



## **BIG DATA SCREENING: USING BIG DATA TO PRIORITISE SCHOOL ROAD SAFETY ASSESSMENTS**

**Final version, November 2021**

## ABOUT THIS PROJECT

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

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

### Project Funders

#### Lead Funder



Fondation Botnar

<https://www.fondationbotnar.org>

#### Co-funder



FIA Foundation

<https://www.fiafoundation.org>

### Project Partners



AIP Foundation (Lead partner)

<https://www.aip-foundation.org>



International Road Assessment  
Programme (iRAP)

<https://irap.org>



Anditi

<https://www.anditi.com>

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## EXECUTIVE SUMMARY

This report presents an application of the Big Data Screening Methodology developed for the *AI&Me: Empowering youth for safer roads* project. It describes big data sources and the attribute calculations based on the specificity of the three cities where the project is being piloted: Ho Chi Minh City, Pleiku City and Yen Bai City.

The methodology aligns evidence-based attributes and big data sources to allow the ranking of schools from the highest to lowest road safety risk for pedestrians, resulting in a prioritized list for further detailed Star Rating for Schools assessments. The schools that should be prioritized are presented for each of the three pilot cities.

## ABBREVIATIONS

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

| Abbreviation | Definition                         |
|--------------|------------------------------------|
| CSV          | Comma-separated values data format |
| FRC          | Functional road classes            |
| GHSL         | Global Human Settlement Layer      |
| GIS          | Geographic information system      |
| HCMC         | Ho Chi Minh City                   |
| KPI          | Key performance indicator          |
| LiDAR        | Light detection and ranging        |
| MN-R         | Multinet R data                    |
| NGO          | Non-governmental organization      |
| SR4S         | Star Rating for Schools            |
| TAZ          | Traffic analysis zones             |
| UN           | United Nations                     |

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# 1 INTRODUCTION

All children have the right to access education safely and sustainably. The *AI&Me: Empowering youth for safer roads* project aims to promote a safe environment for children around schools. Using technology to boost change, the project provides tools to prioritize actions and engage the community.

This report is the second of five deliverables which will be produced during the project. It builds on the first deliverable of the project, which proposed a risk screening methodology using big data sources to assess road safety for pedestrians from a macro-level perspective.

The aim of the risk screening methodology is to allow the categorization of schools in a given geographical area based on road safety risk, resulting in a priority list for further investigation using the iRAP Star Rating for Schools (SR4S) tool.

Together with SR4S, the method will help decision-makers make effective and evidence-based choices linked to the highest impact and most cost-effective road safety interventions to save children's lives.

This report puts into practice the methodology presented in the previous *Big Data Analysis Report*<sup>1</sup>. The method uses available big data sources, including open data hubs, telematics, and satellite data, to 'scan' school locations in three cities in Viet Nam. Data collected for Ho Chi Minh City, Yen Bai City, and Pleiku City helps to target at-risk communities, identify built environment risk and examine pedestrian exposure to identify the 106 highest risk schools across the three cities.

This report presents the results of the analysis. Different contributions from the application of the methodology are presented in this document. They are:

- i) Presentation of data sources
- ii) Description of attributes and calculation methods
- iii) Attribute values used to rank schools that can be applied in other analyses, and
- iv) High-risk schools that need to be prioritized in the SR4S assessment.

This report is structured as follows:

- Section 2 (Big Data Analysis) provides a summary of the methodology. More detailed information can be assessed in the *Big Data Analysis Report*
- Section 3 provides details on the data sources used
- Section 4 present the availability of the attributes in the Vietnamese context and the description of the results in detail, and
- Section 5 concludes with lessons learned in the final remarks section.

<sup>1</sup> Access to the report and more information about the proposed method need to be requested from Project Leaders.

## 1.1 Project Overview

The *AI&Me: Empowering youth for safer road* is a three-year project that aims to harness proven and emerging technologies to support governments in focusing life-saving road upgrades and speed management. The young people are active voices in the project since they are involved in identifying a range of issues impacting their health/wellbeing. The tools and methodology delivered in the project will be piloted in three cities in Vietnam (Pleiku City, Yen Bai City and Ho Chi Mihn City). Our approach draws on past interventions which successfully promoted public awareness while enabling governments to identify and document hazardous road environments, incorporate community feedback and direct funding to interventions with the greatest potential to save lives.

Big data screening is a crucial activity to achieve the project objectives. It is fundamentally related to other activities including the empower youth tool and the SR4S assessments. Figure 1 presents an overview of the project organization and interrelation between activities/deliverables.

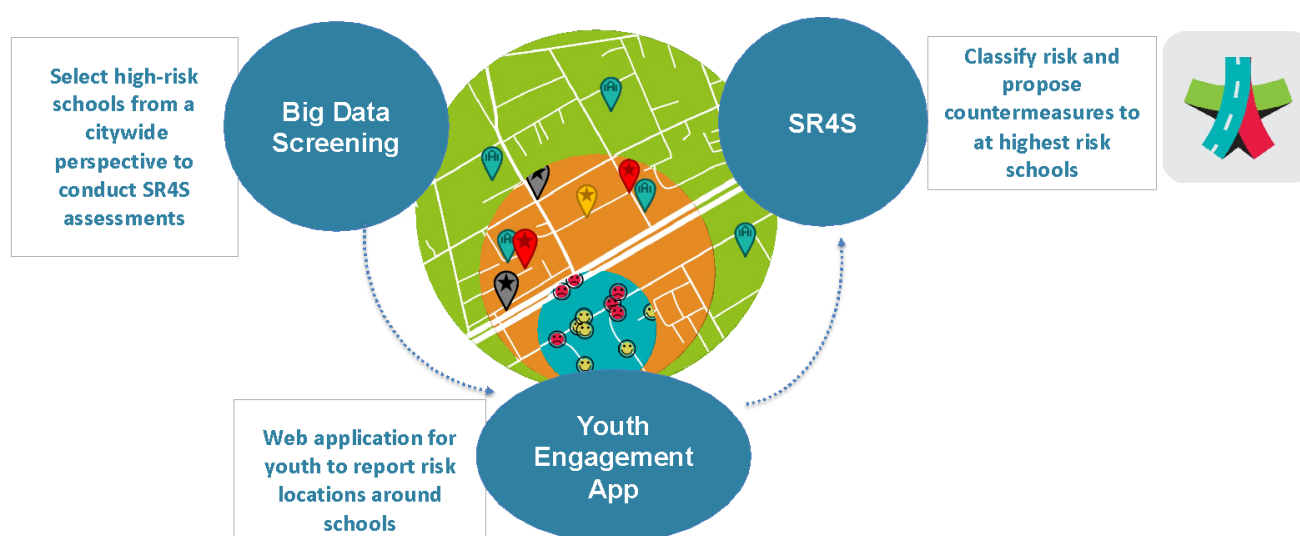


Figure 1 Project overview

## 1.2 Project objectives

The project's objectives are to:

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

## 1.3 Project funders and partners

### About Fondation Botnar

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

More information is available at: [www.fondationbotnar.org](http://www.fondationbotnar.org)

### About FIA Foundation

The FIA Foundation is an independent UK registered charity that supports an international programme of activities promoting road safety, the environment and sustainable mobility. Their aim is to ensure 'safe, clean, fair and green' mobility for all, playing a part to ensure a sustainable future through:

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

More information is available at: [www.fiafoundation.org](http://www.fiafoundation.org)

### About AIP Foundation

AIP Foundation is a non-profit organization dedicated to preventing road injuries and fatalities in low and middle-income countries. For over 20 years, AIP Foundation has been delivering effective road safety programs in locations across Asia and Africa.

More information is available at: [www.aip-foundation.org](http://www.aip-foundation.org) or connect with on Twitter @AIPFoundation.

### About iRAP

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

More information is available at: [www.irap.org](http://www.irap.org) and at the [SR4S Website](#).

### About Anditi

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

powerful 3D data portal enables decision makers to access and view spatial data in a flexible and user-friendly way.

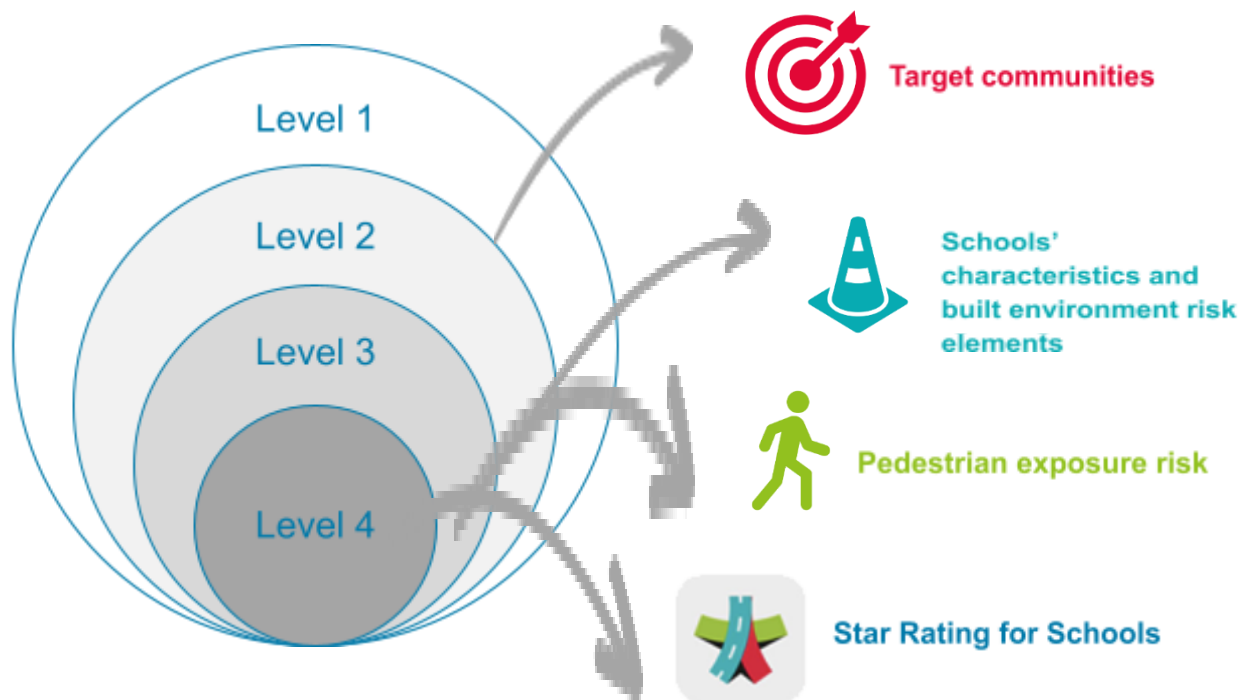
Anditi is working to create more sustainable global communities by helping clients better manage, visualize, and understand data insights. Through our projects and partnerships, Anditi is working to reduce waste and unnecessary use of resources, create safer roads and working environments and improve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

More information is available at: [www.anditi.com](http://www.anditi.com)

## 2 BIG DATA ANALYSIS – METHODOLOGY SUMMARY

The proposed method aims to create an automatic, scalable, evidence-based approach using big data to identify schools located in high-risk road environments.

The design of this method is organized in four different analytical levels to increase detailed data requirements as the stage progresses. Road safety attributes are allocated at each level based on the available information and the required precision level. At every level, schools or the surrounding areas are ranked from highest to lowest risk. The top-ranking schools will then be evaluated at the next stage of analysis. Figure 2 presents the conceptual methodology framework.



**Figure 2 Big Data Analysis Conceptual Framework**

The method is based on filtering and ranking attributes that increase pedestrian risk at the community or local levels. This approach systematically reduces the number of schools at each level. It starts from a citywide perspective, prioritizing relevant locations for more detailed data collection and assessments.

The Level 1, called the 'Target communities' level, is designed to identify and target high priority communities. Relevant attributes are based on data from available official socioeconomic and sociodemographic information and satellite image manipulation.

In the Level 2, 'Schools characteristics and built environment risk' data from land use, urban infrastructure, road network, and built environment help prioritize schools in the areas selected from the first analysis level. The second-level analysis focuses on the assessment of school streets and school surroundings.

Crucial elements for assessing pedestrian exposure risk (speed and flow) are considered in the Level 3. The Level 3 high-risk schools are the candidates for the Star Rating for Schools (SR4S) assessments in Level 4.

All the attributes are theory driven. The theoretical framework and literature review that supports the methodology is present in the preceding *Big Data Analysis Report*.<sup>2</sup>

<sup>2</sup> Access to the report and more information about the proposed method need to be requested from Project Leaders.

### 3 BIG DATA SOURCES

There are a wide variety of big data sources that come with varying coverage, frequency of collection, licencing conditions, and cost. The selection of available big data sources may vary by country and by available budget as part of any scaling of the initiative. A description of the big data sources used in this project is provided below.

#### Government open data sources

Government agencies at different administrative levels collect, maintain, and make available data to citizens from national jurisdiction to local authorities. Portals to access the data are available in other parts of the world, providing socioeconomic and sociodemographic variables and information about the built environment and crash data history. Identification of the government body and building the relationship with local stakeholders are examples of initiatives that need to be made to access the data.

Data aggregation level can be an issue with using governmental open data sources. Socioeconomic information is traditionally aggregated in determining geographic boundaries (e.g., districts). Population density and casualties are examples of data that traditionally come through governments open data sources.

This project relies on data from the Provincial Traffic Safety Committees and the Department of Education & Training in Vietnam as official data sources.

#### IPUMS Terra

IPUMS Terra<sup>3</sup> is a data hub for human population characteristics, land use, land cover, climate, and other environmental characteristics data worldwide. Developed by the University of Minnesota, it provides census and surveys data for the different countries worldwide.

The available information depends on the country assessed, but there are options to select timeframes and aggregation levels. Data and services available are free of charge, and data can be downloaded in tabular or GIS format.

#### WorldPop

The WorldPop program provides high-resolution open data of population distribution. The data comes in grids down to 100m resolution and allows for aggregation into different spatial units such as administrative areas.

This data is generated from modelling using factors like census data, UN population estimates, and land use. The data is free to use and is available for every country, although the accuracy varies between countries due to the availability of model input data. This is a valuable dataset to use when other census data is too broad in scale.

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<sup>3</sup> Steven Ruggles, Steven M. Manson, Tracy A. Kugler, David A. Haynes II, David C. Van Riper, and Maryia Bakhtsiyarava. IPUMS Terra: Integrated Data on Population and Environment: Version 2 [dataset]. Minneapolis, MN: IPUMS, 2018. <https://doi.org/10.18128/D090.V2>

## Global Human Settlements Layer

The Global Human Settlement Layer (GHSL)<sup>4</sup> provides a variety of open-data products on human settlement distribution. Multi-temporal spatial layers of built-up areas derived from satellite imagery are available with global coverage. The GHSL Landsat derived product provides built-up areas at 30m resolution at the epoch's 1975, 1990, 2000, and 2014. The GHSL data can be used to estimate rapid urban growth by comparing the built-up layers between different epochs.

## Satellite images

Satellite imagery has tremendous potential application in almost any field of work. Gathering data from earth observation help governments, policymakers, and other stakeholders to address future and present challenges like climate change<sup>5</sup>. The over 3,000 operational satellites<sup>6</sup> that are orbiting around Earth are equipped with camera and sensor information capable of producing high-resolution images from all parts of the globe. With support to process a large amount of information available from satellite imagery, researchers can introduce more scalable, flexible, and cost-effective data in their monitoring and modelling process.

Satellite imagery can help assess land use and built environment attributes for transportation, urban planning, and road safety studies. Essential attributes to road safety assessments can be identified using image recognition algorithms like the number of road lanes and the presence of intersections. Also, negative difference spectral indices allow tracing changes in urban sprawl. Although it is also possible to obtain, it is still challenging to collect pedestrian infrastructure data due to the difficulty to identify thin elements (crossings) or invisibility (sidewalks covered by trees).

This project has several potential uses for satellite data, such as analysing land use, counting the number of road lanes, and measuring urban sprawl.

## Multinet-R (MN-R) data

The Multinet-R data is a road network database provided by TomTom. It is provided as a navigation tool to find locations, guide routes and display maps for users<sup>7</sup>. A range of attributes are available for purchasing that address point data, road attributes (e.g., gradient and road curvature), cities point of interest, speed data and others.

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

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<sup>4</sup> Corbane, Christina; Florczyk, Aneta; Pesaresi, Martino; Politis, Panagiotis; Syrris, Vasileios (2018): GHS built-up grid, derived from Landsat, multitemporal (1975-1990-2000-2014), R2018A. European Commission, Joint Research Centre (JRC) doi: 10.2905/jrc-ghsl-10007 PID: <http://data.europa.eu/89h/jrc-ghsl-10007>

<sup>5</sup> European Commission. Big Data in Earth Observation. No. November, 2017, pp. 1–65.

<sup>6</sup> UCS. UCS Satellite Database User's Manual 1-1-17. 1–10. <https://www.ucsusa.org/resources/satellite-database>.

<sup>7</sup> Tomtom. *Maps & Enhanced Content: Delivering High Quality Maps How Seamless Coverage Is Community Driven*. 2021.
















### ***Notes on human inputs in big data analysis***






It is essential to highlight that, although big data sources are revolutionary sources of information, the analysis will never be purely digital. There is always a need for some level of human/manual judgment to guarantee the quality, fulfil gaps or validate the information. Tasks that required human judgment in the analysis included cleaning school location data, manual editing of MN-R road intersection data, and identifying the number of lanes per school road using satellite imagery.

## 4 BIG DATA SCREENING RESULTS IN VIETNAM

The big data screening was conducted in three cities in Vietnam: Ho Chi Minh City, Yen Bai City and Pleiku City. The project tests how the method performs for Vietnam and the types of data available. Table 1 presents the attributes available for the pilot study. Explanation about partially available attributes are provided in the following sections.

**Table 1 Attributes' availability**

| Analyses Level | Attributes                                     | Availability  |   | Data Sources                        | Note  |
|----------------|--|---|---|-------------------------------------|---|
| Level 1        | Density of pedestrian casualties (crashes/km2) |    | Partially available   | Provincial Traffic Safety Committee | Pedestrians casualties available for Pleiku City and overall casualties for HCMC. |
|                | Population Density (inhabitants/km2)           |    | Partially available   | IPUMS Terra / WorldPop              | Only used for HCMC  |
|                | % of population 6-18 years old                 |    | Partially available   | IPUMS Terra                         | Only used for HCMC  |
|                | Area type                                      |    | Partially available   | IPUMS Terra                         | Only used for HCMC  |
|                | Income   |   | Partially available   | IPUMS Terra                         | Unemployment rates only used for HCMC   |
|                | Urban rapid growth                             |  | Partially available   | Satellite image / GHSL              | Only used for HCMC  |
|                | Road density (km/km2)                          |  | Partially available   | MN-R data                           | Only used for HCMC  |
|                | School density (Schools/km2)                   |  | Partially available   | MN-R data                           | Only used for HCMC  |
| Level 2        | Km for road type                               |  | Available   | MN-R data                           | -   |
|                | Number of intersections                        |  | Available   | MN-R data                           | -   |
|                | % of commercial land use                       |  | Not available   | -                                   | -   |
|                | Number of transit stops                        |  | Partially available – only available at the district level. | City data available                 | -   |
|                | School road type                               |  | Available   | MN-R data                           | -   |
|                | Number of lanes on the school road             |  | Available   | Satellite / Google Earth            | -   |
|                | Number of students                             |  | Available   | Provincial Department of            | -   |

| Analyses Level | Attributes                                    | Availability  |                     | Data Sources  | Note                                |
|----------------|---|---|---------------------|---|-------------------------------------|
|                |   |   |                     | Education and Training  |                                     |
|                | Shift schedule                                |  | Not available       | -   | -                                   |
| Level 3        | Average operational speed in the buffer zone  |  | Available           | MN-R data   | -                                   |
|                | Average operational speed on the school roads |  | Available           | MN-R data   | -                                   |
|                | Average peak flow in the buffer zone          |  | Partially available | To be collected by Tomtom once Level 3 schools have been identified | Available as a proxy (data records) |
|                | Average peak flow on the school roads         |  | Partially available | To be collected by Tomtom once Level 3 schools have been identified | Available as a proxy (data records) |

### **Target school number in each city**

The *AI&Me: Empowering youth for safer roads* project is committed to conducting SR4S assessments in 106 schools. The big data screening provides the list of schools that need to be prioritized in the three cities part of the project.

Based on the commitment with stakeholders, available spots in the final list were distributed for each city. Therefore, 56 schools from Ho Chi Minh City, 25 from Yen Bai City, and more than 25 from Pleiku City comprise the final list of schools.

### **Output indicator for big data screening**

The aim was to use the big data screening to assess a total of 1,200 schools, thereby understanding which schools have the highest risk (and rank in risk order). A total of 1,063 schools were used in the analysis:

- 980 in Ho Chi Minh City
- 56 in Pleiku City, and
- 27 in Yen Bai City.

This number comprises the total number of schools in the official data for the Viet Nam Government in each city where it was possible to find the correct location.

## **4.1 Level 1 Analysis**

The Level-2 administrative boundaries (Districts) were used as the 1<sup>st</sup> level target community scale. District boundaries came from the 2009 IPUMS Terra census data set. Although the district level is a good administrative boundary for Ho Chi Minh City, the area is too broad for Yen Bai City and Pleiku City analysis.

In the case of the two cities, the Level-3 administrative boundary (ward<sup>8</sup>) is more appropriate. However, the smaller boundaries at the first level reduce the number of schools more than expected. Census data for Pleiku City and Yen Bai city were also at a too broad of a scale to be used to calculate Level 1 attributes based on census data. For these reasons, it is important to note that only the first level was used for Ho Chi Minh City. Yen Bai City and Pleiku City analysis starts on the 2<sup>nd</sup> level. This means that more detailed information is collected for a broader area in these two cities, not jeopardizing the amount of data collected.

For Level 1, six attributes were fully available, and two were partially available. Those partially available were:

- Crash statistics 2018-20: This data was retrieved from the city's Traffic Safety Committee. The data for Ho Chi Minh city was not pedestrian specific, and total number of crashes was used as an alternative.
- Income: direct income statistics are not available in the IPUMS 2009 census data, so the unemployment rate was used instead.

In 2021, District 2, District 9 and Thu Duc were merged into a single district named Thu Duc City. The census data 2009 data for these three districts were aggregated to get totals of Thu Duc City.

## Level 1 Attributes calculation

### ***Crash density***

The total number of crashes from 2018-2020 from the Provincial Traffic Safety Committee data was divided by district area to get the number of crashes per km<sup>2</sup>. Crash density was ranked from highest to lowest.

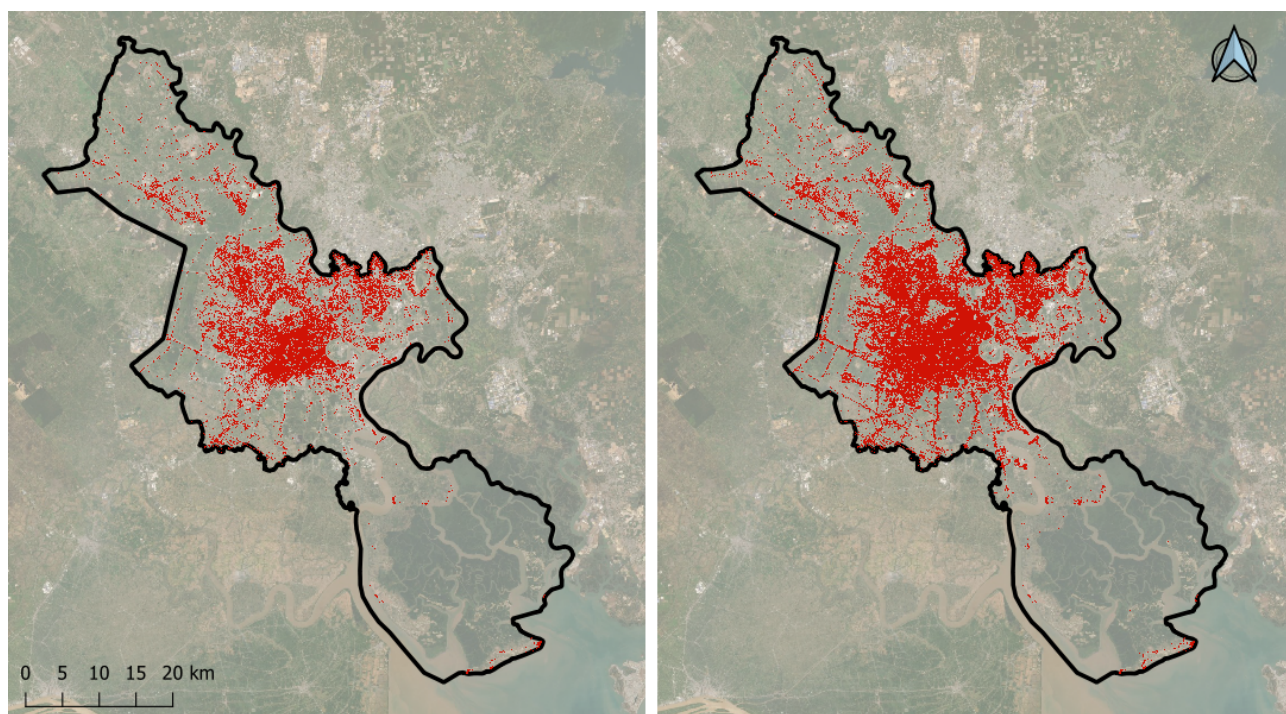
### ***Rapid urban growth***

The GHSL Landsat multi-temporal (1975-1990-2000-2014) built-up layer was used to estimate rapid urban growth. The epoch range considered was 1990 to 2014 (see Figure 3). The built-up area up to 1990 was compared against the built-up area from 2014 to find the percentage increase for each District.

