

THE PLAN FOR BICYCLE TRANSPORTATION IN HUE CITY Phase 2024-2028

Agencies involved in the Plan development:

Lead: People's Committee of Hue City

Coordination and content oversee: Urban Management Office of Hue City

Implementation: Health Bridge Canada in Vietnam (HBV)

Technical support: GIZ

The Plan for the Development of Bicycle Transportation in Hue City is developed under the framework of the Pilot Project "Public Bicycle Sharing System in Hue City" (develoPPP PBS), funded by the German Federal Ministry for Economic Cooperation and Development (BMZ) through the DeveloPPP program, implemented by GIZ.

November 2023

Foreword

Hue City has been actively engaged in a variety project to develop a green, environmental sustainably run, and people-friendly transportation infrastructure in recent years. This has been made possible by a number of efforts, including bike-sharing programs, pedestrian streets, and bike and pedestrian combination pathways built on both sides of the Huong River and Nhu Ý river. These efforts have garnered widespread support from the residents and tourists. The People's Committee of Hue City hopes to build on these achievements and make Hue the nation's leading bicycle-friendly city. This strategic vision reflects a long-term commitment to sustainable urban development.

The People's Committee of Thua Thien Hue Province assigned the Institute of Construction Planning of Thua Thien Hue Province to develop a plan for bicycle lane in its Announcement No. 365/TB-UBND dated October 26, 2022, in anticipation of the aforementioned idea. Subsequently, within the framework of the Pilot Project for Public Bicycle Sharing in Hue City funded by the German International Cooperation Agency (GIZ), in document No. 9610/UBND-VH dated December 8, 2022, the People's Committee of Hue City entrusted the Urban Management Office to take the lead in formulating the Plan for the Development of Bicycle Transportation in Hue City, with technical assistance from HealthBridge Canada in Vietnam.

The Bicycle Transportation Development Plan for Hue City 2024-2028 is designed to bring to life the goals set by the Provincial and City People's Committee, and the planning proposals from the Provincial Institute of Construction Planning. The plan addresses safety concerns and community health issues by creating a comprehensive strategy for green and sustainable transportation. It places a central emphasis on bicycle transportation and the safety of cyclists, recognizing them as one of the most vulnerable groups on the road. The plan prioritizes cyclists and bicycle transportation to achieve benefits such as environmental improvement, enhanced public health, local economic development, and fostering equitable access to city transportation infrastructure.

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Abreviation

ADB : Asian Development Bank

GSDG : Global Street Design Guideline

GIZ : (Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH)

WRI : World Resources Institute

1 Rationale

1.1 Background

1.1.1 Vietnam government's orientation in sustainable development

In the face of global challenges associated with climate change and the exhaustion of fossil fuel resources, the Vietnam government holds a clear perspective on sustainable development: (i) Environmental protection and economic development are inextricably connected. Economic expansion will not come at the expense of the environment; (ii) Reduce the number of personal motorized vehicles (cars and motorcycles), shift from fossil fuel-powered vehicles to cleaner, low-emission energy sources; (iii) Encourage the development of sustainable transportation such as public transportation, cycling and walking to assist cities in lowering greenhouse gas emissions, reducing traffic congestion, traffic accidents, and environmental pollution. This is reflected in numerous legal documents and national strategies on sustainable development, ecology, energy conversion, green growth, etc.; two prominent ones are Decision No. 876/QĐ-TTg - the Action Plan for Green Energy Conversion and Emission Reduction in the Transportation Sector, issued in 2022, and Decision No. 2060/QĐ-TTg - the National Strategy for Ensuring Road Traffic Order and Safety 2021-2023, with a vision to 2045, issued in 2020. The transportation sector is striving to build a society characterized by a transportation system that is safe, seamless, convenient, efficient, and environmentally friendly. With this in mind, the goal is to reduce the number of fatalities and injuries from road traffic accidents by 5-10 percent per year.

Bicycle holds a significant role in the urban transportation system and should be prioritized and encouraged for development. The Ministry of Construction, in 2018, incorporated the ratio of roads allocated for bicycles as one of the 24 benchmarks for the categorization of urban green growth, as per Circular No. 01:2018/TT-BXD. Additionally, investing in bicycle infrastructure is recognized as one of the effective solutions to enhance public health and improve the living conditions for city dwellers.

1.1.2 Current status of bicycle transportation development in Vietnam

Cities in Vietnam are moving towards sustainable development, focusing on energy transition and shifting modes of transportation from personal motorized vehicles to greener, more sustainable, and environmentally friendly alternatives (Viết Tuấn, 2022, 2023).

One practical option that towns and citizens are considering is the use of bicycles as a mode of transportation. Hoi An is the first city in the country to develop a bicycle development plan and experiment with approximately 4.0 km of dedicated bike lanes. Hue City has invested in building around 10 km of pedestrian and cycling paths along both sides of the Huong River. In an effort to lessen traffic congestion and environmental pollution, several large cities, including Da Nang, Ho Chi Minh City, and Hanoi, are currently investigating ways to develop bicycles as a means of transportation for locals (including cycling infrastructure and public bicycle sharing).

In addition, there is a growing demand in many urban areas for people to use bicycles for sports, recreation, and health promotion. Furthermore, a variety of sports bicycle and electric-assist bicycle models have been introduced to the market and are being studied for future advancements, with the prospect of replacing motorcycles and personal cars in daily commuting in cities.

1.2 Current status of bicycle transportation in Hue City

Images of Hue's streets show that, before 2015, bicycles remained the city's primary mode of transportation for residents. Bicycles used to be one of the distinctive images of Hue representing the city's tranquility, beauty, safety, and friendliness (Hue TRT, 2023).

However, a survey by HealthBridge (March 2023) shows that the actual rate of bicycles on the road is only 1.5%, while the rate of gasoline-powered motorcycles and electric vehicles accounts for nearly 90%, personal cars and taxis account for 7.2%. About 80–90% of primary school students and 40–50% of secondary school students rely on parents' transportation by motorcycles or cars because they feel unsafe enough to let their kids walk or cycle to school. This lack of confidence in the safety of the streets has worsened traffic congestion.



Figure 1: People using bicycles on Truong Tien Bridge in 2013 and 2014 (Photo source: Internet)

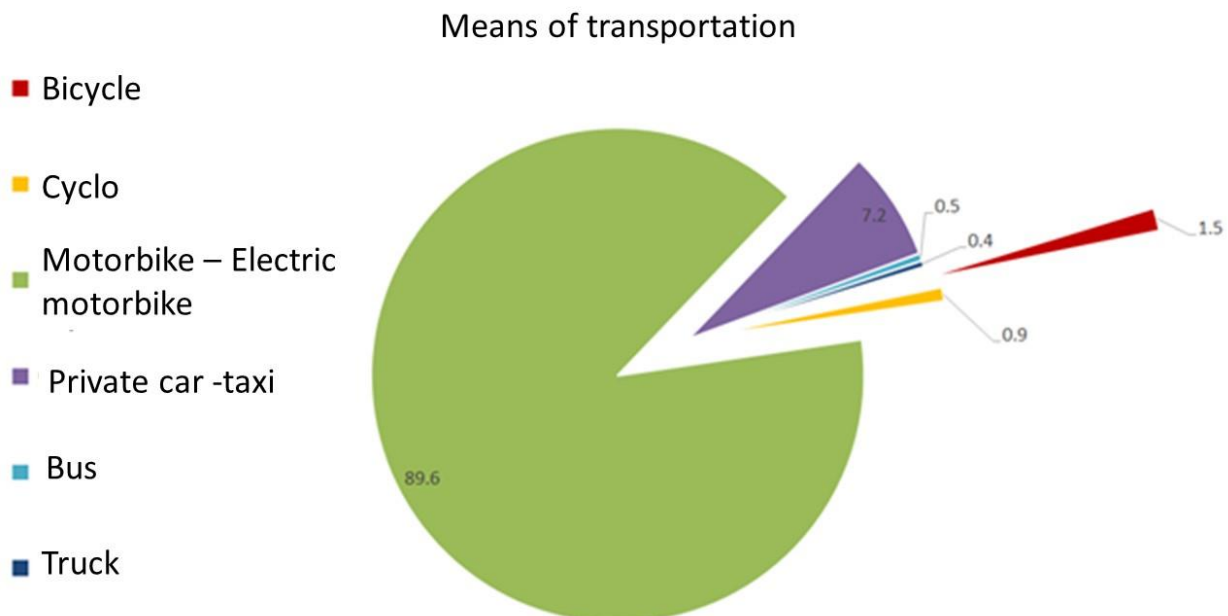


Figure 2: Percentage of transportation modes on some main roads (survey by HealthBridge in March 2023)

1.3 Hue City is aiming to become the first bicycle city in Vietnam

The Resolution No. 54/NQ-TW has clearly identified Hue city as a tourist city based on historical and cultural values, an intellectual city with a foundation in education, high-tech

science and technology, and a city for resort, health care, and wellness. Therefore, the primary orientation in urban development of the city is focused on becoming green, ecological, sustainable, safe, environmental-friendly, harmonious and connected to nature (Harley, 2023). Based on this, the General Urban Planning (GP) of Thua Thien Hue until 2045, vision to 2065 (VIUP, 2023), has designated green, ecological, sustainable, safe, people-friendly, harmonious, and connected to nature as the key orientation for urban development. Regarding transportation, Hue city determines to develop an efficient, safe, environmentally friendly transportation system, reducing emissions and pollution. Along with the development orientation of the Public Transport system, the city will prioritize the bicycle transportation as a green and safe mode of transportation.

