

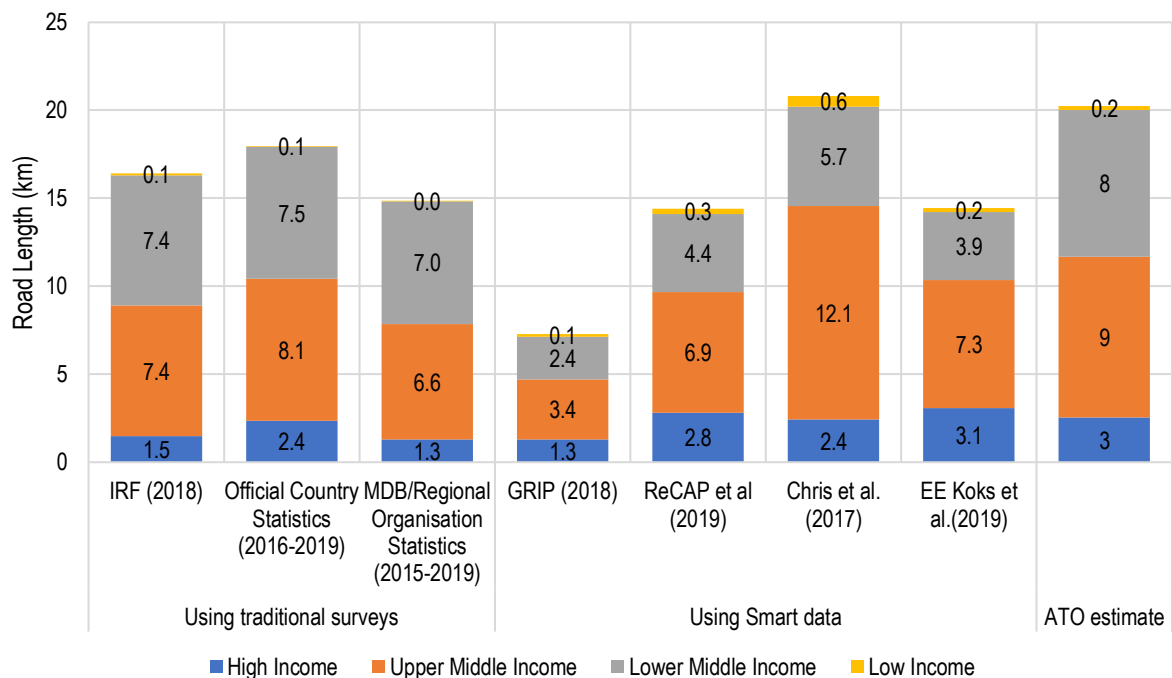
Asian Transport Outlook (ATO)

What is the Current Status of Road Transport Infrastructure in Asia?

The size of road infrastructure in the Asian Transport Outlook (ATO) economies is estimated to be around 20 million kilometres (ranging from 7 to 21 million kilometres depending upon the methodology of data collection). This is about 98% of the total surface transport infrastructure (with heavy railways, high-speed railways and urban transit rail infrastructure share to be 1.8%, 0.2% and 0.1%, respectively).

There is a significant variation between the national road statistics and data derived from OpenStreetMap, a crowdsourced geographic database that provides the open and licensed source of global geospatial road data (Figure 1). The OpenStreetMap data in high-income economies provide higher road network length when compared with the national statistics. In middle and low-income economies, in several cases, OpenStreetMap data is still not complete, and thus the local statistics till now tend to provide the best source of information on the size of the road network.¹

Figure 1: Road Network ATO economies (millions of kilometers)