A district was considered to have experienced rapid urban growth when there was at least a 20% increase in built-up area from 1990 to 2014. Districts that reached the 20% increase threshold were ranked from highest to lowest % built-up increase. Districts that didn't reach the threshold were all given a ranking equivalent to the total number of Districts in the Level 1 analysis. Table 2 presents the percentage of urban expansion for each District in HCMC.

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<sup>8</sup> Ward is an urban sub-district of cities in Viet Nam. It is smaller than the city but greater than the neighbourhood.



**Figure 3 Built-up areas in Ho Chi Minh City 1990 (left) 2014 (right).**

Data source: Global Human Settlement Layer (GHSL). Image source: Google Satellite 2021.

**Table 2 Urban sprawl for Ho Chi Minh Districts 1990-2014**

| District           | 1990 Built-up area (km <sup>2</sup> ) | 2014 Built-up area (km <sup>2</sup> ) | Increase (%) | Rapid urban growth |
|--------------------|---------------------------------------|---------------------------------------|--------------|--------------------|
| <i>Binh Chanh</i>  | 20.98                                 | 49.78                                 | 137.30       | yes                |
| <i>Binh Tan</i>    | 18.65                                 | 36.55                                 | 95.95        | yes                |
| <i>Binh Thanh</i>  | 10.66                                 | 13.98                                 | 31.17        | yes                |
| <i>Can Gio</i>     | 2.06                                  | 5.01                                  | 143.27       | yes                |
| <i>Cu Chi</i>      | 22.56                                 | 39.31                                 | 74.19        | yes                |
| <i>District 1</i>  | 6.28                                  | 6.92                                  | 10.23        | no                 |
| <i>District 3</i>  | 4.39                                  | 4.73                                  | 7.91         | no                 |
| <i>District 4</i>  | 3.24                                  | 3.66                                  | 13.01        | no                 |
| <i>District 5</i>  | 3.84                                  | 4.04                                  | 5.18         | no                 |
| <i>District 6</i>  | 5.37                                  | 6.91                                  | 28.82        | yes                |
| <i>District 7</i>  | 7.03                                  | 17.70                                 | 151.63       | yes                |
| <i>District 8</i>  | 7.43                                  | 13.68                                 | 84.17        | yes                |
| <i>District 10</i> | 4.99                                  | 5.50                                  | 10.43        | no                 |
| <i>District 11</i> | 4.30                                  | 4.71                                  | 9.59         | no                 |
| <i>District 12</i> | 19.96                                 | 31.72                                 | 58.96        | yes                |

| District  | 1990 Built-up area (km <sup>2</sup> ) | 2014 Built-up area (km <sup>2</sup> ) | Increase (%) | Rapid urban growth |
|-----------|---------------------------------------|---------------------------------------|--------------|--------------------|
| Go Vap    | 11.63                                 | 17.63                                 | 51.59        | yes                |
| Hoc Mon   | 24.05                                 | 37.47                                 | 55.81        | yes                |
| Nha Be    | 2.49                                  | 14.16                                 | 467.99       | yes                |
| Phu Nhuan | 3.69                                  | 4.42                                  | 19.66        | no                 |
| Tan Binh  | 11.69                                 | 16.35                                 | 39.90        | yes                |
| Tan Phu   | 9.76                                  | 14.64                                 | 50.10        | yes                |
| Thu Duc   | 42.22                                 | 70.79                                 | 67.66        | yes                |

### **Population Density**

IPUMS Terra population data were used to calculate population density. The total population for a district was divided by the total area of the district to get the population per km<sup>2</sup> attribute. The population density was ranked from highest to lowest.

### **Population at school-age**

Using the IPUMS Terra census data, population counts of the age bracket's 5 to 9, 10 to 14, and 15 to 19 were aggregated and then divided by the total population count to get the percentage of the school-age population for each district. Population school age was ranked from highest to lowest.

### **Income/Unemployment**

There was no available data for income, so the unemployment rate from IPUMS census data was used as a proxy. Unemployment rates of each District were ranked from highest to lowest.

### **Road Density**

The total length of road centrelines from the MN-R road network data was divided by district area to get road density (Road km/km<sup>2</sup>). This likely overestimates some areas where there is a high presence of divided roads. Divided roads are considered twice in the database (a link for each carriageway).

### **School density**

School density was calculated by dividing the number of schools by area of the District to get schools per km<sup>2</sup>. A manual compatibility between the MN-R data and the official data regarding the school's location was necessary to ensure that all the schools included in the analysis had the right information associated. Due to the high number of schools in Ho Chi Minh City, it was not practical to clean the dataset to get an accurate number of schools at the Level 1 analysis stage. This was instead done at the Level 2 stage where the top four districts were shortlisted. School density should therefore be considered an estimate. School density was ranked from highest to lowest.

### **Area Type**

Due to the level of urbanization of the area under study, all the district were considered urban/suburban areas.

## **Level 1 Results – HCMC**

Table 3 present the values for each attribute. All attributes calculated were ranked from high to lower risk (1 to 22) as presented in

Table 4. Annex I brings geographical visualization for the attributes calculated.

**Table 3 Level 1 attributes database**

| Districts   | Casualties density | Population Density | Population at school-age | Area type | Income/Unemployment | Rapid urban growth | Road density | School density |
|-------------|--------------------|--------------------|--------------------------|-----------|---------------------|--------------------|--------------|----------------|
| Binh Chanh  | 1.64               | 1623.34            | 22.12                    | urban     | 2.95                | 137.30             | 6.54         | 0.24           |
| Binh Tan    | 3.06               | 10756.83           | 21.03                    | urban     | 2.78                | 95.95              | 17.41        | 1.25           |
| Binh Thanh  | 3.31               | 21050.80           | 20.85                    | urban     | 4.18                | 31.17              | 21.33        | 3.36           |
| Can Gio     | 0.05               | 95.68              | 27.03                    | urban     | 5.93                | 143.27             | 0.55         | 0.05           |
| Cu Chi      | 0.34               | 771.84             | 23.91                    | urban     | 1.97                | 74.19              | 4.96         | 0.23           |
| District 1  | 11.27              | 21367.44           | 21.07                    | urban     | 7.08                | 10.23              | 30.84        | 7.09           |
| District 10 | 3.14               | 37722.97           | 21.38                    | urban     | 4.73                | 10.43              | 31.69        | 6.63           |
| District 11 | 2.95               | 42293.09           | 21.94                    | urban     | 3.65                | 9.59               | 35.83        | 8.26           |
| District 12 | 2.41               | 7353.37            | 22.20                    | urban     | 2.43                | 58.96              | 15.33        | 1.08           |
| District 3  | 7.64               | 36900.28           | 20.05                    | urban     | 4.47                | 7.91               | 33.72        | 8.88           |
| District 4  | 4.11               | 40175.35           | 21.60                    | urban     | 6.84                | 13.01              | 32.01        | 6.52           |
| District 5  | 23.05              | 38194.02           | 21.16                    | urban     | 4.66                | 5.18               | 33.07        | 10.08          |
| District 6  | 6.89               | 33540.99           | 22.42                    | urban     | 4.22                | 28.82              | 33.53        | 7.31           |
| District 7  | 2.52               | 6543.28            | 20.74                    | urban     | 2.92                | 151.63             | 13.80        | 1.19           |
| District 8  | 0.83               | 20454.44           | 21.50                    | urban     | 7.84                | 84.17              | 20.32        | 2.61           |
| Go Vap      | 2.95               | 25294.44           | 21.72                    | urban     | 3.10                | 51.59              | 27.55        | 2.95           |
| Hoc Mon     | 0.95               | 3081.70            | 21.94                    | urban     | 2.56                | 55.81              | 7.85         | 0.54           |
| Nha Be      | 0.67               | 899.90             | 23.48                    | urban     | 5.66                | 467.99             | 4.35         | 0.26           |
| Phu Nhuan   | 2.08               | 33906.04           | 20.03                    | urban     | 4.92                | 19.66              | 35.15        | 7.28           |
| Tan Binh    | 1.33               | 17885.57           | 22.35                    | urban     | 3.56                | 39.90              | 18.53        | 3.32           |
| Tan Phu     | 3.67               | 24306.12           | 23.12                    | urban     | 2.72                | 50.10              | 24.97        | 3.55           |
| Thu Duc     | 1.72               | 3820.46            | 20.97                    | urban     | 3.90                | 67.66              | 10.68        | 0.68           |

**Table 4 Level 1 ranked attributed**

| Districts  | Casualties density | Population Density | Population at school age | Area type | Income/Unemployment | Urban rapid growth | Road density | School density |
|------------|--------------------|--------------------|--------------------------|-----------|---------------------|--------------------|--------------|----------------|
| Binh Chanh | 16                 | 19                 | 8                        | 1         | 16                  | 4                  | 19           | 20             |
| Binh Tan   | 9                  | 14                 | 17                       | 1         | 18                  | 5                  | 14           | 14             |
| Binh Thanh | 7                  | 11                 | 19                       | 1         | 11                  | 14                 | 11           | 10             |
| Can Gio    | 22                 | 22                 | 1                        | 1         | 4                   | 3                  | 22           | 22             |
| Cu Chi     | 21                 | 21                 | 2                        | 1         | 22                  | 7                  | 20           | 21             |

| Districts   | Casualties density | Population Density | Population at school age | Area type | Income/Unemployment | Urban rapid growth | Road density | School density |
|-------------|--------------------|--------------------|--------------------------|-----------|---------------------|--------------------|--------------|----------------|
| District 1  | 2                  | 10                 | 16                       | 1         | 2                   | 22                 | 8            | 6              |
| District 10 | 8                  | 4                  | 14                       | 1         | 7                   | 22                 | 7            | 7              |
| District 11 | 11                 | 1                  | 9                        | 1         | 13                  | 22                 | 1            | 3              |
| District 12 | 13                 | 15                 | 7                        | 1         | 21                  | 9                  | 15           | 16             |
| District 3  | 3                  | 5                  | 21                       | 1         | 9                   | 22                 | 3            | 2              |
| District 4  | 5                  | 2                  | 12                       | 1         | 3                   | 22                 | 6            | 8              |
| District 5  | 1                  | 3                  | 15                       | 1         | 8                   | 22                 | 5            | 1              |
| District 6  | 4                  | 7                  | 5                        | 1         | 10                  | 15                 | 4            | 4              |
| District 7  | 12                 | 16                 | 20                       | 1         | 17                  | 2                  | 16           | 15             |
| District 8  | 19                 | 12                 | 13                       | 1         | 1                   | 6                  | 12           | 13             |
| Go Vap      | 10                 | 8                  | 11                       | 1         | 15                  | 11                 | 9            | 12             |
| Hoc Mon     | 18                 | 18                 | 9                        | 1         | 20                  | 10                 | 18           | 18             |
| Nha Be      | 20                 | 20                 | 3                        | 1         | 5                   | 1                  | 21           | 19             |
| Phu Nhuan   | 14                 | 6                  | 22                       | 1         | 6                   | 22                 | 2            | 5              |
| Tan Binh    | 17                 | 13                 | 6                        | 1         | 14                  | 13                 | 13           | 11             |
| Tan Phu     | 6                  | 9                  | 4                        | 1         | 19                  | 12                 | 10           | 9              |
| Thu Duc     | 15                 | 17                 | 18                       | 1         | 12                  | 8                  | 17           | 17             |

The ranks are summed together to produce the big data screening score. The districts with the lowest scores are considered the priority district. The project team conducted tests including different weights in certain attributes (e.g.: double the scores for road crash densities). This approach did not significantly change the results.

Table 5 presents the priority rank and the number of schools per district. It is possible to see the results for Level 1 analysis on the map in Figure 4.

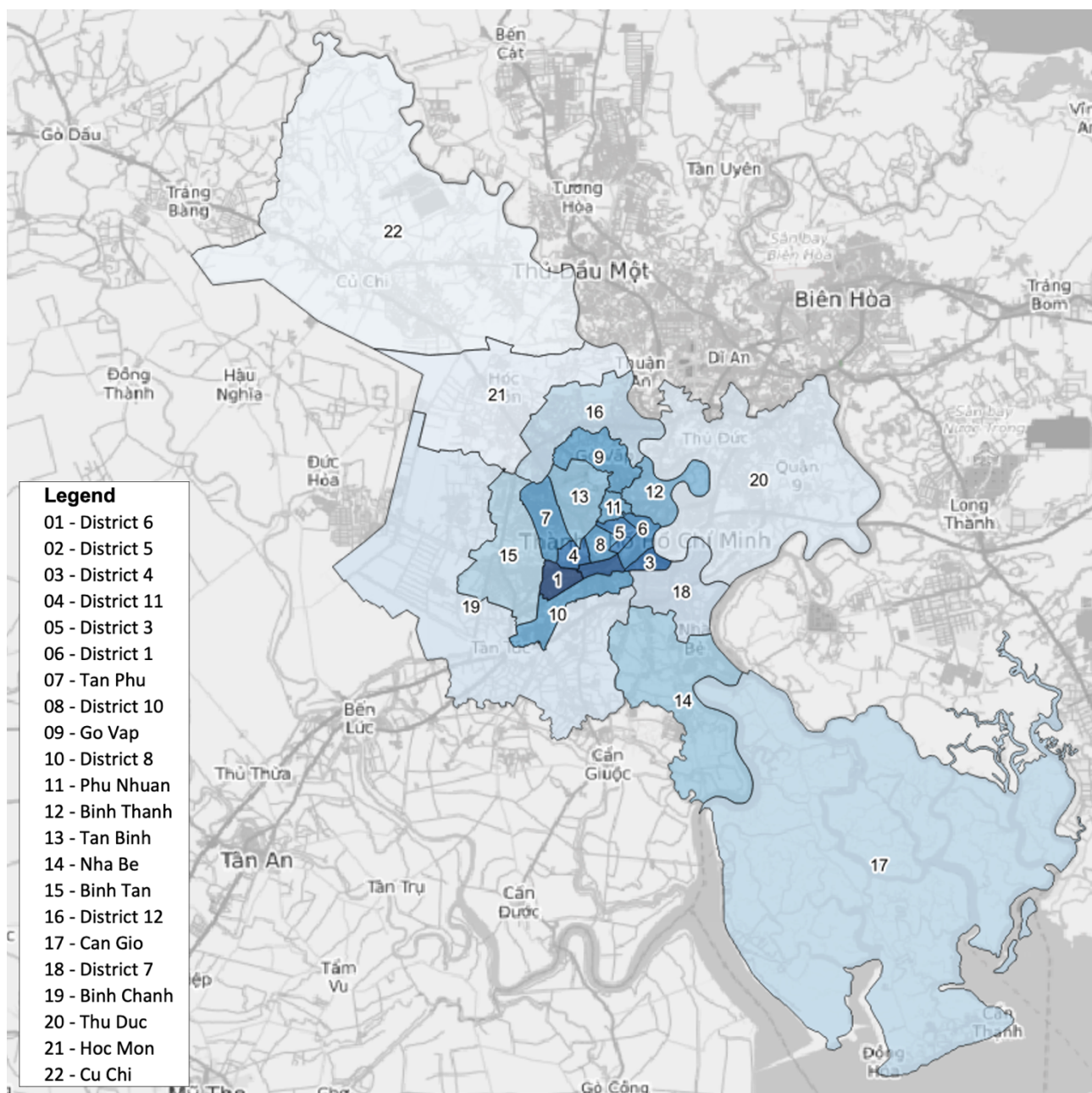


Figure 4 HCMC District priority rank

**Table 5 High-risk districts in HCMC**

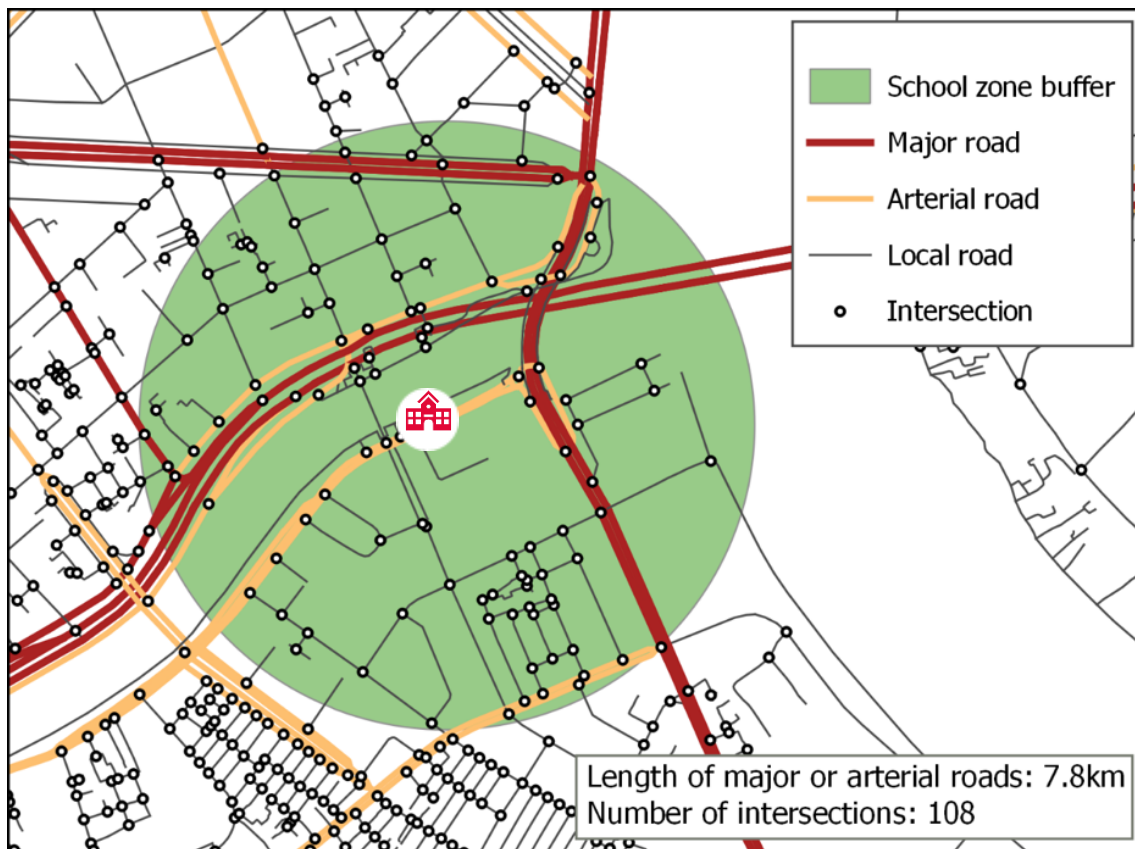
| Area        | District Score | Priority Rank | Number of Schools per district |
|-------------|----------------|---------------|--------------------------------|
| District 6  | 50             | 1             | 52                             |
| District 5  | 56             | 2             | 42                             |
| District 4  | 59             | 3             | 27                             |
| District 11 | 61             | 4             | 42                             |
| District 3  | 66             | 5             | 43                             |
| District 1  | 67             | 6             | 56                             |
| Tan Phu     | 70             | 7             | 56                             |
| District 10 | 70             | 7             | 38                             |
| Go Vap      | 77             | 9             | 59                             |
| District 8  | 77             | 9             | 50                             |
| Phu Nhuan   | 78             | 11            | 35                             |
| Binh Thanh  | 84             | 12            | 70                             |
| Tan Binh    | 88             | 13            | 75                             |
| Nha Be      | 90             | 14            | 26                             |
| Binh Tan    | 92             | 15            | 65                             |
| District 12 | 97             | 16            | 57                             |
| Can Gio     | 97             | 16            | 29                             |
| District 7  | 99             | 18            | 42                             |
| Binh Chanh  | 103            | 19            | 61                             |
| Thu Duc     | 105            | 20            | 145                            |
| Hoc Mon     | 112            | 21            | 59                             |
| Cu Chi      | 115            | 22            | 99                             |

## 4.2 Level 2 and Level 3 Analyses

At Level 2, data for land use, urban infrastructure, road network, and built environment help prioritize schools in the areas selected from the first analysis level. The Level 2 analysis focuses on the assessment of school streets and school surroundings.

Two attributes from Level 2 were unavailable: Percentage of commercial land use and shift schedule. The number of transit stops was only available at the district level and therefore were not used in the analysis.

Level 2 attributes are based on measures on the school road and within a walkable school zone. The school zones were defined by generating a 400-meter buffer around the school location. The buffers represent the walkable areas around the school and are limited by natural barriers to walking (rivers, train lines, freeways). Figure 5 present an example of road type length and number intersections calculated within the school buffer zone.



**Figure 5 Example of attribute calculation in the school zone buffer**

## Level 2 Attributes calculation

### ***Number of intersections***

Intersections points were extracted using the MN-R network data. Intersections were extracted from the road network where at least three different road segments intersected. This required some manual editing at complex intersections to remove excess points. The total number of intersections were counted per school zone. The number of intersections per school zone was ranked from highest to lowest.

### ***Km of high-risk roads***

The MNR-R data has a Functional Road Class (FRC) attribute that represents a classification of roads based on the importance that the constituting roads have in the total road network. The FRC represents a hierarchical classification of roads into nine distinct levels: 10 = Motorway, 20 = Major Road of High Importance, 30 = Other Major Road, 40 = Secondary Road, 51 = Local Connecting Road, 52 = Local Road Of High Importance, 60 = Local Road, 70 = Local Road Of Minor Importance, 80 = Other Road.

Roads in the Tomtom data MN-R data with an FRC of 52 or lower were classified as high-risk roads. Then the total length of high-risk roads per school zone was calculated. The total length of high-risk roads was ranked from highest to lowest.

### ***School road type***

The school road type was extracted from the MN-R data using the FRC value. Road types were classified into local, arterial, and major based on the FRC (FRC 10 to 30 = major roads, FRC 51 to 52 = arterial road, FRC 60 to 80 = local road).

All schools on arterial or major roads were given a ranking of 1, whilst schools on local roads were all given a ranking equivalent to the total number of Level 2 schools per city.

### ***Number of lanes on the school road***

The number of lanes was assigned by viewing satellite/aerial imagery on Google Earth Pro. Roads were classified into one lane (per direction) or two or more lanes. All schools where the number of lanes was two or more were given a ranking of 1, whilst schools with one lane were all given a ranking equivalent to the total number of level 2 schools for that city.

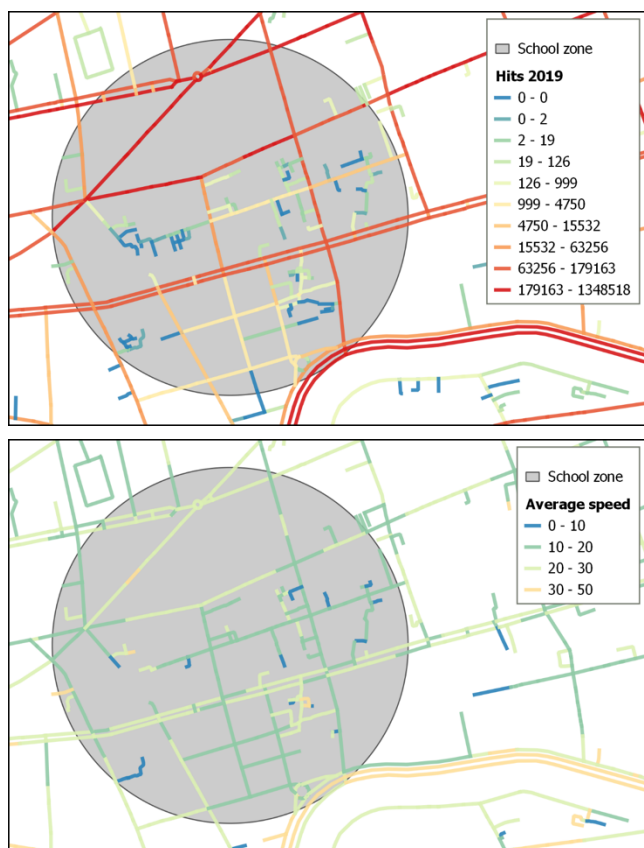
The analysis uses a categorical attribute because of the difficulties to obtain the actual number of lanes. A lack of road markings on the pavement or non-compliance of vehicle with the markings that are present make it hard to identify the number of lanes using satellite images.

### ***Number of students***

AIPF sourced a list of student numbers per school from the Provincial Department of Education and Training. The number of students per school was ranked from highest to lowest.

## **Level 3 Attribute calculation**

Figure 6 provides an example of speed and number of records (number of individual vehicles that have been measured in the specified time range) collected in the school buffer zone. All the information of the MN-R data is collected from all times of 2019. The methodology recommended using peak hours flows. However, the analyses include all data available for two reasons. Firstly, some of the roads did not present data for specific periods of the day. Therefore, we increase the data sample considering all the data available in the analysis period. Secondly, it is hard to identify peak hours without complete counting for the roads.