Based on this, the province and city authority have made the objective of making Hue the "first bicycle city in Vietnam" a political determination and action goal. This is manifested by specific activities such as planning World Environment Day workshops and bicycle-related events, leading cycling-related activities and movements to improve health, investing in the construction of pedestrian and bicycle paths along the Huong river and Nhu Y river, working with GIZ and HealthBridge to develop a e-bicycle transportation plan, advocating for public bicycle-sharing services, etc.

With its unique and distinctive characteristics, the advancement of bicycles will not only enhance the city's appeal for tourism but also steer it towards sustainable, long-term development, honoring its rich cultural heritage. This approach sets Hue apart from the youthful vibrancy of Da Nang or the tranquil serenity of Hoi An (Chánh Trung, 2021; VTV8, 2022).



Figure 3: Proposed bicycle network by the Institute of Construction Planning of Thua Thien Hue Province (Hue UPI, 2023)

In November 2022, as part of a long-term strategy to support Hue City, the People's Committee of Thua Thien Hue Province commissioned the province's Institute of Construction Planning to devise a plan for bicycle lanes across the province. The planning project was presented at a workshop on September 28, 2023, where it garnered strong support from the provincial leadership, relevant provincial departments, and Hue City. The project was officially adopted as stated in the official document No. 369/TB-UBND of Thua Thien Hue Province dated October 10, 2023. This document announced the Chairman of the People's Committee's conclusion on the Report on the Planning Situation and Implementation Plan for Bicycle Transport in the Province. This approval serves as a pivotal foundation for the development plan of bicycle transportation in Hue City.

1.4 Benefits of bicycle development

Investing in the development of bicycle infrastructure yields numerous advantages, as evidenced by its implementation and application in many cities globally and regionally (Hải Hà, 2023; Phan Hoàng, 2017).

1.4.1 Enhancing the environment in cities

Investing in bicycle infrastructure can revolutionize urban transportation by reducing the number of motorized vehicles, cars, and gasoline-powered motorcycles. This shift can significantly reduce CO₂ emissions, contributing to environmental protection and helping to mitigate the effects of global climate change. For instance, a person cycling 7.5 km per day (instead of driving a car) can help the city reduce nearly 1 ton of CO₂ per year (Dutch Cycling Embassy, 2018), equivalent to 1 carbon credit.

Furthermore, investing in bicycle infrastructure and enhancing traffic safety not only augments the tourism environment in Hue City but also boosts its appeal to tourists. It helps cultivate an image of a serene, safe, and people-friendly city, thereby making it more liveable and attractive.

1.4.2 Improving public health

Investing in bicycle infrastructure can significantly benefit all city dwellers, from children to the elderly, with students being a primary beneficiary. This investment can instill a sense of safety and confidence when bicycling in urban areas. Consequently, the general health of city residents, particularly students, can see substantial improvement. Regular bicycle commuting can help mitigate the risk of numerous severe health conditions, including heart disease, hypertension, diabetes, cancer, and stress-related disorders (Portland BOT, 2010).

1.4.3 Positive impact on economic development

Investing in bicycle infrastructure can indeed bring a multitude of economic benefits to a city. Here are a few examples:

- Boosting the city's competitiveness and appeal for the development of tourism, thus fostering local economic expansion.
- Improving traffic safety conditions, reducing economic and human losses caused by traffic accidents.
- Reducing costs for road maintenance and repairs; decreasing healthcare expenses and treatment costs due to improved public health through regular cycling.

- Reducing economic losses from traffic congestion¹. In the absence of congestion, people can devote more time to work, thereby contributing to societal wealth and resource generation, or allocate more time to family, physical activities for health improvement, leisure, entertainment, and labor force renewal.
- Additionally, the decrease in CO₂ emissions could lead to economic advantages through the trading of carbon credits, a strategy that is heavily endorsed by the Vietnamese government (Quang Thế, 2023; Thái Sơn, 2022; Thu Trinh, 2023). The establishment of the Carbon Credit Trading Platform ASEAN joint stock company (CCTPA) will support businesses, organizations, and individuals in Vietnam in building carbon credit projects, registration processes, verification, confirmation as well as the mechanisms for trading compensation and credit financing. The platform also provide mechanism for applying carbon taxes both regionally and globally (Ngọc Hiền, 2023).

1.4.4 Promoting equal access to transportation and reducing traffic congestion

Investing in bicycle infrastructure is a cost-effective way to foster a more equitable, fair, and community-focused society. It enables individuals who are unable to use motorized vehicles, such as children, the elderly, and people with disabilities, to travel in the city independently. The widespread use of bicycles can lead to a more equal society by erasing distinctions based on wealth, income levels, and social classes (Dutch Cycling Embassy, 2018).

Research indicates that the capacity of bicycle traffic can reach 6,500-7,500 cyclists per hour, which is comparable to the capacity of a bus lane and significantly surpasses that of individual cars or mixed traffic within the same 3.0m lane width (GDCI, 2023). Thus, implementing dedicated bicycle lanes could be a more efficient strategy for mitigating traffic congestion than promoting a transition from motorcycles to cars.

1.4.5 Enhancing urban space efficiency

Efficiency in urban space utilization can be enhanced by minimizing the need for car parking and reallocating the space needed for expanding car traffic lanes. This approach allows for the repurposing of urban areas for human activities. For example, the removal of a single car parking spot could provide sufficient space for 6-10 bicycles or the equivalent movement area for 4-5 bicycles. This shift not only optimizes space but also fosters a more people-centric urban environment.

1.5 Favourable conditions for bicycle transportation development in Hue:

In comparison to other Vietnamese cities, Huế possesses a number of advantages that promote the growth of bicycle usage, including:

- **Compact City:** Fundamentally, Huế is evolving within an approximate radius of 3.0 km (measured from the intersection of Trường Tiền Bridge and Lê Lợi Street) and has plans for future expansion within a range of about 5 km. This scale is ideal for commuting by bicycle, particularly with the aid of electric bicycles.

¹ i.e. The annual cost of traffic congestion in Ho Chi Minh City is projected to be approximately 6 billion USD. (Đào Trang, 2023).

- **Beautiful natural landscapes, fresh and peaceful air, harmoniously connected with the heritage system and tourist attractions:** Hue, a heritage city, is celebrated for its abundant historical-cultural monuments seamlessly blended with striking natural landscapes. The city's serene ambiance is amplified by its fresh air, interspersed public spaces, water bodies, and shady tree-lined streets. These elements together make Hue a city where heritage and nature coexist in harmony.
- **Towards a high-quality cultural, educational, and resort tourism urban area development:** Hue is committed to preserving cultural heritage, high-quality tourism, education, and resort city, rather than becoming an industrialized city. Therefore, developing environmentally friendly and safe transportation, such as bicycles, is one of the suitable choices.
- **Hue used to be a bicycle-friendly city:** Prior to 2015, Hue was recognized as a bicycle-friendly city. It was a place where residents, students, and tourists could rely on bicycles for safe daily commuting.
- **Hue residents still have a fondness for bicycles:** According to the household survey conducted by HealthBridge in March 2023, about 70% of households in Hue still possess bicycles. These bicycles are used for various activities including exercise, morning/evening sports, and trips to the market.
- **Provincial and city leaders are determined to develop Hue into the first bicycle city in Vietnam.** Through concrete and practical actions, the city leadership has garnered the trust and unanimous backing from the people in achieving this common goal.

