Revert or readjust?

Designing mobility for liveable and social cities

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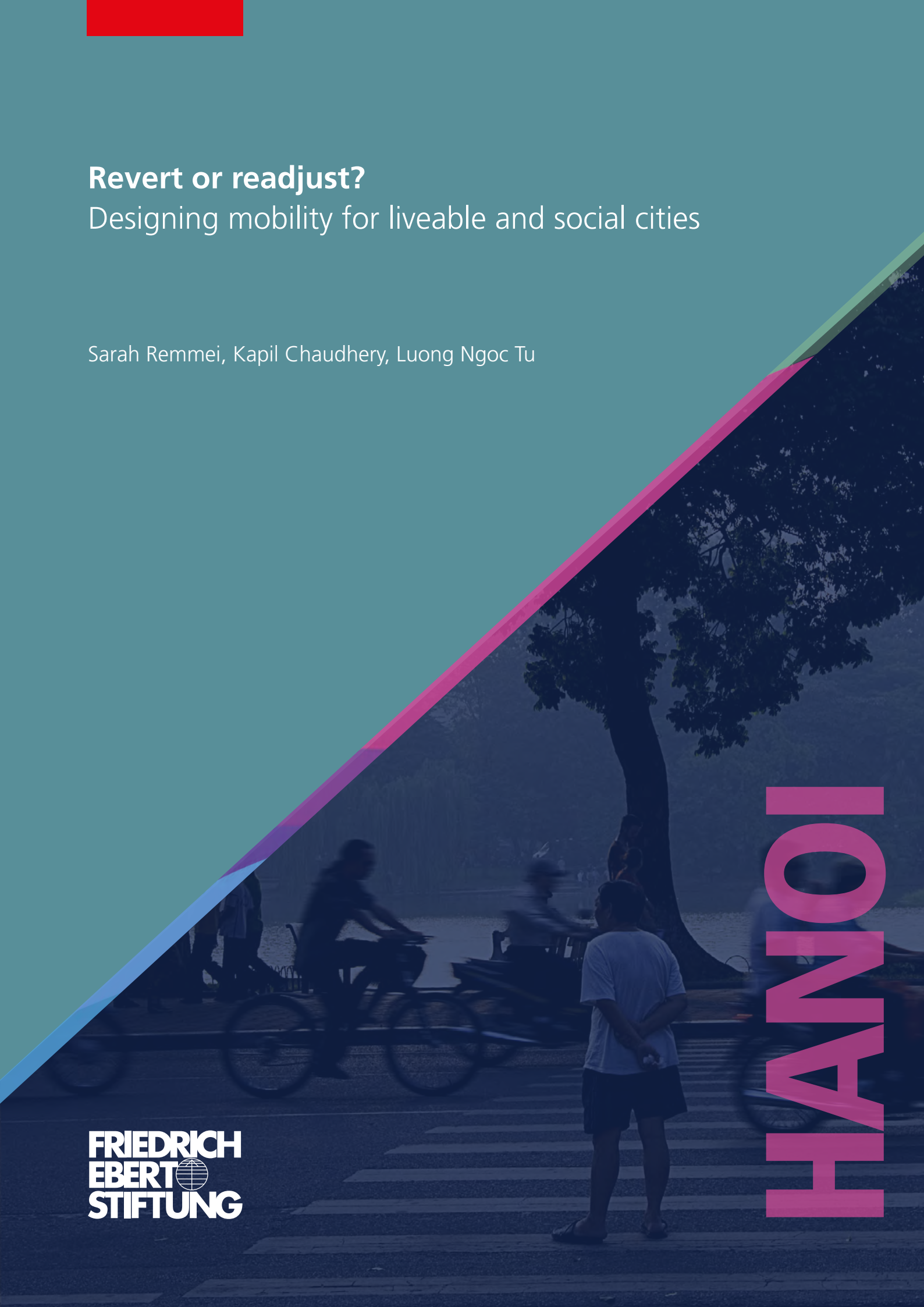

FRIEDRICH EBERT STIFTUNG

About this series

A lot of money has been spent on transport infrastructure and services worldwide in recent decades. The aim was to enable people to participate in social and economic life and to ensure the functioning of businesses. This has certainly contributed to the economic development visible in many regions. However, since many things necessary for daily life and economic activity were centralised, dependence on the mobility system increased at the same time. The resulting longer journeys place a temporal and economic burden on people, and the increase in passenger and freight transport is a burden on societies through more noise, exhaust fumes, CO_2 emissions, accidents, and more.

In view of its importance and the negative social, ecological and economic consequences, mobility must change, and much more quickly and comprehensively than before. Cities in particular can set good examples in this respect.

Friedrich-Ebert-Stiftung (FES) examined four cities in Asia to see the current state of each city, how they plan to shape mobility in the coming years, how this plan is to be assessed and what leads can be derived from this particular strategy for other cities. The central question is how can a mobility system be designed in such a way that all people can participate in social and economic life, economic development is supported and negative effects for the society and the climate can be eliminated?

CITIES COVERED IN THIS SERIES:

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HANOI

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Designing mobility for liveable and social cities

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Executive Summary

Hanoi struggles in balancing between traffic and liveability. That struggle is currently tipping towards increasing traffic. The level of affordability and accessibility is high due to subsidized public transport and a significant share of motorcycles. At the same time, the flexibility, speed and comparable costs of personal motorcycle use undermines the development of public transport services.

