This external cause coding was not used by most of the hospitals until the road injury reporting system was introduced. Participating hospitals started reporting all admissions and deaths due to road injuries on a monthly basis in January 2017.

After 6 months, the Health Department together with Vital Strategies invited all hospitals participating to do an interim assessment in July 2017. Most of the hospitals were documenting key variables (including crash location, external cause codes, admission and discharge dates, etc.) in a consistent and complete manner. There were some hospitals with significant delays in sending the reports. An important challenge with this reporting is the labour intensity, despite the limited number of variables collected, which requires ongoing commitment from hospital medical records departments. The city now is planning to develop a bridging application as a solution for this.



Interim assessment meeting
after 6 months reporting



The atmosphere of ICD-10 training at
Hasan Sadikin Hospital



Data coordination meeting between
Bandung Traffic Police and Jasa
Raharja

Courtesy of Vital Strategies
Figure 40. Road safety data surveillance activities



 @dudisugandi



— FUN FACT —

Bandung Command Center (BCC) is the innovation of Bandung City Government in public service and it has officially operated since January 19, 2015. People can contact 112 to report emergency cases including road traffic crashes.

REFERENCES

1. Badan Pusat Statistik (2014): *Kota Bandung dalam angka 2014*, Badan Pusat Statistik Kota Bandung. Bandung.
2. Badan Pusat Statistik (2015): *Kota Bandung dalam angka 2015*, Badan Pusat Statistik Kota Bandung. Bandung.
3. Badan Pusat Statistik (2016): *Kota Bandung dalam angka 2016*, Badan Pusat Statistik Kota Bandung. Bandung.
4. Badan Pusat Statistik (2017): *Kota Bandung dalam angka 2017*, Badan Pusat Statistik Kota Bandung. Bandung.
5. Badan Pusat Statistik (2018): *Kota Bandung dalam angka 2018*, Badan Pusat Statistik Kota Bandung. Bandung.
6. County Health Rankings. (2018): *Premature death*, <http://www.countyhealthrankings.org/explore-health-rankings/what-and-why-we-rank/health-outcomes/mortality/premature-death> (accessed on 27 July 2018, 14:00 PM)
7. Departemen Pemukiman dan Prasarana Wilayah. (2004): *Penanganan lokasi rawan kecelakaan lalu lintas*. Pd. T-09-2004-B. Jakarta.
8. Dinas Perhubungan Kota Bandung. (2015): *Bandung urban mobility project*. Bandung.
9. Institute of Health Metrics and Evaluation. (2016): *Global burden of disease report*, <http://www.healthdata.org/indonesia> (accessed on 25 July 2018, 13:35 PM)
10. Johns Hopkins International Injury Research Unit and Universitas Padjajaran. (2017): *Data technical report – round 6, Bloomberg Initiative for Global Road Safety*. Bandung.
11. Korlantas Polri. (2013): *User manual IRSMS accident information system (AIS)*. Jakarta.
12. Korlantas Polri. (2017): *Statistik Kecelakaan Lalu Lintas Jalan di Indonesia Tahun 2016*. Jakarta.
13. Pemerintah Kota Bandung. (2017): *Bandung road safety annual report 2015-2016*. Bandung.
14. Pemerintah Republik Indonesia. (2010): *Rencana umum nasional keselamatan jalan*. Jakarta.
15. Vital Strategies. (2018): *Communicating with data: a guide to writing public health data reports*. Vital Strategies. New York.
16. World Atlas. (2018): *Biggest city in Indonesia*, <https://www.worldatlas.com/articles/biggest-cities-in-indonesia.html> (accessed on 14 August 2018, 11:34 AM)
17. World Health Organization (WHO). (2007): *Youth and road safety*. World Health Organization, Switzerland.
18. World Health Organization (WHO). (2010): *ICD-10, International statistical classification of diseases and related health problems*. World Health Organization, Switzerland.
19. World Health Organization (WHO). (2010): *Data systems*. World Health Organization, Switzerland.
20. World Health Organization (WHO). (2015): *Global status report on road safety 2015*. World Health Organization, Switzerland.





design by

pikirmikir
design
studio

@pikirmikir



Bandung City Government
Planning, Research and Development Board
City of Bandung
Jl. Aceh No. 36 Bandung
Indonesia