2 Planning process for the development of bicycle transportation in Hue city

The planning for the bicycle transport development in Hue city began in late 2022. This was part of the Pilot Project for the Public Bike Sharing System in Hue City, sponsored by the German International Cooperation Organization (GIZ). The initiative received approval by Hue People's Committee, as stated in the official document number 9610/UBND-VH, signed by Vice Chairman Truong Dinh Hanh on December 8, 2022, regarding the Development Plan for Bicycle Traffic within the scope of the Pilot Project for the Public Bike Sharing System in Hue City.

In order to formulate the plan, the technical experts undertook a range of activities. These included gathering documents for desk review, exchanging information, engaging in discussions with both international and local experts in bicycle development, conducting field surveys to collect data, and organizing specialized discussions and workshops for opinion contributions, etc.

2.1 Document collection and international and national experience review

The plan started with gathering existing documents on bicycle development both domestically and internationally, summarizing international experiences, and developing the framework for the plan.

2.2 Survey, data collection on-site, household and tourist interviews

The expert team from HealthBridge has executed numerous surveys, evaluated the prevailing circumstances, and gathered relevant data and information.

In March 2023, HealthBridge carried out a comprehensive survey, interviewing around 350 households, 90 lodging facilities, and 100 local and foreign tourists, which yielded significant information. Additionally, HealthBridge conducted a quick survey on the transportation modes utilized by students in selected primary, secondary, and high schools. They also organised a bicycle count on various primary routes during peak evening hours to ascertain the proportion of different vehicle types on the road and the actual bicycle usage. Furthermore, HealthBridge's experts teamed up with the Traffic Police of Huế City, the Traffic Police Department, and the provincial police in Thừa Thiên Huế to gather data on vehicle registration within the city.

ACTION PLAN

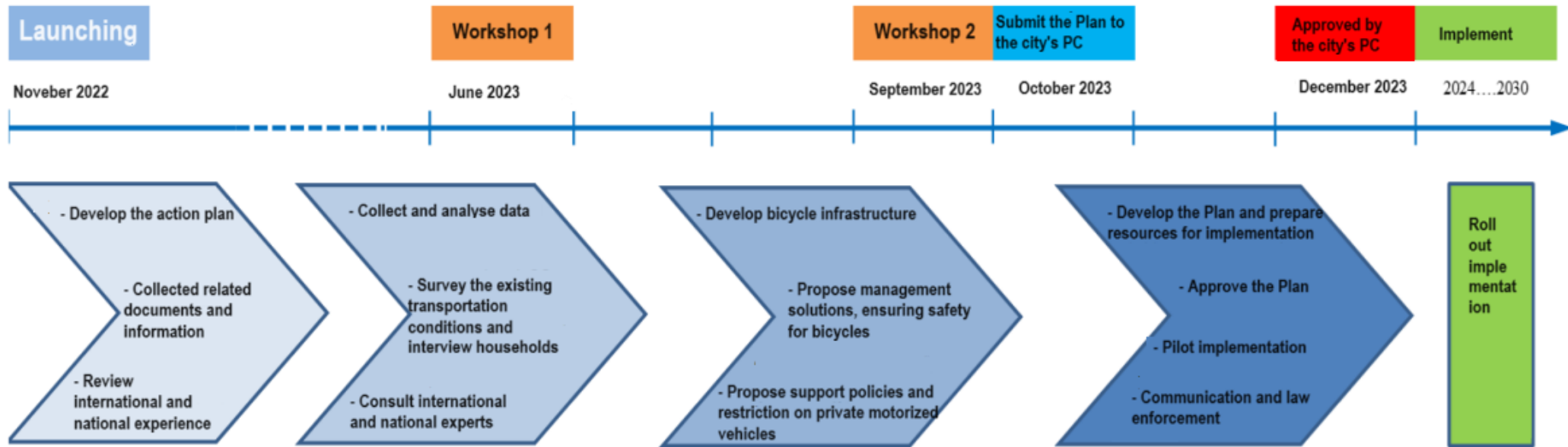


Figure 1: Planning process for the development of bicycle transportation in Hue city

2.3 Meeting and exchanging with local specialists and officials

The project team has met and exchanged with local specialists, and relevant staff regarding the actual situation, technical issues, and ongoing projects in the local area, such as the Urban Management Office of the city, the Provincial Institute of Planning and Construction of Thua Thien Hue, and the Institute for Research and Development of Thua Thien Hue.

2.4 Consulting with international experts

To ensure objectivity, HealthBridge sought the expert opinions of professionals such as Kim Beng Lua from the Global Road Safety Partnership in Switzerland, and Mochizuki Shinichi from the CarFreeDay organization in Japan. Both these experts possess extensive knowledge about the development of bicycle infrastructure and have practical insights into the conditions in Hué. A site visit was arranged by HealthBridge for Kim Beng Lua to evaluate the actual traffic conditions in Hué .

2.5 Organising technical consultation workshops

HealthBridge also held specialized discussions with officials from relevant departments on the key aspects of the plan. In June 2023 and September 2023, HealthBridge, in coordination with the People's Committee of Hue City and the German International Cooperation Organization (GIZ), organized consultation sessions to solicit feedback on the draft content of the plan. These sessions were attended by the Vice Chairman of the city, representatives from various departments, research institutes of Thua Thien Hue province, and relevant departments of Hue City.

3 Relevant technical guidelines

3.1 Standards and specifications

The design of bicycle infrastructure has been addressed in various standards and specifications related to urban planning and technical infrastructure in urban areas, as outlined in Table 1. These documents serve as legal references for designing infrastructure to ensure safety for bicycle transport. It's worth highlighting that the standard TCXDVN 104:2007 has been revised and updated to the TCVN 13592:2022 standard.

Table 1: Standards and regulations related to the development of bicycle infrastructure

No.	Standards, Specifications	Content	Issuing date
1	Standard TCVN 4449: 1987	Urban Planning - Design Standards	1987
2	Standard TCVN 4054-2005	Car lane – Road design requirements	07/02/2005
3	Standard TCXDVN 104: 2007/ TCVN 13592:2022 (sửa đổi)	Urban roads - Design requirements. Requirements: Bicycles are a highly recommended mode of transportation; establish traffic management strategies for bicycles in urban areas.	30/05/2007 2022
4	Specifications QCXDVN	National technical standards for Urban	03/04/2008

	01: 2008/BXD	Planning (<i>QCXDVN 01:2008/BXD has been replaced by QCVN 01:2019 since 2020</i>).	
5	Specifications QCXDVN 07:2010	Construction Law - Urban technical infrastructure. Requirements: it is mandated that dedicated lanes must be provided for bicycles on regional main roads and above	5/2/2010
6	Specifications QCVN 07-4:2016/BXD	National Technical Standards for Technical Infrastructure – Transportation. Requirements: main roads at the regional level and above must allocate dedicated lanes for bicycles.	01/02/2016
7	Specifications QCVN 01:2021/BXD	National Technical Standards for Urban Planning (replacing QCVN 01:2019/BXD) stipulate that map at the 1/500 scale must illustrate bicycle and pedestrian paths in addition to land plots.	31/12/2019
8	Specifications QCVN 41:2019/BGTVT	National Standards on Road Signs specify the regulations for road signs and road markings intended for bicycles.	2019

3.2 Additional guidelines

In addition to the existing standards and regulations, in June 2023, the Ministry of Construction issued *Guidelines on the Design of Bicycle Infrastructure in urban area*.

Table 2: Technical guidance on the development of bicycle infrastructure

No.	Technical documents	Content	Issuing date
1	Guidelines for Designing Urban Bicycle Lanes / Ministry of Construction ²	Guidelines for Designing Bicycle Lanes in urban area - 2023 - Ministry of Construction	6 - 2023
2	Global Street Design Guidelines (GSDG) ³	Developed by Global Designing Cities Initiative (GDCI), first published in 2016 in the United States. The Vietnamese translation was released by the Hanoi Department of Transport in July 2023.	7 - 2023
3	<i>Safe Bike Lane Design Principles – Responding to Cycling Needs in Cities During and Beyond</i> ⁴	Developed by World Resources Institute (WRI) in 2020. The Vietnamese translation was released in July 2023.	7 - 2023

² Free download at: <https://healthbridge.ca/dist/library/technical-guideline-for-bicycle-infrastructure-design-in-urban-area-vn.pdf>

³ Free download at: <https://globaldesigningcities.org/publication/global-street-design-guide-vn/>

⁴ Free download for English version: <https://www.wri.org/research/safe-bicycle-lane-design-principles>; for Vietnamese version:

Additionally, the *Global Street Design Guide* (GSDG) (Le Tuoi, 2023) and the *Safe Bike Lane Design Principles – Responding to Cycling Needs in Cities During and Beyond* (WRI) provide additional technical guidance and successful case studies applied in many cities worldwide.

