



Partnership Ready Cambodia: Sustainable mobility

Increasing urbanisation, motorisation and trade in Cambodia are causing high traffic density, with impacts on road safety, climate and the environment, especially in the country's capital Phnom Penh. Accidents, severe traffic congestion and air pollution have become major issues, making transport, logistics and travelling in and outside of cities unsafe, time-consuming, expensive and unhealthy.

Current situation and challenges

→ ROAD TRAFFIC ACCIDENTS

In 2019, 4,121 road traffic accidents (RTAs) were recorded across the country, causing 1,981 fatalities and seriously injuring 3,919 people. While the absolute number of fatalities increased in the last decades, it must be noted that between 2006 and 2016 the population grew by 18% and the number of registered motorised vehicles shot up by 553% (from around 714,000 to 3.3 million vehicles, about 88% of which were motorcycles or mopeds). The number of fatalities per 100,000 inhabitants increased, but the number of fatalities per 10,000 registered vehicles decreased significantly, which is a positive sign. In 2016, there were 4.9 fatalities per 10,000 registered vehicles in Cambodia, which is

lower than in the Lao People's Democratic Republic (5.87) and higher than in Vietnam (1.66). The fatality rate per 100,000 inhabitants was 11.9, which, again, is lower than in the Lao PDR (16.49) and higher than in Vietnam (9.29).

RTAs account for over nine times more deaths than are caused by malaria, dengue fever and landmines/unexploded ordnance combined. While the highest number of fatalities occur in Phnom Penh, other cities and the interurban road network are not exempt: travelling (by car, motorcycle, bus, mini-van, etc.) on national, provincial and rural roads is dangerous. Some of the factors contributing to the high accident rate include limited public awareness of traffic laws, corruption in the process of issuing driving licences and unsatisfactory law enforcement. To compound this issue, road accident victims have limited access to justice. Human error like speeding or drunk driving contributed to 97.4% of crashes and fatalities, followed by vehicle defects (2.4%), the road environment (0.7%) and weather (0.4%).

RTAs not only cause injuries and deaths; they also have negative socio-economic effects. Research conducted by Handicap International shows that in 2013, the economic cost of road collisions stood at approximately USD 337 million (2.3% of Cambodia's GDP) and it is probably higher today.

The non-governmental Institute for Road Safety is active in education, advocacy and engineering. Other relevant NGOs include the AIP Foundation, the Coalition For Road Safety and Handicap International. Since 2004, Handicap International, in close collaboration with Cambodia's Ministry of Health, Ministry of Interior and Ministry of Public Works and Transport (MPWT), has been progressively developing the country's Road Crash and Victim Information System (RCVIS). The Netherlands has provided support in developing monitoring tools, which include tools to analyse data from the RCVIS (e.g. on fatalities and trends), perform observational studies (e.g. on helmet wearing) and conduct surveys and interviews.





→ CONGESTION

Road infrastructure in Cambodian cities has not kept pace with the increases in population and vehicle usage. Higher incomes are enabling more and more citizens to buy large vehicles that still are in a minority but already represent an additional burden for the road network that was initially designed for two-wheelers which are highly road-space effective.

However, road construction is not considered as the universal remedy to reduce congestion since more roads generally lead to a rise in traffic volume. For instance, the insufficient facilities for cyclists and pedestrians as well as the lack of public transport in most cities leave people with no choice but to travel individually in motorised vehicles that contribute to traffic density and congestions. Another issue is that pavements and traffic lanes are often used as parking areas or as a place to set up a mobile business. During the rainy season congestion is even more frequent because, when certain roads are flooded and cannot be used, the traffic density increases on the other roads in the network.



The most developed public transport system can be found in the capital; there are water taxis, an airport train and the country's only formalised public bus network. Phnom Penh City Bus started operations in 2014 with three routes. Today the network features 13 routes. However, network coverage is still insufficient and the slow and infrequent buses struggle to attract passengers. Currently, the sale of tickets only covers 20% of the operational costs with the rest being covered by Phnom Penh City Hall (PPCH).

The almost 2,000 km of navigable waterways can be considered as an alternative to road transportation, but their importance has decreased due to the construction of major roads. In general, trains are another means of avoiding congestion, but the railway network needs to be expanded, maintained and modernised in order to offer an interesting option for transporting passengers and goods. For instance, trains only operate between Sihanoukville, Phnom Penh and Poipet located at the border with Thailand.

→ ENVIRONMENTAL IMPACT AND AIR QUALITY

Given Cambodia's growing levels of traffic and the fact that no age limits or emission standards are applied to most of the vehicles imported, the transport sector's greenhouse gas emissions are rapidly increasing (from 0.7 Mt CO₂eq in 2000 to 4.7 Mt CO₂eq in 2016).