The government's plan to completely ban motorcycles in the inner city must be carefully designed to avoid more congestion elsewhere. Congestion already costs roughly 22 trillion dong annually. This double-edged sword of motorcycles must be leveraged rather than curtailed.

Transport accessibility for people with disabilities is taking time to implement. Overall, Hanoi is poor on walkability, except in the inner city. Rethinking accessibility for cyclists and pedestrians is increasingly important to sustain personal and environmental health. Improved and digitalized data gathering could be a huge step for future mobility.

Law enforcement on road safety is getting tighter, symbolized by the helmet requirement being enforced. The recent appearance of electric vehicles calls for an adaptive and sustainable mobility policy. If done right, Hanoi could demonstrate the viability of a unique combination of individual and collective mobility in a thriving, densely populated city as a way forward.

Introduction to Hanoi

Hanoi is Vietnam's capital as well as its cultural and political centre. After expansion of its administrative boundary in 2008, it has become the country's largest city geographically (at 3,325 square kilometres). A province as well as the capital city with a population of 8 million[1], it is also an important transport centre of the Red River Delta Region in particular and the whole country in general.

Hanoi's urban population was nearly 4 million in 2020, with an average population density of 2,505 persons per square kilometre (GSO, 2020). It has the largest concentration of persons per square kilometre in the inner city, making it one of the most densely populated cities in Southeast Asia.

As of 2000, the urban landscape changed from low buildings to high-rise structures. The development of satellite towns in the suburbs has created additional pressure on transport infrastructure. The rise in population and income has accelerated motorization. In 2019, 6.7 million motorcycles and cars accounted for 80 per cent of all vehicles on the road, while public transport stagnated at 12 per cent (JICA and Michinori Holdings, 2020).

Figure 1: Hanoi city and province administrative map

Source: Thuy, 2014.

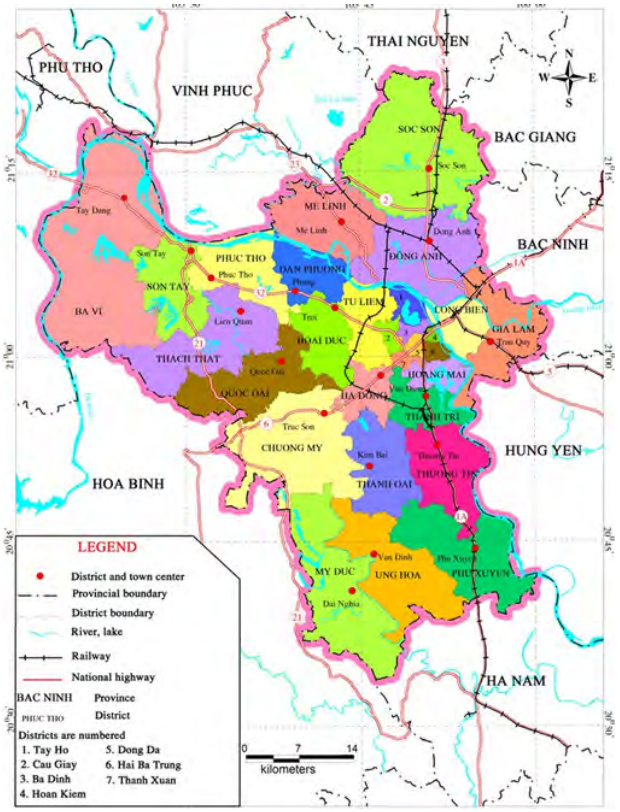
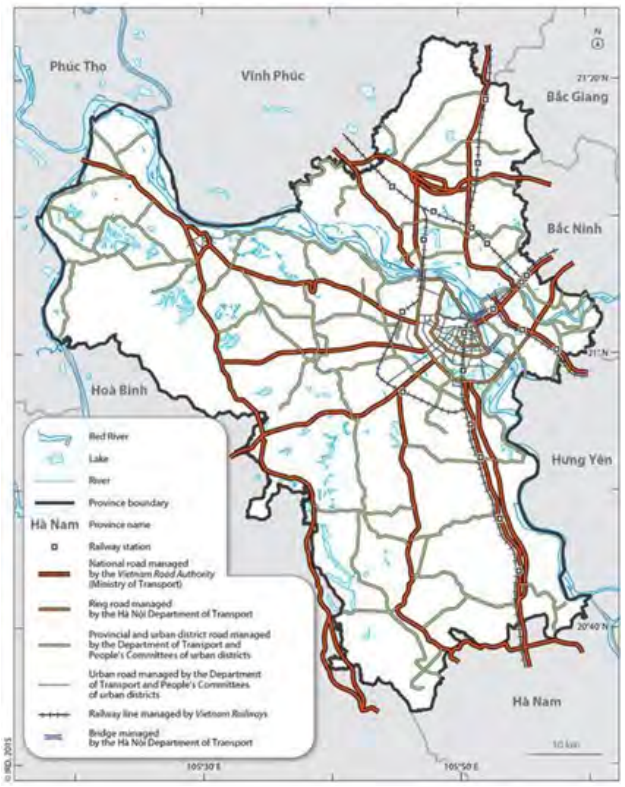


Figure 2: Transport road network and its various managers

Source: Fanchette, 2016b.



Looking back

Now a millennium old, Hanoi in its early years consisted of the imperial city, with a small trading area next door. When the French settled in Hanoi around the 1870s, they designed and built road and transport infrastructure[2] that remains a city landmark.