**Figure 6 Example of records and average speed in the school buffer zone**

**Note:** Speed and flow data is based on a road network database provided by TomTom. Speed data is considered very accurate in representing vehicle speed in the traffic stream. In the case of traffic flows, TomTom data present only a sample of the vehicles on the road with TomTom navigation device in use. We are assuming this sample is evenly distributed around the cities, and the number of records (number of individual vehicles that have been measured in the specified time range) represents the busier roads. This means that roads with more records are also considered the roads with more traffic.

**Note:** All roads with less than 100 records were included in the same category. A lack of records does not mean there is no traffic. It only says that there are no vehicles captured within the TomTom sample. The other values are used as a continuous variable in order to produce more granular information to rank the schools.

### ***School Road Average Speed***

The average speed for the school road was extracted from traffic stats data. If there was no data for a road, the average speed from historical data in the MN-R database was used. The average speed of school roads was ranked from highest to lowest.

### ***School Road Traffic Density***

The number of records/samples for the school road was extracted from traffic probe data. The number of records on the school road was ranked highest to lowest.

### **School Zone Average Speed**

The average of all average speeds per road in the school zone was used to calculate the school zone average speed. School zone average speed was ranked from highest to lowest.

### **School Zone Traffic Density**

The number of records per road was summed together to get the total records within the school zone. School zone traffic density was ranked from highest to lowest.

## **Level 2 and 3 Results – HCMC**

Level 1 analysis targets the community based on attributes to conduct macrolevel pedestrian road safety analysis. The schools for the fourth highest risk districts are the ones assessed in Level 2. The districts selected are District 6 (1<sup>st</sup>), District 5 (2<sup>nd</sup>), District 4 (3<sup>rd</sup>) and District 11 (4<sup>th</sup>). The fourth districts together comprise 124 schools.

In order to not reduce the number of schools too fast, second and third levels were combined to select the 56 highest risk schools in HCMC. Although different from the original proposal method, this assumption did not jeopardize the level of information provided. Speed and flow data is collected for a broader number of schools than initially proposed.

Accessing [Annex II](#) is possible to see the values of the attributes and their scores for each school assessed. Table 6 presents the final prioritisation list of schools for HCMC.

### **History of SR4S assessments in Ho Chi Minh City**

Looking at the register of the SR4S assessments, we identified that some schools selected as high-risk using the big data screening methodology for Ho Chi Minh City already has a star rating associated. From the 12 schools already assessed using the SR4S platform, four schools were evaluated and intervened by AIPF Walk this Way project (2019-2020) with good post-intervention results. AIPF assessed the other five schools in 2017 with low star ratings. The remaining three schools were evaluated in 2017 with risk classified as 3- or 4-star ratings. Therefore, the four schools more recently assessed will be excluded from the list bring space to include four subsequent schools in the risk rank. The AI&Me project will reassess the other ones due to potential changes in the built environment and traffic patterns in recent years. The data collected in the big data screening will help update parameters like speed and flow.

District 5 has the most schools on the final list (20 schools), followed by District 11 (18 schools), District 6 (9 schools) and District 4 (9 schools). Most schools are primary schools. Twenty-seven schools from the list are classified as primary schools. In addition, thirteen schools are classified as secondary schools and eleven schools as high school. Another three schools include secondary and high school students. Completing the 56 schools in the list, school 121 and 125 have students from all levels: primary, secondary and high school.

**Table 6 Priority schools to conduct SR4S assessments in HCMC**

| ID  | School Name  | District    | School Type* | Big Data Screening Score | Priority Rank | Assessed on SR4S |
|-----|--|-------------|--------------|--------------------------|---------------|------------------|
| 124 | Trường Tiểu Học Nguyễn Thi   | District 11 | PS           | 190                      | 1             | -                |
| 35  | Trường Trung Học Cơ Sở Phú Thọ   | District 11 | MS           | 227                      | 2             | -                |
| 121 | Trường Tiểu Học, Trung Học Cơ Sở và Trung Học Phổ Thông Trương Vĩnh Ký | District 11 | PS, MS,HS    | 236                      | 3             | -                |

| ID  | School Name  | District    | School Type* | Big Data Screening Score | Priority Rank | Assessed on SR4S |
|-----|--|-------------|--------------|--------------------------|---------------|------------------|
| 22  | Trường Trung Học Phổ Thông Chuyên Lê Hồng Phong  | District 5  | HS           | 263                      | 4             | -                |
| 13  | Trường Trung Học Cơ Sở Văn Đồn   | District 4  | MS           | 267                      | 5             | -                |
| 64  | Trường Tiểu Học Lê Đình Chinh  | District 11 | PS           | 272                      | 6             | -                |
| 46  | Trường Tiểu Học Phùng Hưng   | District 11 | PS           | 281                      | 7             | -                |
| 122 | Trường Tiểu Học Trần Văn Ơn  | District 11 | PS           | 283                      | 8             | -                |
| 91  | Trường Trung Học Phổ Thông Dân Lập Thăng Long  | District 5  | HS           | 292                      | 9             | -                |
| 44  | Trường Trung Học Cơ Sở Trần Bội Cơ   | District 5  | MS           | 306                      | 10            | <sup>9</sup>     |
| 58  | Trường Trung Học Cơ Sở Lê Quý Đôn  | District 11 | MS           | 307                      | 11            | -                |
| 61  | Trường Tiểu Học Đặng Trần Côn  | District 4  | PS           | 309                      | 12            | -                |
| 97  | Trường Tiểu Học Lê Văn Tám   | District 5  | PS           | 309                      | 13            | -                |
| 114 | Trường Trung Học Phổ Thông Trần Khai Nguyên  | District 5  | HS           | 312                      | 13            | -                |
| 125 | Dân lập Việt Mỹ  | District 11 | PS, MS, HS   | 323                      | 15            | -                |
| 50  | Trường Trung Học Thực Hành Đại Học Sư Phạm   | District 5  | HS           | 330                      | 17            | -                |
| 77  | Trường Trung Học Cơ Sở Hồng Bàng   | District 5  | MS           | 331                      | 16            | -                |
| 95  | Trường Trung Học Phổ Thông Trần Hữu Trang  | District 5  | HS           | 334                      | 18            | -                |
| 85  | Trường Tiểu Học Trần Quốc Toàn   | District 5  | PS           | 340                      | 19            | -                |
| 38  | Trường Tiểu Học Kim Đồng   | District 6  | PS           | 342                      | 20            | -                |
| 59  | Trường Trung Học Phổ Thông Nguyễn Hữu Thọ  | District 4  | HS           | 344                      | 21            | -                |
| 67  | Trường Trung Học Phổ Thông Hùng Vương  | District 5  | HS           | 359                      | 22            | -                |
| 52  | Trường Trung Học Phổ Thông Trần Quang Khải   | District 11 | HS           | 361                      | 23            | -                |
| 79  | Trường Phổ Thông Năng Khiếu - Đại Học Quốc Gia Thành Phố Hồ Chí Minh                               | District 5  | HS           | 365                      | 24            | -                |
| 62  | Trường Trung Học Cơ Sở Nguyễn Huệ  | District 11 | MS           | 366                      | 25            | -                |
| 98  | Trường Tiểu Học Phạm Văn Hai   | District 11 | PS           | 367                      | 25            | -                |
| 100 | Trường Tiểu Học Công Lập Thái Phiên  | District 11 | PS           | 377                      | 27            | -                |
| 43  | Trường Trung Học Cơ Sở Nguyễn Đức Cảnh   | District 6  | MS           | 382                      | 28            | -                |
| 27  | Trường Trung Học Cơ Sở Mạch Kiếm Hùng  | District 5  | MS           | 383                      | 28            | <sup>10</sup>    |
| 26  | Trường Tiểu Học Bến Cảng   | District 4  | PS           | 386                      | 30            | -                |
| 123 | Trường Trung Học Cơ Sở, Trung Học Phổ Thông Quang Trung Nguyễn Huệ                                 | District 5  | MS,HS        | 408                      | 31            | -                |
| 45  | Trường Tiểu Học Anh Việt Mỹ  | District 4  | PS           | 409                      | 31            | -                |
| 71  | Trường Tiểu Học Huỳnh Mẫn Đạt  | District 5  | PS           | 427                      | 33            | -                |
| 96  | Trường Tiểu Học Bàu Sen  | District 5  | PS           | 433                      | 34            | -                |
| 60  | Trường Dự Bị Đại Học Thành Phố Hồ Chí Minh - Trường Trung Học Cơ Sở và Trung Học Phổ Thông An Đông | District 5  | MS, HS       | 439                      | 35            | -                |
| 80  | Trường Tiểu Học Trần Bình Trọng  | District 5  | PS           | 440                      | 36            | -                |
| 101 | Trường Tiểu Học Hưng Việt  | District 11 | PS           | 481                      | 37            | -                |

<sup>9</sup> Result after implement modifications.

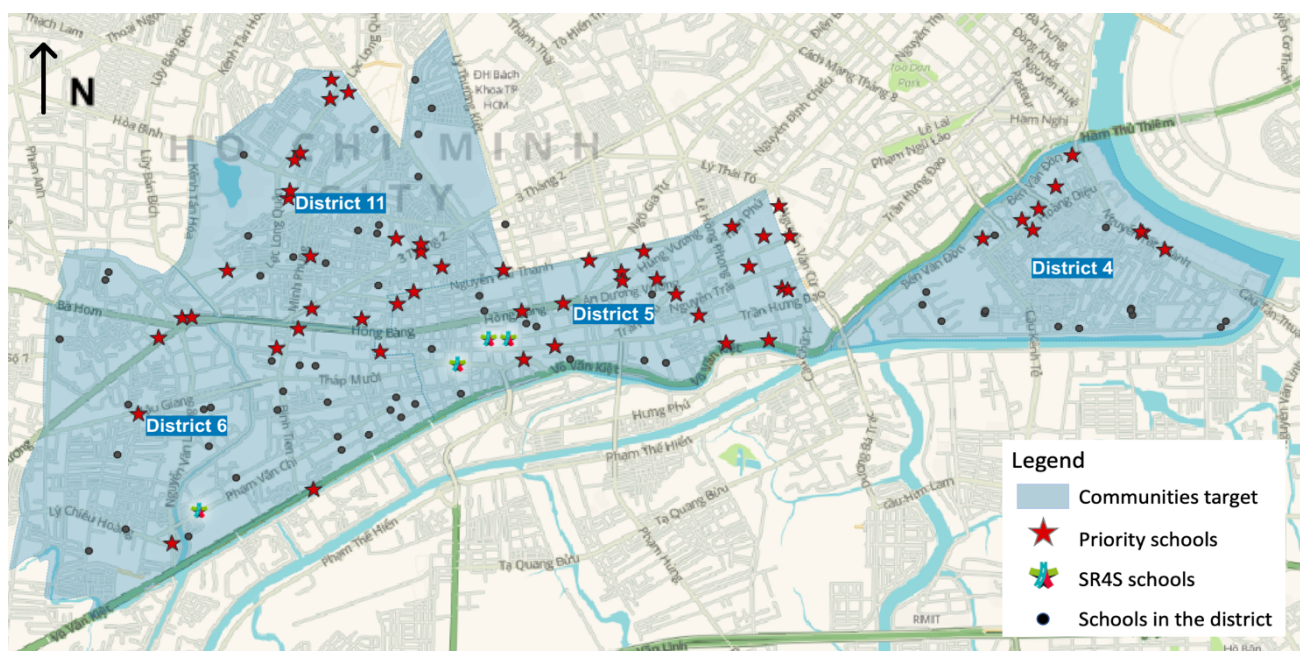
<sup>10</sup> Result after implement modifications

| ID  | School Name                             | District    | School Type* | Big Data Screening Score | Priority Rank | Assessed on SR4S |
|-----|---|-------------|--------------|--------------------------|---------------|------------------|
| 73  | Trường Tiểu Học Đặng Nguyên Cẩn         | District 6  | PS           | 511                      | 38            | -                |
| 39  | Trường Trung Học Cơ Sở Hậu Giang        | District 11 | MS           | 512                      | 39            | -                |
| 69  | Trường Trung Học Thực Hành Sài Gòn      | District 5  | MS,HS        | 521                      | 40            | -                |
| 103 | Trường Trung Học Cơ Sở Chi Lăng         | District 4  | MS           | 522                      | 40            | -                |
| 6   | Trường Tiểu Học Võ Văn Tần              | District 6  | PS           | 528                      | 42            | -                |
| 54  | Trường Tiểu Học Nguyễn Văn Trỗi         | District 4  | PS           | 537                      | 43            | -                |
| 76  | Trường Tiểu Học Hàm Tử                  | District 5  | PS           | 551                      | 44            | -                |
| 11  | Trường Tiểu Học Nguyễn Viết Xuân        | District 5  | PS           | 557                      | 45            | <sup>11</sup>    |
| 78  | Trường Tiểu Học Phú Thọ                 | District 11 | PS           | 561                      | 46            | -                |
| 86  | Trường Trung Học Cơ Sở Lam Sơn          | District 6  | MS           | 576                      | 47            | -                |
| 66  | Trường Tiểu Học Phú Định                | District 6  | PS           | 588                      | 48            | -                |
| 51  | Trường Tiểu Học Hùng Vương              | District 6  | PS           | 589                      | 49            | <sup>12</sup>    |
| 37  | Trường Tiểu Học Phú Lâm                 | District 6  | PS           | 599                      | 50            | -                |
| 19  | Trường Tiểu Học Bạch Đằng               | District 4  | PS           | 603                      | 51            | -                |
| 63  | Trường Phổ Thông Trung Học Mạc Đĩnh Chi | District 6  | HS           | 611                      | 52            | -                |
| 47  | Trường Trung Học Cơ Sở Hoàng Lê Kha     | District 6  | MS           | 618                      | 53            | -                |
| 113 | Trường Trung Học Cơ Sở Lý Phong         | District 5  | MS           | 625                      | 54            | -                |
| 10  | Trường Tiểu Học Âu Cơ                   | District 11 | PS           | 627                      | 55            | -                |
| 83  | Trường Trung Học Cơ Sở Kim Đồng         | District 5  | MS           | 634                      | 56            | -                |
| 40  | Trường Trung Học Cơ Sở Ba Đình          | District 5  | MS           | 634                      | 57            | -                |
| 53  | Trường Trung Học Phổ Thông Nguyễn Trãi  | District 4  | HS           | 636                      | 58            | -                |
| 90  | Trường Tiểu Học Lạc Long Quân           | District 11 | PS           | 640                      | 59            | -                |
| 68  | Trường Tiểu Học Đề Thám                 | District 11 | PS           | 641                      | 60            | -                |

\*PM: Primary School, MS: Middle School and HS: High School

<sup>11</sup> Result after implement modifications.

<sup>12</sup> Result after implement modifications.



**Figure 7 Location of the priority schools in HCMC**

## Level 2 and 3 Results – Pleiku City

As mentioned before, Level 1 was omitted for Pleiku City. Therefore, the analysis for Pleiku City is conducted in one stage, combining Levels 2 and 3. The tables in [Annex III](#) show the values of the attributes and their scores for each school assessed.

**Error! Reference source not found.** presents the final prioritisation for Pleiku City.

### History of SR4S assessments in Pleiku City

AIPF have already assessed thirty one schools on the priority list as part of the project *Slow Zone Safe Zone* (2021) and have modifications implemented. These schools will not be reassessed. Therefore, we include the subsequent school in the rank to be assessed in the AI&Me Project.

Therefore, the final list of schools presents, excluding those already assessed on SR4S or being modified, fourteen middle schools, eight high schools, and one primary schools. Two school include all levels.

**Table 7 Priority schools to conduct SR4S assessments in Pleiku City**

| ID  | School Name                           | School Type | Big Data Screening Score | Priority Rank | Assessed on SR4S |
|-----|---------------------------------------|-------------|--------------------------|---------------|------------------|
| 156 | Trường Trung Học Cơ Sở Phạm Hồng Thái | MS          | 82                       | 1             |                  |
| 150 | Trường Tiểu Học Hoàng Hoa Thám        | PS          | 97                       | 2             | #                |
| 148 | Trường Tiểu Học Võ Thị Sáu            | PS          | 106                      | 3             | #                |
| 151 | Trường Tiểu Học Ngô Mây               | PS          | 116                      | 4             | #                |
| 137 | Trường Trung Học Cơ Sở Nguyễn Du      | MS          | 121                      | 5             |                  |
| 154 | Trường Tiểu Học Nguyễn Lương Bằng     | PS          | 128                      | 6             | #                |

| ID   | School Name                                   | School Type | Big Data Screening Score | Priority Rank | Assessed on SR4S |
|------|---|-------------|--------------------------|---------------|------------------|
| 142  | Trường Trung Học Phổ Thông Chuyên Hùng Vương  | HS          | 131                      | 7             |                  |
| 128  | Trường Phổ Thông Dân Tộc Nội Trú Tỉnh Gia Lai | HS          | 139                      | 8             |                  |
| 138  | Trường Trung Học Phổ Thông Phan Bội Châu      | HS          | 142                      | 9             |                  |
| 135  | Trường Tiểu Học Lê Quý Đôn                    | PS          | 150                      | 10            |                  |
| 141  | Trường Tiểu Học Chu Văn An                    | PS          | 157                      | 11            | #                |
| 145  | Trường Trung Học Phổ Thông Lê Lợi             | HS          | 167                      | 12            |                  |
| 149  | Trường Tiểu Học Nguyễn Văn Trỗi               | PS          | 176                      | 13            | #                |
| 161  | Trường Tiểu Học Anh Hùng Núp                  | PS          | 173                      | 14            | #                |
| 131  | Trường Trung Học Cơ Sở Trưng Vương            | MS          | 184                      | 15            |                  |
| 166  | Trường Trung Học Cơ Sở Trần Phú               | MS          | 196                      | 16            |                  |
| 139  | Trường Tiểu Học Nguyễn Bá Ngọc                | PS          | 196                      | 16            | #                |
| 175  | Trường Trung Học Phổ Thông Chi Lăng           | HS          | 206                      | 18            |                  |
| 158  | Trường Trung Học Phổ Thông Hoàng Hoa Thám     | HS          | 226                      | 19            |                  |
| 140  | Trường Tiểu Học Nguyễn Trãi                   | PS          | 228                      | 20            | #                |
| 165  | Trường Trung Học Cơ Sở Lý Thường Kiệt         | MS          | 217                      | 21            |                  |
| 179  | Trường Tiểu Học Lê Lai                        | PS          | 231                      | 22            | #                |
| 143  | Trường Tiểu Học Cù Chính Lan                  | PS          | 232                      | 23            | #                |
| 129  | Trường Trung Học Cơ Sở Huỳnh Thúc Kháng       | MS          | 233                      | 24            |                  |
| 133  | Trường Trung Học Cơ Sở Nguyễn Văn Cừ          | MS          | 233                      | 25            |                  |
| 170  | Trường Tiểu Học Nguyễn Khuyến                 | PS          | 241                      | 26            | #                |
| 147  | Trường Tiểu Học Nguyễn Thị Minh Khai          | PS          | 243                      | 27            | #                |
| 132  | Trường Tiểu Học Nguyễn Bình Khiêm             | PS          | 244                      | 28            | #                |
| 146  | Trường Trung Học Cơ Sở Nguyễn Viết Xuân       | MS          | 250                      | 29            |                  |
| 162  | Trường Trung Học Phổ Thông Pleiku             | HS          | 254                      | 30            |                  |
| 144  | Trường Trung Học Cơ Sở Nguyễn Huệ             | MS          | 259                      | 31            |                  |
| 153  | Trường Trung Học Phổ Thông Nguyễn Chí Thanh   | HS          | 262                      | 32            |                  |
| 159  | Trường Tiểu Học Phan Đăng Lưu                 | PS          | 266                      | 33            | #                |
| 178  | Trường Tiểu Học Đinh Tiên Hoàng               | PS          | 273                      | 34            | #                |
| 155  | Trường Trung Học Cơ Sở Lý Tự Trọng            | MS          | 284                      | 35            |                  |
| 130  | Trường Tiểu Học Trần Quốc Toản                | PS          | 299                      | 36            | #                |
| 169  | Trường Tiểu Học Lê Hồng Phong                 | PS          | 301                      | 37            | #                |
| 181  | Trường Tiểu Học Lương Thạnh                   | PS          | 327                      | 38            | #                |
| 136  | Trường Trung Học Cơ Sở Tôn Đức Thắng          | MS          | 326                      | 40            |                  |
| 152  | Trường Tiểu Học Bùi Dự                        | PS          | 339                      | 41            | #                |
| 1111 | Trường Tiểu Học Ngô Quyền                     | PS          | 345                      | 42            | #                |
| 164  | Trường Trung Học Cơ Sở Lương Thế Vinh         | MS          | 334                      | 44            |                  |
| 172  | Trường Tiểu Học Nay Der                       | PS          | 347                      | 45            | #                |
| 173  | Trường Tiểu Học Nguyễn Đức Cảnh               | PS          | 366                      | 46            | #                |
| 127  | Trường Tiểu Học, Trung Học Cơ Sở Bùi Thị Xuân | PS,MS       | 362                      | 47            | #                |

| ID   | School Name  | School Type | Big Data Screening Score | Priority Rank | Assessed on SR4S |
|------|--|-------------|--------------------------|---------------|------------------|
| 174  | Trường Quốc Tế Châu Á Thái Bình Dương                            | PS, MS, HS  | 373                      | 48            |                  |
| 180  | Trường Tiểu Học Trần Đại Nghĩa                                   | PS          | 375                      | 49            | #                |
| 157  | Trường Tiểu Học, Trung Học Cơ Sở Nguyễn Chí Thanh                | PS,MS       | 378                      | 50            | #                |
| 167  | Trường Tiểu Học, Trung Học Cơ Sở Lê Văn Tám                      | PS,MS       | 406                      | 51            | #                |
| 168  | Trường Tiểu Học Hồ Tùng Mậu                                      | PS          | 420                      | 52            | #                |
| 177  | Trường Tiểu Học, Trung Học Cơ Sở Anh Hùng Vũu                    | PS,MS       | 428                      | 53            |                  |
| 171  | Trường Tiểu Học Trần Quý Cáp                                     | PS          | 430                      | 54            | #                |
| 1112 | Trường Trung Học Cơ Sở Lê Lợi                                    | MS          | 431                      | 55            |                  |
| 163  | Trường Tiểu Học, Trung Học Cơ Sở và Trung Học Phổ Thông Sao Việt | PS,MS,HS    | 432                      | 56            |                  |
| 1113 | Trường Trung Học Cơ Sở Ngô Gia Tự                                | MS          | 448                      | 57            |                  |
| 176  | Trường Tiểu Học, Trung Học Cơ Sở Anh Hùng Đôn                    | PS, MS      | 494                      | 58            | #                |