Air quality levels in Phnom Penh regularly exceed recommendations from the World Health Organization (WHO), posing serious health risks to the city's inhabitants. Even though Cambodia is not a heavily industrialised country, in the 2018 Environmental Performance Index it ranked 164th out of 180 countries for air quality. The Health Effects Institute's 2018 report attributed fine particulate matter (PM_{2.5}) pollution to 72.6 deaths per 100,000 people in Cambodia; the global average is only 62.5 deaths.

Policy and regulation

→ LINE MINISTRIES

MPWT was established in 1996 and is in charge of managing and improving transport in Cambodia. The Ministry has seven General Departments: Administration and Finance, Planning and Policy, Techniques, Public Works, Land Transport (including the departments of Road Safety and Urban Public Transport), Logistics, Waterway and Maritime Transport and Ports.

Motorcycles and mopeds are exempted from the road tax, which is collected by the Ministry of Economy and Finance (MEF). At present, there is little knowledge-sharing between MEF and MPWT. However, both ministries seem to be interested in improving their cooperation and in launching a joint database.

The Ministry of Environment is the main authority in charge of pollution issues and air quality monitoring. The Sub-Decree on the Control of Air Pollution and Noise Disturbance, adopted in 2000, specifies the ambient air quality standard.



→ NATIONAL ROAD SAFETY COMMITTEE

The leading agency on road safety is the National Road Safety Committee (NRSC). Established in 2005, the Committee was initially the responsibility of MPWT. However, a traffic law adopted in 2016 placed the NRSC under the Ministry of Interior, with the chairperson of the Committee thenceforth being the Minister of Interior. Partners include several stakeholders such as other ministries (Health, Education), Handicap International, Global Road Safety Partnership, Cambodia Red Cross, Coalition For Road Safety, WHO, World Bank, Asian Development Bank and the Japan International Cooperation Agency (JICA).

Based on the action plan developed under the framework of the United Nations Decade of Action for Road Safety, the NRSC drafted the National Plan for Road Safety 2011–20, which comprises the following pillars: road safety management, infrastructure, safe vehicles, safe road user behaviour, post-crash care, traffic law legislation and enforcement, driver licensing, and better transport services for passengers and cargo. To strengthen provincial road safety committees and interventions, the government has rolled out road safety action plans in most provinces.

→ REGULATIONS CONCERNING VEHICLES AND DRIVING

The Departments of Public Works and Transport are in charge of vehicle registration, and it is possible to carry out the registration process online. Vehicle Inspection Centres undertake regular inspections: once a year for commercial vehicles and once every two years for private vehicles.

An updated law on land traffic was adopted in 2015, which stipulated stricter regulations and punishments for reckless driving and made it a requirement for motorcyclists to hold a driving licence. Following a barrage of complaints from unlicensed parties, the government decided to amend the law, allowing an exception for motorcycles with a capacity below 125 cc. As a result, more than 80% of all registered vehicles are exempt. Drivers of other vehicles must renew their driving licence every 10 years and, once over the age of 65, must renew it every two years.

The maximum authorised blood alcohol content is set at 0.5 gram per litre. As for drug-driving, the country lacks a legal framework and facilities to enforce penalties. The above-mentioned 2015 land traffic law bans the use of handheld mobile phones when driving but permits the use of hands-free models. Seatbelt wearing has been compulsory since 2007, but only for front-seat passengers, and regulations on baby carriers and child seats are in place. Helmet wearing is compulsory for riders of motorcycles and mopeds over 49 cc and for drivers of moto-remorques and of motorised tricycles. Road users' compliance with these regulations is weak.

JICA has been involved in the Project for Modernisation of Vehicle Registration and Inspection Administration System. Cambodia operates a database of vehicle owners, but it is neither centralised nor up to date. With the help of private companies, more work could be undertaken on gathering additional data and expanding the use of existing data.



→ INFRASTRUCTURE AND PUBLIC TRANSPORT

The government attaches great importance to public works and transport projects but is dependent on external financing. While responsibility for major infrastructure projects lies at national level, the provinces cannot rely on central government funding for local infrastructure and public transport, but have to finance their own budgets from tax revenues. In comparison with other provinces which heavily depend on donor support, PPCH is quite strong in terms of self-financing and can thus invest in public infrastructure on its own. PPCH is in charge of local transport planning and urban infrastructure, in coordination with MPWT.