Between 1945 and 1975, the government's development policy focused on dispersal of the population and industries away from Hanoi, limiting both physical and demographic growth and transport infrastructure development. Until 1979, all motorized travel was public transport, with trams

1 Hanoi the city and province (**Thành phố Hà Nội**) is divided into 12 urban districts and 17 rural districts.

2 Long Bien bridge, railway line and train stations.

and buses accounting for 25–30 per cent. This paradigm collapsed[3] after 90 years as the subsidy funds dried up and the import of spare parts became politically difficult (ALMEC Corporation, Nippon Koei Co., and YACHIYO Engineering Co., 2007).

Policies for transportation continued to push for road expansion and upgrading and for building new infrastructure. The first impetus to this paradigm came through the Doi Moi reforms. By 1990, public transport expanded from buses to taxis, xe ôm (motorcycle taxis) and cyclos (pedicabs). As the urban landscape transformed, people transitioned from bicycles to motorcycles, which amounted to around 80–85 per cent of all vehicles. By 2000, new vehicle registrations in Hanoi rose at a two-digit rate, while the number of bicycles plummeted.[4] In 2002, Hanoi launched a policy aimed at reviving the bus system, which saw a rise in the passenger numbers, but traffic was unorderly and chaotic (Labbé, 2021).[5]

As the city density grew, the prime minister in 2008 approved expansion of Hanoi's administrative boundary.[6] By 2010, Hanoi faced an overloaded, weak transport system[7] and adopted a new planning paradigm—transit-oriented development (Nguyen, Kato and Le, 2020), following which, the first BRT Line No. 1 was opened (14.7 km) in 2016.

> The changes in transportation in Hanoi over the last twenty years can be succinctly summarized as leaping from 'bikes to motorbikes to cars in one generation'." – (Drummond et al, 2012)

A second transition towards cars followed after the high import tax on sedans was relaxed, at first incrementally and then fully in 2020.[8] Facilitated by smart phones and internet penetration, ride-sharing taxis[9] took off, and even regular taxis[10] became app-based. Pedestrian facilities, such as walking streets, are limited to the inner city, in Hoan Kiem District.

Sociocultural impacts on mobility behaviour

The shift in Hanoi from bicycles in the 1980s to motorcycles in the 1990s and then to cars reflects sociocultural changes in the city. A case study on Hanoi mobility (Nguyen, Kato and Le, 2020) found that vehicle ownership and travel behaviour are not entirely based on service quality but rather affected by households' socioeconomic status. Owning a car is perceived as higher socioeconomic status. High-income households are more likely to own more than one vehicle, while households with young children own at least one vehicle. Walking as a mode of transport has declined, from 50 per cent in 1995 to 25 per cent in 2005 and continues to fall (Hansen, 2016b). The ease of driving two-wheelers in narrow alleyways characteristic of the city makes public transport further unpopular. There is currently a renewed interest in bicycles but only as a means of physical exercise.

Players in shaping mobility

The urban mobility and transport sector are largely determined by government policies, aligned with investment plans from international funding. All major infrastructure projects are implemented with financing through overseas development assistance, private investment and the

3 Ridership went from 40 million per year to almost zero.

4 Accounting for 47 per cent of travel in 1995 and only 3 per cent in 2008.

5 From 12 million in 2000 to 400 million in 2008.

6 Resolution No.15/2008/NQ-QH12, dated 29 May 2008.

7 Transportation land use prescribes 25 per cent road surface for moderate density, but Hanoi with a higher density has less than 20 per cent.

8 In 2019 from ASEAN countries and in 2020 from European Union countries. See https://e.vnexpress.net/news/business/economy/vietnam-to-cut-import-tariffs-on-european-cars-4116914.html and https://e.vnexpress.net/news/business/industries/vietnam-loosens-regulations-for-car-imports-4057759.html.

9 Taxis such as Grab, Be, Fast Go and Go-Viet.

10 Mai Linh and Vinasun Taxi.

central government. The eight metro lines (160 km) were constructed by different contractors,[11] while construction of the BRT lines (14.7 km) was financed by the World Bank (C40 Cities, 2019). The country's biggest private investor, VinFast, is producing electric vehicles and recently test drove an electric bus in Hanoi. Motorcycle manufacturing companies, such as Honda, Yamaha, Piaggio and Vespa, have invested heavily to meet the growing demand.

Figure 3: Existing and proposed transport system

Source: Hanoi Master Plan 2030, vision to 2050.

11 In partnership with the governments of Japan (Japan International Cooperation Agency), China (China Railway Sixth Group Co Ltd) and France (French Development Agency and DG Trésor), the European Investment Bank and the Asian Development Bank.

State and market

The government often prepares and proposes transportation often plans without the involvement or consultation of private investors. This causes a demand–supply mismatch because the market is the backbone for implementing, manufacturing and driving the public mobility behaviour. Another area in which the State has an important role is the intervention in market trends and formulating a balanced policy. There is a tendency for a big player to monopolize the market,[12] and in such instances, the State can control the dominance to allow fair competition.

COVID-19 pandemic impact

The COVID-19 pandemic has highlighted the advantages of active transport. There is speculation that the low infection rate in Hanoi could be due to the high use of personal vehicles, compared with other metropolitan cities where the percentage of public transport is higher. Another consequence of the pandemic-related restrictions is the drastically improved air quality. When walking and bicycling gained renewed interested for pandemic-related social distancing purposes, pollution levels fell. The benefits of active mobility provide new impetus to transport and city planners to rethink all forms of mobility and city planning (Regmi, 2020).