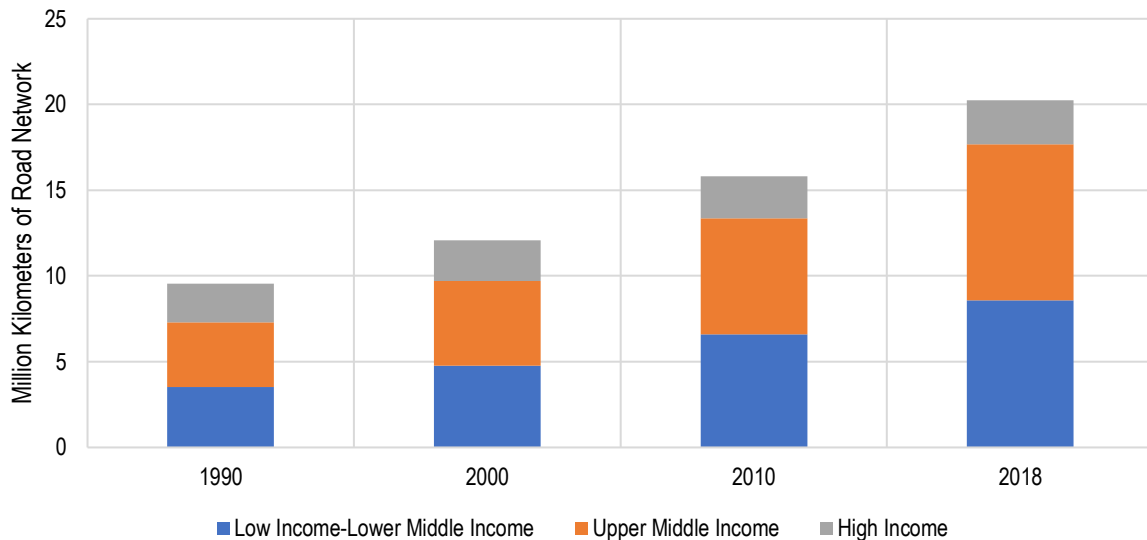
¹ <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0180698>

Source: Country Statistical Yearbooks, GRIP (Global Roads Inventory Project), <https://rai.azavea.com/>, <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0180698>, <https://www.nature.com/articles/s41467-019-10442-3#MOESM1>, World Bank & ADB.

ATO Data Used: INF-TTI-005

There are significant gaps for several ATO economies in the country level time-series of road network data. Owing to this, as well as differences in the definitions used to classify roads and survey methodology, we construct a plausible historic baseline estimate for road infrastructure using the best available data on historical growth rates. This assessment indicates that the road network has roughly doubled over the past three decades, i.e., increased from around 10 million kilometres in 1990 to about 20 million kilometres in 2018 (Fig. 2). On average, ATO economies have added about 380,000 kilometres of road infrastructure every year. Most of the growth in the road network has occurred in upper middle Income economies followed by low income and lower middle Income countries.

Figure 2: Growth in Road Network 1990-2018 by Income Category (millions of kilometers)



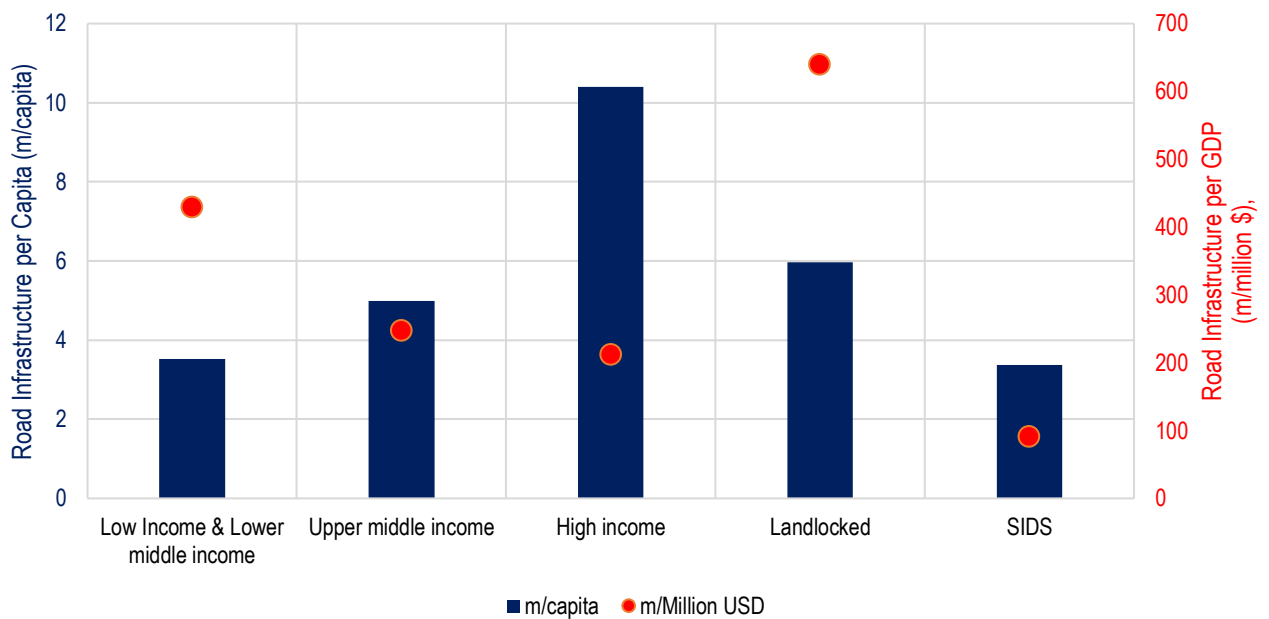
Source: Country Statistical Yearbooks, GRIP (Global Roads Inventory Project), <https://rai.azavea.com/>, <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0180698>, <https://www.nature.com/articles/s41467-019-10442-3#MOESM1>, World Bank and ADB.