3.3 Essential technical guidance

Below is a summary of essential details related to the development of safe bicycle infrastructure, as described in the previously mentioned technical guidelines.

3.3.1 Width of the bicycle lane

There are various types of bicycles, from single-person bikes to cargo/child-carrying bikes and tricycles, with the necessary width dimensions ranging from 1.0 to 1.5 meters.

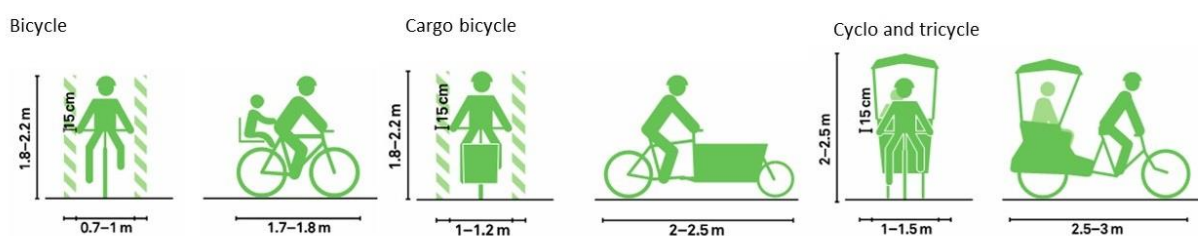


Figure 2: Dimensions of some types of bicycles (GDCI, 2023)

Depending on the circumstances, the width of the bicycle lane can vary, ranging from 1.5 meters to 3.5 meters. The guidelines recommend that, the width of a one-way bicycle lane should, if possible, be between 1.8 to 2.5 meters, and for a two-way bicycle lane, it should be between 2.5 to 3.5 meters."

The bicycle lane should be at least 1.5 meters wide to ensure comfort for cyclists. In certain exceptional cases, reducing the width to 1.0 meter may be deemed acceptable, but such adjustments should be made selectively at specific locations.

The arrangement of bicycle lanes can also be flexible, either on one side or both sides, for one-way or two-way traffic, depending on the actual conditions of each road segment.

3.3.2 Classification of bicycle network

Based on flexibility and accessibility, TCXDVN 104:2007 and TCVN 13592:2022 classify urban roads into two main groups:

- (i) Urban main road system, from the inter-regional level and above: These routes prioritize flexibility, enabling fast movement of motorized vehicles. To ensure safety and improve traffic flow on these routes, it is necessary to separate bicycle lanes from lanes designated for motorized vehicles. Separation measures can include painted markings, barriers, raised surfaces, planters, etc.
- (ii) The network of collector roads and internal roads in the area places a greater emphasis on accessibility over flexibility. Motorized vehicles are not permitted to travel at high speeds on these routes. This leads to the designation of Zone 30 areas, also referred to as low-speed zones, where bicycles can share lanes with other motorized vehicles.

Consequently, the city consists of numerous Zone 30 areas, where bicycles can safely share the road with motorized vehicles. These areas are interconnected with roads featuring designated bicycle lanes, which are separated from spaces for motorized vehicles by painted markings or physical measures.

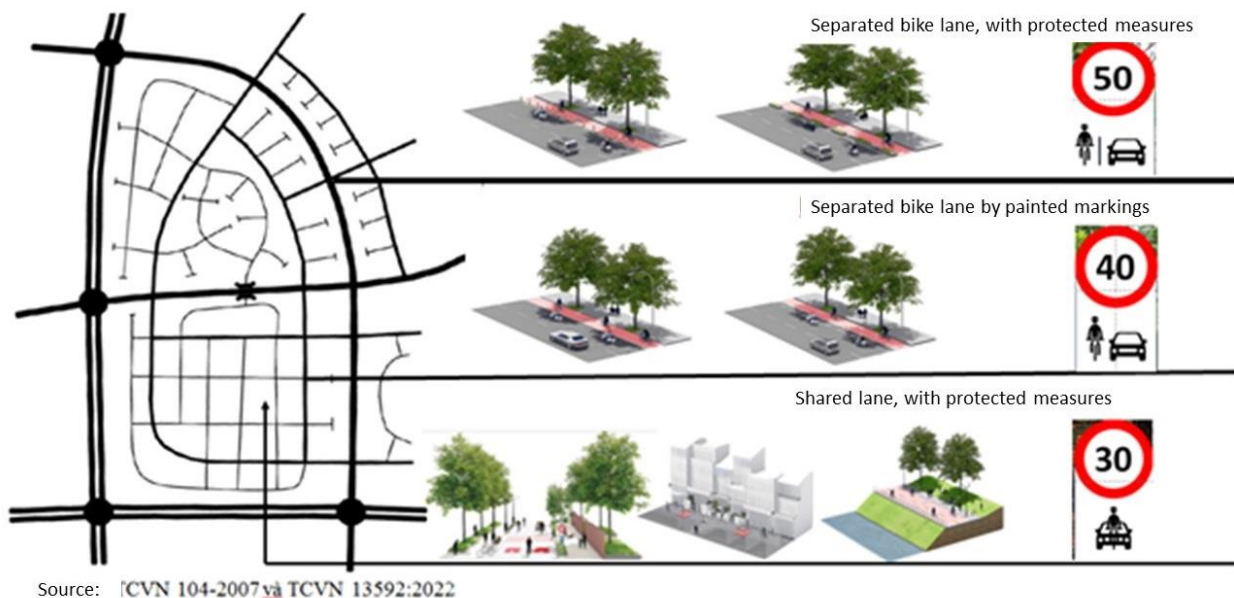


Figure 3: Planning Bicycle Lanes in Urban area

In applying these considerations to the specific conditions in Huế:

- For roads that are wide, at least 10.5 meters, with substantial motorized vehicle traffic (2,000 vehicles or more per day), and fast travel speeds exceeding 30 km/h, it's practical to establish a dedicated bicycle lane with a minimum width of 1.5 meters on both sides. The lanes for motorized vehicles can be reduced to 6.0 meters, with each lane being 3.0 meters wide. This reduction helps to slow down motorized traffic, creating a more orderly, safer environment with less congestion. Roads with speeds exceeding 40 km/h should have physical separation, while those with lower speeds may only need painted markings for division.
- For roads with a cross-section less than 10.5 meters and low motorized vehicle flow (ideally under 2,000 vehicles/day), shared use will be arranged to enhance traffic safety. This involves measures like expanding sidewalks at intersections, constructing raised intersections and crosswalks, installing speed humps, introducing prioritized bicycle boxes and bicycle lights, etc., ensuring that bicycles can safely share the road with motorized vehicles.

In summary, by implementing speed-focused design and management strategies, the urban road network will be sensibly organized to provide a safe, comfortable, and convenient experience for bicycle users.



Figure 4: In the Zone 30 areas in the Netherlands, priority is given to bicycles, and motorized traffic is considered 'guests,' obliged to move at a slow speed below 30 km/h. (Source: DutchCycling.nl)

Besides the two common types of bicycle lanes mentioned, there could be additional bicycle infrastructure based on the specific conditions of each city. These may include: (i) landscape bike paths catering to tourism, recreation, and sports entertainment; (ii) bicycle highways, where the bike lane is entirely separated from the motorized traffic lane; (iii) priority bike lanes (and pedestrian lanes), where motorized vehicles are prohibited, not allowed to enter, or only permitted to move at a slow speed below 15 km/h.

Table 2: Classification of bicycle lane network

TT	Types of bicycle lanes	Characteristics
1	Landscape bicycle path	<ul style="list-style-type: none"> - This is a dedicated bicycle lane, entirely separated from traffic lanes, designed to provide shortcuts for bicycles or landscape bike paths along rivers, green corridors, and tourist areas, serving both local residents and tourists. - The width of the bicycle lane is 2.0-4.0 meters; - This represents the current infrastructure in Hué, primarily catering to sports, recreation, and tourism. However, it doesn't significantly contribute to addressing challenges related to urban mobility transformation and other complex issues in urban transportation.
2	High-Speed Bicycle Lane:	<ul style="list-style-type: none"> - On major highway or urban express routes with high motorized vehicle flow and fast speeds, the bicycle lane is completely separated from the roadway for motorized vehicles. - Underpasses and overpasses may be provided, and dedicated bicycle lanes should be positioned at a minimum distance of 3.0 meters from car roads to ensure safety and minimize noise and air pollution for cyclists.