12 Like the state-owned enterprise Hanoi Transport and Services Corporation for bus operations and the early days of Grab taxi.

Visions for a liveable & social city

The mobility vision for the city wants to make public transportation a preferable choice by restricting private vehicles and upgrading public transport quality, as reflected in the Transport Master Plan 2030. In a bid to reduce traffic and control air pollution, the city introduced a ban on motorcycles and old and highly polluting vehicles from the inner city by 2030. A law[13] to encourage transport inclusivity for persons with disabilities was adopted, with the standards now being tested through a pilot project.[14] The city created several public squares and parks in keeping with Sustainable Development Goal targets[15] and towards achieving a green and people-friendly city (Söderström and Geertman, 2013). In a recent attempt to control and manage emissions, the Hanoi People's Committee issued a plan, 172/KH-UBND, to check emissions levels for motorized two-wheelers between 2021 and 2022.

The processes for establishing a general vision and then making the appropriate plans are carried out through a top-down approach. High-level administrators draft broad vision frameworks in line with the desired growth targets. The Ministry of Transport formulates and implements the vision for national-level transport. The Hanoi People's Committee is responsible for citywide transport planning and implementation. A participatory approach to vision formulation is relatively new and has yet to be institutionalized. This applies to all aspects of planning and design, not just the transport sector.[16]

Stakeholders' role in mobility

The government regulates the market share of public transport, policy priorities and the portfolio of projects and investment projects. Most infrastructure projects involve myriad of stakeholders, including foreign experts, companies, contractors, consultants and international organizations to finance, design, build and operate a public transport system. Stakeholder meetings are conducted primarily to gather the opinions of the experts, policymakers and agencies and to determine the best solutions, policies and follow-up action. Sometimes, there are conflicting interests and approaches on what is considered sustainable mobility for Hanoi. In Vietnam, there is no legal codification allowing citizens to demand their rights. Thus, public meetings to inform residents of ongoing projects are not arenas for confrontation; exceptions to this general rule are extremely rare. This is not viewed as a weak system but rather a different configuration of responsibility and responses. Hence, stakeholders' roles vary, and stakeholders (and their roles) are defined specific to projects and programmes.

13 Decisions No. 51/2001/QH10 Law No. 51/2010/QH12, 17 June 2010, made provisions for accessibility for people with disabilities in urban transport (articles 39, 40 and 41).

14 The National Coordinating Council on Disability is the coordinating agency, with representation from 17 ministries, including the Ministry of Transport.

15 On 31 December 2020, Prime Minister Nguyen Xuan Phuc issued Directive No.45/CT-TTg on organizing the 1 million Tree-Planting Festival and enhancing forest protection and growth from early 2021.

16 The exception is the public consultation required on environmental and resettlement matters for all big projects. However, most overseas development assistance-funded projects involve consultation between technical and administrative personnel.

Political and administrative setting

Following the reunification of the country in 1975, almost all business and industry of any size were carried out by state-owned enterprises, and the country was largely closed to the Western world. The open-door policy of Đổi Mới that began in 1986 changed the country.

Hanoi's urban transport is managed by the Hanoi Department of Transport, operating under the Hanoi People's Committee. The Department works with national regulations, policies and design standards provided by the Ministry of Transport. Other national ministries are also involved in the planning and policy formulation within the urban transport sector.

The Hanoi People's Committee, as the top administrative level, is represented by the chairperson who subsumes the mayoral position and responsibility (typical in Western democratic systems). The People's Committee is responsible for strategic-level planning and coordination across all departments.

Under the Hanoi People's Committee's direction, the Department of Transport is responsible for developing transport policies with clearly defined targets for the medium to long term and addressing all local mobility issues. Under the Department of Transport, public transport is mainly overseen by two bodies: the Transport Management and Operation Centre for bus service and the Hanoi Metropolitan Railway Management Board for the urban rail system (CODATU, 2012).

The Ministry of Transport is also responsible for the long-term strategic transport plans and for seeking approvals from the prime minister. It addresses all modes of urban transport, development policies and infrastructure plans at the national level through the National Transport Development Strategy. This strategy also provides specific policies as part of the policy framework of Hanoi's Transport Master Plan (Doan and Dotson, 2013). The master plan is coordinated across all line departments and agencies (appendix 5) through the Hanoi People's Committee and approved by the government.

Figure 4: Transport agencies and authorities

Source: Adapted from JICA and ALMEC Corporation, 2021; Doan and Dotson, 2013.