ATO Data Used: INF-TTI-005

Road transport infrastructure is the most frequently used means of transporting goods and people in Asia and can have a transformative or incremental impact on economic growth depending upon the overall economic structure, regional connectivity, and infrastructure. (Fig. 3) Expansion of road transport infrastructure is transformative in low-income and lower-middle-income economies, where the per-capita availability of road infrastructure remains still lower than in middle-income and high-income economies. In initial phases of development, investments in road infrastructure provision can greatly accelerate access to jobs, healthcare facilities, education centres and other related services.

As the income-level rises, road expansion becomes less of a priority and there is greater emphasis on i.e., maintaining existing infrastructure, completing missing links, and addressing congestion hotspots. The role of transport infrastructure (as measured by km to GDP) changes as economies prioritise the service sector investments. Thus, the creation of transport infrastructure is more transformative at lower economic development levels, while for upper-middle-income and high-income economies, it is more incremental. Further, the road infrastructure is a priority in landlocked economies when compared to other economies. For Small Islands Developing States (SIDS) economies, the role of road transport infrastructure is mostly incremental, and improving shipping access and connectivity are more critical.

Figure 3: Road Infrastructure Per Capita and Road Infrastructure by Income Group (meters per capita and millions \$)

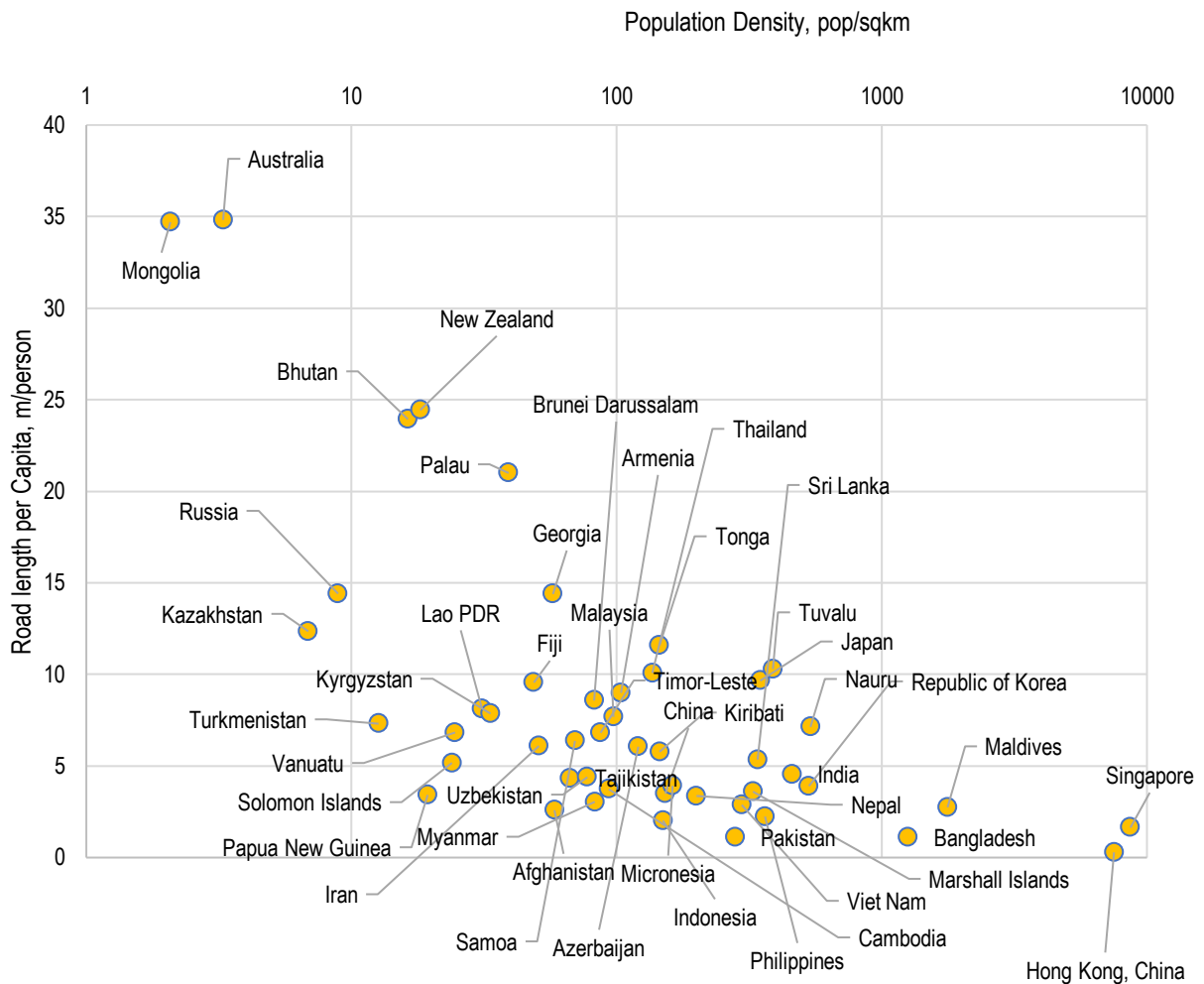


Source: Country Statistical Yearbooks, GRIP (Global Roads Inventory Project), <https://rai.azavea.com/>, <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0180698>, <https://www.nature.com/articles/s41467-019-10442-3#MOESM1>, World Bank & ADB.

ATO Data Used: INF-TTI-005, SEC-DEV-001 & SEC-SEG-002