3	Bicycle lane	<ul style="list-style-type: none"> - Applicable to roads with a cross-section width of 10.5 meters or more and high motorized vehicle flow, exceeding 2,000 vehicles per day. - The bicycle lane is designed to be 1.5–2.5 meters wide on both sides, or 3.5 meters for two-way bicycle traffic (on one side), separated from the motorized vehicle lane by painted markings (for roads with speeds below 40 km/h), a wide buffer zone of 0.25–0.5 meters, or a green strip of 0.5–1.0 meters. Other physical measures are used for roads with high flow and vehicle speeds over 40 km/h to ensure safety. - Cars, motorcycles, and other motorized vehicles are not allowed to stop, park, or enter the bicycle lane. - Installment of traffic signal prioritization for bicycles at intersections. - The bicycle lane should be clearly marked with bicycle symbols, using colors that are easily distinguishable from the motorized vehicle section. This can be combined with signs indicating the bicycle priority lane at intersections
4	Mixed-Use Shared Lane (Zone 30 Area):	<ul style="list-style-type: none"> - This is applicable to internal roads in residential areas with a cross-section width below 10.5 meters and low motorized vehicle flow, ideally under 2,000 motorized vehicles per day - Bicycles and motorized vehicles share the road without dedicated lanes for each type. Motorized vehicles are required to move slowly, with a maximum speed not exceeding 30 km/h. - Warning, enforcement, and speed control measures should be applied to motorized vehicles, such as Zone 30 area signs, 30 km/h speed limit signs, speed bumps, raised intersections, sidewalk expansion-road narrowing, surveillance cameras, etc. - Parking may be allowed on one or both sides, depending on the specific conditions of each road segment.
5	Priority Lane for Bicycles and Pedestrians	<ul style="list-style-type: none"> - This applies to a neighborhood or a designated lane prioritized for pedestrians and bicycles. The entire roadway is designated for the priority use of pedestrians and bicycles. - Motorized vehicles are not allowed to enter or are only permitted to move at a slow speed below 15 km/h.

3.3.3 *Bicycle networks need to ensure the following factors:*

3.3.3.1 *Safety*

Traffic safety poses a significant challenge for bicycle users.

In society, potential bicycle users constitute approximately 60% (GDCI, 2023), yet they are apprehensive about traffic safety and lack the confidence to incorporate cycling into their daily routines. Consequently, the commitment and specific measures implemented by authorities to enhance safety conditions for bicycles, particularly through the establishment of dedicated bike

lanes, will motivate these individuals to adopt cycling and gradually contribute to a shift in transportation methods within the city. As safety conditions improve, cycling will become more attractive to more people.

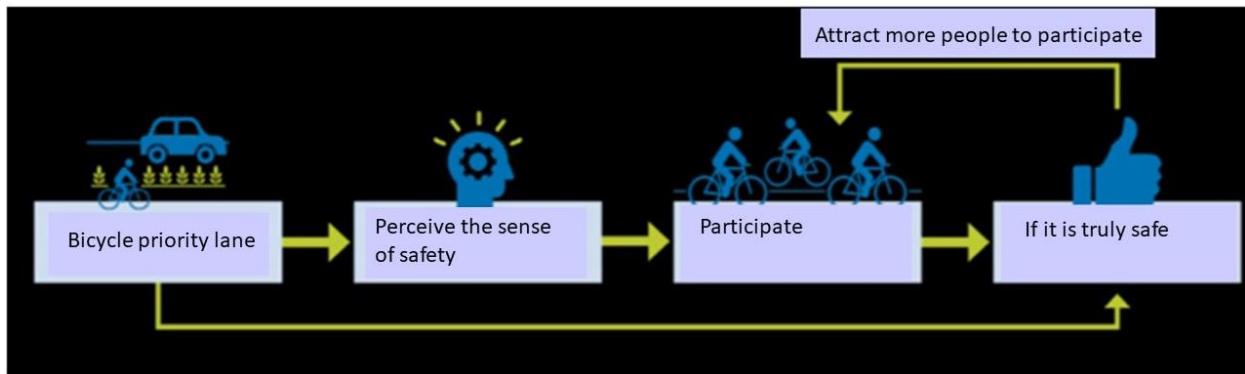


Figure 5: The Role of Safety in Attracting and Encouraging People to Use Bicycles (Rob Burchfield, 2018)

When establishing exclusive priority lanes for bicycles, it is essential for authorities to prevent motorized vehicles from intruding, converting the designated bicycle space into parking or thoroughfare for cars and motorcycles. Enforcing laws and implementing impactful legal advocacy, education, and awareness campaigns play a pivotal role in achieving this goal.

3.3.3.2 Convenience



a. Motorized vehicle roads (Red)



b. Bicycle lanes (Green)

Figure 6: Bicycles enjoy unrestricted movement in the city centre, while motorized vehicles experience limited mobility (Source: DutchCycling.nl)

The bicycle network should be extended with direct and safe shortcuts, even if narrow (only 1.0 meter wide), to ensure that bicycles continue to be a convenient and efficient mode of transportation in urban areas, providing a competitive edge over motorcycles and cars.

Additionally, control the use of individual motorized vehicles by introducing one-way traffic lanes, prohibiting vehicle entry into specific roads and designated areas using No Entry signs, restricting motorized vehicles, or employing automatic bollards that permit only a limited number of authorized vehicles to enter the area during specified hours.

3.3.3.3 Connectivity

Having several disconnected landscape bike paths or isolated, fragmented bike lanes may not effectively encourage people to use bicycles and may not significantly contribute to promoting a shift towards greener and more sustainable transportation methods in the city.

In addition to safety considerations, bicycle lanes need to be connected to form a complete, uninterrupted network that spans the entire city. Due to their flexibility and low investment costs, bike lane networks can directly link to key locations in the city, such as parks, schools, hospitals, etc., and seamlessly integrate with the overall public transportation system to enhance convenience for cyclists.



Figure 7: Raised Intersection between the bicycle lane and the road for motorized vehicles (Source: DutchCycling.nl)

At intersections, the bicycle lane is given priority, ensuring it remains flat, continuous, and does not undergo changes in elevation. Additionally, the car lane is narrowed, creating a raised intersection, compelling vehicles to move slowly, observe cyclists, and avoid collisions. The bicycle lane is always kept clear, free of obstacles, especially ensuring that cars do not encroach on it for parking or stopping.

3.3.3.4 Consistency

Measures implemented, such as the surface structure of the bike lane, raised pedestrian walks, road markings, signage, color scheme, etc., should be consistent throughout the city. This ensures uniformity and easy compliance for all traffic participants.

3.3.4 Separation for bicycle lanes

Depending on specific conditions, the bike lane may be separated from the motorized vehicle lane using methods like painted markings, green strips, parking spaces, bollards, etc.



a. Separated by bollards



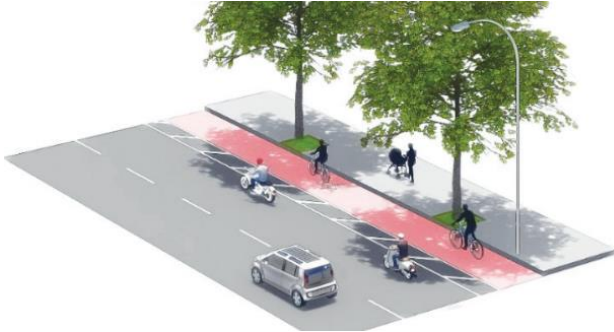
b. Separated by markings (Hội An city)



c. Separated by parking spaces



d. Separated by green strips



e. Separated by creating a safe buffer zone using channelization markings



f. The bicycle lane is completely separated from the motorized vehicle lane.