\*PM: Primary School, MS: Middle School and HS: High School

# Modifications recently implemented.

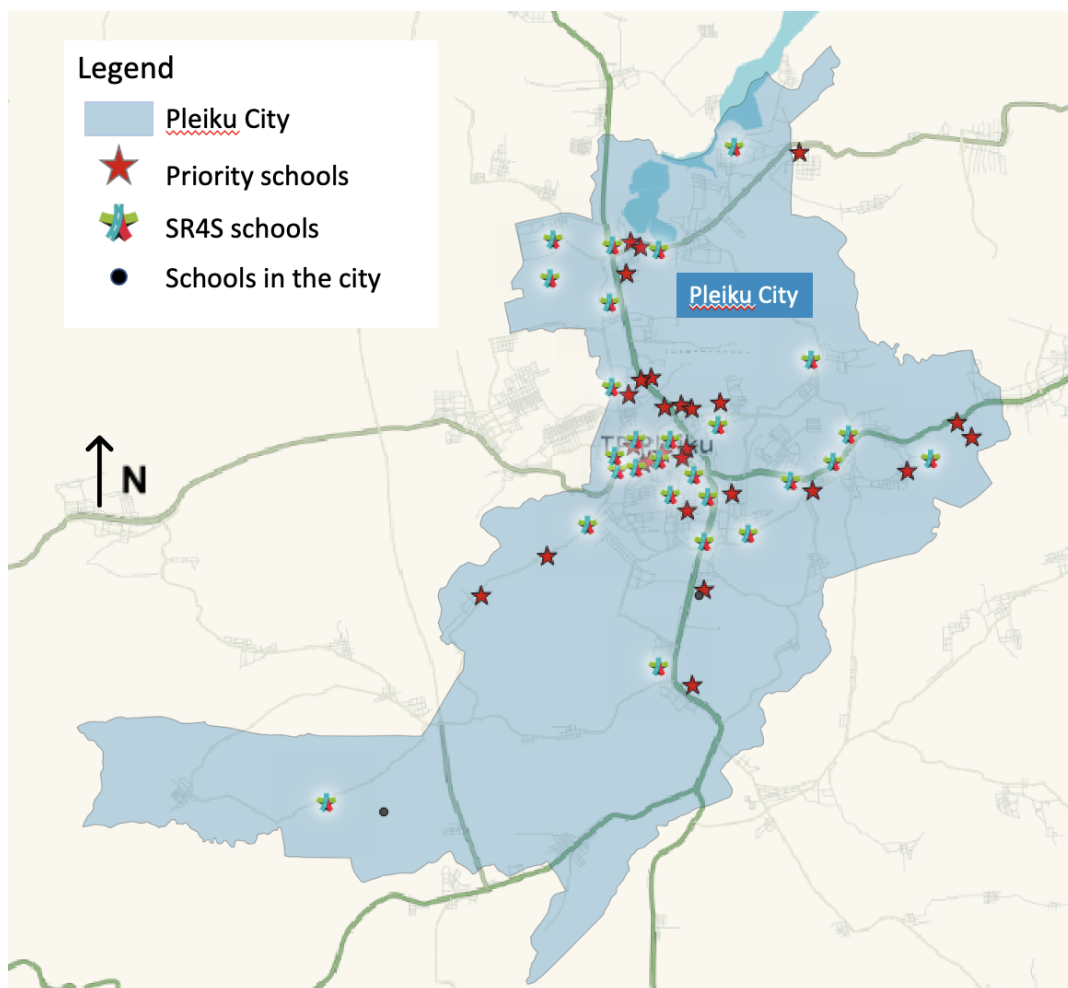


Figure 8 Location of the priority schools in Pleiku City

## Level 2 and 3 Results – Yen Bai City

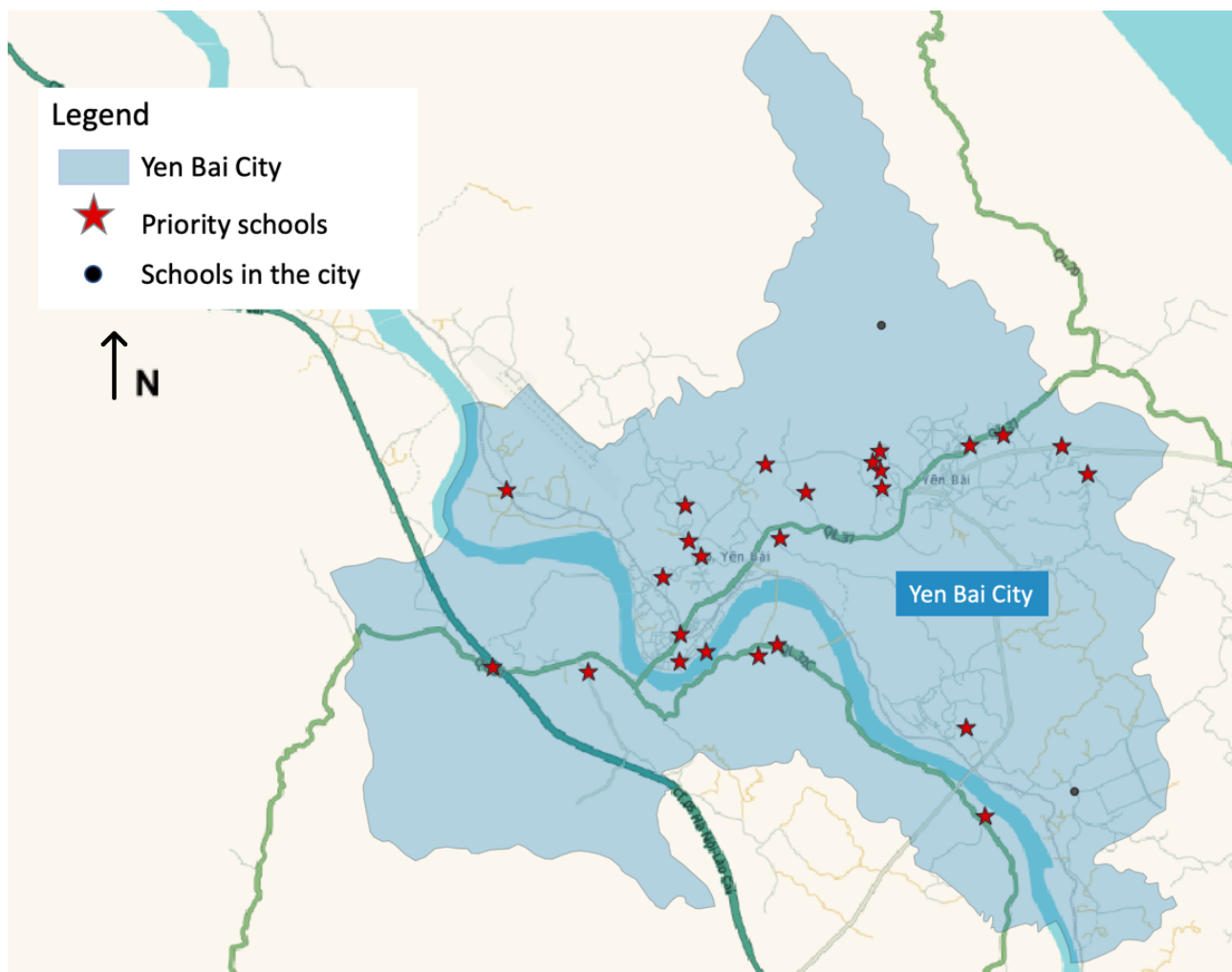
The combination of Level 2 and Level 3 attributes were also applied to Yen Bai City. The tables in [Annex IV](#) provides the values of the attributes and their scores for each school assessed.

The city only has 27 schools. Therefore, almost all the schools are candidates for the SR4S assessments (25 schools) since no one was assessed before. Table 8 presents the schools ranked from higher to lower risk. In the case of Yen Bai City, the priority schools list it's made of eight primary schools, five secondary school and five high school. Seven schools teach at the primary and secondary school levels.

**Table 8 Priority schools to conduct SR4S assessments in Yen Bai City**

| ID  | School name   | School Type | Big Data Screening Score | Priority Rank |
|-----|---|-------------|--------------------------|---------------|
| 206 | Trường Trung Học Phổ Thông Nguyễn Huệ                             | HS          | 78                       | 1             |
| 185 | Trường Trung Học Phổ Thông Chuyên Nguyễn Tất Thành                | HS          | 80                       | 2             |
| 188 | Trường Tiểu Học Nguyễn Phúc                                       | PS          | 88                       | 3             |
| 187 | Trường Tiểu Học Nguyễn Thái Học                                   | PS          | 93                       | 4             |
| 191 | Trường Trung Học Cơ Sở Quang Trung                                | MS          | 105                      | 5             |
| 204 | Trường Tiểu Học Hồng Thái   | PS          | 112                      | 6             |
| 183 | Trường Tiểu Học Yên Ninh  | PS          | 113                      | 7             |
| 201 | Trường Tiểu Học, Trung Học Cơ Sở Âu Lâu                           | PS,MS       | 115                      | 8             |
| 200 | Trường Trung Học Phổ Thông Hoàng Quốc Việt                        | HS          | 117                      | 9             |
| 198 | Trường Trung Học Phổ Thông Lý Thường Kiệt                         | HS          | 125                      | 10            |
| 205 | Trường Trung Học Cơ Sở Lê Hồng Phong                              | MS          | 133                      | 11            |
| 184 | Trường Tiểu Học Kim Đồng  | PS          | 134                      | 12            |
| 194 | Trường Tiểu Học Nguyễn Trãi                                       | PS          | 140                      | 13            |
| 195 | Trường Tiểu Học và Trung Học Cơ Sở Hợp Minh                       | PS, MS      | 140                      | 13            |
| 199 | Trường Trung Học Cơ Sở Yên Thịnh                                  | MS          | 143                      | 15            |
| 186 | Trường Tiểu Học, Trung Học Cơ Sở Tân Thịnh                        | PS,MS       | 146                      | 16            |
| 193 | Trường Trung Học Cơ Sở Nguyễn Du                                  | MS          | 149                      | 17            |
| 192 | Trường Tiểu Học Yên Thịnh   | PS          | 150                      | 18            |
| 189 | Trường Tiểu Học, Trung Học Cơ Sở Giới Phiên Cơ Sở 2               | PS,MS       | 153                      | 19            |
| 197 | Trường Phổ Thông Dân Tộc Nội Trú Trung Học Phổ Thông Tỉnh Yên Bái | HS          | 161                      | 20            |
| 190 | Trường Trung Học Cơ Sở Yên Ninh                                   | MS          | 162                      | 21            |
| 196 | Trường Tiểu Học, Trung Học Cơ Sở Giới Phiên Cơ Sở 1               | PS, MS      | 170                      | 22            |
| 208 | Trường Tiểu Học, Trung Học Cơ Sở Tuy Lộc                          | PS, MS      | 182                      | 23            |
| 207 | Trường Tiểu Học, Trung Học Cơ Sở Văn Phú                          | PS, MS      | 190                      | 24            |
| 203 | Trường Tiểu Học Nam Cường   | PS          | 211                      | 25            |

\*PM: Primary School, MS: Middle School and HS: High School



**Figure 9 Location of the priority schools in Yen Bai City**

## 5 FINAL REMARKS AND LESSONS LEARNED

This report presents an application of the Big Data Screening Methodology developed for the *AI&Me: Empowering youth for safer roads* project. The methodology aligns evidence-based attributes and big data sources to allow ranking of schools from the highest to low road safety risk for pedestrians, resulting in a prioritization list for further, detailed assessments.

The methodology was applied in the three project pilot cities: Ho Chi Minh City, Pleiku City and Yen Bai City. Differences in size and administrative boundaries affected the way the methodology was applied in each of the cities.

In the case of Pleiku City and Yen Bai City, the Level 1 analysis was omitted due to the scale of the city. It was considered that the target community in these two cases was the entire city.

Level 1 was well suited for the HCMC case. Starting from a citywide perspective, It helped identify the areas with a high density of road crashes and where people potentially walk more. The Level 1 optimised the data collection effort to focus on the denser and centralized communities.

However, it does not mean that road safety problems in other parts of the city do not deserve attention. The methodology can be seen as a first attempt to tackle road safety issues, where continuous and comprehensive assessments need to be made to guarantee that kids have a safe walk to and from schools. Where resources permit the more detailed big data analyses presented in Level 2 and 3 can be undertaken across a whole region.

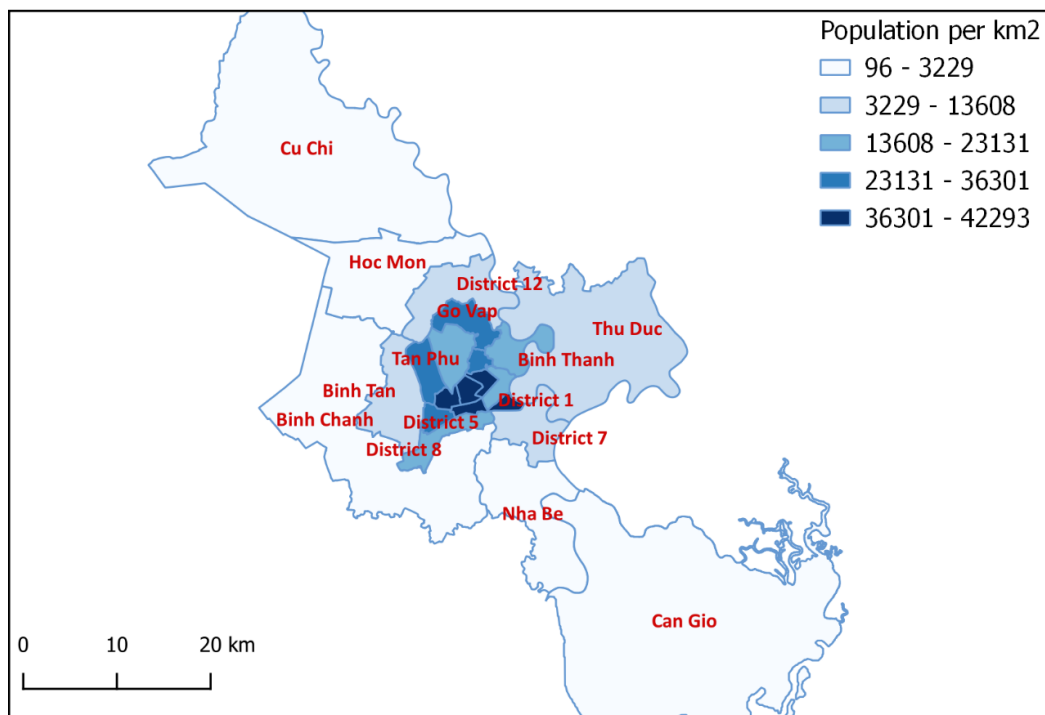
The final list of schools are then the nominated candidates for the SR4S assessments in the following stages of the project. The number of schools identified as part of the final list is a predetermined based on the project goals and agreements with the local government. Applications in other contexts might present different values and a different number of target schools.

Since the project's overall aim is to see infrastructure improvements implemented, it depends on political commitment and agreements among decision-makers. The results of piloting the methodology showed that the number of target schools influences the appropriate level of analysis to use in the localised methodology.

For this reason, based on the Viet Nam specific needs, the project team decided to combine the second and third levels since the number of schools was already close to the desired number in the final list, even though the attributes still bring valuable information to prioritize investments. A new application might include more areas in the Level 1 analysis results. For smaller cities, the attributes may be used in full without narrowing down the number of schools.

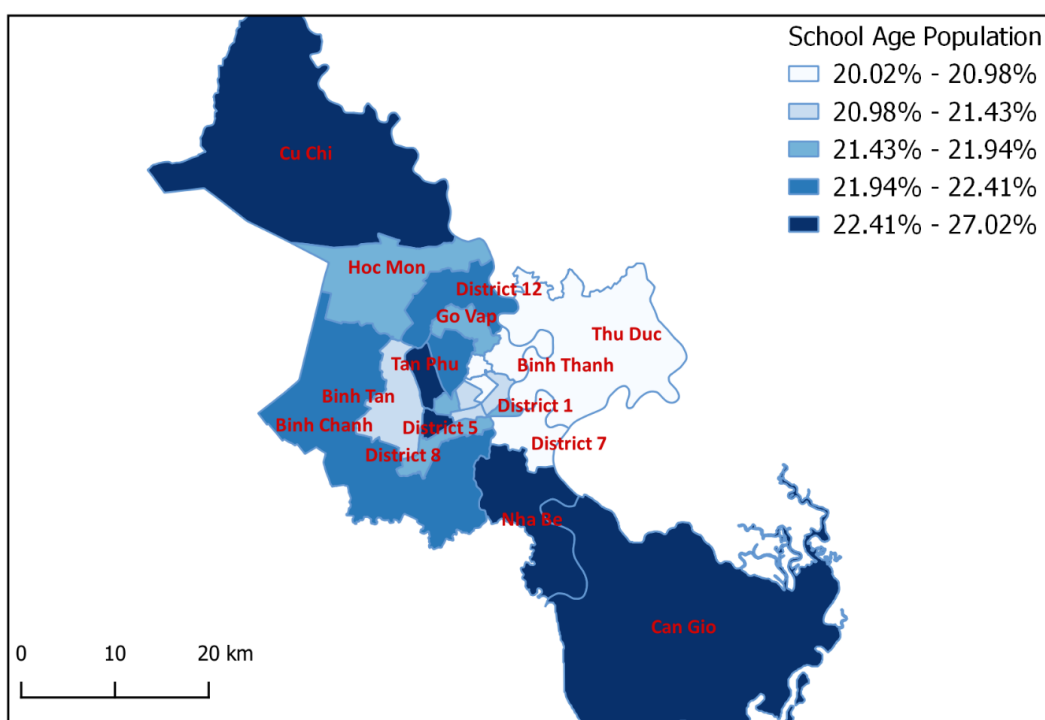
Finally, it is possible to say that the methodology meets the objectives proposed. The attributes included are simple and easy to obtain using big data sources, although some manipulations and human verification are needed. Most of them are available in different parts of the world and at a low cost. Therefore, the application and the results reinforce the potential scalability and repeatability of the methodology, being part of the package of solutions that the *AI&Me: Empowering youth for safer roads* project delivers.

## ANNEX I HCMC – LEVEL 1 ATTRIBUTES MAPS



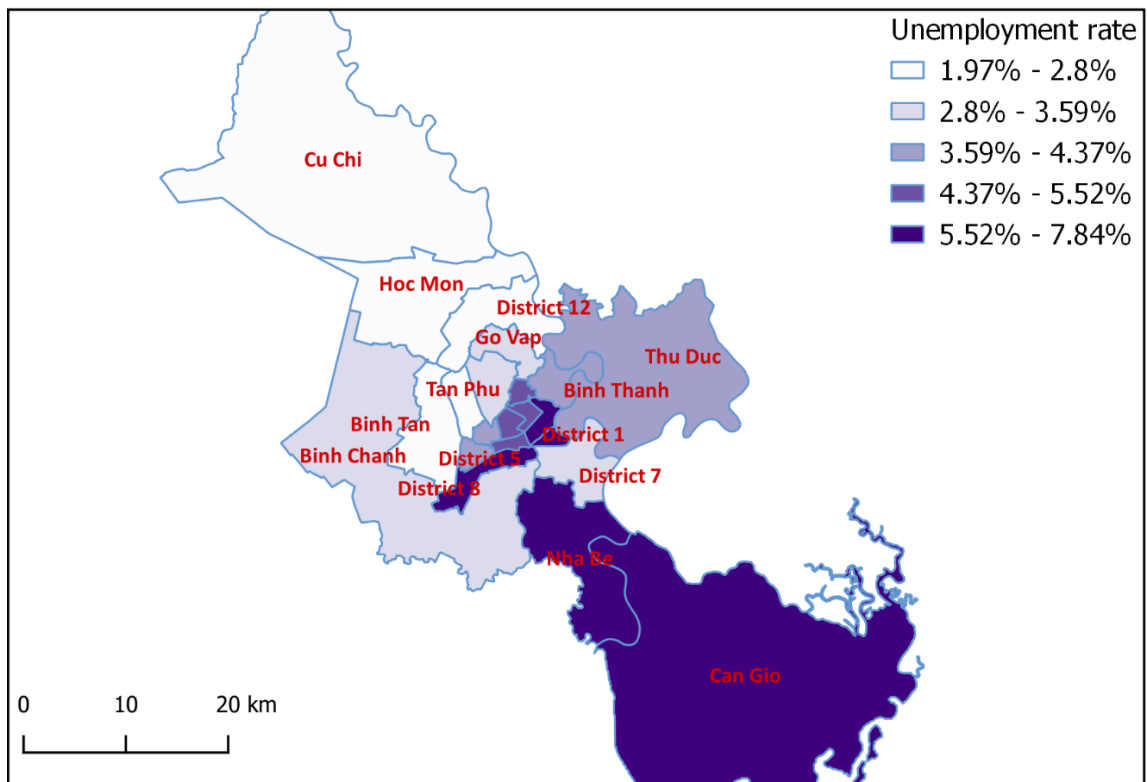
**Figure 10 Population density Ho Chi Minh City.**

Data source: IMPUMS Terra Census Data 2009



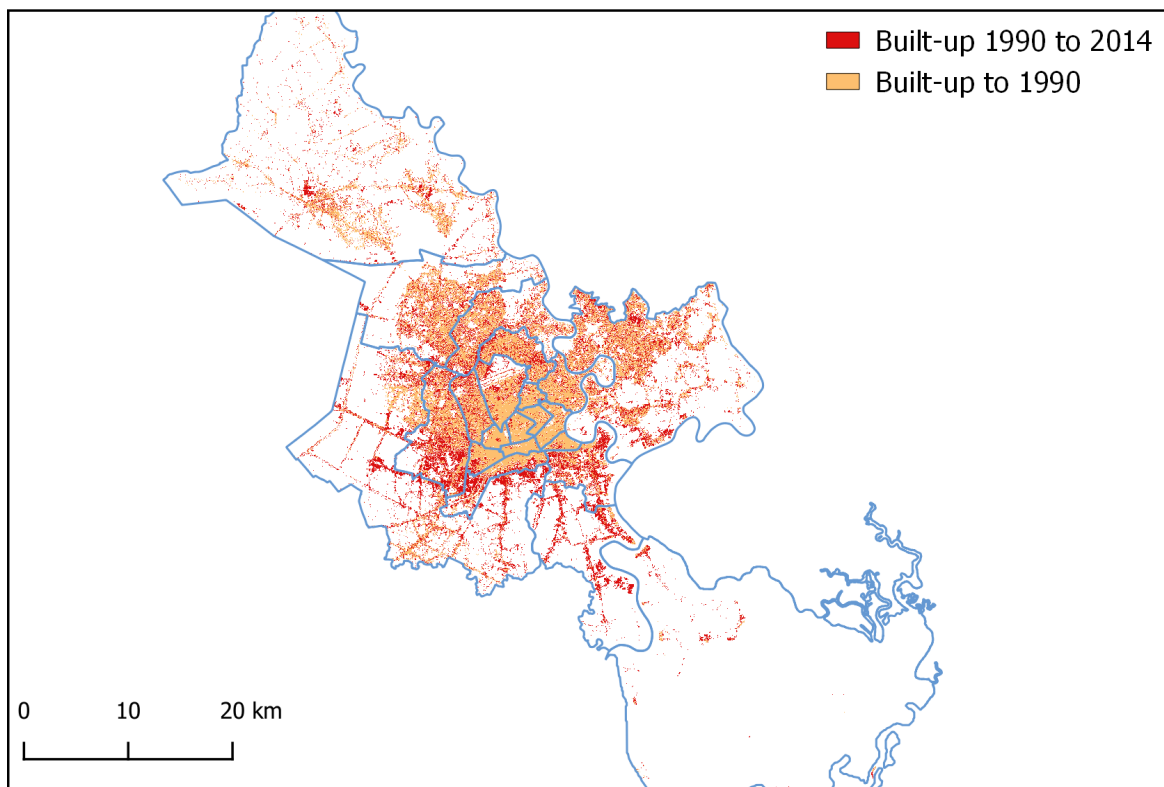
**Figure 11 Population school-age Ho Chi Minh City.**

Data source: IMPUMS Terra Census Data 2009



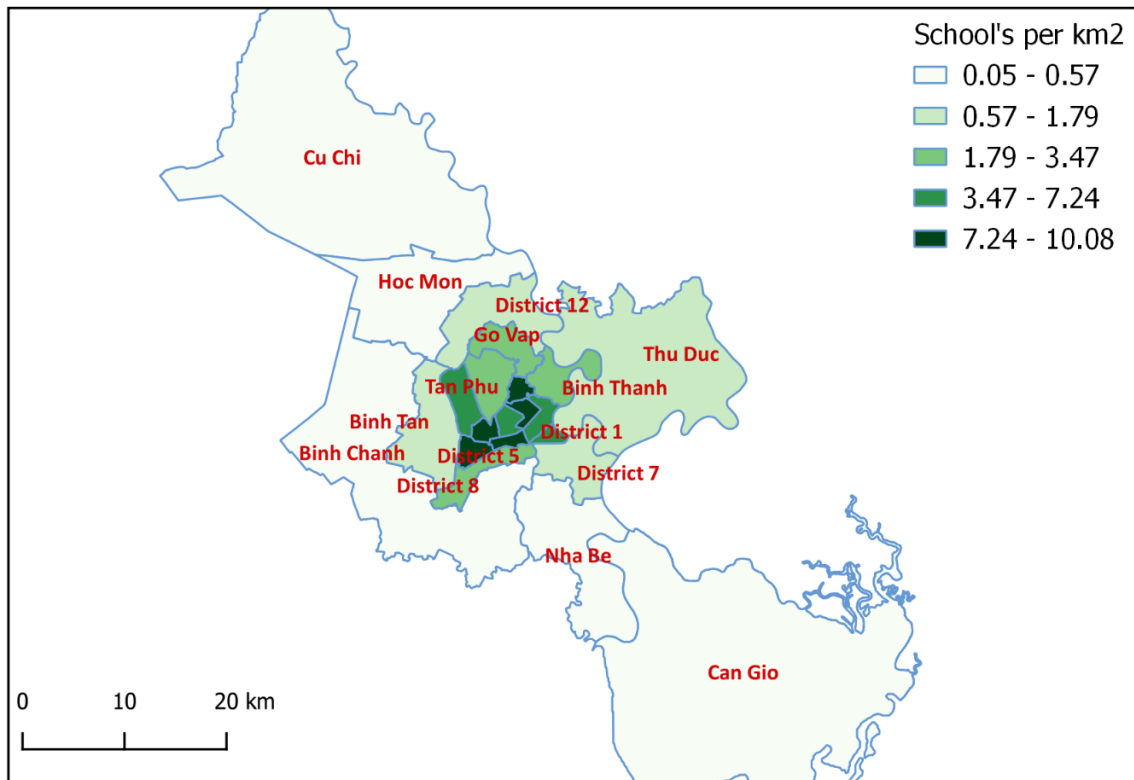
**Figure 12 Unemployment rate Ho Chi Minh City.**

Data source: IMPUMS Terra Census Data 2009



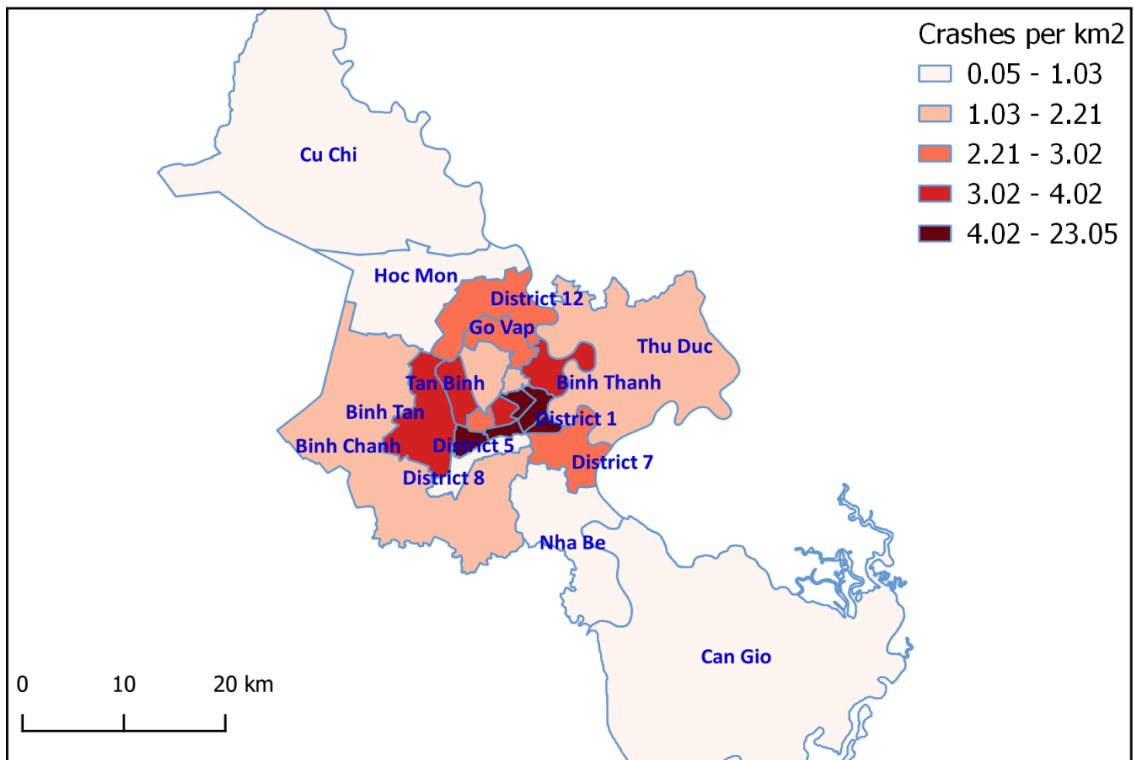
**Figure 13 Increase of built-up area in Ho Chi Minh City from 1990 to 2014.**

Data source: Global Human Settlement Layer (GHSL).