Intercity bus connections are operated by the private sector. In 2019, MPWT announced that operators need a concession that must be renewed every five years. A master plan for the interurban bus network is not yet in place, but an initial study has been conducted. Comprehensive regulations for company buses that carry workers and para-transit modes (tuk-tuks, etc.) are also lacking.

→ INSTITUTIONS AND REGULATIONS IN THE FIELD OF LOGISTICS

The institutional framework concerning logistics consists of the National Logistics Council (NLC), the National Logistics Steering Committee (NLSC) and the General Department of Logistics' secretariat within MPWT. The Deputy Prime Minister is the NLC's chairman and its other members are MPWT, MEF, the Council for Development of Cambodia (CDC), the Ministry of Planning, the Ministry of Commerce and the Supreme National Economic Council. NLSC's members are MPWT as chairman, other line ministries, representatives from the private sector and academia.

The government has been working on transport improvement, with a Logistics Master Plan being developed with support from JICA and the World Bank. For instance, there is as yet no primary legislation for railway, inland waterway, port and maritime transport. Several decrees, sub-decrees and regulations are largely dispersed across agencies; international standards are not met and not all logistics and transport services are covered.

Cambodia has signed the ASEAN Framework Agreement on Multimodal Transport, but this agreement has not yet been formalised in law. Thus, Cambodian operators are not widely recognised outside of the country, which is a burden for transnational logistics. Streamlined border operations and transparency are missing. While operators are obliged to obtain a licence and overloading is prohibited, access barriers to the logistics market and the profession of truck driver are low in general.

→ INVESTMENT INCENTIVES

Foreign investors can apply at the CDC or the Provincial-Municipal Investment Sub-Committee to have their project treated as a Qualified Investment Project (QIP). This allows them to benefit from governmental investment incentives. According to Sub-Decree No. 111, the production of motor vehicles, parts and accessories is eligible provided that the investment is USD 300,000 or more. Investments in the railway sector can benefit from the QIP status, while transportation services by waterway and by road (including car parking) are not eligible.

Business opportunities

While the transport sector is in need of expertise and know-how from foreign companies, Cambodia remains a difficult market because the country lacks a systematic approach to spatial and transport planning. A worthwhile strategy is to harness the network of development agencies, NGOs and business associations active in Cambodia (e.g. the Cambodia Automotive Industry Federation) as a means of shaping policy and stimulating public authority interest in specific projects. For instance, capacity-building and awareness-raising measures are needed at the administrative level in order to improve the market's accessibility for innovative technologies and products. Most of the projects are likely to be government-led and financed by donor funds. The World Bank, the Asian Development Bank and the governments of China and Japan are particularly involved in road and bridge construction and the railway sector.

Cambodia's 2014 National Road Safety Policy promotes the engagement of private sector actors from both the national and international levels. The Policy's action plan engages the NRSC in the creation of partnerships and cooperation with development partners, civil society and the private sector on the implementation of road safety programmes.

Urbanisation, motorisation and trade in the ASEAN region require solutions related to transport and logistics, urban planning and infrastructure, as well as eco-friendly mobility solutions. Business approaches that are successful in Cambodia have the potential to be replicated in other ASEAN countries.

→ INTELLIGENT TRAFFIC MANAGEMENT

Intelligent traffic management systems apply communication and information technologies, including Artificial Intelligence (AI) and the Internet of Things (IoT), to the field of transport. They increase the efficiency and capacity of an existing road network cost-effectively; reduce travel time, travel costs, fuel



consumption, and pollution; and contribute to the prevention of accidents and congestion. With these systems, road users are better informed. Safer, more efficient and coordinated decisions can be made. With German and Korean support, Cambodia is working on its first strategies for Intelligent Transport Systems, a market that will most likely proliferate in the next decade.

With support from China's Ministry of Public Security, Cambodian authorities have installed a network of CCTV cameras in Phnom Penh (plans for other provinces already exist), which could, in theory, enhance stakeholders' understanding of the effects of congestion and air pollution. However, functionalities to perform the required analyses are not implemented. Companies with expertise in this area could seek to fill this gap. There are also potential business opportunities for companies developing self-adaptive systems that respond quickly to changes in the road conditions by modifying signal policies and rerouting drivers; implementation of such a real-time traffic management is already ongoing in the capital. Variable speed limits combined with automated enforcement (e.g. based on the recognition of number plates) could be deployed to increase traffic fluidity and decrease the number of accidents.

