

Transport Starter Data Kit: Historical socio-transport data for Philippines

Authors

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Abstract

Data on transport activity is an important element for the development of national transport decarbonisation strategies. By having freight and passenger transport information, the impacts on vehicle and fuel consumption changes from replacing internal combustion engine vehicles with electric vehicles can be calculated. The development of a national decarbonisation strategy requires significant efforts. However, access to data is often a barrier to starting transport system modelling in developing countries, thereby causing delays. This article provides data that can be used to support a model for the Philippines, which may act as a starting point for further model development and scenario analysis. The data are collected entirely from publicly available and accessible sources, focusing on national reports, statistical yearbooks, and academia.

Keywords

U4RIA

Transport data

Transport modelling

MAED

The Philippines

Specifications Table

Subject	Transport
Specific subject area	Transport Data
Type of data	Tables Graphs
How data were acquired	Literature survey (databases and reports from international organisations; journal articles)
Data format	Raw and analysed
Parameters for data collection	Data collected based on inputs required to create an energy system model for Philippines
Description of data collection	Data were collected from the websites, annual reports and databases of international organisations, as well as from academic articles and existing modelling databases.
Data source location	Not applicable
Data accessibility	With the article and in a repository. Repository name: Zenodo. Direct URL to data: https://doi.org/10.5281/zenodo.6539991

Value of the Data

- The data can be used to develop national transport demand models to inform national investment outlooks and decarbonisation strategies.
- The data are useful for country analysts, policy makers, and the broader scientific community, as a zero-order starting point for model development.
- This data could be used to examine a range of possible transport pathways, in addition to the examples given in this study, to provide further insights into the evolution of the Philippines' transport system.
- The data can be used both for conducting an analysis of transport activity and emissions, but also for capacity building activities.
- The data can be used as a call to action in addressing transport data gaps and establishing parameters for data collection to improve the consistency of transport-climate research in these countries.

1. Data Description

The data provided in this paper can be used to support the development of a transport model for the Philippines. The data provided were collected from publicly available sources, including statistical yearbooks, transport ministry reports, statistics from national authorities and affiliated research institutions, academia, and journal articles. Global datasets (primarily from the World Bank) were only consulted if severe data gaps existed. The dataset includes parameters on passenger and freight transport activity, disaggregated by transport mode (road, rail, aviation, etc.) and geographic scale (inter-city or

inner-city), if available. The dataset also covers the size of the vehicle fleet, disaggregated by vehicle types. The data coverage and subtypes vary among the parameters. The overall ambition is to include the most recent available year(s).

<i>Item</i>	<i>Description of Content</i>
Figure 1	A graph showing total population (million people), as well as the share of urban and rural population in Philippines.
Figure 2	A graph showing total GDP (million USD in 2015), as well as the share of the different sectors contributing to GDP in Philippines: agriculture, construction, mining, manufacturing, service, and energy.
Table 1	A table showing passenger transport activity in the Philippines for the most recent year data was available. The data are curated from national statistics agencies or other government-affiliated agencies.
Table 2	An additional table showing passenger transport activity in the Philippines based on UN DESA Statistics Division data (see explanation below). The data feature information for 2018.
Table 3	A table showing freight transport activity in the Philippines based on UN DESA Statistics Division data (see explanation below). The data feature information for 2018.
Table 4	A table showing vehicle fleet data in the Philippines for the most recent year data were available.

For the parameters on passenger and freight transport activity, an additional dataset was included in Table 2 and Table 3. The UN DESA Statistics Division modelled passenger activity and freight activity for every country in support of SDG Indicator 9.1.2¹. Passenger activity data provide information for road, rail, and air transport. Freight data cover road, rail and inland water, and aviation. The passenger-km and tonnes-km data originate from the Open SDG Data Hub. In this dataset, only the data for International Transport Forum (ITF) (representing mostly OECD countries) and UNECE countries (mostly European countries) are based on national reporting. For non-ITF/UNECE countries, the data are estimated using the ITF model, which uses several covariates such as GDP, population, and transport network coverage. A description of the model can be found in the ITF Transport Outlook 2017.