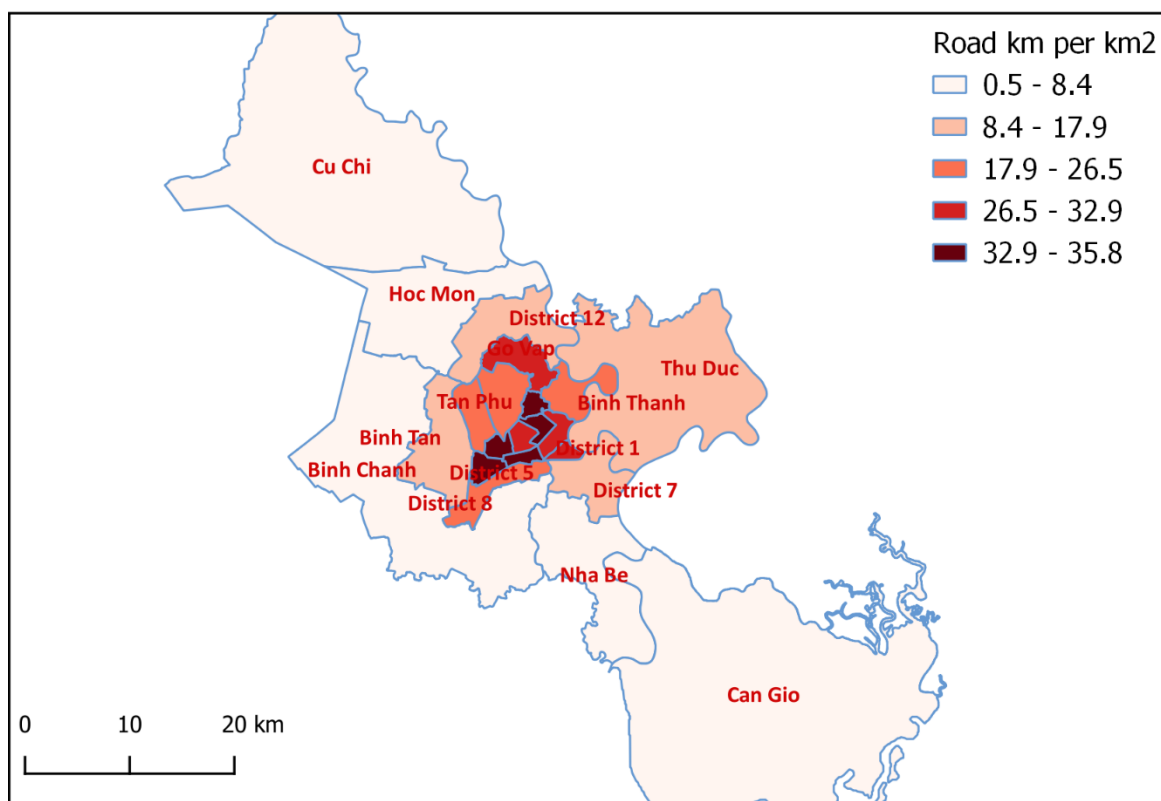
**Figure 14 School density Ho Chi Minh City**

Data source: Provincial Department of Education and Training and MN-R data



**Figure 15 Crash Density Ho Chi Minh City.**

Data source: Provincial Traffic Safety Committee



**Figure 16 Road density Ho Chi Minh City.**

Data source: Tomtom-MNR

## ANNEX II HCMC – LEVEL 2 AND 3 ATTRIBUTES AND RANKS

It is possible to see in the following tables, Table 9 and Table 10, the list of schools in Ho Chi Minh City assessed in the Level 2 and 3 analyses. Every school is identified by ID, name, type of school and the district where the school is located.

- Table 9 presents the calculate values for the attributes.
- Table 10 presents the scores associated with the attributes ranked.

**Table 9 Level 2 and 3 attributes database – HCMC**

| id | Name  | District | School Type <sup>13</sup> | Number of student s | School road type | Length high risk roads | Number of Intersect. | Number of lanes | School Road Rec. <sup>14</sup> | School road avg. speed | School Zone Rec. <sup>15</sup> | School zone avg. speed |
|----|---|----------|---------------------------|---------------------|------------------|------------------------|----------------------|-----------------|--------------------------------|------------------------|--------------------------------|------------------------|
| 1  | Trường Phạm Văn Chí   | 6        | PS                        | 1104                | local            | 1.0                    | 59                   | 1               | 0.23                           | 33.00                  | 48.83                          | 32.81                  |
| 2  | Trường Nguyễn Minh Hoàng  | 11       | MS                        | 451                 | local            | 3.5                    | 268                  | 1               | 0.00                           | 0.00                   | 286.68                         | 20.52                  |
| 3  | Trường Tiểu Học Trương Công Định  | 6        | PS                        | 862                 | local            | 1.1                    | 358                  | 1               | 0.00                           | 0.00                   | 16.28                          | 26.56                  |
| 4  | Trường Trung Học Cơ Sở Nguyễn Văn Luông                                 | 6        | MS                        | 2005                | local            | 0.0                    | 140                  | 1               | 0.00                           | 0.00                   | 1.70                           | 25.04                  |
| 5  | Trường Tiểu Học Và Trung Học Cơ Sở Quốc Tế Mỹ Úc - Trường Anh Ngữ Mỹ Úc | 6        | PS                        | 92                  | local            | 0.0                    | 352                  | 1               | 0.78                           | 22.72                  | 2.71                           | 24.61                  |
| 6  | Trường Tiểu Học Võ Văn Tần  | 6        | PS                        | 881                 | arterial         | 3.1                    | 229                  | 1               | 5.57                           | 26.63                  | 141.80                         | 20.79                  |
| 7  | Trường Tiểu Học Đại Thành   | 11       | PS                        | 593                 | local            | 1.5                    | 341                  | 1               | 0.00                           | 0.00                   | 183.11                         | 21.19                  |
| 8  | Trường Tiểu Học Nguyễn Huệ  | 6        | PS                        | 1312                | local            | 1.6                    | 156                  | 1               | 0.13                           | 17.89                  | 36.72                          | 19.90                  |
| 9  | Trường Tiểu Học Công Lập Trưng Trắc                                     | 11       | PS                        | 1346                | local            | 0.0                    | 208                  | 1               | 1.67                           | 21.64                  | 9.00                           | 19.20                  |
| 10 | Trường Tiểu Học Âu Cơ   | 11       | PS                        | 521                 | local            | 2.8                    | 405                  | 1               | 2.10                           | 21.00                  | 210.06                         | 22.41                  |
| 11 | Trường Tiểu Học Nguyễn Viết Xuân  | 5        | PS                        | 846                 | arterial         | 4.9                    | 137                  | 1               | 8.55                           | 17.00                  | 262.21                         | 19.87                  |
| 12 | Trường Tiểu Học Phạm Hồng Thái  | 5        | PS                        | 929                 | local            | 4.9                    | 170                  | 1               | 4.27                           | 19.90                  | 203.40                         | 20.33                  |
| 13 | Trường Trung Học Cơ Sở Văn Đồng   | 4        | MS                        | 950                 | arterial         | 5.6                    | 338                  | 2 or more       | 24.72                          | 17.80                  | 326.51                         | 21.68                  |
| 14 | Trường Tiểu Học Vĩnh Hội  | 4        | PS                        | 759                 | local            | 0.8                    | 232                  | 1               | 0.00                           | 0.00                   | 34.48                          | 17.20                  |
| 15 | Trường Tiểu Học Hòa Bình  | 11       | PS                        | 818                 | local            | 1.5                    | 140                  | 1               | 0.00                           | 0.00                   | 117.61                         | 23.13                  |
| 16 | Trường Trung Học Cơ Sở Quang Trung                                      | 4        | MS                        | 1034                | local            | 0.9                    | 187                  | 1               | 0.00                           | 0.00                   | 68.21                          | 23.41                  |
| 17 | Trường Tiểu Học Huỳnh Kiến Hoa  | 5        | PS                        | 793                 | local            | 4.0                    | 131                  | 1               | 0.60                           | 21.55                  | 168.98                         | 25.26                  |
| 18 | Trường Tiểu Học Chương Dương  | 5        | PS                        | 593                 | local            | 3.4                    | 162                  | 1               | 0.00                           | 0.00                   | 92.16                          | 23.45                  |
| 19 | Trường Tiểu Học Bạch Đằng   | 4        | PS                        | 770                 | local            | 5.0                    | 189                  | 1               | 2.17                           | 21.62                  | 241.97                         | 22.77                  |

<sup>13</sup> School types are classified as PS: Primary School / MS: Middle School / HS: High School.

<sup>14</sup> School road records are presented divided by 10.000.

<sup>15</sup> School zone records are presented divided by 100.000

| id | Name   | District | School Type <sup>13</sup> | Number of student s | School road type | Length high risk roads | Number of Intersect. | Number of lanes | School Road Rec. <sup>14</sup> | School road avg. speed | School Zone Rec. <sup>15</sup> | School zone avg. speed |
|----|--|----------|---------------------------|---------------------|------------------|------------------------|----------------------|-----------------|--------------------------------|------------------------|--------------------------------|------------------------|
| 20 | Trường Tiểu Học Nguyễn Bá Ngọc                       | 11       | PS                        | 638                 | local            | 3.1                    | 374                  | 1               | 0.00                           | 0.00                   | 86.10                          | 22.63                  |
| 21 | Trường Trung Học Phổ Thông Bình Phú                  | 6        | HS                        | 1993                | local            | 0.0                    | 91                   | 1               | 0.00                           | 30.00                  | 3.40                           | 24.65                  |
| 22 | Trường Trung Học Phổ Thông Chuyên Lê Hồng Phong      | 5        | HS                        | 2030                | major            | 3.5                    | 113                  | 2 or more       | 35.74                          | 25.73                  | 292.44                         | 23.19                  |
| 23 | Trường Trung Học Cơ Sở Chuẩn Quốc Gia Nguyễn Văn Phú | 11       | MS                        | 1260                | local            | 1.4                    | 336                  | 1               | 0.00                           | 0.00                   | 32.04                          | 19.58                  |
| 24 | Trường Tiểu Học Dân Lập Bình Thới                    | 11       | PS                        | 131                 | local            | 2.4                    | 284                  | 1               | 0.00                           | 0.00                   | 114.68                         | 22.93                  |
| 25 | Trường Tiểu Học Khánh Hội B                          | 4        | PS                        | 956                 | local            | 1.2                    | 133                  | 1               | 0.43                           | 26.29                  | 27.42                          | 27.90                  |
| 26 | Trường Tiểu Học Bến Cảng                             | 4        | PS                        | 478                 | major            | 1.6                    | 237                  | 2 or more       | 45.29                          | 24.24                  | 138.01                         | 23.87                  |
| 27 | Trường Trung Học Cơ Sở Mạch Kiếm Hùng                | 5        | MS                        | 1462                | arterial         | 5.2                    | 131                  | 2 or more       | 9.65                           | 16.01                  | 282.15                         | 20.33                  |
| 28 | Trường Tiểu Học Nguyễn Văn Luông                     | 6        | PS                        | 1059                | local            | 0.0                    | 316                  | 1               | 0.00                           | 0.00                   | 2.43                           | 25.98                  |
| 29 | Trường Tiểu Học Lê Đình Chinh                        | 5        | PS                        | 859                 | local            | 3.1                    | 128                  | 1               | 0.09                           | 18.35                  | 113.48                         | 21.55                  |
| 30 | Trường Tiểu Học Nguyễn Thiện Thuật                   | 6        | PS                        | 539                 | local            | 2.2                    | 189                  | 1               | 0.03                           | 18.43                  | 41.89                          | 18.94                  |
| 31 | Trường Tiểu Học Chi Lăng                             | 6        | PS                        | 1038                | local            | 1.2                    | 346                  | 1               | 0.00                           | 0.00                   | 52.87                          | 22.51                  |
| 32 | Trường Tiểu Học Nhật Tảo                             | 6        | PS                        | 429                 | local            | 1.1                    | 308                  | 1               | 0.04                           | 25.13                  | 15.37                          | 22.85                  |
| 33 | Trường Tiểu Học Quốc Tế Việt Mỹ Úc                   | 11       | PS                        | 41                  | local            | 0.0                    | 350                  | 1               | 0.00                           | 19.86                  | 20.23                          | 19.94                  |
| 34 | Trường Trung Học Cơ Sở Đoàn Kết                      | 6        | MS                        | 1061                | local            | 0.5                    | 325                  | 1               | 0.00                           | 0.00                   | 9.15                           | 26.99                  |
| 35 | Trường Trung Học Cơ Sở Phú Thọ                       | 11       | MS                        | 1528                | major            | 2.3                    | 392                  | 2 or more       | 20.33                          | 26.64                  | 212.14                         | 22.64                  |
| 36 | Trường Tiểu Học Nguyễn Huệ                           | 4        | PS                        | 320                 | local            | 1.3                    | 165                  | 1               | 0.12                           | 14.11                  | 44.20                          | 24.15                  |
| 37 | Trường Tiểu Học Phú Lâm                              | 6        | PS                        | 2307                | local            | 1.9                    | 171                  | 2 or more       | 0.00                           | 0.00                   | 177.92                         | 26.79                  |
| 38 | Trường Tiểu Học Kim Đồng                             | 6        | PS                        | 920                 | major            | 1.6                    | 206                  | 2 or more       | 27.02                          | 46.65                  | 28.77                          | 27.40                  |
| 39 | Trường Trung Học Cơ Sở Hậu Giang                     | 11       | MS                        | 2133                | local            | 3.8                    | 330                  | 1               | 0.62                           | 19.44                  | 197.66                         | 24.76                  |
| 40 | Trường Trung Học Cơ Sở Ba Đình                       | 5        | MS                        | 1779                | local            | 4.2                    | 270                  | 1               | 0.00                           | 19.00                  | 320.01                         | 20.58                  |
| 41 | Trường Trung Học Cơ Sở Văn Thân                      | 6        | MS                        | 949                 | local            | 0.0                    | 272                  | 1               | 0.00                           | 21.37                  | 0.31                           | 27.65                  |
| 42 | Trường Tiểu Học Lê Văn Tám                           | 6        | PS                        | 1021                | local            | 1.8                    | 316                  | 1               | 0.00                           | 0.00                   | 97.46                          | 25.72                  |
| 43 | Trường Trung Học Cơ Sở Nguyễn Đức Cảnh               | 6        | MS                        | 1232                | local            | 5.0                    | 303                  | 2 or more       | 0.95                           | 17.81                  | 232.34                         | 25.99                  |

| id | Name   | District | School Type <sup>13</sup> | Number of student s | School road type | Length high risk roads | Number of Intersect. | Number of lanes | School Road Rec. <sup>14</sup> | School road avg. speed | School Zone Rec. <sup>15</sup> | School zone avg. speed |
|----|--|----------|---------------------------|---------------------|------------------|------------------------|----------------------|-----------------|--------------------------------|------------------------|--------------------------------|------------------------|
| 44 | Trường Trung Học Cơ Sở Trần Bội Cơ   | 5        | MS                        | 2313                | arterial         | 4.6                    | 157                  | 2 or more       | 12.91                          | 25.84                  | 201.64                         | 20.91                  |
| 45 | Trường Tiểu Học Anh Việt Mỹ  | 4        | PS                        | 149                 | major            | 1.6                    | 235                  | 2 or more       | 45.29                          | 24.24                  | 146.66                         | 23.12                  |
| 46 | Trường Tiểu Học Phùng Hưng   | 11       | PS                        | 1196                | arterial         | 3.2                    | 231                  | 2 or more       | 16.54                          | 28.63                  | 180.02                         | 23.18                  |
| 47 | Trường Trung Học Cơ Sở Hoàng Lê Kha  | 6        | MS                        | 1174                | local            | 3.1                    | 284                  | 1               | 0.01                           | 21.88                  | 200.04                         | 25.92                  |
| 48 | "Văn Lang High school /  |          |                           |                     |                  |                        |                      |                 |                                |                        |                                |                        |
| 49 | Trường Tiểu Học Vĩnh Xuyên   | 6        | PS                        | 79                  | local            | 2.3                    | 163                  | 1               | 0.19                           | 17.02                  | 40.09                          | 19.79                  |
| 50 | Trường Trung Học Thực Hành Đại Học Sư Phạm   | 5        | HS                        | 816                 | major            | 3.3                    | 110                  | 2 or more       | 36.25                          | 30.99                  | 204.60                         | 23.25                  |
| 51 | Trường Tiểu Học Hùng Vương   | 6        | PS                        | 1015                | local            | 0.9                    | 137                  | 2 or more       | 0.11                           | 32.61                  | 17.07                          | 31.78                  |
| 52 | Trường Trung Học Phổ Thông Trần Quang Khải   | 11       | HS                        | 2376                | arterial         | 2.4                    | 202                  | 2 or more       | 0.00                           | 33.00                  | 148.94                         | 23.59                  |
| 53 | Trường Trung Học Phổ Thông Nguyễn Trãi   | 4        | HS                        | 1716                | local            | 1.6                    | 214                  | 1               | 0.17                           | 20.78                  | 129.58                         | 27.58                  |
| 54 | Trường Tiểu Học Nguyễn Văn Trỗi  | 4        | PS                        | 1205                | local            | 5.7                    | 263                  | 1               | 1.12                           | 21.37                  | 283.61                         | 22.38                  |
| 55 | Trường Tiểu Học Phù Đổng   | 6        | PS                        | 1550                | local            | 0.0                    | 122                  | 1               | 0.00                           | 12.45                  | 0.41                           | 21.74                  |
| 56 | Trường Trung Học Phổ Thông Phạm Phú Thứ  | 6        | HS                        | 1991                | local            | 1.5                    | 273                  | 1               | 0.01                           | 24.15                  | 23.35                          | 24.33                  |
| 57 | Trường Tiểu Học Đồng Đa  | 4        | PS                        | 409                 | local            | 0.1                    | 222                  | 1               | 0.00                           | 4.00                   | 8.39                           | 17.69                  |
| 58 | Trường Trung Học Cơ Sở Lê Quý Đôn  | 11       | MS                        | 1668                | arterial         | 2.4                    | 188                  | 2 or more       | 14.65                          | 26.41                  | 151.61                         | 24.07                  |
| 59 | Trường Trung Học Phổ Thông Nguyễn Hữu Thọ  | 4        | HS                        | 1729                | arterial         | 2.9                    | 54                   | 2 or more       | 7.45                           | 30.21                  | 121.45                         | 25.85                  |
| 60 | Trường Dự Bị Đại Học Thành Phố Hồ Chí Minh - Trường Trung Học Cơ Sở và Trung Học Phổ Thông An Đông | 5        | HS                        | 1                   | arterial         | 4.4                    | 184                  | 2 or more       | 8.24                           | 21.33                  | 226.64                         | 20.34                  |
| 61 | Trường Tiểu Học Đặng Trần Côn  | 4        | PS                        | 787                 | arterial         | 4.2                    | 163                  | 2 or more       | 27.09                          | 23.48                  | 264.44                         | 23.21                  |
| 62 | Trường Trung Học Cơ Sở Nguyễn Huệ  | 11       | MS                        | 498                 | arterial         | 2.2                    | 244                  | 2 or more       | 15.82                          | 33.42                  | 128.44                         | 23.22                  |
| 63 | Trường Phổ Thông Trung Học Mạc Đĩnh Chi  | 6        | HS                        | 2853                | local            | 1.6                    | 149                  | 2 or more       | 0.00                           | 0.00                   | 180.73                         | 26.83                  |
| 64 | Trường Tiểu Học Lê Đình Chinh  | 11       | PS                        | 1085                | arterial         | 3.7                    | 307                  | 2 or more       | 13.78                          | 27.87                  | 213.64                         | 21.41                  |
| 65 | Trường Trung Học Cơ Sở Nguyễn Huệ  | 4        | MS                        | 979                 | local            | 0.0                    | 161                  | 1               | 0.48                           | 23.43                  | 2.14                           | 20.86                  |

| id | Name   | District | School Type <sup>13</sup> | Number of students | School road type | Length high risk roads | Number of Intersect. | Number of lanes | School Road Rec. <sup>14</sup> | School road avg. speed | School Zone Rec. <sup>15</sup> | School zone avg. speed |
|----|--|----------|---------------------------|--------------------|------------------|------------------------|----------------------|-----------------|--------------------------------|------------------------|--------------------------------|------------------------|
| 66 | Trường Tiểu Học Phú Định   | 6        | PS                        | 1448               | local            | 0.6                    | 79                   | 2 or more       | 0.10                           | 29.83                  | 48.75                          | 31.46                  |
| 67 | Trường Trung Học Phổ Thông Hùng Vương                                | 5        | HS                        | 3147               | major            | 3.5                    | 106                  | 2 or more       | 26.95                          | 26.28                  | 175.91                         | 19.66                  |
| 68 | Trường Tiểu Học Đề Thám  | 11       | PS                        | 544                | arterial         | 3.3                    | 250                  | 1               | 2.59                           | 16.09                  | 131.02                         | 19.36                  |
| 69 | Trường Trung Học Thực Hành Sài Gòn                                   | 5        | MS,HS                     | 2267               | local            | 4.2                    | 147                  | 1               | 8.16                           | 22.09                  | 229.62                         | 23.70                  |
| 70 | Trường Tiểu Học Nguyễn Đức Cảnh                                      | 5        | PS                        | 998                | local            | 3.0                    | 182                  | 1               | 7.04                           | 17.50                  | 147.54                         | 19.56                  |
| 71 | Trường Tiểu Học Huỳnh Mẫn Đạt  | 5        | PS                        | 662                | major            | 3.1                    | 167                  | 2 or more       | 36.61                          | 30.60                  | 97.09                          | 20.20                  |
| 72 | Trường Trung Học Cơ Sở Phú Định                                      | 6        | MS                        | 1714               | local            | 0.0                    | 101                  | 2 or more       | 0.19                           | 31.31                  | 0.59                           | 21.30                  |
| 73 | Trường Tiểu Học Đặng Nguyên Cẩn                                      | 6        | PS                        | 785                | local            | 2.4                    | 191                  | 2 or more       | 7.98                           | 26.20                  | 123.08                         | 23.75                  |
| 74 | Trường Trung Học Cơ Sở Lê Anh Xuân                                   | 11       | MS                        | 1469               | local            | 2.4                    | 395                  | 1               | 0.00                           | 0.00                   | 58.44                          | 22.12                  |
| 75 | Trường Phổ Thông Trung Học Nam Kỳ Khởi Nghĩa                         | 11       | HS                        | 2120               | local            | 2.5                    | 376                  | 1               | 0.00                           | 0.00                   | 168.24                         | 21.82                  |
| 76 | Trường Tiểu Học Hàm Tử   | 5        | PS                        | 851                | local            | 3.3                    | 129                  | 2 or more       | 4.67                           | 31.15                  | 104.84                         | 22.18                  |
| 77 | Trường Trung Học Cơ Sở Hồng Bàng                                     | 5        | MS                        | 3094               | major            | 4.7                    | 100                  | 2 or more       | 28.48                          | 24.96                  | 223.26                         | 18.82                  |
| 78 | Trường Tiểu Học Phú Thọ  | 11       | PS                        | 1210               | local            | 1.9                    | 405                  | 1               | 6.49                           | 21.46                  | 206.74                         | 22.68                  |
| 79 | Trường Phổ Thông Năng Khiếu - Đại Học Quốc Gia Thành Phố Hồ Chí Minh | 5        | HS                        | 1457               | arterial         | 3.0                    | 171                  | 2 or more       | 20.91                          | 25.55                  | 154.04                         | 21.33                  |
| 80 | Trường Tiểu Học Trần Bình Trọng                                      | 5        | PS                        | 1140               | local            | 4.3                    | 260                  | 2 or more       | 8.05                           | 21.11                  | 293.13                         | 20.85                  |
| 81 | Trường Tiểu Học Hàn Hải Nguyên                                       | 11       | PS                        | 652                | local            | 2.7                    | 390                  | 1               | 0.00                           | 20.10                  | 121.96                         | 23.40                  |
| 82 | Trường Tiểu Học Him Lam  | 6        | PS                        | 673                | local            | 2.1                    | 183                  | 1               | 2.77                           | 24.00                  | 43.67                          | 23.69                  |
| 83 | Trường Trung Học Cơ Sở Kim Đồng                                      | 5        | MS                        | 2139               | local            | 3.7                    | 275                  | 1               | 0.19                           | 15.54                  | 205.61                         | 20.00                  |
| 84 | Trường Trung Học Cơ Sở Phạm Đình Hổ                                  | 6        | MS                        | 1513               | local            | 1.5                    | 211                  | 1               | 0.04                           | 23.80                  | 33.41                          | 21.89                  |
| 85 | Trường Tiểu Học Trần Quốc Toàn                                       | 5        | PS                        | 653                | arterial         | 4.5                    | 221                  | 2 or more       | 19.03                          | 29.41                  | 215.78                         | 19.93                  |
| 86 | Trường Trung Học Cơ Sở Lam Sơn                                       | 6        | MS                        | 2140               | local            | 0.7                    | 181                  | 2 or more       | 0.18                           | 28.07                  | 31.85                          | 22.87                  |
| 87 | Trường Tiểu Học Quyết Thắng  | 11       | PS                        | 490                | local            | 1.9                    | 282                  | 1               | 0.00                           | 0.00                   | 149.07                         | 21.83                  |
| 88 | Trường Tiểu Học Lý Nhơn  | 4        | PS                        | 623                | local            | 4.7                    | 197                  | 1               | 1.68                           | 18.54                  | 308.81                         | 21.79                  |
| 89 | Trường Trung Học Cơ Sở Hậu Giang                                     | 6        | MS                        | 1271               | local            | 1.3                    | 362                  | 1               | 0.00                           | 0.00                   | 59.66                          | 23.98                  |