Figure 8: Bicycle lane separation (Source: WRI, DutchCycling.nl)

3.3.5 Bicycle priority traffic lights at intersections

To enhance the competitiveness of bicycles compared to motorized vehicles, it is essential to install bicycle priority traffic lights at intersections for both straight-ahead movements and left turns. The waiting time for cyclists at signalized intersections should not exceed 40 seconds, with an ideal duration of 20 seconds. Upon reaching the intersection, cyclists can press a button to request priority. Within a short timeframe, typically around 20 seconds, the traffic light for bicycles will turn green, ensuring their priority and allowing them to safely traverse the intersection before motorized vehicles are permitted to proceed.

This measure is crucial for ensuring the safety of cyclists by minimizing conflicts with motorized vehicles. Additionally, it promotes the advantages of cycling over motorized transportation, discouraging the use of personal motor vehicles and encouraging bicycle usage.



Figure 9: Bicycle priority traffic lights (Source: DutchCycling.nl)

3.3.6 Enhancing visibility of bicycle priority lanes

On lanes dedicated to bicycles, it is crucial to install a system of road signs (R. 412h Signs) and/or painted markings (bicycle symbols) to: (i) emphasize the priority of bicycles; (ii) notify motorized vehicles of the dedicated safe space reserved for bicycles, promoting proactive safety measures during traffic interactions.

Given this, the authorities can issue reminders or penalties if motorized vehicles, especially cars, intentionally violate the rules, such as stopping or parking in the bicycle priority lane.



a. Painting bicycle symbols on the road surface in Hoi An

Sign No. 412: Separate lane for each type of vehicle. This sign indicates the presence of a dedicated lane for each specific type of vehicle. The sign is positioned above the lane, at the beginning of the road in the direction of traffic flow. Depending on the type of vehicle to be regulated, signs are arranged accordingly. Other types of vehicles are not allowed to enter lanes with this sign (except for vehicles with priority as specified by regulations).



h) Biển số R.412h

b. Displaying R. 412h signs on the bicycle lane (QCVN 41/2019, bộ GTVT)

Biển số 412 - Làn đường dành riêng cho từng loại xe. Để báo hiệu cho người tham gia giao thông biết có làn đường dành riêng cho từng loại xe riêng biệt. Biển được đặt phía trên làn xe, ở đầu đường theo chiều xe chạy. Tùy loại phương tiện cần quy định mà bố trí biển cho phù hợp. Các loại xe khác không được đi vào làn đường có đặt biển này (trừ các xe được quyền ưu tiên theo quy định).

Figure 10: Establishing ownership for bicycle priority lanes (Source: DutchCycling.nl)

4 Vision, Objectives, and Scope of the Plan

4.1 Vision

The People's Committee of Hue city envisions that by 2030, Hue will emerge as the first bicycle-friendly city in Vietnam. This represents a strategic and long-term plan.

4.2 Objectives

The objectives of the Bicycle Transportation Development Plan for Hue City include:

- Creating an environment that encourages residents and visitors of all ages to use bicycles for transportation safely and conveniently.
- Facilitating Hue City's transition towards greener, ecological, sustainable, and safer urban transportation methods

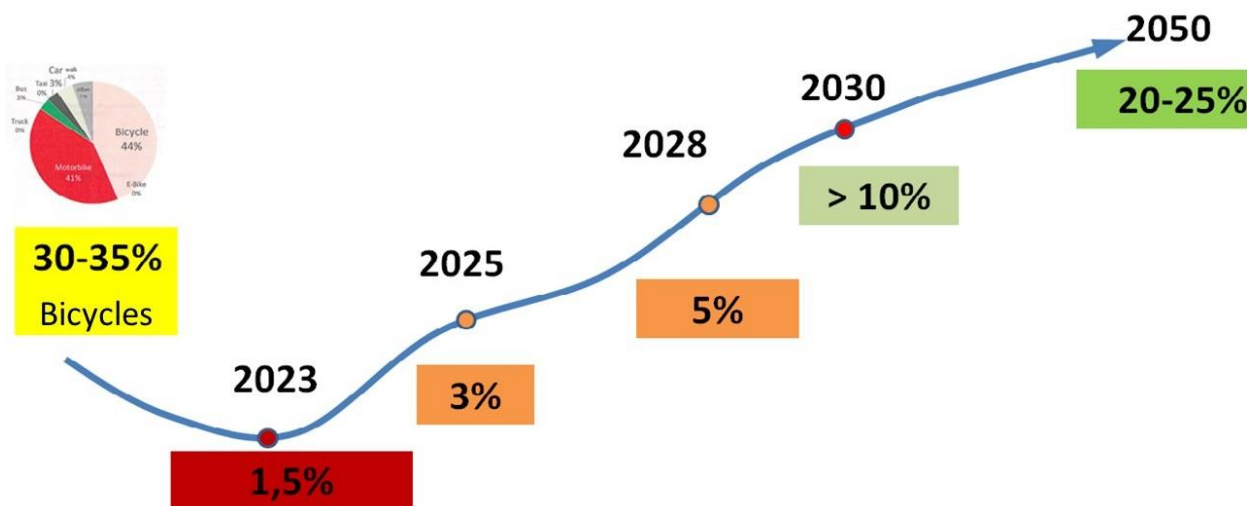


Figure 11: Development Roadmap for Bicycles in Hue City

The People’s Committee of Hue city is aiming for a bicycle usage rate of over 10% on the roads by 2030, with aspirations for even higher rates in the subsequent years. However, within the framework of this plan, the city has set a target to increase the bicycle usage rate from 1.5% in 2023 to 3% in 2025 and 5% in 2028.⁵

4.3 Scope

4.3.1 Spatial scope

The Plan will be applicable to the expanded area of Hue city, including 29 wards and 07 communes, covering an approximate area of 265 km² and a population of around 652,000 people (as of 2023).

4.3.2 Timeframe

The plan's implementation period is 5 years, from 2024 to 2028

5 Different group using bicycles

The groups of bicycle users are diverse, including not only adults⁶ but also the elderly, children, women, etc.

These user groups are not limited to tourists or those who use bicycles for weekend leisure or sports training during early mornings and evenings. It also encompasses working-age individuals and students who use bicycles for daily commuting, people with low incomes, and those who use bicycles for transporting goods. The transportation infrastructure needs to ensure that all these user groups can travel safely and comfortably.

Based on the statistical data from the city and Thua Thien Hue province, the potential bicycle user groups in Hue that require attention and encouragement include:

⁵ The development roadmap for bicycles is feasible and has received high consensus from the participants in the second workshop, held on September 29, 2023, under the leadership of the Vice Chairman of the People’s Committee of Hue City, Mr. Trương Đình Hạnh, and Mr. Daniel Herrman - Chief Advisor, Project Support to Viet Nam for the Implementation of the Paris Agreement (VN-SIPA II).

⁶ Those proficient in skills, physically capable, and confident enough to participate in traffic alongside motorized vehicles.

5.1 Students

The sight of female students elegantly riding bicycles in traditional “áo dài” on the streets was once a beautiful and iconic scene in Hue. However, this picturesque image has become increasingly scarce in recent times.



Figure 12: Students' transportation

Results from a survey on student transportation methods conducted by HealthBridge in March 2023 reveal that 70-80% of high school students (Grades 10-12) use 50cc gasoline motorcycles or electric scooters, with only about 3.2% using bicycles. For middle school students (Grades 6-9), the bicycle usage rate is approximately 20%, while about 30-50% of students are driven to school by their parents on motorcycles. The rate of students commuting to school by electric scooters is around 15-20%. Primary school students (Grades 1-5) primarily rely on their parents who go by motorcycle or car, with a rate reaching 70-90%. Only 5.7% of students commute to school by bicycle. The fact that students do not commute independently or use 50cc motorcycles and electric scooters contributes to traffic congestion and reduces safety in Hue.



Figure 13: Safe Routes to School for Children in the Netherlands (Source: DutchCycling.nl)⁷

Students represent a group that can be easily encouraged and mobilized, given that their trips are typically simple, and their commuting distances are short. Encouraging students to commute to school independently by bicycle (and on foot) will help change the traffic picture in Hue, reducing congestion and fostering a more peaceful, safe, and livable city. Therefore, it's crucial to increase the proportion of students using bicycles at the primary, secondary, and university levels.

The total student population in Hue City is 88,000, making up approximately 18% of the city's population. By encouraging about 20-30% of primary school students (grades 4 and 5) and 30-50% of secondary and high school students to use bicycles, the bicycle usage rate on the roads could increase to between 6.0% and 8.6%. It's crucial for the city to prioritize bicycle infrastructure and enhance the traffic environment for safer commuting, making parents feel confident about their children cycling to school.