Traffic and transport data collection, storage and analysis offer multiple opportunities for specialised companies. Several data collection strategies can be combined, such as roadside-collected acoustic, image and sensor data (microchips, radio frequency identification, Bluetooth, GPS, and intelligent beacon-sensing technologies). Inductive loops embedded in a road measure the number, speed, length and class of vehicles using it and also determine the distance between the vehicles. Speed cameras

identify speeding vehicles and traffic-light cameras detect vehicles that run red lights. These are just a few examples of intelligent traffic management technologies. Strengthening data management is part of the National Road Safety Policy strategy, which also emphasises the need to install traffic signs (especially for speed limits).

To understand and tackle vehicular air pollution, an in-depth investigation of the on-the-road fleet is needed, looking at its composition and movement. At the moment, little is known about the exact composition of the fleet because databases currently only cover registered vehicles and do not hold information on which vehicles have been taken out of circulation.

Since more and more Cambodians can now afford well-equipped vehicles, demand is increasing for advanced driver-assistance systems such as lane-assist, speed-assist, blind-spot detection, and driver advisory and route planning. It makes good sense to consider services that can be provided independently of new vehicles because the fleet still mainly consists of used vehicles. Tuk-tuk and taxi drivers use ride-hailing mobile phone apps (e.g. Grab, PassApp) and route planning services (e.g. Google Maps) that provide information on congestion and suggest alternative itineraries.

AI, IoT and other digital solutions offer an opportunity to increase efficiency in logistics. However, such measures alone will not be sufficient to remove competitive disadvantages in the logistics sector unless they are accompanied by significant improvements in infrastructure and regulatory transparency.





Transport and logistics are the second-largest service field after tourism in Cambodia and play a significant role for the country's further economic development. There is a need for solutions coming from the private sector and public authorities that could engage together in public-private partnerships. By 2030, it is expected that 4.1 times more goods will be transported than today in Cambodia. For instance, costs to export per container are USD 795 while they are only USD 610 in Viet Nam and USD 595 in Thailand. Costs to import per container are USD 240; slightly more expensive than in Thailand (USD 233), but less expensive than in Viet Nam (USD 392).

Urban Voice Cambodia (UVC) is a map-based visualisation of developments in the urban space and, as it is open-access, anyone can contribute to it. Between 2014 and 2016, 1,229 reports on traffic flow and safety and 536 reports focused on road conditions were posted on UVC. On a more positive note, there were 128 reports on road improvement works. Additionally, MPWT has developed the Road Care mobile phone app that road users and pedestrians can use to report road infrastructure problems. Those coming across road damage or deterioration (e.g. potholes) upload photos of the problem to the app, which are then forwarded to the Departments of Public Works and Transport.

→ INFRASTRUCTURE

To address traffic-related challenges in Cambodia, infrastructure projects funded by the public and private sectors are key. Some of these projects involve intelligent traffic management (e.g. installation of sensors and adaptive traffic lights). Others will require the construction of new roads and the repair of existing ones, particularly in the interurban network. Additional business opportunities include the building of cycle paths, footpaths, pedestrian bridges and underpasses in order to promote non-motorised transport. The provision of public transport in and outside of cities (buses, bus lanes and stations, urban rail, trains, planes, boats, water taxis, etc.) calls for important investments in infrastructure development. The insufficient supply of public transport services explains the success of ride-hailing mobile phone apps for travelling by tuk-tuk, motodrop and taxi.

JICA provides buses as well as capacity development for operators, and has undertaken a sky train feasibility study in Phnom Penh. In 2020, JICA will introduce a pilot project for bus lanes. In June 2018, Japanese investors provided USD 74 million for a multi-purpose terminal in the Sihanoukville Autonomous Port. China is another major donor who plays a key role in developing transport infrastructure, ports and airports through grant aid and concessional loans, partly within the framework of the Belt and Road Initiative. In total, it is estimated that with China's assistance, 3,287 km of roads and eight large-scale bridges with an aggregate length of 7.95 km have been constructed, as well as a new container terminal for the Phnom Penh Autonomous Port.

Best Practice

The project of **Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on Sustainable Mobility in Medium-Sized Metropolitan Regions in ASEAN (SMMR)**, which is being implemented by **GFA Consulting Group**, emphasises the importance of intelligent traffic management in Cambodia and thus encourages private sector initiatives and innovations in this field. The SMMR project is currently supporting MPWT in its work to roll out the machine-learning analysis system for traffic surveillance cameras.

The ride-hailing app **Grab** entered into a public-private partnership with MPWT on the sharing of data to improve road safety and traffic management. Grab gathers data collected by its drivers and makes them available to the Ministry and the United Nations Development Programme, which then use the information to enhance safety, improve traffic efficiency and reduce air pollution. The company also promotes the use of eco-friendly vehicles among its driver-partners.