| id  | Name  | District | School Type <sup>13</sup> | Number of students | School road type | Length high risk roads | Number of Intersect. | Number of lanes | School Road Rec. <sup>14</sup> | School road avg. speed | School Zone Rec. <sup>15</sup> | School zone avg. speed |
|-----|---|----------|---------------------------|--------------------|------------------|------------------------|----------------------|-----------------|--------------------------------|------------------------|--------------------------------|------------------------|
| 90  | Trường Tiểu Học Lạc Long Quân                 | 11       | PS                        | 1165               | local            | 1.6                    | 349                  | 1               | 0.52                           | 21.73                  | 168.50                         | 21.90                  |
| 91  | Trường Trung Học Phổ Thông Dân Lập Thăng Long | 5        | HS                        | 1030               | arterial         | 5.7                    | 128                  | 2 or more       | 19.26                          | 26.95                  | 243.18                         | 22.41                  |
| 92  | Trường Tiểu Học Châu Văn Liêm                 | 6        | PS                        | 843                | local            | 0.0                    | 357                  | 1               | 0.00                           | 18.45                  | 3.60                           | 21.17                  |
| 93  | Trường Trung Học Phổ Thông Nguyễn Hiền        | 11       | HS                        | 1208               | local            | 1.2                    | 338                  | 1               | 0.34                           | 22.16                  | 120.16                         | 21.28                  |
| 95  | Trường Trung Học Phổ Thông Trần Hữu Trang     | 5        | HS                        | 865                | arterial         | 4.9                    | 123                  | 2 or more       | 17.06                          | 26.07                  | 229.79                         | 22.20                  |
| 96  | Trường Tiểu Học Bàu Sen                       | 5        | PS                        | 1016               | arterial         | 3.4                    | 269                  | 1               | 22.72                          | 24.61                  | 203.13                         | 21.51                  |
| 97  | Trường Tiểu Học Lê Văn Tám                    | 5        | PS                        | 491                | arterial         | 3.7                    | 202                  | 2 or more       | 22.89                          | 31.82                  | 209.49                         | 23.22                  |
| 98  | Trường Tiểu Học Phạm Văn Hai                  | 11       | PS                        | 551                | arterial         | 3.1                    | 320                  | 2 or more       | 7.35                           | 27.58                  | 196.85                         | 20.88                  |
| 99  | Trường Trung Học Cơ Sở Lữ Gia                 | 11       | MS                        | 1474               | local            | 0.9                    | 172                  | 1               | 0.00                           | 0.00                   | 83.20                          | 22.04                  |
| 100 | Trường Tiểu Học Công Lập Thái Phiên           | 11       | PS                        | 384                | arterial         | 2.9                    | 388                  | 2 or more       | 10.45                          | 26.65                  | 80.01                          | 22.50                  |
| 101 | Trường Tiểu Học Hưng Việt                     | 11       | PS                        | 934                | arterial         | 1.8                    | 285                  | 1               | 4.71                           | 26.25                  | 52.38                          | 26.62                  |
| 102 | Trường Tiểu Học Tăng Bạt Hổ B                 | 4        | MS                        | 1544               | local            | 0.0                    | 217                  | 1               | 0.00                           | 0.00                   | 0.79                           | 20.17                  |
| 103 | Trường Trung Học Cơ Sở Chi Lăng               | 4        | MS                        | 1466               | local            | 6.0                    | 255                  | 1               | 2.15                           | 20.29                  | 357.36                         | 22.24                  |
| 104 | Trường Tiểu Học Chính Nghĩa                   | 5        | PS                        | 1714               | local            | 3.9                    | 123                  | 1               | 7.24                           | 18.14                  | 195.21                         | 20.27                  |
| 105 | Trường Tiểu Học Nguyễn Thị Nhỏ                | 11       | PS                        | 590                | local            | 1.5                    | 216                  | 1               | 7.67                           | 22.50                  | 170.81                         | 22.12                  |
| 106 | Trường Tiểu Học Xóm Chiếu                     | 4        | PS                        | 777                | local            | 1.9                    | 324                  | 1               | 3.48                           | 21.24                  | 134.40                         | 19.93                  |
| 107 | Trường Trung Học Cơ Sở Bình Tây               | 6        | MS                        | 1868               | local            | 1.6                    | 190                  | 1               | 0.00                           | 19.00                  | 36.12                          | 19.63                  |
| 108 | Trường Tiểu Học Đoàn Thị Điểm                 | 4        | PS                        | 854                | local            | 1.5                    | 173                  | 1               | 0.62                           | 21.69                  | 60.21                          | 25.98                  |
| 109 | Trường Trung Học Cơ Sở Chu Văn An             | 11       | MS                        | 1520               | local            | 0.7                    | 344                  | 1               | 0.34                           | 22.16                  | 91.72                          | 21.20                  |
| 110 | Trường Tiểu Học Bán Trú Nguyễn Trường Tộ      | 4        | PS                        | 678                | local            | 0.0                    | 253                  | 1               | 0.00                           | 0.00                   | 0.71                           | 19.94                  |
| 111 | Trường Tiểu Học Bình Tiên                     | 6        | PS                        | 782                | local            | 0.0                    | 337                  | 1               | 0.00                           | 16.34                  | 2.50                           | 25.37                  |
| 112 | Trường Tiểu Học Lý Cảnh Hớn                   | 5        | PS                        | 653                | local            | 3.8                    | 94                   | 1               | 0.00                           | 0.00                   | 157.62                         | 24.92                  |

| id  | Name   | District | School Type <sup>13</sup> | Number of students | School road type | Length high risk roads | Number of Intersect. | Number of lanes | School Road Rec. <sup>14</sup> | School road avg. speed | School Zone Rec. <sup>15</sup> | School zone avg. speed |
|-----|--|----------|---------------------------|--------------------|------------------|------------------------|----------------------|-----------------|--------------------------------|------------------------|--------------------------------|------------------------|
| 113 | Trường Trung Học Cơ Sở Lý Phong  | 5        | MS                        | 1570               | local            | 5.8                    | 146                  | 1               | 4.69                           | 16.02                  | 257.19                         | 20.37                  |
| 114 | Trường Trung Học Phổ Thông Trần Khai Nguyên                            | 5        | HS                        | 2241               | major            | 4.7                    | 117                  | 2 or more       | 15.38                          | 25.88                  | 220.72                         | 20.88                  |
| 115 | Nguyễn Tất Thành high school   | 6        | HS                        | 2222               | local            | 0.0                    | 319                  | 1               | 0.00                           | 0.00                   | 2.48                           | 24.86                  |
| 116 | Lê Thánh Tôn primary school  | 4        | PS                        | 529                | local            | 1.0                    | 197                  | 1               | 0.00                           | 0.00                   | 76.68                          | 22.30                  |
| 117 | Đình Bộ Lĩnh primary school  | 4        | PS                        | 574                | local            | 0.0                    | 246                  | 1               | 0.00                           | 0.00                   | 0.75                           | 20.06                  |
| 118 | Nguyễn Thái Bình primary school  | 4        | PS                        | 614                | local            | 1.7                    | 135                  | 1               | 0.42                           | 26.72                  | 67.94                          | 28.71                  |
| 119 | Minh Đạo primary school  | 5        | PS                        | 2028               | local            | 4.3                    | 109                  | 1               | 0.37                           | 14.94                  | 220.44                         | 19.61                  |
| 120 | Lam Sơn primary school   | 6        | PS                        | 1378               | local            | 1.2                    | 180                  | 1               | 0.00                           | 0.00                   | 63.66                          | 23.94                  |
| 121 | Trường Tiểu Học, Trung Học Cơ Sở và Trung Học Phổ Thông Trương Vĩnh Ký | 11       | PS,MS, HS                 | 3291               | arterial         | 2.2                    | 253                  | 2 or more       | 16.01                          | 32.77                  | 172.17                         | 23.36                  |
| 122 | Trường Tiểu Học Trần Văn Ôn  | 11       | PS                        | 1120               | arterial         | 2.4                    | 238                  | 2 or more       | 15.58                          | 32.57                  | 178.63                         | 23.39                  |
| 123 | Trường Trung Học Cơ Sở, Trung Học Phổ Thông Quang Trung Nguyễn Huệ     | 5        | MS,HS                     | 496                | arterial         | 5.2                    | 113                  | 2 or more       | 21.71                          | 24.58                  | 225.70                         | 20.34                  |
| 124 | Trường Tiểu Học Nguyễn Thị   | 11       | PS                        | 533                | major            | 5.9                    | 360                  | 2 or more       | 7.56                           | 36.17                  | 230.62                         | 26.16                  |
| 125 | Dân lập Việt Mỹ  | 11       | PS, MS, HS                | 718                | arterial         | 3.3                    | 223                  | 2 or more       | 16.98                          | 27.76                  | 182.44                         | 23.16                  |

**Table 10 Level 2 and 3 attributes ranked – HCMC**

| id | Name  | District | School Type <sup>16</sup> | Number of students | School road type | Length main road | Number of Intersect. | Number of lanes | School road rec.. | School road avg. speed | School zone avg. speed | School zone rec. |
|----|---|----------|---------------------------|--------------------|------------------|------------------|----------------------|-----------------|-------------------|------------------------|------------------------|------------------|
| 1  | Trường Phạm Văn Chí   | 6        | PS                        | 53                 | 126              | 100              | 125                  | 126             | 71                | 5                      | 91                     | 1                |
| 2  | Trường Nguyễn Minh Hoàng  | 11       | MS                        | 115                | 126              | 35               | 42                   | 126             | 126               | 126                    | 7                      | 96               |
| 3  | Trường Tiểu Học Trương Công Định  | 6        | PS                        | 73                 | 126              | 99               | 11                   | 126             | 126               | 126                    | 108                    | 13               |
| 4  | Trường Trung Học Cơ Sở Nguyễn Văn Luông                                 | 6        | MS                        | 17                 | 126              | 111              | 100                  | 126             | 126               | 126                    | 120                    | 23               |
| 5  | Trường Tiểu Học Và Trung Học Cơ Sở Quốc Tế Mỹ Úc - Trường Anh Ngữ Mỹ Úc | 6        | PS                        | 123                | 126              | 111              | 13                   | 126             | 58                | 50                     | 115                    | 28               |
| 6  | Trường Tiểu Học Võ Văn Tần  | 6        | PS                        | 71                 | 1                | 48               | 56                   | 126             | 43                | 28                     | 61                     | 94               |
| 7  | Trường Tiểu Học Đại Thành   | 11       | PS                        | 99                 | 126              | 87               | 18                   | 126             | 126               | 126                    | 39                     | 87               |
| 8  | Trường Tiểu Học Nguyễn Huệ  | 6        | PS                        | 41                 | 126              | 84               | 95                   | 126             | 77                | 81                     | 97                     | 111              |
| 9  | Trường Tiểu Học Công Lập Trưng Trắc                                     | 11       | PS                        | 40                 | 126              | 111              | 66                   | 126             | 55                | 58                     | 111                    | 120              |
| 10 | Trường Tiểu Học Âu Cơ   | 11       | PS                        | 109                | 126              | 55               | 1                    | 126             | 53                | 67                     | 27                     | 63               |
| 11 | Trường Tiểu Học Nguyễn Viết Xuân  | 5        | PS                        | 77                 | 1                | 11               | 102                  | 126             | 31                | 86                     | 11                     | 112              |
| 12 | Trường Tiểu Học Phạm Hồng Thái  | 5        | PS                        | 69                 | 126              | 13               | 87                   | 126             | 47                | 71                     | 32                     | 101              |
| 13 | Trường Trung Học Cơ Sở Văn Đồng   | 4        | MS                        | 66                 | 1                | 6                | 19                   | 1               | 10                | 83                     | 2                      | 79               |
| 14 | Trường Tiểu Học Vĩnh Hội  | 4        | PS                        | 88                 | 126              | 105              | 54                   | 126             | 126               | 126                    | 99                     | 126              |
| 15 | Trường Tiểu Học Hòa Bình  | 11       | PS                        | 80                 | 126              | 88               | 100                  | 126             | 126               | 126                    | 71                     | 52               |
| 16 | Trường Trung Học Cơ Sở Quang Trung                                      | 4        | MS                        | 58                 | 126              | 104              | 77                   | 126             | 126               | 126                    | 83                     | 40               |
| 17 | Trường Tiểu Học Huỳnh Kiến Hoa  | 5        | PS                        | 82                 | 126              | 25               | 106                  | 126             | 61                | 60                     | 50                     | 22               |
| 18 | Trường Tiểu Học Chương Dương  | 5        | PS                        | 99                 | 126              | 38               | 92                   | 126             | 126               | 126                    | 77                     | 39               |
| 19 | Trường Tiểu Học Bạch Đằng   | 4        | PS                        | 87                 | 126              | 9                | 74                   | 126             | 51                | 59                     | 14                     | 57               |
| 20 | Trường Tiểu Học Nguyễn Bá Ngọc  | 11       | PS                        | 96                 | 126              | 47               | 8                    | 126             | 126               | 126                    | 79                     | 60               |
| 21 | Trường Trung Học Phổ Thông Bình Phú                                     | 6        | HS                        | 18                 | 126              | 111              | 123                  | 126             | 126               | 15                     | 114                    | 27               |
| 22 | Trường Trung Học Phổ Thông Chuyên Lê Hồng Phong                         | 5        | HS                        | 15                 | 1                | 34               | 115                  | 1               | 5                 | 37                     | 6                      | 49               |
| 23 | Trường Trung Học Cơ Sở Chuẩn Quốc Gia Nguyễn Văn Phú                    | 11       | MS                        | 43                 | 126              | 91               | 22                   | 126             | 126               | 126                    | 101                    | 117              |

<sup>16</sup> School types are classified as PS: Primary School / MS: Middle School / HS: High School

| id | Name                                       | District | School Type <sup>16</sup> | Number of student s | School road type | Length main road | Number of Intersect. | Number of lanes | School road rec.. | School road avg. speed | School zone avg. speed | School zone rec. |
|----|--|----------|---------------------------|---------------------|------------------|------------------|----------------------|-----------------|-------------------|------------------------|------------------------|------------------|
| 24 | Trường Tiểu Học Dân Lập Bình Thới          | 11       | PS                        | 122                 | 126              | 63               | 34                   | 126             | 126               | 126                    | 72                     | 54               |
| 25 | Trường Tiểu Học Khánh Hội B                | 4        | PS                        | 65                  | 126              | 95               | 105                  | 126             | 64                | 30                     | 104                    | 5                |
| 26 | Trường Tiểu Học Bến Càng                   | 4        | PS                        | 114                 | 1                | 78               | 52                   | 1               | 1                 | 43                     | 62                     | 34               |
| 27 | Trường Trung Học Cơ Sở Mạch Kiếm Hùng      | 5        | MS                        | 36                  | 1                | 8                | 106                  | 1               | 30                | 92                     | 9                      | 100              |
| 28 | Trường Tiểu Học Nguyễn Văn Luông           | 6        | PS                        | 56                  | 126              | 111              | 28                   | 126             | 126               | 126                    | 118                    | 16               |
| 29 | Trường Tiểu Học Lê Đình Chinh              | 5        | PS                        | 74                  | 126              | 45               | 109                  | 126             | 81                | 79                     | 73                     | 80               |
| 30 | Trường Tiểu Học Nguyễn Thiện Thuật         | 6        | PS                        | 106                 | 126              | 66               | 74                   | 126             | 84                | 78                     | 95                     | 121              |
| 31 | Trường Tiểu Học Chi Lăng                   | 6        | PS                        | 57                  | 126              | 96               | 16                   | 126             | 126               | 126                    | 89                     | 61               |
| 32 | Trường Tiểu Học Nhật Tảo                   | 6        | PS                        | 116                 | 126              | 98               | 30                   | 126             | 82                | 39                     | 109                    | 56               |
| 33 | Trường Tiểu Học Quốc Tế Việt Mỹ Úc         | 11       | PS                        | 125                 | 126              | 111              | 14                   | 126             | 126               | 72                     | 106                    | 108              |
| 34 | Trường Trung Học Cơ Sở Đoàn Kết            | 6        | MS                        | 55                  | 126              | 109              | 24                   | 126             | 126               | 126                    | 110                    | 9                |
| 35 | Trường Trung Học Cơ Sở Phú Thọ             | 11       | MS                        | 30                  | 1                | 64               | 4                    | 1               | 15                | 27                     | 26                     | 59               |
| 36 | Trường Tiểu Học Nguyễn Huệ                 | 4        | PS                        | 119                 | 126              | 93               | 89                   | 126             | 78                | 95                     | 93                     | 30               |
| 37 | Trường Tiểu Học Phú Lâm                    | 6        | PS                        | 7                   | 126              | 72               | 85                   | 1               | 126               | 126                    | 45                     | 11               |
| 38 | Trường Tiểu Học Kim Đồng                   | 6        | PS                        | 70                  | 1                | 83               | 67                   | 1               | 8                 | 1                      | 103                    | 8                |
| 39 | Trường Trung Học Cơ Sở Hậu Giang           | 11       | MS                        | 13                  | 126              | 29               | 23                   | 126             | 60                | 73                     | 36                     | 26               |
| 40 | Trường Trung Học Cơ Sở Ba Đình             | 5        | MS                        | 21                  | 126              | 23               | 40                   | 126             | 126               | 74                     | 3                      | 95               |
| 41 | Trường Trung Học Cơ Sở Văn Thân            | 6        | MS                        | 67                  | 126              | 111              | 39                   | 126             | 126               | 62                     | 126                    | 6                |
| 42 | Trường Tiểu Học Lê Văn Tám                 | 6        | PS                        | 60                  | 126              | 74               | 28                   | 126             | 126               | 126                    | 75                     | 20               |
| 43 | Trường Trung Học Cơ Sở Nguyễn Đức Cảnh     | 6        | MS                        | 44                  | 126              | 10               | 32                   | 1               | 57                | 82                     | 15                     | 15               |
| 44 | Trường Trung Học Cơ Sở Trần Bội Cơ         | 5        | MS                        | 6                   | 1                | 17               | 94                   | 1               | 28                | 36                     | 34                     | 89               |
| 45 | Trường Tiểu Học Anh Việt Mỹ                | 4        | PS                        | 121                 | 1                | 77               | 53                   | 1               | 1                 | 43                     | 59                     | 53               |
| 46 | Trường Tiểu Học Phùng Hưng                 | 11       | PS                        | 48                  | 1                | 44               | 55                   | 1               | 21                | 18                     | 43                     | 50               |
| 47 | Trường Trung Học Cơ Sở Hoàng Lê Kha        | 6        | MS                        | 49                  | 126              | 49               | 34                   | 126             | 126               | 55                     | 35                     | 18               |
| 48 | "Văn Lang High school /                    |          |                           | 79                  | 126              | 28               | 64                   | 126             | 66                | 87                     | 60                     | 124              |
| 49 | Trường Tiểu Học Vĩnh Xuyên                 | 6        | PS                        | 124                 | 126              | 65               | 90                   | 126             | 73                | 85                     | 96                     | 113              |
| 50 | Trường Trung Học Thực Hành Đại Học Sư Phạm | 5        | HS                        | 81                  | 1                | 39               | 117                  | 1               | 4                 | 12                     | 31                     | 44               |
| 51 | Trường Tiểu Học Hùng Vương                 | 6        | PS                        | 62                  | 126              | 103              | 102                  | 1               | 79                | 7                      | 107                    | 2                |

| id | Name   | District | School Type <sup>16</sup> | Number of students | School road type | Length main road | Number of Intersect. | Number of lanes | School road rec.. | School road avg. speed | School zone avg. speed | School zone rec. |
|----|--|----------|---------------------------|--------------------|------------------|------------------|----------------------|-----------------|-------------------|------------------------|------------------------|------------------|
| 52 | Trường Trung Học Phổ Thông Trần Quang Khải   | 11       | HS                        | 5                  | 1                | 61               | 68                   | 1               | 126               | 4                      | 57                     | 38               |
| 53 | Trường Trung Học Phổ Thông Nguyễn Trãi   | 4        | HS                        | 23                 | 126              | 82               | 63                   | 126             | 76                | 68                     | 65                     | 7                |
| 54 | Trường Tiểu Học Nguyễn Văn Trỗi  | 4        | PS                        | 47                 | 126              | 4                | 43                   | 126             | 56                | 62                     | 8                      | 65               |
| 55 | Trường Tiểu Học Phù Đổng   | 6        | PS                        | 28                 | 126              | 111              | 113                  | 126             | 126               | 96                     | 125                    | 78               |
| 56 | Trường Trung Học Phổ Thông Phạm Phú Thứ  | 6        | HS                        | 19                 | 126              | 90               | 38                   | 126             | 85                | 45                     | 105                    | 29               |
| 57 | Trường Tiểu Học Đồng Đa  | 4        | PS                        | 117                | 126              | 110              | 59                   | 126             | 126               | 97                     | 112                    | 125              |
| 58 | Trường Trung Học Cơ Sở Lê Quý Đôn  | 11       | MS                        | 26                 | 1                | 62               | 76                   | 1               | 26                | 29                     | 55                     | 31               |
| 59 | Trường Trung Học Phổ Thông Nguyễn Hữu Thọ  | 4        | HS                        | 22                 | 1                | 54               | 126                  | 1               | 38                | 14                     | 69                     | 19               |
| 60 | Trường Dự Bị Đại Học Thành Phố Hồ Chí Minh - Trường Trung Học Cơ Sở và Trung Học Phổ Thông An Đông | 5        | HS                        | 126                | 1                | 19               | 78                   | 1               | 32                | 64                     | 19                     | 99               |
| 61 | Trường Tiểu Học Đặng Trần Côn  | 4        | PS                        | 83                 | 1                | 22               | 90                   | 1               | 7                 | 48                     | 10                     | 47               |
| 62 | Trường Trung Học Cơ Sở Nguyễn Huệ  | 11       | MS                        | 110                | 1                | 67               | 50                   | 1               | 23                | 3                      | 66                     | 45               |
| 63 | Trường Phổ Thông Trung Học Mạc Đĩnh Chi  | 6        | HS                        | 4                  | 126              | 80               | 96                   | 1               | 126               | 126                    | 42                     | 10               |
| 64 | Trường Tiểu Học Lê Đình Chinh  | 11       | PS                        | 54                 | 1                | 31               | 31                   | 1               | 27                | 20                     | 25                     | 82               |
| 65 | Trường Trung Học Cơ Sở Nguyễn Huệ  | 4        | MS                        | 64                 | 126              | 111              | 93                   | 126             | 63                | 49                     | 119                    | 92               |
| 66 | Trường Tiểu Học Phú Định   | 6        | PS                        | 38                 | 126              | 108              | 124                  | 1               | 80                | 16                     | 92                     | 3                |
| 67 | Trường Trung Học Phổ Thông Hùng Vương  | 5        | HS                        | 2                  | 1                | 36               | 119                  | 1               | 9                 | 31                     | 46                     | 114              |
| 68 | Trường Tiểu Học Đề Thám  | 11       | PS                        | 105                | 1                | 42               | 48                   | 126             | 50                | 90                     | 64                     | 119              |
| 69 | Trường Trung Học Thực Hành Sài Gòn   | 5        | MS;HS                     | 8                  | 126              | 23               | 97                   | 126             | 33                | 54                     | 18                     | 36               |
| 70 | Trường Tiểu Học Nguyễn Đức Cảnh  | 5        | PS                        | 63                 | 126              | 51               | 80                   | 126             | 41                | 84                     | 58                     | 118              |
| 71 | Trường Tiểu Học Huỳnh Mẫn Đạt  | 5        | PS                        | 92                 | 1                | 50               | 88                   | 1               | 3                 | 13                     | 76                     | 103              |
| 72 | Trường Trung Học Cơ Sở Phú Định  | 6        | MS                        | 24                 | 126              | 111              | 120                  | 1               | 74                | 10                     | 124                    | 84               |
| 73 | Trường Tiểu Học Đặng Nguyên Cẩn  | 6        | PS                        | 84                 | 126              | 58               | 72                   | 1               | 35                | 33                     | 67                     | 35               |
| 74 | Trường Trung Học Cơ Sở Lê Anh Xuân   | 11       | MS                        | 34                 | 126              | 59               | 3                    | 126             | 126               | 126                    | 88                     | 70               |
| 75 | Trường Phổ Thông Trung Học Nam Kỳ Khởi Nghĩa   | 11       | HS                        | 14                 | 126              | 57               | 7                    | 126             | 126               | 126                    | 52                     | 76               |
| 76 | Trường Tiểu Học Hàm Tử   | 5        | PS                        | 76                 | 126              | 40               | 108                  | 1               | 46                | 11                     | 74                     | 69               |
| 77 | Trường Trung Học Cơ Sở Hồng Bàng   | 5        | MS                        | 3                  | 1                | 16               | 121                  | 1               | 6                 | 40                     | 21                     | 122              |
| 78 | Trường Tiểu Học Phú Thọ  | 11       | PS                        | 45                 | 126              | 73               | 1                    | 126             | 42                | 61                     | 29                     | 58               |