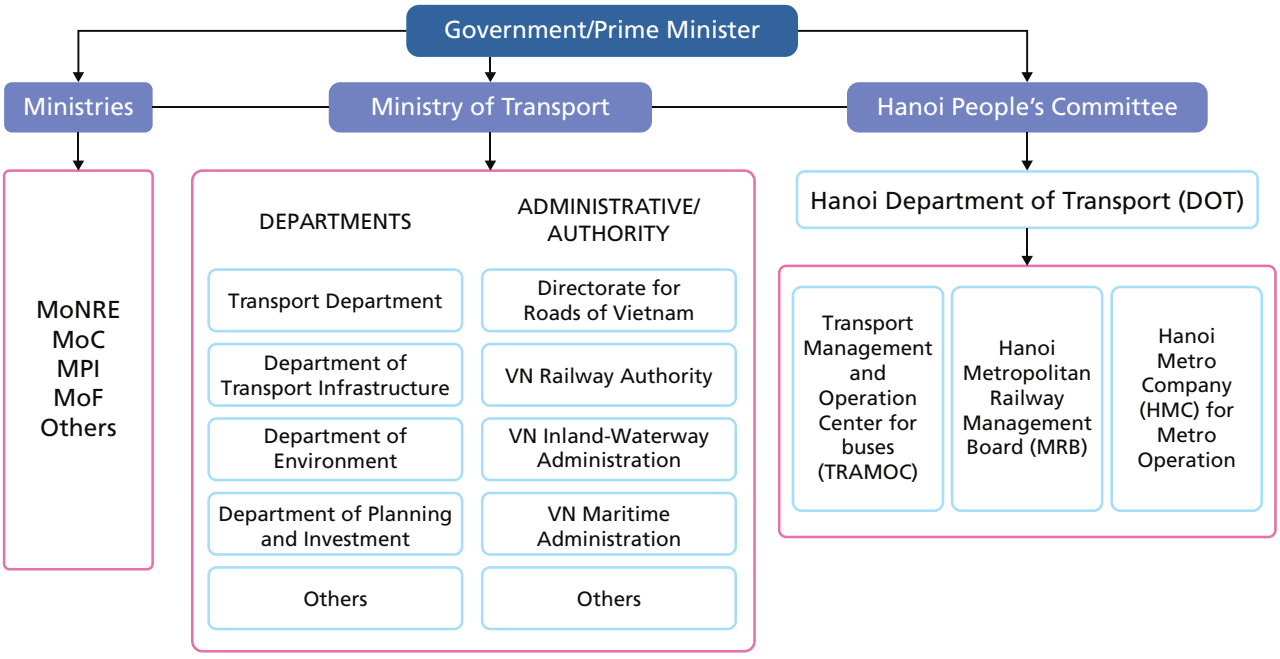
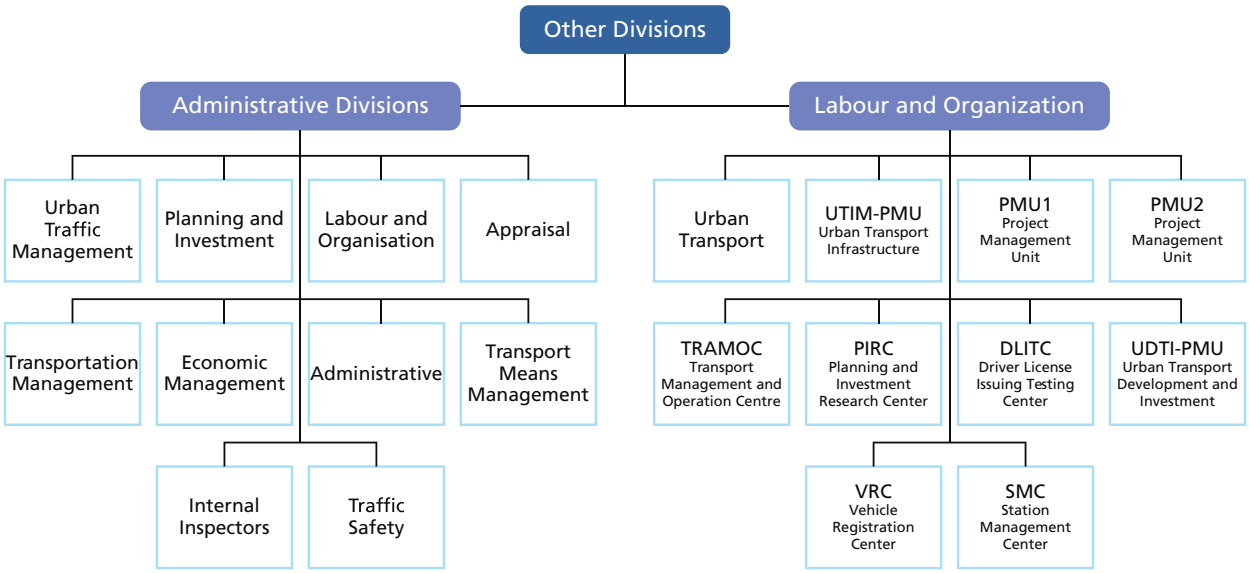


Figure 5: Structure of urban transport under the Department of Transport

Source: Doan and Dotson, 2013.



Policy tools to steer mobility behaviour

The government of Hanoi has promoted public transport by increasing the number and quality of public buses and through such incentives as discounted ticket fees and short-term schemes of free rides for a month. These have not significantly increased the ridership due to the long walking distance from bus stops (7–10 minutes), the absence of walkways and poor last-mile connectivity, compared to the ease of door-to-door mobility of motorcycles. Taxes were used as a mechanism to limit imported car ownership (Hansen, 2016a). Until recently, the high import tax on cars was effective in controlling the growth of car ownership. The recently relaxed tax, the comparatively low fuel prices and rising income levels have made private transport much more affordable and desirable. Relatively unequitable measures, such as a complete ban on motorbikes in Hanoi's city centre by 2030, have also been contemplated in a bid to decongest the streets, reduce pollution and encourage public transport.