The number of university and college students exceeds 50,000, accounting for about 10% of the population. Therefore, a 10% increase in the number of university and college students using bicycles would contribute to a 1% increase in the overall bicycle usage rate on the roads.

⁷ In Utrecht, the Netherlands, secondary school students from ages 12 to 16 use bicycles to commute to school daily, with a rate of 85%. Therefore, parents can be fully reassured, as they do not need to provide transportation and do not have to worry about the traffic safety of their children.

Table 3: Potential bicycle users

Dung lượng thị trường và khả năng huy động									
TT	Nội dung	Dân số	Tổng lượng khách DL lưu trú qua đêm (2019 - 1.880.543 lượt)	Học sinh cấp 1	Học sinh cấp 2	Học sinh cấp 3	Sinh viên ĐH-CD	Lao động hành chính (50% toàn tỉnh)	Tỷ lệ xe đạp tiềm năng đạt được (%)
A	Số liệu thống kê								
1	Số người	491.346	12.442	44.435	26.865	16.466	51.608	153.127	
2	Tỷ lệ so với Dân số		2,5%	9,0%	5,5%	3,4%	10,5%	31,2%	62,1%
B	Khả năng huy động								
1	Hiện trạng (2023)	1,5%							1,5%
2	Giả định 1: 10% học sinh các cấp và các đối tượng khác sử dụng xe đạp		0,25%	0,90%	0,55%	0,34%	1,05%	3,12%	7,7%
3	Giả định 2 - 20% học sinh các cấp và 10% các đối tượng khác sử dụng xe đạp		0,3%	1,8%	1,1%	0,7%	2,1%	3,1%	10,54%
4	Giả định 3 - học sinh cấp 2-3 30%, các đối tượng khác 20%		0,5%	1,8%	1,6%	1,0%	2,1%	6,2%	14,79%

5.2 Officials and Administrative Staff

Individuals of working age with regular commuting schedules and short travel distances, such as officials, administrative staff, and office workers, represent potential bicycle users. They should be the target of communication campaigns to encourage cycling. This demographic makes up about 30% of the population. If 10% of this group were to switch to cycling for their daily commute, the city could see an increase in bicycle usage by approximately 3.0%.”

Results from family interviews conducted by HealthBridge in March 2023 suggest that one of the reasons young families use motorcycles is the convenience of combining work commutes with school drop-offs and pickups. Therefore, if the city improves bicycle infrastructure and enhances traffic safety (including security), enabling students to travel to school independently on foot or by bike, it would simplify parents’ commutes, making the transition to bicycles easier.

Besides promoting the use of bicycles for sports and recreation, organizations could launch a campaign encouraging the use of bicycles one day a week. This initiative would contribute to building an image of the city as safe, peaceful, and attractive.

5.3 Tourists

Tourists in Hue have a strong inclination towards using bicycles to experience the serene lifestyle, fresh air, and easily explore historical sites, scenic spots, visit gardens, traditional villages, etc. Currently, there are cycling tours available in Hue, although the percentage of tourists using bicycles is relatively low. Bike rental services exist at tourist information centers, some homestays, and gardens, but they are not as widely popular as in Hoi An.

According to a survey conducted by HealthBridge in March 2023, only 35% of international tourists have used bicycles, while the figure is much lower for Vietnamese tourists, around 14%.

Improving the safety of the traffic environment and prioritizing dedicated lanes for bicycles will encourage tourists to use bikes for sightseeing and exploration in Hue. Additionally, expanding the public bike-sharing network and offering bicycle rental services at accommodations (hotels, homestays) will make it more convenient for tourists to use bicycles.

To achieve this goal, Hue needs to enhance communication about the benefits of cycling, promote cycling tours at accommodations, transportation hubs such as airports, train stations, tourist attractions, etc.

5.4 Other user groups

There are additional groups that may frequently use bicycles, including individuals who engage in cycling for sports and fitness, women who use bicycles for shopping, or those with short commuting distances, etc.

6 Bicycle lane network

6.1 Establishment process

In reality, the scenic pedestrian path and bicycle paths on both sides of the Huong River have catalyzed the development of cycling in Hue. They have not only spurred interest in recreational cycling but also led to the introduction of bicycle tour services and public bike-sharing initiatives. Importantly, these developments have fostered a sense of confidence among the public in a future of transportation that is green, clean, safe, and sustainable. This area has evolved into a central hub for various bicycle-related activities and events.

The Bicycle Development Plan for Hue City is grounded in the following information: (i) the proposed bicycle lane network by the Provincial Institute of Planning and Construction (refer to section 1.3); (ii) priority investment projects suggested by the Provincial Institute of Planning and Construction; and (iii) completed, ongoing, and planned road projects by both the province and the city. Notably, the priority projects of the province and city, along with those proposed by the Provincial Institute of Planning and Construction, are collectively geared towards the gradual establishment of a comprehensive and interconnected bicycle lane network on both sides of the Huong River.

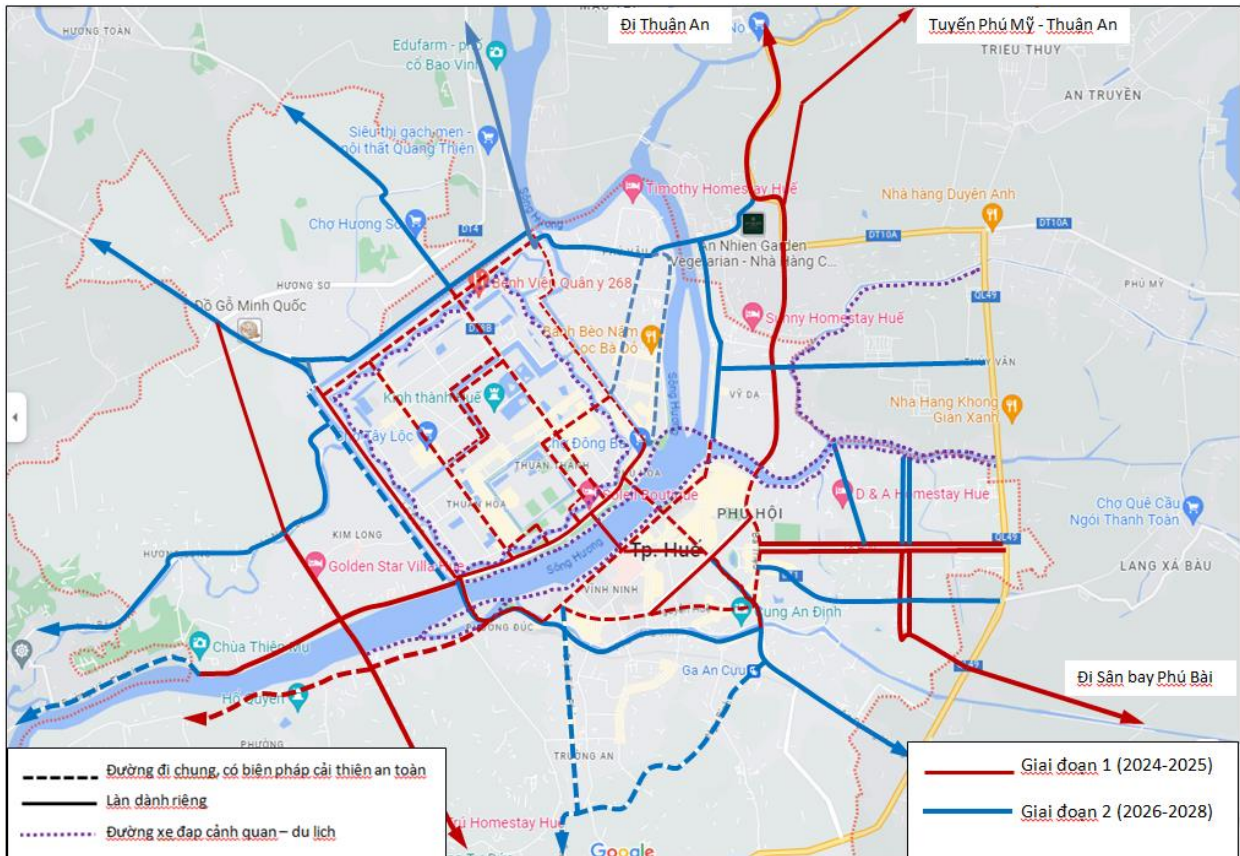


Figure 14: The core area of the bicycle lane network in the central area

Moreover, given its history as a bicycle-friendly city, Hue has naturally developed numerous low-speed areas (Zone 30). These include the Imperial City area, the central urban core on the southern bank of the Huong River, villages, and residential areas situated between river branches like Con Hen, Thuy Bieu, Kim Long, among others. The roads within these residential zones primarily consist of small, short routes, with low motorized vehicle traffic and slow movement, rendering them relatively safe. Therefore, implementing safety enhancements such as roundabouts, raised pedestrian paths, speed bumps, etc., for the main routes in these areas would genuinely ensure safety without the necessity of a dedicated bicycle lane.