JICA has already started work on developing intelligent traffic management solutions: in addition to installing 115 traffic signals, JICA has established a centralised Traffic Control Centre that works to prevent heavy congestion by modifying traffic signals. JICA expects actions from the private sector, such as contributions to public transport operations, transit-oriented development, parking services, and feeder transport.

The China Road and Bridge Corporation has been actively developing a 190 km four-lane expressway from Phnom Penh to Preah Sihanouk province with its deep-sea port. This is a USD 2 billion project that includes 89 bridges.

The country's three airports in Phnom Penh, Siem Reap and Sihanoukville are operated by Cambodia Airports, a joint venture between Muhibbah Masteron Cambodia and the French Vinci Group. There are already plans for two new airports in Phnom Penh and Siem Reap, financed by Chinese banks.

The government has drawn up a Railway Master Plan in cooperation with the Korean International Cooperation Agency. According to this plan, almost USD 3 billion are to be invested in the short term, 86% of which is to come from private funds.

For a list of large ongoing or planned infrastructure projects, please see 'Partnership-Ready Cambodia: the construction sector' at www.giz.de/en/worldwide/71954.html



→ ELECTRIC MOBILITY

Targeted electrification efforts can create environmental, social and economic benefits. More government incentives are needed to encourage e-mobility. For instance, high taxes (e.g. on imported batteries) represent a major obstacle to the sector's further development. Many consumers and policy-makers are unaware of the environmental and cost-benefit advantages of e-mobility, so action is required to raise awareness in this field. That said, there is already a growing niche market for e-mobility: electric passenger cars, golf carts, motorcycles, tricycles and bicycles are already in use on the Cambodian road network. In Siem Reap province alone there are some 1,500 electric vehicles. The Cambodian e-mobility market will likely begin to develop over the coming years and could therefore provide European companies with interesting business opportunities. In particular, companies specialised in electric bicycles, motorcycles (including tuk-tuks) and cargobikes could stand to benefit, given the ongoing predominance of motorcycles and mopeds, including in the field of urban logistics. When it comes to eco-friendly mobility, the electrification of commercial vehicles (e.g. garbage lorries) and of public transport (e.g. buses and trains) achieves quick results. The introduction of kick-scooters in Cambodia might also be successful.

EnergyLab Cambodia promotes eco-friendly solutions and renewable energies, including in the transport sector, with a particular focus on innovation, start-ups and entrepreneurship, and addresses both local and international businesses. In September 2019, the Green Climate Fund provided Cambodia's National Council for Sustainable Development with funding for its Readiness and Preparatory Support Project, an initiative that will be supported by the Global Green Growth Institute. To achieve the project's ambition of promoting the shift from petrol-powered motorcycles to electric ones, it will undertake a thorough situation and market study, examine the economic, environmental and social implications of the electrification of motorcycles, analyse policy as well as regulatory gaps and design a financing mechanism.

Best Practice

Voltra Motors has launched a French-designed and French-engineered electric bike that is the first e-bike to be assembled in Cambodia. Going forward, the Voltra team's ambition is to develop the local value chain by producing more and more of the e-bike's components in Cambodia. In another scheme called Green e-bike, electric bicycles can be hired for exploring Angkor.

Further e-mobility solutions are offered by the French company **Bolloré**, which, under its Blue-Mobility brand, rents out electric cars (mainly powered by solar energy) to tourists in Angkor.

Agile has developed a new product that transforms a wheelchair into an electric vehicle in only one minute. At present, the product's components are being imported from China, which means the product is unaffordable for most Cambodians (costing USD 600). The goal is therefore to manufacture these parts locally. It is estimated that 15% of the Cambodian population have a disability (many as a result of road accidents). Mobility solutions for disabled people are therefore another market that may provide European companies with business opportunities.



Practical information and sources:

The Cambodia NGO Database of the Council for the Development of Cambodia (2019):

www.odacambodia.com/ngo/

Tender information:

- Public Procurement Portal of Cambodia's Ministry of Economy and Finance: gdpp.gov.kh (in Khmer)
- DailyBids: dailybids.com.kh (in Khmer and English)
- Cambodia Tenders: cambodiatenders.com
- Asian Development Bank: adb.org/projects/tenders
- World Bank: worldbank.org/en/projects-operations/products-and-services/procurement-projects-programs
- UN Global Market Place: ungm.org/Public/Notice



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The booklet shows companies the economic potential of future markets as well as the funding and consulting opportunities offered by the German development cooperation. “New Markets – New Opportunities: A Guide for German Companies” is supported by the Federal Ministry for Economic Cooperation and Development (BMZ). All issues are published on the websites of GTAI and GIZ. You can find selected issues, for example on Cambodia also at

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