Conflict and contestation

Institutionalized public participation is not commonplace in the country. There is an exceptionally low level of public involvement in policy implementation. In recent years, however, social media has emerged as a platform for the public to express their concerns.[17]

Rethinking accessibility to social infrastructure

Social infrastructure within Hanoi city is more interspersed, but pedestrian sidewalks are taken up with utility infrastructure, parking and other encroachments that have made mobility less accessible for many people. In contrast, new urban areas, ostensibly better planned, are designed for vehicular access, with facilities farther apart and less functional for pedestrian engagement. This resultant trajectory is opposite to the desired state of minimizing traffic. Unregulated electric motorbikes, commonly used by middle-schoolers, have further increased personal mobility at the cost of community accessibility. Timing restrictions for commercial vehicles and staggered school timings and workplace timings have proven to be relatively ineffective

17 Protests against the city authorities' plans to cut down 6,700 mature trees found outlet on social media, like Facebook, leading the Hanoi People's Committee to reconsider, review and amend the plan.

schemes. No cohesive action is currently planned to increase walkability or accessibility.

Going forward

Foreseeable issues and concerns to address in the coming years:

Traffic congestion – Personal motorized vehicle use is expected to increase. The road network is already overloaded. Travel time will continue to increase beyond the current average of 45 minutes lost in traffic congestion. And service quality will continue to decline, especially during rush hour, unless strategic long-term measures are devised (Chung, 2017).

Increasing cars – The future modal share of car travel is expected to rise, the HAIDEP study estimated an increase from 3.6 per cent to 19.5 per cent in 2020, with a ratio of car-owning households increasing from 1.6 per cent to 20 per cent (ALMEC Corporation,Nippon Koei Co., andYACHIYO Engineering Co. 2007). Although no current data is available at this moment, it is clear that cars will occupy more space per capita on the roads, thus increasing congestion. Parking requirements could take up more public walkable space.

Air pollution – In 2019, Hanoi had only eight days with PM2.5 lower than the national standard (Huu and Ngoc. 2021). The number of "unhealthy" days is expected to increase. Vehicular emissions need to be reduced by investing in clean mobility and emissions-control regulation.

Climate change – A modal shift to rail or waterborne transport, including inland waterways and coastal transport, could be considered as a resilience-building strategy. According to a World Bank report (2019), moving 10 per cent of traffic from road to other modes of transport would reduce climate risks by an estimated 25 per cent.

E-mobility – Electrically powered vehicles will need a comprehensive policy to incentivize and promote as a future mobility option.

Reverse paradigm – Hanoi needs to contemplate a change back from increasingly vehicle-centric mobility and road design to better neighbourhood mobility plans by restoring pedestrian spaces, walkability and the neighbourhood distribution and accessibility of social and civic infrastructure.

Affordability, availability & inclusivity

Affordability

Concerted effort for affordable public transport, in keeping with the broad objective of competitive transport with social equity (MOT, 2000), was made through subsidized bus fares (10–50 per cent) for students, older persons, people with disabilities and children. Ironically, the low fuel cost makes private vehicles preferred transport over public transport. Of an average income of 3.5 million dong in 2016, Hanoians spent 6 per cent of income on public transport (see appendix 1). Additional transportation costs are a concern for those with mobility disability. This affects their ability to travel to work, to do errands or to seek medical care. Family members are typically relied upon for transport, which carries a further and often forgotten cost.

Disparity in mobility

Gender differences in mobility and access are also affected by ability to pay for transport services. Most women have limited access to financial and other resources and inadequate voice in local-level transport priority-setting, compared with men (World Bank, 2012).

Far more women walk or carry and push and pull loads, while far more men have access to other modes of transport.[18] The law promoting gender equality[19] does not specify any provision to adapt the transit system to adjust for women and their different requirements. At a regional scale, women are subject to escalating HIV transmission and human trafficking arising from the transnational road corridor construction projects. Ethnic minority women were trained to supplement the labour gap in transport projects[20] in the mountainous region, but their participation in community decision-making remains restricted (World Bank, 2012). Data segregation based on gender to understand gender mobility is unavailable, which hinders mobility planning that caters to women's need.

Measures towards inclusivity

More than the quality and standard of the existing transport facilities, accessibility is of concern for people who live with disabilities. Even though the BRT incorporated disabled-accessible features, end-to-end service is still lacking. Through training and awareness programmes, transport operators are becoming more conscious of their role in addressing safety issues, supplemented with improved street lighting and policing to increase the confidence in all forms of urban mobility. The bus service app provides real-time information and opportunity to purchase online tickets.[21] Although the gap between private and public transport is somewhat bridged by app-based ride-sharing taxis, older persons and people with disabilities face technology barriers as well as limited disability-accessible vehicle services.

Land-use planning

The land-use distribution in inner city districts[22] is being adjusted to attain the targeted socioeconomic growth. There is a plan to decongest and relocate people out of the city centre, but it lacks a clear and firm action plan on how to deliver. Regulatory controls on high-rise buildings in the inner city are not strictly imposed to decongest and reduce density.

18 Nearly 60 per cent of people walking are women, while men account for nearly 90 per cent of people using bicycles and more than 70 per cent of people using motorbikes.

19 Law on Gender Equality, National Assembly, Viet Nam, No. 73/2006/QH11 (29 November 2006), Article 24. See http://www.ilo.org/dyn/travail/docs/934/Law per cent20on per cent20Gender per cent20Equality per cent.

20 The pilot project was funded by a World Bank Gender Action Plan's Just in Time grant (2010) and trained 1,533 minority women to maintain roads in remote, mountainous areas where contracting firms were reluctant to take their equipment. Women and a few male road workers received wages to cut trees, shrubs and grasses; clear culverts and drains; fill potholes; and clean roadsides on 51 km of roads in four communes.

21 Timbuyt, an app for smartphones that allows users to find buses in Hanoi, officially launched by the Hanoi Transport Corporation in 2017. The bus operations centre handles 92 routes and more than 1,000 buses in Hanoi. See https://vneconomictimes.com/article/society/hanoi-launches-bus-app.