1.1 Population

Population data including total population, population growth, and split by rural or urban was gathered from The World Bank Open Data platform². Figure 1 displays the total population disaggregated by urban and rural in the Philippines.

¹ Freight: <https://www.sdg.org/datasets/undesa::indicator-9-1-2-freight-volume-by-mode-of-transport-tonne-kilometres/about> ;

Passenger: <https://www.sdg.org/datasets/undesa::indicator-9-1-2-passenger-volume-passenger-kilometres-by-mode-of-transport/about>

² <https://data.worldbank.org/>

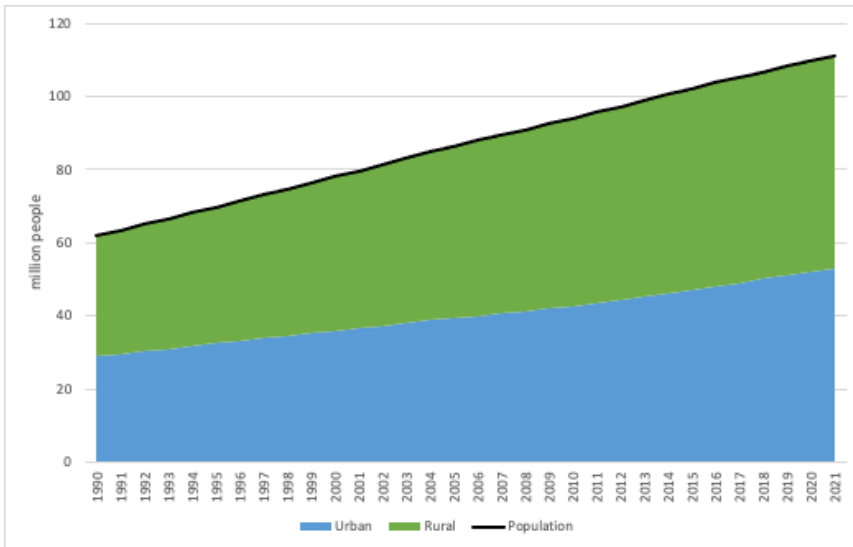


Figure 1: Total population (million people) disaggregated by urban and rural in Philippines

1.2 Gross domestic product (GDP)

GDP data including total GDP, GDP growth, and GDP share by sector (agriculture, manufacturing, service) was collected from The World Bank Open Data platform². Where data was not available, data processing was done. Figure 2 shows the total GDP, as well as the share by sector, in Philippines.

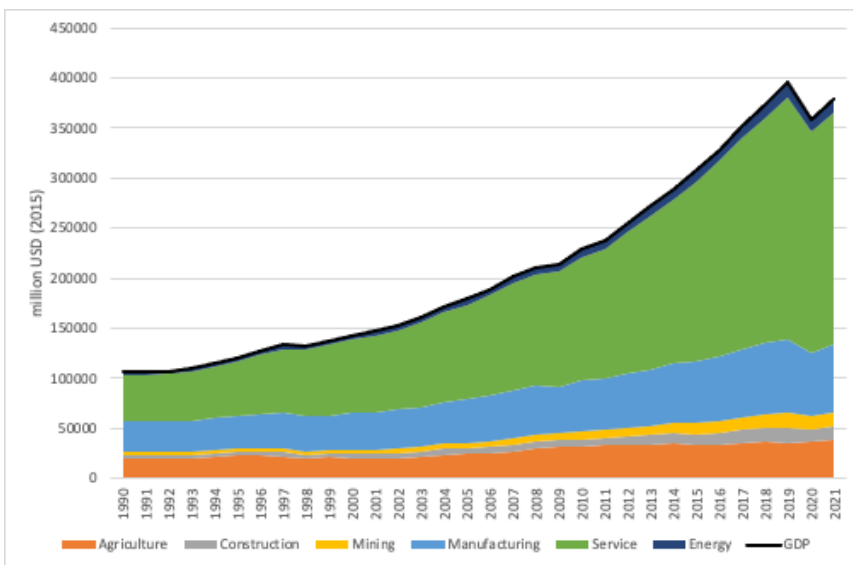


Figure 2: Total GDP (million USD in 2015) disaggregated by share in Philippines

1.3 Passenger transport activity

Recorded data on passenger transport activity in the Philippines is only captured for rail transport. Rail passenger activity totalled about 27 million passenger-km in 2007. A steady decrease in rail passenger