| id  | Name  | District | School Type <sup>16</sup> | Number of student s | School road type | Length main road | Number of Intersect. | Number of lanes | School road rec.. | School road avg. speed | School zone avg. speed | School zone rec. |
|-----|---|----------|---------------------------|---------------------|------------------|------------------|----------------------|-----------------|-------------------|------------------------|------------------------|------------------|
| 79  | Trường Phổ Thông Năng Khiếu - Đại Học Quốc Gia Thành Phố Hồ Chí Minh" | 5        | HS                        | 37                  | 1                | 52               | 85                   | 1               | 14                | 38                     | 54                     | 83               |
| 80  | Trường Tiểu Học Trần Bình Trọng                                       | 5        | PS                        | 51                  | 126              | 20               | 44                   | 1               | 34                | 66                     | 5                      | 93               |
| 81  | Trường Tiểu Học Hàn Hải Nguyên  | 11       | PS                        | 95                  | 126              | 56               | 5                    | 126             | 126               | 70                     | 68                     | 41               |
| 82  | Trường Tiểu Học Him Lam   | 6        | PS                        | 91                  | 126              | 69               | 79                   | 126             | 49                | 46                     | 94                     | 37               |
| 83  | Trường Trung Học Cơ Sở Kim Đồng                                       | 5        | MS                        | 12                  | 126              | 32               | 37                   | 126             | 72                | 93                     | 30                     | 106              |
| 84  | Trường Trung Học Cơ Sở Phạm Đình Hổ                                   | 6        | MS                        | 32                  | 126              | 89               | 65                   | 126             | 83                | 47                     | 100                    | 74               |
| 85  | Trường Tiểu Học Trần Quốc Toàn  | 5        | PS                        | 93                  | 1                | 18               | 60                   | 1               | 17                | 17                     | 24                     | 109              |
| 86  | Trường Trung Học Cơ Sở Lam Sơn  | 6        | MS                        | 11                  | 126              | 106              | 81                   | 1               | 75                | 19                     | 102                    | 55               |
| 87  | Trường Tiểu Học Quyết Thắng   | 11       | PS                        | 113                 | 126              | 70               | 36                   | 126             | 126               | 126                    | 56                     | 75               |
| 88  | Trường Tiểu Học Lý Nhơn   | 4        | PS                        | 97                  | 126              | 15               | 70                   | 126             | 54                | 76                     | 4                      | 77               |
| 89  | Trường Trung Học Cơ Sở Hậu Giang                                      | 6        | MS                        | 42                  | 126              | 92               | 9                    | 126             | 126               | 126                    | 87                     | 32               |
| 90  | Trường Tiểu Học Lạc Long Quân   | 11       | PS                        | 50                  | 126              | 81               | 15                   | 126             | 62                | 56                     | 51                     | 73               |
| 91  | Trường Trung Học Phổ Thông Dân Lập Thăng Long                         | 5        | HS                        | 59                  | 1                | 5                | 109                  | 1               | 16                | 24                     | 13                     | 64               |
| 92  | Trường Tiểu Học Châu Văn Liêm   | 6        | PS                        | 78                  | 126              | 111              | 12                   | 126             | 126               | 77                     | 113                    | 88               |
| 93  | Trường Trung Học Phổ Thông Nguyễn Hiền                                | 11       | HS                        | 46                  | 126              | 94               | 19                   | 126             | 69                | 52                     | 70                     | 85               |
| 95  | Trường Trung Học Phổ Thông Trần Hữu Trang                             | 5        | HS                        | 72                  | 1                | 12               | 111                  | 1               | 18                | 34                     | 17                     | 68               |
| 96  | Trường Tiểu Học Bàu Sen   | 5        | PS                        | 61                  | 1                | 37               | 41                   | 126             | 12                | 41                     | 33                     | 81               |
| 97  | Trường Tiểu Học Lê Văn Tám  | 5        | PS                        | 112                 | 1                | 33               | 68                   | 1               | 11                | 9                      | 28                     | 46               |
| 98  | Trường Tiểu Học Phạm Văn Hai  | 11       | PS                        | 104                 | 1                | 46               | 26                   | 1               | 39                | 23                     | 37                     | 90               |
| 99  | Trường Trung Học Cơ Sở Lữ Gia   | 11       | MS                        | 33                  | 126              | 102              | 84                   | 126             | 126               | 126                    | 80                     | 72               |
| 100 | Trường Tiểu Học Công Lập Thái Phiên                                   | 11       | PS                        | 118                 | 1                | 53               | 6                    | 1               | 29                | 26                     | 81                     | 62               |
| 101 | Trường Tiểu Học Hưng Việt   | 11       | PS                        | 68                  | 1                | 75               | 33                   | 126             | 44                | 32                     | 90                     | 12               |
| 102 | Trường Tiểu Học Tăng Bạt Hổ B   | 4        | MS                        | 29                  | 126              | 111              | 61                   | 126             | 126               | 126                    | 121                    | 104              |
| 103 | Trường Trung Học Cơ Sở Chi Lăng                                       | 4        | MS                        | 35                  | 126              | 1                | 45                   | 126             | 52                | 69                     | 1                      | 67               |
| 104 | Trường Tiểu Học Chính Nghĩa   | 5        | PS                        | 24                  | 126              | 27               | 111                  | 126             | 40                | 80                     | 38                     | 102              |

| id  | Name   | District | School Type <sup>16</sup> | Number of student s | School road type | Length main road | Number of Intersect. | Number of lanes | School road rec.. | School road avg. speed | School zone avg. speed | School zone rec. |
|-----|--|----------|---------------------------|---------------------|------------------|------------------|----------------------|-----------------|-------------------|------------------------|------------------------|------------------|
| 105 | Trường Tiểu Học Nguyễn Thị Nhỏ   | 11       | PS                        | 101                 | 126              | 86               | 62                   | 126             | 36                | 51                     | 49                     | 71               |
| 106 | Trường Tiểu Học Xóm Chiếu  | 4        | PS                        | 86                  | 126              | 71               | 25                   | 126             | 48                | 65                     | 63                     | 110              |
| 107 | Trường Trung Học Cơ Sở Bình Tây  | 6        | MS                        | 20                  | 126              | 79               | 73                   | 126             | 126               | 74                     | 98                     | 115              |
| 108 | Trường Tiểu Học Đoàn Thị Điểm  | 4        | PS                        | 75                  | 126              | 85               | 83                   | 126             | 59                | 57                     | 86                     | 17               |
| 109 | Trường Trung Học Cơ Sở Chu Văn An                                      | 11       | MS                        | 31                  | 126              | 107              | 17                   | 126             | 69                | 52                     | 78                     | 86               |
| 110 | Trường Tiểu Học Bán Trú Nguyễn Trường Tộ                               | 4        | PS                        | 90                  | 126              | 111              | 46                   | 126             | 126               | 126                    | 123                    | 107              |
| 111 | Trường Tiểu Học Bình Tiên  | 6        | PS                        | 85                  | 126              | 111              | 21                   | 126             | 126               | 89                     | 116                    | 21               |
| 112 | Trường Tiểu Học Lý Cảnh Hôn  | 5        | PS                        | 93                  | 126              | 30               | 122                  | 126             | 126               | 126                    | 53                     | 24               |
| 113 | Trường Trung Học Cơ Sở Lý Phong  | 5        | MS                        | 27                  | 126              | 3                | 98                   | 126             | 45                | 91                     | 12                     | 97               |
| 114 | Trường Trung Học Phổ Thông Trần Khai Nguyên                            | 5        | HS                        | 9                   | 1                | 14               | 114                  | 1               | 25                | 35                     | 22                     | 91               |
| 115 | Nguyễn Tất Thành high school   | 6        | HS                        | 10                  | 126              | 111              | 27                   | 126             | 126               | 126                    | 117                    | 25               |
| 116 | Lê Thánh Tôn primary school  | 4        | PS                        | 108                 | 126              | 101              | 70                   | 126             | 126               | 126                    | 82                     | 66               |
| 117 | Đình Bộ Lĩnh primary school  | 4        | PS                        | 102                 | 126              | 111              | 49                   | 126             | 126               | 126                    | 122                    | 105              |
| 118 | Nguyễn Thái Bình primary school  | 4        | PS                        | 98                  | 126              | 76               | 104                  | 126             | 65                | 25                     | 84                     | 4                |
| 119 | Minh Đạo primary school  | 5        | PS                        | 16                  | 126              | 21               | 118                  | 126             | 68                | 94                     | 23                     | 116              |
| 120 | Lam Sơn primary school   | 6        | PS                        | 39                  | 126              | 97               | 82                   | 126             | 126               | 126                    | 85                     | 33               |
| 121 | Trường Tiểu Học, Trung Học Cơ Sở và Trung Học Phổ Thông Trương Vĩnh Ký | 11       | PS,MS, HS                 | 1                   | 1                | 68               | 46                   | 1               | 22                | 6                      | 48                     | 43               |
| 122 | Trường Tiểu Học Trần Văn Ôn  | 11       | PS                        | 52                  | 1                | 60               | 51                   | 1               | 24                | 8                      | 44                     | 42               |
| 123 | Trường Trung Học Cơ Sở, Trung Học Phổ Thông Quang Trung Nguyễn Huệ     | 5        | MS,HS                     | 111                 | 1                | 7                | 115                  | 1               | 13                | 42                     | 20                     | 98               |
| 124 | Trường Tiểu Học Nguyễn Thị   | 11       | PS                        | 107                 | 1                | 2                | 10                   | 1               | 37                | 2                      | 16                     | 14               |
| 125 | Dân lập Việt Mỹ  | 11       | PS, MS, HS                | 89                  | 1                | 43               | 58                   | 1               | 19                | 21                     | 40                     | 51               |

## ANNEX III PLEIKU CITY – LEVEL 2 AND 3 ATTRIBUTES AND RANKS

Tables in the next page presented the values and rankings for the Level 2 and 3 analyses for Pleiku City. Every school is identified by ID, name, and type of school.

- Table 11 presents the calculate values for the attributes.
- Table 12 presents the scores associated with the attributes ranked.

**Table 11 Level 2 and 3 attributes database – Pleiku City**

| ID  | name   | School Type | Number of Students | School road type | Length main road | Number of Intersect. | Number of lanes | School road records <sup>17</sup> | School Road Avg Speed | School Zone records <sup>18</sup> | School Zone Avg Speed |
|-----|--|-------------|--------------------|------------------|------------------|----------------------|-----------------|-----------------------------------|-----------------------|-----------------------------------|-----------------------|
| 156 | Trường Trung Học Cơ Sở Phạm Hồng Thái        | MS          | 2240               | major            | 2.44             | 50                   | 2 or more       | 38.54                             | 42.40                 | 134.72                            | 27.98                 |
| 150 | Trường Tiểu Học Hoàng Hoa Thám               | PS          | 813                | arterial         | 3.59             | 64                   | 2 or more       | 24.96                             | 31.49                 | 159.25                            | 31.94                 |
| 148 | Trường Tiểu Học Võ Thị Sáu                   | PS          | 1250               | arterial         | 4.54             | 71                   | 2 or more       | 18.58                             | 33.28                 | 105.28                            | 27.09                 |
| 151 | Trường Tiểu Học Ngô Mây                      | PS          | 1555               | major            | 2.95             | 29                   | 2 or more       | 28.24                             | 45.56                 | 56.62                             | 28.87                 |
| 137 | Trường Trung Học Cơ Sở Nguyễn Du             | MS          | 2073               | arterial         | 6.60             | 41                   | 2 or more       | 6.89                              | 33.08                 | 61.97                             | 25.46                 |
| 154 | Trường Tiểu Học Nguyễn Lương Bằng            | PS          | 1224               | major            | 3.81             | 34                   | 2 or more       | 16.40                             | 44.94                 | 35.71                             | 28.69                 |
| 142 | Trường Trung Học Phổ Thông Chuyên Hùng Vương | HS          | 1378               | arterial         | 7.09             | 51                   | 2 or more       | 10.33                             | 28.01                 | 108.98                            | 23.68                 |
| 128 | Trường Phổ Thông Dân Tộc Nội Trú Tỉnh Gia La | HS          | 399                | major            | 3.06             | 37                   | 2 or more       | 24.31                             | 47.80                 | 51.11                             | 31.16                 |
| 138 | Trường Trung Học Phổ Thông Phan Bội Châu     | HS          | 1634               | arterial         | 7.92             | 49                   | 2 or more       | 8.13                              | 22.76                 | 71.61                             | 23.67                 |
| 135 | Trường Tiểu Học Lê Quý Đôn                   | PS          | 1449               | arterial         | 4.25             | 31                   | 2 or more       | 7.03                              | 35.27                 | 45.38                             | 26.77                 |
| 141 | Trường Tiểu Học Chu Văn An                   | PS          | 1263               | arterial         | 6.20             | 40                   | 2 or more       | 23.31                             | 25.41                 | 46.56                             | 23.83                 |
| 145 | Trường Trung Học Phổ Thông Lê Lợi            | HS          | 1606               | arterial         | 5.08             | 59                   | 1               | 24.23                             | 30.28                 | 131.07                            | 24.02                 |
| 149 | Trường Tiểu Học Nguyễn Văn Trỗi              | PS          | 1975               | arterial         | 3.10             | 57                   | 1               | 3.48                              | 33.10                 | 156.14                            | 26.26                 |
| 161 | Trường Tiểu Học Anh Hùng Núp                 | PS          | 547                | major            | 1.88             | 25                   | 2 or more       | 14.95                             | 50.53                 | 18.04                             | 31.22                 |
| 131 | Trường Trung Học Cơ Sở Trưng Vương           | MS          | 1210               | arterial         | 7.65             | 40                   | 2 or more       | 2.90                              | 24.12                 | 41.34                             | 23.18                 |
| 166 | Trường Trung Học Cơ Sở Trần Phú              | MS          | 1885               | arterial         | 3.57             | 30                   | 1               | 2.45                              | 28.46                 | 65.62                             | 31.61                 |
| 139 | Trường Tiểu Học Nguyễn Bá Ngọc               | PS          | 1250               | local            | 1.72             | 46                   | 2 or more       | 0.00                              | 87.25                 | 86.69                             | 28.90                 |
| 175 | Trường Trung Học Phổ Thông Chi Lăng          | HS          | 370                | major            | 1.56             | 21                   | 2 or more       | 0.00                              | 59.00                 | 23.05                             | 45.20                 |
| 158 | Trường Trung Học Phổ Thông Hoàng Hoa Thám    | HS          | 1721               | arterial         | 2.28             | 38                   | 1               | 12.90                             | 38.98                 | 15.68                             | 23.42                 |
| 140 | Trường Tiểu Học Nguyễn Trãi                  | PS          | 1176               | arterial         | 6.86             | 50                   | 1               | 2.51                              | 22.43                 | 49.34                             | 24.91                 |

<sup>17</sup> School road records are presented divided by 1.000.

<sup>18</sup> School zone records are presented divided by 10.000

| ID  | name  | School Type | Number of Students | School road type | Length main road | Number of Intersect. | Number of lanes | School road records <sup>17</sup> | School Road Avg Speed | School Zone records <sup>18</sup> | School Zone Avg Speed |
|-----|---|-------------|--------------------|------------------|------------------|----------------------|-----------------|-----------------------------------|-----------------------|-----------------------------------|-----------------------|
| 165 | Trường Trung Học Cơ Sở Lý Thường Kiệt         | MS          | 623                | major            | 1.67             | 9                    | 2 or more       | 0.00                              | 62.00                 | 15.77                             | 43.78                 |
| 143 | Trường Tiểu Học Cù Chính Lan                  | PS          | 808                | arterial         | 5.06             | 46                   | 1               | 5.93                              | 19.94                 | 136.19                            | 24.39                 |
| 129 | Trường Trung Học Cơ Sở Huỳnh Thúc Kháng       | MS          | 672                | arterial         | 0.81             | 12                   | 2 or more       | 15.47                             | 41.43                 | 7.73                              | 27.47                 |
| 179 | Trường Tiểu Học Lê Lai                        | PS          | 626                | arterial         | 3.15             | 26                   | 1               | 4.10                              | 35.52                 | 27.15                             | 35.30                 |
| 133 | Trường Trung Học Cơ Sở Nguyễn Văn Cừ          | MS          | 1424               | arterial         | 2.56             | 37                   | 1               | 0.44                              | 29.39                 | 36.53                             | 27.67                 |
| 170 | Nguyen Khuyen                                 | PS          | 701                | major            | 0.82             | 8                    | 1               | 27.02                             | 54.09                 | 16.28                             | 43.99                 |
| 147 | Trường Tiểu Học Nguyễn Thị Minh Khai          | PS          | 1069               | arterial         | 2.35             | 17                   | 1               | 9.99                              | 36.39                 | 11.21                             | 30.93                 |
| 132 | Trường Tiểu Học Nguyễn Bình Khiêm             | PS          | 1066               | arterial         | 2.56             | 37                   | 1               | 0.44                              | 29.39                 | 40.47                             | 27.81                 |
| 146 | Trường Trung Học Cơ Sở Nguyễn Viết Xuân       | MS          | 989                | arterial         | 3.40             | 38                   | 1               | 7.54                              | 36.65                 | 9.65                              | 23.08                 |
| 162 | Trường Trung Học Phổ Thông Pleiku             | HS          | 1765               | arterial         | 1.13             | 12                   | 1               | 1.40                              | 34.45                 | 10.69                             | 35.20                 |
| 144 | Trường Trung Học Cơ Sở Nguyễn Huệ             | MS          | 1419               | local            | 4.40             | 48                   | 1               | 4.40                              | 28.01                 | 121.37                            | 24.75                 |
| 153 | Trường Trung Học Phổ Thông Nguyễn Chí Thanh   | HS          | 1652               | arterial         | 0.80             | 16                   | 1               | 2.70                              | 40.29                 | 2.24                              | 31.13                 |
| 159 | Trường Tiểu Học Phan Đăng Lưu                 | PS          | 1181               | arterial         | 1.53             | 20                   | 1               | 9.72                              | 36.63                 | 4.75                              | 27.47                 |
| 178 | Trường Tiểu Học Đinh Tiên Hoàng               | PS          | 827                | arterial         | 0.78             | 20                   | 1               | 14.99                             | 41.02                 | 7.48                              | 27.71                 |
| 155 | Trường Trung Học Cơ Sở Lý Tự Trọng            | MS          | 958                | arterial         | 3.67             | 30                   | 1               | 0.19                              | 21.53                 | 16.74                             | 25.49                 |
| 130 | Trường Tiểu Học Trần Quốc Toản                | PS          | 1348               | local            | 5.62             | 34                   | 1               | 0.11                              | 31.75                 | 33.32                             | 23.25                 |
| 169 | Trường Tiểu Học Lê Hồng Phong                 | PS          | 1023               | local            | 3.31             | 30                   | 1               | 0.05                              | 26.68                 | 50.69                             | 31.91                 |
| 181 | Trường Tiểu Học Lương Thạnh                   | PS          | 775                | local            | 2.87             | 45                   | 1               | 0.00                              | 13.00                 | 58.21                             | 28.72                 |
| 136 | Trường Trung Học Cơ Sở Tôn Đức Thắng          | MS          | 1231               | local            | 1.16             | 39                   | 1               | 0.01                              | 17.83                 | 54.98                             | 30.29                 |
| 152 | Trường Tiểu Học Bùi Dự                        | PS          | 372                | arterial         | 2.03             | 34                   | 1               | 0.32                              | 21.96                 | 8.83                              | 22.23                 |
| 164 | Trường Trung Học Cơ Sở Lương Thế Vinh         | MS          | 508                | arterial         | 0.83             | 22                   | 1               | 0.07                              | 28.42                 | 0.06                              | 28.51                 |
| 172 | Trường Tiểu Học Nay Der                       | PS          | 546                | local            | 1.20             | 32                   | 1               | 0.00                              | 28.00                 | 10.78                             | 59.05                 |
| 173 | Trường Tiểu Học Nguyễn Đức Cảnh               | PS          | 320                | local            | 0.00             | 12                   | 1               | 0.11                              | 52.47                 | 0.18                              | 42.09                 |
| 127 | Trường Tiểu Học, Trung Học Cơ Sở Bùi Thị Xuân | PS,MS       | 749                | arterial         | 0.80             | 14                   | 1               | 0.00                              | 29.00                 | 0.29                              | 24.29                 |
| 180 | Trường Quốc Tế Châu Á Thái Bình Dương         | PS          | 633                | local            | 1.65             | 22                   | 1               | 0.02                              | 22.56                 | 3.20                              | 30.91                 |
| 174 | Trường Tiểu Học Trần Đại Nghĩa                | PS, MS, HS  | 126                | local            | 0.00             | 10                   | 1               | 0.03                              | 59.13                 | 0.01                              | 56.90                 |

| ID   | name   | School Type | Number of Students | School road type | Length main road | Number of Intersect. | Number of lanes | School road records <sup>17</sup> | School Road Avg Speed | School Zone records <sup>18</sup> | School Zone Avg Speed |
|------|--|-------------|--------------------|------------------|------------------|----------------------|-----------------|-----------------------------------|-----------------------|-----------------------------------|-----------------------|
| 157  | Trường Tiểu Học, Trung Học Cơ Sở Nguyễn Chí Thanh                | PS, MS      | 163                | local            | 0.00             | 11                   | 1               | 0.02                              | 51.62                 | 0.01                              | 45.99                 |
| 167  | Trường Tiểu Học, Trung Học Cơ Sở Lê Văn Tám                      | PS,MS       | 500                | local            | 0.99             | 13                   | 1               | 0.00                              | 27.00                 | 2.76                              | 30.50                 |
| 168  | Trường Tiểu Học Hồ Tùng Mậu                                      | PS          | 458                | local            | 0.00             | 16                   | 1               | 0.01                              | 31.37                 | 0.00                              | 27.24                 |
| 163  | Trường Tiểu Học, Trung Học Cơ Sở và Trung Học Phổ Thông Sao Việt | PS,MS, HS   | 55                 | local            | 0.78             | 25                   | 1               | 0.00                              | 19.00                 | 14.25                             | 25.14                 |
| 177  | Trường Tiểu Học, Trung Học Cơ Sở Anh Hùng Vũu                    | PS,MS       | 295                | local            | 0.00             | 3                    | 1               | 0.00                              | 28.00                 | 0.00                              | 40.69                 |
| 171  | Trường Tiểu Học Trần Quý Cáp                                     | PS          | 702                | local            | 0.00             | 19                   | 1               | 0.02                              | 28.07                 | 0.01                              | 21.75                 |
| 176  | Trường Tiểu Học, Trung Học Cơ Sở Anh Hùng Đôn                    | PS          | 115                | local            | 0.00             | 0                    | 1               | 0.00                              | 0.00                  | 0.00                              | 0.00                  |
| 1111 | Trường Tiểu Học Ngô Quyền  | PS          | 423                | Local            | 1.143            | 18                   | 1               | 0.00                              | 40.00                 | 176293                            | 40.27                 |
| 1112 | Trường Trung Học Cơ Sở Lê Lợi                                    | MS          | 365                | Local            | 0.838            | 14                   | 1               | 0.00                              | 21.00                 | 11850                             | 28.21                 |
| 1113 | Trường Trung Học Cơ Sở Ngô Gia Tự                                | MS          | 825                | Local            | 0                | 4                    | 1               | 0.00                              | 28.00                 | 0                                 | 19.64                 |