22 Districts of Hoan Kiem, Ba Dinh, Dong Da and Hai Ba Trung.

Financing public transport

Major transport infrastructure is financed by international agencies, such as the World Bank, the Japan International Cooperation Agency, the French Development Agency, the Asian Development Bank, and the European Investment Bank, along with a certain percentage contribution from the government. The city authority is seeking to expand funding sources through user charges, value capture and domestic borrowing. Options are being explored for private investors in the forms of build–transfer, build–operate–transfer, public–private partnership and build–own-operate for future.

Safety & reliability

Road safety

Road accidents are underreported, especially those that occur in peri-urban and rural areas. According to statistics from the Hanoi Police, there were 1,552 traffic accidents involving 594 fatalities in 2016 (Chung, 2017).[23] Most accidents take place on the main roads leading into Hanoi from suburban areas, where traffic moves at greater speeds. Sidewalks are typically turned into parking lots due to the absence of proper parking facilities, which forces pedestrians to use the vehicular carriageways. Improving walkability and ensuring parking facilities through better transport and land-use planning could enhance safety and reduce traffic accidents. ActionAid survey results (2014) indicate that women and girls face sexual harassment in public transport, at bus stops and on the streets. The situation is further worsened by weak law enforcement. The absence of public lighting, poor infrastructure, lack of toilets or bus stops and car parks with security systems all increase the public's feelings of less safety and insecurity.

Hanoians usually drive their children to and from school, yet safety regulations for children are not strictly followed. A casual attitude towards the use of child restraints or seat belts poses a high risk.

Safety measures

A helmet has become the symbol of road safety for the extensive motorcycle traffic of Hanoi. Since 2007, wearing a helmet has become mandatory[24] for motorcycle use. It was met with strong opposition, but the enforcement has grown stricter over the years. A penalty is imposed by the traffic police if anyone is caught without a helmet or without wearing a seat belt in their car.

Drinking and driving is another concern for road safety. The National Plan on Drink-Driving Prevention and Control 2015–2020 was issued to curb it. Speed limits are imposed on all streets,[25] but widespread lack of awareness is still prevalent.

The management of driver training and testing before issuing a driver's license is another way of ensuring safety. This process is strict for cars, but many motorcyclists still drive without a license. Cases of underaged driving are common.[26] Surveillance cameras were installed on major intersection, but their efficacy has been debated because traffic defaulters get away without being penalized. Other measures include awareness campaigns through the school curriculum and TV programmes.

Transport reliability

Bus stops have names and designated route numbers, which helps commuters to find the right route and destination. Many stops have good passenger information in the form of route maps and route descriptions. Public transport quality and reliability are reported to be satisfactory, at 79 per cent and punctuality at 76.3 per cent, according to a user survey in 2017 (Chung, 2017). The traffic system has gradually developed through different projects, but only some of the total 160 traffic lights are controlled via area traffic control signals connected to the central computer system. Traffic management is still weak, which limits the effective use of road space as well as the improvement of safety and amenity levels. Road users do not strictly observe traffic rules. Car accidents totalled 585 while motorbike accidents numbered 383 in 2019, resulting in 375 deaths and 603 casualties (DOT, 2019). Considerable time lost in traffic amounts to 45–60 minutes per day, costing 22 trillion dong yearly (Chung, 2017).

23 From 2015 to October 2020, traffic accidents decreased: there was an average annual reduction of 167 traffic accidents (11.5 per cent), 31 deaths (6.4 per cent) and 199 injured people (16 per cent).

24 Resolution 32/2007/NQ-CP was passed in 2007 to make helmet compulsory while driving motorcycle.

25 Maximum speed for motorbikes is 70 km per hour and 90 km per hour for cars on a double lane; on a two-way street, it is 60 km per hour for motorbikes and 80 km per hour for cars, and 70 km per hour on a one-way road. The speed limit is only 40 km per hour for motorbikes that are less than 50 cc.

26 For motorcycles under 50cc, the permissible driving age is 16 years; the age for driving motorcycles, cars or trucks is 18.

Measures for traffic reliability

Traffic management is still nascent, and the basic traffic management techniques are synchronized between different operations and systems. Some bus fleets have electronic digital displays of origin and destination, but quality is lacking in older buses. Traffic signals and infrastructure need improvement and standardization for people with disabilities and older persons, although the BRT service has incorporated ramp and automatic doors.

Traffic awareness campaigns are organized to deter negative mobility behaviour, such as speeding, drunk driving, using a mobile phone while driving, not wearing a seat belt, no child restraint and no helmet. There is a need for capacity-building within the traffic management team to prioritize safety and introduce better order in traffic management.

Ecological sustainability, internalization of external costs & traffic avoidance

Ecological impact of mobility

According to a report by Hanoi's Department of Environmental Protection, vehicle emissions cause 70 per cent of the city's air pollution,[27] affecting the air quality, which is three to five times worse than permitted (Kajita and Nguyen, 2018). Unlike in Western cities, honking is common on the roads, and motorbikes honk up the decibel level.[28] There is no emissions-control check for cars or motorcycles, which is partly why Hanoi ranks low among global cities on mobility (Vu, 2017).[29] Large and recently built public spaces are unevenly distributed[30] and are poorly connected. Even though Hanoi Province consists of large rural areas, the urban area accounts for 11.2 square metre per capita of green area, compared with 39 square metre in similar Asian cities,[31] according to the Global Liveability Index (Minh, 2019). Hanoi is not adequately designed for pedestrians and bicyclists (Geertman, 2010); sidewalks are typically obstructed. Pedestrians and poor people often are most exposed to traffic noise, especially where low-income housing is directly adjacent to congested roads.