In the ATO economies, population density is an important determinant for infrastructure development irrespective of income status (Fig. 4). In economies with a higher population density, residents have comparatively better access to road infrastructure and transport services with limited network availability when compared to economies with lower population density. The relationship between population density and road availability is also mutually reinforcing when considered at the sub-national level. Higher population density improves road accessibility. However, higher road density may also cause higher population density (especially in cities).

Figure 4: Road Length per Capita and Population Density (meter per capita and persons per square kilometer)



Source: Country Statistical Yearbooks, GRIP (Global Roads Inventory Project), <https://rai.azavea.com/>, <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0180698>, <https://www.nature.com/articles/s41467-019-10442-3#MOESM1>, World Bank & ADB.

ATO Data Used: INF-TTI-005, SEC-DEV-011

The quality of road transport infrastructure is a crucial determinant of economic growth. However, there are significant gaps in information on road asset management in the ATO economies (data availability, definitions, coverage, quality) and this makes it difficult to develop detailed quantitative time series and to make comparisons among economies. Thus, qualitative data on road quality remains the main source of information on the quality of road transport infrastructure. Road quality is one indicator that is part of the Global Competitiveness Index published annually by the World Economic Forum (WEF). The survey considers the opinions of over 14,000 business leaders in 144 economies. Road quality ratings are assigned, and rankings derived. The data reveals that economies gradually improve the standards and quality of the road infrastructure with growing income. Since 2010, there is a significant improvement in the rankings, with 85% of ATO economies improving their road infrastructure rankings.