**Table 12 Level 2 and 3 attributes ranked – Pleiku City**

| ID  | name   | School Type | Number of Students | School road type | Length main road | Number of Intersect. | Number of lanes | School road records | School Road Avg Speed | School Zone records | School Zone Avg speed |
|-----|--|-------------|--------------------|------------------|------------------|----------------------|-----------------|---------------------|-----------------------|---------------------|-----------------------|
| 156 | Trường Trung Học Cơ Sở Phạm Hồng Thái        | MS          | 1                  | 1                | 27               | 6                    | 1               | 1                   | 12                    | 4                   | 27                    |
| 150 | Trường Tiểu Học Hoàng Hoa Thám               | PS          | 31                 | 1                | 16               | 2                    | 1               | 4                   | 27                    | 1                   | 11                    |
| 148 | Trường Tiểu Học Võ Thị Sáu                   | PS          | 17                 | 1                | 10               | 1                    | 1               | 8                   | 23                    | 8                   | 34                    |
| 151 | Trường Tiểu Học Ngô Mỹ                       | PS          | 10                 | 1                | 23               | 31                   | 1               | 2                   | 10                    | 14                  | 23                    |
| 137 | Trường Trung Học Cơ Sở Nguyễn Du             | MS          | 2                  | 1                | 5                | 14                   | 1               | 20                  | 25                    | 12                  | 38                    |
| 154 | Trường Tiểu Học Nguyễn Lương Bằng            | PS          | 20                 | 1                | 13               | 23                   | 1               | 9                   | 11                    | 24                  | 25                    |
| 142 | Trường Trung Học Phổ Thông Chuyên Hùng Vương | HS          | 14                 | 1                | 3                | 5                    | 1               | 14                  | 37                    | 7                   | 46                    |
| 128 | Trường Phổ Thông Dân Tộc Nội Trú Tỉnh Gia La | HS          | 47                 | 1                | 22               | 20                   | 1               | 5                   | 9                     | 16                  | 15                    |
| 138 | Trường Trung Học Phổ Thông Phan Bội Châu     | HS          | 8                  | 1                | 1                | 8                    | 1               | 17                  | 45                    | 10                  | 47                    |
| 135 | Trường Tiểu Học Lê Quý Đôn                   | PS          | 11                 | 1                | 12               | 27                   | 1               | 19                  | 21                    | 20                  | 35                    |

| ID  | name  | School Type | Number of Students | School road type | Length main road | Number of Intersect. | Number of lanes | School road records | School Road Avg Speed | School Zone records | School Zone Avg speed |
|-----|---|-------------|--------------------|------------------|------------------|----------------------|-----------------|---------------------|-----------------------|---------------------|-----------------------|
| 141 | Trường Tiểu Học Chu Văn An                  | PS          | 16                 | 1                | 6                | 15                   | 1               | 7                   | 43                    | 19                  | 45                    |
| 145 | Trường Trung Học Phổ Thông Lê Lợi           | HS          | 9                  | 1                | 8                | 3                    | 55              | 6                   | 30                    | 5                   | 44                    |
| 149 | Trường Tiểu Học Nguyễn Văn Trỗi             | PS          | 3                  | 1                | 21               | 4                    | 55              | 24                  | 24                    | 2                   | 36                    |
| 161 | Trường Tiểu Học Anh Hùng Núp                | PS          | 42                 | 1                | 31               | 33                   | 1               | 12                  | 8                     | 29                  | 14                    |
| 131 | Trường Trung Học Cơ Sở Trưng Vương          | MS          | 21                 | 1                | 2                | 15                   | 1               | 25                  | 44                    | 21                  | 50                    |
| 166 | Trường Trung Học Cơ Sở Trần Phú             | MS          | 4                  | 1                | 17               | 28                   | 55              | 28                  | 34                    | 11                  | 13                    |
| 139 | Trường Tiểu Học Nguyễn Bá Ngọc              | PS          | 17                 | 55               | 32               | 10                   | 1               | 55                  | 1                     | 9                   | 22                    |
| 175 | Trường Trung Học Phổ Thông Chi Lăng         | HS          | 49                 | 1                | 35               | 37                   | 1               | 55                  | 4                     | 27                  | 4                     |
| 158 | Trường Trung Học Phổ Thông Hoàng Hoa Thám   | HS          | 6                  | 1                | 29               | 18                   | 55              | 13                  | 16                    | 33                  | 48                    |
| 140 | Trường Tiểu Học Nguyễn Trãi                 | PS          | 23                 | 1                | 4                | 6                    | 55              | 27                  | 47                    | 18                  | 40                    |
| 165 | Trường Trung Học Cơ Sở Lý Thường Kiệt       | MS          | 40                 | 1                | 33               | 52                   | 1               | 55                  | 2                     | 32                  | 6                     |
| 143 | Trường Tiểu Học Cù Chính Lan                | PS          | 32                 | 1                | 9                | 10                   | 55              | 21                  | 50                    | 3                   | 42                    |
| 129 | Trường Trung Học Cơ Sở Huỳnh Thúc Kháng     | MS          | 37                 | 1                | 44               | 47                   | 1               | 10                  | 13                    | 40                  | 32                    |
| 179 | Trường Tiểu Học Lê Lai                      | PS          | 39                 | 1                | 20               | 32                   | 55              | 23                  | 20                    | 26                  | 9                     |
| 133 | Trường Trung Học Cơ Sở Nguyễn Văn Cừ        | MS          | 12                 | 1                | 25               | 20                   | 55              | 30                  | 31                    | 23                  | 30                    |
| 170 | Nguyen Khuyen                               | PS          | 36                 | 1                | 43               | 53                   | 55              | 3                   | 5                     | 31                  | 5                     |
| 147 | Trường Tiểu Học Nguyễn Thị Minh Khai        | PS          | 24                 | 1                | 28               | 42                   | 55              | 15                  | 19                    | 35                  | 17                    |
| 132 | Trường Tiểu Học Nguyễn Bình Khiêm           | PS          | 25                 | 1                | 26               | 20                   | 55              | 30                  | 31                    | 22                  | 28                    |
| 146 | Trường Trung Học Cơ Sở Nguyễn Viết Xuân     | MS          | 27                 | 1                | 18               | 18                   | 55              | 18                  | 17                    | 38                  | 51                    |
| 162 | Trường Trung Học Phổ Thông Pleiku           | HS          | 5                  | 1                | 39               | 47                   | 55              | 29                  | 22                    | 37                  | 10                    |
| 144 | Trường Trung Học Cơ Sở Nguyễn Huệ           | MS          | 13                 | 55               | 11               | 9                    | 55              | 22                  | 38                    | 6                   | 41                    |
| 153 | Trường Trung Học Phổ Thông Nguyễn Chí Thanh | HS          | 7                  | 1                | 45               | 43                   | 55              | 26                  | 15                    | 46                  | 16                    |
| 159 | Trường Tiểu Học Phan Đăng Lưu               | PS          | 22                 | 1                | 36               | 38                   | 55              | 16                  | 18                    | 42                  | 31                    |
| 178 | Trường Tiểu Học Đinh Tiên Hoàng             | PS          | 29                 | 1                | 47               | 38                   | 55              | 11                  | 14                    | 41                  | 29                    |
| 155 | Trường Trung Học Cơ Sở Lý Tự Trọng          | MS          | 28                 | 1                | 15               | 28                   | 55              | 33                  | 49                    | 30                  | 37                    |
| 130 | Trường Tiểu Học Trần Quốc Toàn              | PS          | 15                 | 55               | 7                | 23                   | 55              | 35                  | 26                    | 25                  | 49                    |
| 169 | Trường Tiểu Học Lê Hồng Phong               | PS          | 26                 | 55               | 19               | 28                   | 55              | 55                  | 42                    | 17                  | 12                    |

| ID   | name   | School Type | Number of Students | School road type | Length main road | Number of Intersect. | Number of lanes | School road records | School Road Avg Speed | School Zone records | School Zone Avg speed |
|------|--|-------------|--------------------|------------------|------------------|----------------------|-----------------|---------------------|-----------------------|---------------------|-----------------------|
| 181  | Trường Tiểu Học Lương Thạnh                                      | PS          | 33                 | 55               | 24               | 12                   | 55              | 55                  | 54                    | 13                  | 24                    |
| 136  | Trường Trung Học Cơ Sở Tôn Đức Thắng                             | MS          | 19                 | 55               | 38               | 17                   | 55              | 55                  | 52                    | 15                  | 21                    |
| 152  | Trường Tiểu Học Bùi Dự   | PS          | 48                 | 1                | 30               | 23                   | 55              | 32                  | 48                    | 39                  | 53                    |
| 164  | Trường Trung Học Cơ Sở Lương Thế Vinh                            | MS          | 44                 | 1                | 42               | 35                   | 55              | 55                  | 35                    | 49                  | 26                    |
| 172  | Trường Tiểu Học Nay Der  | PS          | 43                 | 55               | 37               | 26                   | 55              | 55                  | 39                    | 36                  | 1                     |
| 173  | Trường Tiểu Học Nguyễn Đức Cảnh                                  | PS          | 50                 | 55               | 55               | 47                   | 55              | 34                  | 6                     | 48                  | 7                     |
| 127  | Trường Tiểu Học, Trung Học Cơ Sở Bùi Thị Xuân                    | PS,MS       | 34                 | 1                | 46               | 45                   | 55              | 55                  | 33                    | 47                  | 43                    |
| 180  | Trường Quốc Tế Châu Á Thái Bình Dương                            | PS          | 38                 | 55               | 34               | 35                   | 55              | 55                  | 46                    | 43                  | 18                    |
| 174  | Trường Tiểu Học Trần Đại Nghĩa                                   | PS, MS, HS  | 53                 | 55               | 55               | 51                   | 55              | 55                  | 3                     | 51                  | 2                     |
| 157  | Trường Tiểu Học, Trung Học Cơ Sở Nguyễn Chí Thanh                | PS, MS      | 52                 | 55               | 55               | 50                   | 55              | 55                  | 7                     | 52                  | 3                     |
| 167  | Trường Tiểu Học, Trung Học Cơ Sở Lê Văn Tám                      | PS,MS       | 45                 | 55               | 40               | 46                   | 55              | 55                  | 41                    | 45                  | 19                    |
| 168  | Trường Tiểu Học Hồ Tùng Mậu                                      | PS          | 46                 | 55               | 55               | 43                   | 55              | 55                  | 28                    | 53                  | 33                    |
| 163  | Trường Tiểu Học, Trung Học Cơ Sở và Trung Học Phổ Thông Sao Việt | PS,MS, HS   | 55                 | 55               | 47               | 33                   | 55              | 55                  | 51                    | 34                  | 39                    |
| 177  | Trường Tiểu Học, Trung Học Cơ Sở Anh Hùng Wưu                    | PS,MS       | 51                 | 55               | 55               | 54                   | 55              | 55                  | 39                    | 54                  | 8                     |
| 171  | Trường Tiểu Học Trần Quý Cáp                                     | PS          | 35                 | 55               | 55               | 40                   | 55              | 55                  | 36                    | 50                  | 54                    |
| 176  | Trường Tiểu Học, Trung Học Cơ Sở Anh Hùng Đôn                    | PS          | 54                 | 55               | 55               | 55                   | 55              | 55                  | 55                    | 55                  | 55                    |
| 1111 | Trường Tiểu Học Ngô Quyền  | PS          | 48                 | 58               | 39               | 41                   | 58              | 46                  | 16                    | 30                  | 9                     |
| 1112 | Trường Trung Học Cơ Sở Lê Lợi                                    | MS          | 52                 | 58               | 43               | 46                   | 58              | 46                  | 52                    | 48                  | 28                    |
| 1113 | Trường Trung Học Cơ Sở Ngô Gia Tự                                | MS          | 31                 | 58               | 51               | 56                   | 58              | 46                  | 40                    | 57                  | 57                    |

## ANNEX IV YEN BAI CITY – LEVEL 2 AND 3 ATTRIBUTES AND RANKS

Tables in the next page presented the values and rankings for the Level 2 and 3 analyses for Yen Bai City. Every school is identified by ID, name, and type of school.

- Table 13 presents the calculated values for the attributes.
- Table 14 presents the scores associated with the attributes ranked.

**Table 13 Level 2 and 3 attributes database – Yen Bai City**

| fid | Name  | School Type | Number of students | School road type | Length of main road | Number of intersec. | Number of lanes | School road records <sup>19</sup> | School road avg. speed | School road records <sup>20</sup> | School zone avg. speed |
|-----|---|-------------|--------------------|------------------|---------------------|---------------------|-----------------|-----------------------------------|------------------------|-----------------------------------|------------------------|
| 206 | Trường Trung Học Phổ Thông Nguyễn Huệ               | HS          | 1350               | arterial         | 1.329               | 20                  | 1               | 18.25                             | 35.87                  | 24.61                             | 33.36                  |
| 185 | Trường Trung Học Phổ Thông Chuyên Nguyễn Tất Thành  | HS          | 866                | major            | 1.899               | 18                  | 2 or more       | 0.00                              | 49.00                  | 8.82                              | 44.89                  |
| 188 | Trường Tiểu Học Nguyễn Phúc                         | PS          | 488                | arterial         | 1.777               | 41                  | 1               | 10.80                             | 35.98                  | 22.75                             | 34.69                  |
| 187 | Trường Tiểu Học Nguyễn Thái Học                     | PS          | 1296               | arterial         | 1.906               | 33                  | 1               | 8.76                              | 30.11                  | 16.71                             | 28.85                  |
| 191 | Trường Trung Học Cơ Sở Quang Trung                  | MS          | 1222               | arterial         | 1.405               | 20                  | 1               | 3.73                              | 31.37                  | 14.85                             | 32.24                  |
| 204 | Trường Tiểu Học Hồng Thái                           | PS          | 745                | arterial         | 2.158               | 45                  | 1               | 0.54                              | 26.75                  | 16.15                             | 26.74                  |
| 183 | Trường Tiểu Học Yên Ninh                            | PS          | 699                | arterial         | 0.809               | 20                  | 1               | 16.24                             | 35.33                  | 15.01                             | 33.02                  |
| 201 | Trường Tiểu Học, Trung Học Cơ Sở Âu Lâu             | PS,MS       | 737                | local            | 2.195               | 17                  | 1               | 0.00                              | 86.00                  | 55.32                             | 51.07                  |
| 200 | Trường Trung Học Phổ Thông Hoàng Quốc Việt          | HS          | 652                | arterial         | 0.827               | 7                   | 1               | 16.02                             | 36.93                  | 11.81                             | 38.56                  |
| 198 | Trường Trung Học Phổ Thông Lý Thường Kiệt           | HS          | 1046               | local            | 3.82                | 51                  | 1               | 0.36                              | 20.16                  | 30.42                             | 25.95                  |
| 205 | Trường Trung Học Cơ Sở Lê Hồng Phong                | MS          | 1263               | arterial         | 1.336               | 18                  | 1               | 0.00                              | 38.00                  | 8.78                              | 26.33                  |
| 184 | Trường Tiểu Học Kim Đồng                            | PS          | 865                | arterial         | 0.929               | 10                  | 1               | 4.47                              | 34.96                  | 2.77                              | 27.70                  |
| 194 | Trường Tiểu Học Nguyễn Trãi                         | PS          | 1450               | local            | 1.382               | 22                  | 1               | 0.00                              | 28.00                  | 23.09                             | 32.44                  |
| 195 | Trường Tiểu Học và Trung Học Cơ Sở Hợp Minh         | PS,MS       | 514                | arterial         | 1.301               | 12                  | 1               | 0.00                              | 29.00                  | 13.75                             | 39.00                  |
| 199 | Trường Trung Học Cơ Sở Yên Thịnh                    | MS          | 636                | local            | 2.575               | 33                  | 1               | 0.00                              | 28.00                  | 22.60                             | 33.21                  |
| 186 | Trường Tiểu Học, Trung Học Cơ Sở Tân Thịnh          | PS,MS       | 482                | arterial         | 0.944               | 3                   | 1               | 0.31                              | 34.21                  | 0.15                              | 36.18                  |
| 193 | Trường Trung Học Cơ Sở Nguyễn Du                    | MS          | 724                | local            | 2.843               | 55                  | 1               | 0.02                              | 14.54                  | 22.90                             | 27.46                  |
| 192 | Trường Tiểu Học Yên Thịnh                           | PS          | 942                | local            | 1.909               | 15                  | 1               | 0.00                              | 27.00                  | 15.19                             | 38.28                  |
| 189 | Trường Tiểu Học, Trung Học Cơ Sở Giới Phiên Cơ Sở 2 | PS,MS       | 225                | arterial         | 0.822               | 6                   | 1               | 8.82                              | 35.58                  | 3.52                              | 31.32                  |

<sup>19</sup> School road records are presented divided by 1.000.

<sup>20</sup> School zone records are presented divided by 10.000

| fid | Name  | School Type | Number of students | School road type | Length of main road | Number of intersec. | Number of lanes | School road records <sup>19</sup> | School road avg. speed | School road records <sup>20</sup> | School zone avg. speed |
|-----|---|-------------|--------------------|------------------|---------------------|---------------------|-----------------|-----------------------------------|------------------------|-----------------------------------|------------------------|
| 197 | Trường Phổ Thông Dân Tộc Nội Trú Trung Học Phổ Thông Tỉnh Yên Bái | HS          | 418                | local            | 1.772               | 24                  | 1               | 0.00                              | 8.19                   | 24.49                             | 34.19                  |
| 190 | Trường Trung Học Cơ Sở Yên Ninh                                   | MS          | 784                | local            | 1.165               | 8                   | 1               | 0.16                              | 23.36                  | 17.41                             | 31.94                  |
| 196 | Trường Tiểu học và Trung Học Cơ Sở Giới Phiên Cơ Sở 1             | PS,MS       | 263                | local            | 0.831               | 9                   | 1               | 0.00                              | 40.00                  | 9.52                              | 40.95                  |
| 208 | Trường Tiểu học và Trung Học Cơ Sở Tuy Lộc                        | PS,MS       | 499                | local            | 0.621               | 11                  | 1               | 0.00                              | 28.00                  | 4.97                              | 40.09                  |
| 207 | Van Phu primary and secondary school                              | PS,MS       | 297                | local            | 0                   | 8                   | 1               | 0.05                              | 40.23                  | 0.03                              | 35.69                  |
| 203 | Trường Tiểu Học Nam Cường   | PS          | 291                | local            | 0                   | 24                  | 1               | 0.00                              | 28.00                  | 0.01                              | 24.21                  |
| 202 | Trường Trung Học Cơ Sở Văn Tiến                                   | MS          | 454                | local            | 0                   | 6                   | 1               | 0.02                              | 31.19                  | 0.02                              | 27.20                  |
| 182 | Trường Tiểu Học Minh Bảo  | PS          | 378                | local            | 0.689               | 2                   | 1               | 0.00                              | 2.67                   | 0.23                              | 26.04                  |

**Table 14 Level 2 and Level 3 attributes ranked – Yen Bai City**

| fid | Name   | School Type | Number of students | School road type | Length of main road | Number of intersec. | Number of lanes | School road records | School road avg. speed | School zone avg. speed | School road records |
|-----|--|-------------|--------------------|------------------|---------------------|---------------------|-----------------|---------------------|------------------------|------------------------|---------------------|
| 206 | Trường Trung Học Phổ Thông Nguyễn Huệ              | HS          | 2                  | 1                | 14                  | 10                  | 27              | 1                   | 8                      | 3                      | 12                  |
| 185 | Trường Trung Học Phổ Thông Chuyên Nguyễn Tất Thành | HS          | 8                  | 1                | 8                   | 13                  | 1               | 27                  | 2                      | 18                     | 2                   |
| 188 | Trường Tiểu Học Nguyễn Phúc                        | PS          | 19                 | 1                | 9                   | 4                   | 27              | 4                   | 7                      | 7                      | 10                  |
| 187 | Trường Tiểu Học Nguyễn Thái Học                    | PS          | 3                  | 1                | 7                   | 5                   | 27              | 6                   | 15                     | 10                     | 19                  |
| 191 | Trường Trung Học Cơ Sở Quang Trung                 | MS          | 5                  | 1                | 11                  | 10                  | 27              | 8                   | 13                     | 14                     | 16                  |
| 204 | Trường Tiểu Học Hồng Thái                          | PS          | 11                 | 1                | 5                   | 3                   | 27              | 9                   | 22                     | 11                     | 23                  |
| 183 | Trường Tiểu Học Yên Ninh                           | PS          | 14                 | 1                | 22                  | 10                  | 27              | 2                   | 10                     | 13                     | 14                  |
| 201 | Trường Tiểu Học, Trung Học Cơ Sở Âu Lâu            | PS,MS       | 12                 | 27               | 4                   | 15                  | 27              | 27                  | 1                      | 1                      | 1                   |
| 200 | Trường Trung Học Phổ Thông Hoàng Quốc Việt         | HS          | 15                 | 1                | 20                  | 23                  | 27              | 3                   | 6                      | 16                     | 6                   |
| 198 | Trường Trung Học Phổ Thông Lý Thường Kiệt          | HS          | 6                  | 27               | 1                   | 2                   | 27              | 10                  | 24                     | 2                      | 26                  |
| 205 | Trường Trung Học Cơ Sở Lê Hồng Phong               | MS          | 4                  | 1                | 13                  | 13                  | 27              | 27                  | 5                      | 19                     | 24                  |

| fid | Name  | School Type | Number of students | School road type | Length of main road | Number of intersec. | Number of lanes | School road records | School road avg. speed | School zone avg. speed | School road records |
|-----|---|-------------|--------------------|------------------|---------------------|---------------------|-----------------|---------------------|------------------------|------------------------|---------------------|
| 184 | Trường Tiểu Học Kim Đồng  | PS          | 9                  | 1                | 18                  | 19                  | 27              | 7                   | 11                     | 22                     | 20                  |
| 194 | Trường Tiểu Học Nguyễn Trãi                                       | PS          | 1                  | 27               | 12                  | 9                   | 27              | 27                  | 17                     | 5                      | 15                  |
| 195 | Trường Tiểu Học và Trung Học Cơ Sở Hợp Minh                       | PS,MS       | 17                 | 1                | 15                  | 17                  | 27              | 27                  | 16                     | 15                     | 5                   |
| 199 | Trường Trung Học Cơ Sở Yên Thịnh                                  | MS          | 16                 | 27               | 3                   | 5                   | 27              | 27                  | 17                     | 8                      | 13                  |
| 186 | Trường Tiểu Học, Trung Học Cơ Sở Tân Thịnh                        | PS,MS       | 20                 | 1                | 17                  | 26                  | 27              | 11                  | 12                     | 24                     | 8                   |
| 193 | Trường Trung Học Cơ Sở Nguyễn Du                                  | MS          | 13                 | 27               | 2                   | 1                   | 27              | 27                  | 25                     | 6                      | 21                  |
| 192 | Trường Tiểu Học Yên Thịnh   | PS          | 7                  | 27               | 6                   | 16                  | 27              | 27                  | 21                     | 12                     | 7                   |
| 189 | Trường Tiểu Học, Trung Học Cơ Sở Giới Phiên Cơ Sở 2               | PS,MS       | 27                 | 1                | 21                  | 24                  | 27              | 5                   | 9                      | 21                     | 18                  |
| 197 | Trường Phổ Thông Dân Tộc Nội Trú Trung Học Phổ Thông Tỉnh Yên Bái | HS          | 22                 | 27               | 10                  | 7                   | 27              | 27                  | 26                     | 4                      | 11                  |
| 190 | Trường Trung Học Cơ Sở Yên Ninh                                   | MS          | 10                 | 27               | 16                  | 21                  | 27              | 12                  | 23                     | 9                      | 17                  |
| 196 | Trường Tiểu Học, Trung Học Cơ Sở Giới Phiên Cơ Sở 1               | PS,MS       | 26                 | 27               | 19                  | 20                  | 27              | 27                  | 4                      | 17                     | 3                   |
| 208 | Trường Tiểu Học, Trung Học Cơ Sở Tuy Lộc                          | PS,MS       | 18                 | 27               | 24                  | 18                  | 27              | 27                  | 17                     | 20                     | 4                   |
| 207 | Trường Tiểu Học, Trung Học Cơ Sở Văn Phú                          | PS,MS       | 24                 | 27               | 27                  | 21                  | 27              | 27                  | 3                      | 25                     | 9                   |
| 203 | Trường Tiểu Học Nam Cường   | PS          | 25                 | 27               | 27                  | 7                   | 27              | 27                  | 17                     | 27                     | 27                  |
| 202 | Trường Trung Học Cơ Sở Văn Tiến                                   | MS          | 21                 | 27               | 27                  | 24                  | 27              | 27                  | 14                     | 26                     | 22                  |
| 182 | Trường Tiểu Học Minh Bảo  | PS          | 23                 | 27               | 23                  | 27                  | 27              | 27                  | 27                     | 23                     | 25                  |