activity has been recorded since 2004, with passenger-km declining more than 80% during this period. The data are provided by the Asian Development Bank's Asian Transport Outlook Database.

Table 1: Recorded passenger transport activity (million passenger-km) in the Philippines

Mode	2004	2005	2006	2007
Rail	134.562	65.2732	80.3325	26.7584

Source: ADB, 2021, Asian Transport Outlook Database, <https://data.adb.org/dataset/asian-transport-outlook-database>

According to the UN DESA modelled data, it is estimated that passenger activity in the Philippines totalled 513 480 million passenger-km in 2018. Most of the passenger activity is conducted through rail transport

Table 2: Modelled passenger transport activity (million passenger-km) in the Philippines

Mode	2018
Aviation	69226.493
Rail	286215.425
Road	158038.375

1.4 Freight transport activity

Recorded data on freight activity for the Philippines is unavailable.

According to the UN DESA modelled data, freight activity for 2018 in the Philippines was estimated at 54 350 million tonnes-km. Road transport accounts for more than 98% of modelled freight transport activity, with data for rail freight transport unavailable.

Table 3: Modelled freight transport activity (million tonnes-km) in the Philippines

Mode	2018
Aviation	835.904513
Road	53514.34

1.5 Vehicle fleets

The Philippines had a total of 11851192 vehicles, as of 2020. Official records cover information from 2010 to 2020. During this period, the total vehicle fleet grew by 79%. The largest growth was recorded for light-duty vehicles. The vehicle fleet data is sourced from the Asian Transport Outlook Database.

Table 4: Recorded vehicle fleet numbers in the Philippines

Mode	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Light-duty vehicles	804825	1112686	1162776	1214544	-	1390586	1464978	1609105	1709260	1843053	1825659
Buses	1996612	2066588	2115105	2172357	-	2009442	1999145	2143770	2219348	2327830	2203679
Freight vehicles	347037	361827	378963	398498	-	429516	457672	483594	504573	540221	493738

Total road vehicles	6634855	7138942	7463393	7690038	-	8706607	9251565	10410814	11595434	12725305	11851192
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Source: ADB, 2021, Asian Transport Outlook Database, <https://data.adb.org/dataset/asian-transport-outlook-database>

2. Methodology

The focus is on national data for passenger activity (passenger-km), freight activity (tonnes-km) and modes of transport (number of vehicles). The priority is to collect data released by national governments, government-affiliated organisations, or country-specific studies. The research identifies the most recent available data and any data available from 1990 onwards. The priority was for any data after 2010, because transport is a very dynamic growth sector and anything before 2010 adds limited value to understanding the current real-world situation.

Desk research is the main data collection approach for the Transport Starter Data Kits. The desk research examined annual yearbooks, transport statistics, country reporting, and any national statistical portals. Websites of the national government, transport ministries, statistical institutes and other related authorities were examined. Only when severe data gaps exist, global datasets are consulted. In some cases, World Bank data³ on rail passenger and rail freight is included.