Climate change has posed higher risk of storms, typhoons, flooding and heatwaves for Hanoi. There is increasing evidence of worsening flood impact because the city is situated in the low-lying Red River Delta. The Asian Development Bank estimates that flood risk could cost Vietnam the equivalent of 6–7 per cent of GDP (ADB, 2012). The cost of damage to vehicles and traffic congestion during heatwaves and the storm season are unaccounted for. There are pockets of a heat island effect in high-density areas during the summer months. With a longer duration of temperatures above 35–40 degrees Celsius, the ordeal of traffic jams is made worse by the intense heat. Workers engaged in outdoor activity suffer from negative impacts on their health and reduced working hours. The rate of habitat loss to make room for transport expansions is alarmingly high. Between 2000 and 2010, nearly half of the 224 urban lakes and ponds were filled in for road expansion (Pham and Labbé, 2018). Many of the rivers and canals that once provided micro aquatic and bird habitat are now buried underground.

Social and ecological externalities

The large share of personalized motor vehicles has led to an increase in traffic injuries and deaths, air pollution, noise pollution and congestion. It also has a strong and negative impact on the independent mobility of children and older persons, as well as their ability to utilize quiet residential street corners and parks as places for socializing and recreation. The main concern is the lack of measurement for externalities that impact city dwellers, with pollution generated by motorcycles and cars and often pedestrians becoming injured.

Many such environmental and health costs are not internalized into conventional fuel and vehicle taxes. Some environmental impacts are indirect, whereby highly polluted streets become unpleasant for pedestrians, residents and businesses, leading to a decline in real estate values and a rise in crime, with economic consequences. The real cost of CO2 emissions is difficult to quantify. The measurement of CO2 emissions from the transport sector is being developed (JICA and ALMEC Corporation, 2021). Patterns of transport and land use generate measurable cross-cutting

27 Air quality saw its average PM2.5 level in 2019 rise to 46.9 micrograms per cubic metre of air, from 40.8 in 2018, according to a report released by the Switzerland-based air quality monitor, IQAir AirVisual.

28 According to the World Health Organization noise guidelines, background noise levels above 55 decibels in community settings, such as playgrounds or outdoor living areas, are a serious annoyance. Above this level, voices must be raised and concentration is interrupted.

29 Hanoi ranks 96th of 100 global cities on mobility, which measures transport efficiency, convenience, traffic emissions and green spaces.

30 According to planning regulations, developers must design new residential areas with approximately 3–4 square metre per capita of parks and gardens in order to obtain development approvals and buildings permits.

31 The World Health Organization recommends a minimum of 9 square metre of green space per capita, with an ideal of 50 square metre per capita.

health impacts in cities like Hanoi through traffic injuries, air pollution, noise pollution and declining physical activity.

Internalization of externalities

Congestion charge: As part of the capital's efforts to reduce traffic jams, the Hanoi People's Committee proposed a plan in 2018 to impose fees on private vehicles for entering congested areas of central districts. The authority is also tasked with preparing potential emissions fees for private vehicles in the city.

Toll fee: Toll fees are being charged based on the size of vehicles.[32] Given that Hanoi is surrounded with industrial parks and factories in the suburbs, this is an appropriate tool.

Carbon tax: Financial tools such as taxes and carbon trading are being explored.[33] According to the existing legal provisions,[34] a carbon fee could be imposed on private vehicles, based on a certain level of emissions (Michaelowa et al., 2018). A pilot project in three cities, including Hanoi, is planned for testing the scheme.

Discourse on sustainable mobility

Discourse and debates on negative externalities of transport are often published in newspapers and on television news channel. Technical discussions and knowledge exchanges, however, remain with high-level think tanks, administrations and organizations dealing with technical solutions and project implementation. There are groups,[35] forums and events organized to raise awareness, exchange knowledge and encourage dialogue among experts, professionals, practitioners and academics. The results of such dialogues are slow, and solutions take time to implement.

Vietnam is still evolving and moving from a low-carbon to a more carbon-intensive transport system in response to its expanding urban footprint. Measures to raise liveability and ecological sustainability are being explored through urban land-use planning, decentralization, standardization of traffic management and carbon trading. It is necessary to change the trajectory back towards liveable and sustainable mobility patterns. This might take more time to achieve, but Vietnam should draw upon international experience in managing such challenges of urban mobility.

32 Toll fees charged to road vehicles are based on the following: (1) distance of the toll highway and (2) type of vehicle. Smaller vehicles, such as cars that do not cause much damage to the roads are charged less, while heavy vehicles such as trucks (carrying 4–10 tons or more) are charged double.

33 In its Nationally Determined Contribution to the UNFCCC, Vietnam committed to reduce greenhouse gas emissions by 9 per cent by 2030 by using domestic resources and by 27 per cent with international support. To achieve these goals, market-based carbon-pricing tools through a system in which carbon emissions quotas and credits can be exchanged fairly are suggested. Article 139 of the Law on Environmental Protection (2020) provides for the organization and development of the carbon market in Vietnam.

34 Prime Minister's Decision 49/2011/QĐ-TTg.

35 The NGO resource centre Climate Change Working Group, the Vietnam Urban Forum and the Urban Climate Resilience-Community of Practice.

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