Each Transport Data for Starter Data Kit set contains an additional dataset, which is sourced from the United Nations Department of Economic and Social Affairs (UN DESA) Statistics Division. It is included as a secondary priority because this dataset is the result of a modelling exercise and covers every country. The UN DESA modelled passenger activity and freight activity has the purpose to support the Sustainable Development Goal Indicator 9.1.2⁴. The passenger activity provides information for road, rail, and air transport. Freight data covers the road, rail and inland water, and aviation. The passenger-km and tonnes-km data originate from the Open Sustainable Development Goals (SDG) Data Hub. In the UN DESA dataset, only the data for countries participating in the International Transport Forum (ITF) (representing mostly member countries of the Organisation for Economic Co-operation and Development (OECD)) and the United Nations Economic Commission for Europe (UNECE) (mostly European countries) are based on national reporting. For non-ITF/UNECE countries, data are estimated using the ITF model, which uses several covariates such as gross domestic product, population, and transport network coverage. A description of the model can be found in the ITF Transport Outlook 2017⁵. The UN DESA dataset is included in the Transport Data for Starter Data Kits as additional tables to fill in the incomplete picture that most countries present. The UN DESA modelled data is less accurate and it shall only be regarded as offering the wider picture of transport activity in the country.

³ Rail passenger data: World Bank, 2022, Railways, passengers carried (million passenger-km), <https://data.worldbank.org/indicator/IS.RRS.PASG.KM>; rail freight data: World Bank, 2022, Railways, goods transported (million ton-km), <https://data.worldbank.org/indicator/IS.RRS.GOOD.MT.K6>

⁴ UN DESA, 2021, Indicator 9.1.2: Freight volume by mode of transport (tonne kilometres): <https://www.sdg.org/datasets/undesa::indicator-9-1-2-freight-volume-by-mode-of-transport-tonne-kilometres/about> ;

UN DESA, 2021, Indicator 9.1.2: Passenger volume (passenger kilometres) by mode of transport: <https://www.sdg.org/datasets/undesa::indicator-9-1-2-passenger-volume-passenger-kilometres-by-mode-of-transport/about>

⁵ ITF, 2017, ITF Transport Outlook 2017, <https://www.itf-oecd.org/transport-outlook-2017>

The collected data have been shared with a group of relevant SLOCAT partners to validate and explore any additional sources. The SLOCAT partners were selected based on their actions to lead projects in the region and their involvement in data-focused knowledge products or projects. The consultation involved ten anonymous organisations.

Desk research is an approach that limits the research to material available on the internet, accessible through search engines and linked to government and statistical institutes' websites. However, this does not pose a major limitation to obtaining data. Nearly every country has functional websites for statistics and transport authorities. In a few cases, websites are not well maintained, resulting in missing or broken hyperlinks to reports. By using services that provide access to archived websites, some of these broken pages can be retrieved. The collected information has been shared with partners and no additional information has been received.

Government datasets are generally published in local languages. For this study, the relevant information is accessed through the Asian Transport Outlook Database⁶ which is available in English, thus no language issues were encountered.

Due to missing values in the country's historical GDP data, extrapolation between available years was done by the authors to address this. The World Bank's data platform provided GDP share by sector for agriculture, manufacturing, and services. However, GDP share by construction, mining, and energy was also needed to align the data structure with the MAED tool. To address the lack of data available for these sectors, the authors assumed that construction, mining, manufacturing, and energy all fall within the industry sector. Thus, to obtain data for the three remaining sectors, the remaining percentage after considering agriculture, manufacturing, and services from The World Bank's data platform, was divided by three. It is therefore assumed that the GDP share of the construction, mining, and energy sectors are the same.

3. Ethics Statement

Not applicable.

4. CRediT Author Statement

Naomi Tan: Investigation, Conceptualisation, Methodology; Data Collection; Visualization, Writing and Editing; **Robert Ambunda:** Data Collection; Investigation; Writing and Editing; **Nikola Medimorec:** Conceptualisation; Methodology; Data Collection; Investigation; Writing, Review & Editing; Supervision; **Angel Cortez:** Data Collection; **Agustina Krapp:** Data Collection; **Erin Maxwell:** Data Collection; **John Harrison:** Supervision; **Mark Howells:** Supervision

⁶ ADB, 2021, Asian Transport Outlook Database, <https://data.adb.org/dataset/asian-transport-outlook-database>

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Declaration of Competing Interests

The authors declare that they have no known competing financial interests or personal relationships which have or could be perceived to have influenced the work reported in this article.