Alongside the landscape bike paths along both sides of the Huong River, connecting the Imperial City area with the existing urban area on the southern bank of the Huong River will establish the core area of the bicycle lane network. Based on this foundation, the bicycle lane network will gradually expand. Enhancing traffic safety for bicycles in village areas/Zone 30 regions and implementing dedicated lanes for bicycles on major routes, connecting the Zone 30 areas, will contribute to forming a comprehensive bicycle lane network.

6.2 Implementation plan

The bicycle infrastructure development is planned to be rolled out in two consecutive phases:

- **Phase 1 - Core area development (2024-2025)**

Phase 1 concentrates on developing the core area by extending and linking landscape bike paths on both sides of the Huong River to the Imperial City area and the urban area on the river's southern bank. Lane separation measures will be implemented on some main trunk roads with adequate width and high vehicle flow, where safety is currently

not guaranteed. This aims to create seamless connectivity between the Imperial City area, landscape bike paths along both sides of the Huong River, and the urban center on the southern bank. Smaller roads will adopt safety improvement measures such as raised intersections, elevated pedestrian paths, speed bumps, etc., on main routes to truly ensure safety in these areas (Zone 30).

The establishment of the core area is vital as it encompasses around 70% of the population, administrative centers, tourist destinations, businesses, etc., laying the groundwork for expanding the bicycle lane network in subsequent phases.

The investment projects in Phase 1 are outlined in Appendix 1.

- **Phase 2 – Expand the bicycle network (2026 - 2028)**

Starting from the core area, the bicycle lane network will progressively expand. By enhancing traffic safety for bicycles in Zone 30 areas and establishing dedicated lanes for bicycles on major routes that connect the Zone 30 areas, a comprehensive bicycle lane network will be completed.



Image a



Image b

Figure 15: The slogan "Build it and they will come" has become a reality in the Netherlands. Image a - Dutch streets in the 1960s-70s and Image b – Dutch streets today (Source: <https://www.dutchcycling.nl/>)

Each year, and following each phase, the city will review and evaluate the outcomes, identify suitable or unsuitable points, address challenges, obstacles, and existing issues, among other considerations.

6.3 Typical cross-section presentation

Depending on the specific conditions of each road, including traffic conditions, buildings, services, and parking needs, the bicycle lane can be implemented as follows:

- For roads narrower than 10.5 meters: The road should be organized for shared use by bicycles and other vehicles. Safety measures for bicycles, such as roundabouts, raised pedestrian paths, speed bumps, etc., should be implemented to ensure that the maximum travel speed of all vehicles does not exceed 30 km/h."
-

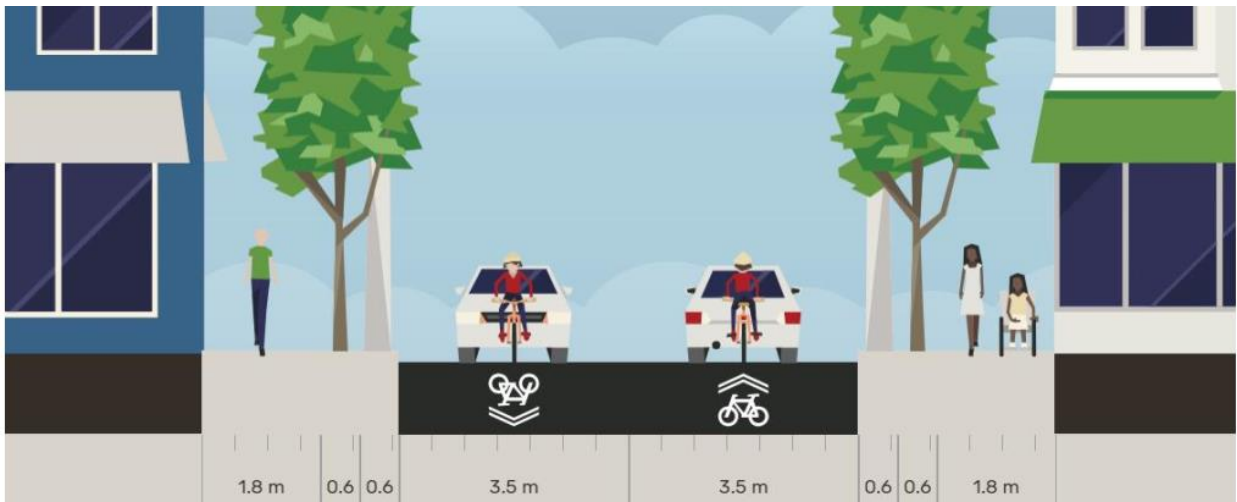


Figure 16: Illustration of cross-section for roads narrower than 10.5 meters – shared bicycle and motorized vehicle lane.

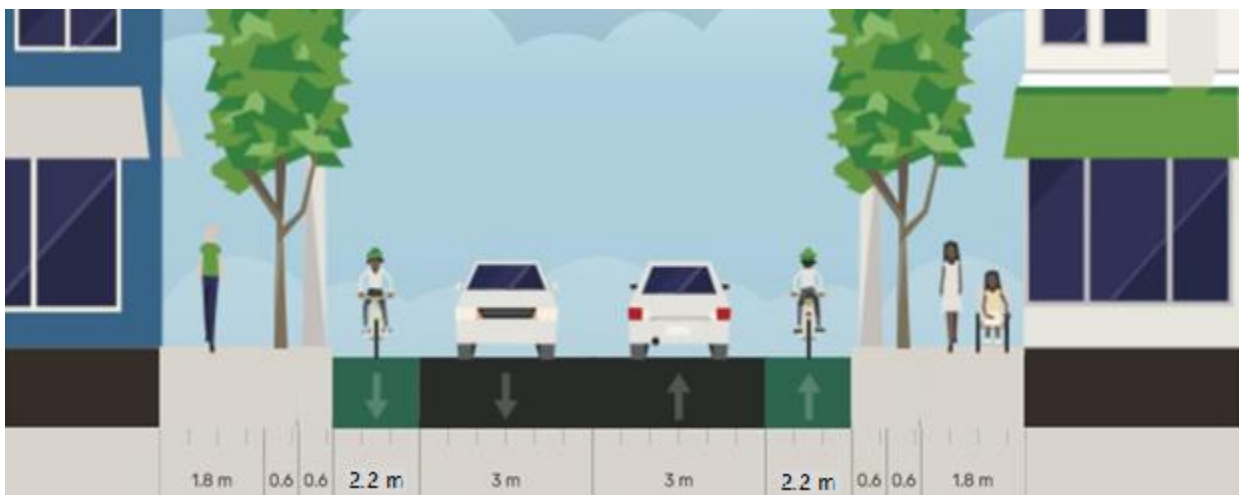


Figure 17: Illustration of cross-section for roads 10.5-15.0 meters wide – Bicycle lanes are separated by painted markings.

- For roads with a width ranging from 10.5 to 15.0 meters: The bicycle lane should be separated by painted markings and can be combined with a 2.5-meter-wide parking strip on one side. The use of a bicycle symbol (marking 9.6 according to QCVN 41:2019/BGTVT), colored paint patches (similar to those in Hoi An or with a specific design for Hue), and the installation of bicycle lane signs (Signs R.412h and R.413p according to QCVN 41:2019/BGTVT) are necessary to enhance visibility and clearly establish the ownership of the bicycle traffic space. Motorized vehicles (including cars and motorcycles) are not allowed to encroach (enter or stop, park) on the bicycle priority space and must be penalized if they deliberately violate this rule.
- For roads wider than 15.0 meters: The bicycle lane should be separated using physical measures such as bollards, tree planting strips, flower pots, combined with a 2.5-meter-wide parking bay on one or both sides. Motorized vehicles (including cars and motorcycles) are not allowed to encroach (enter or stop, park) on the bicycle priority space and must be penalized if they deliberately violate this rule.

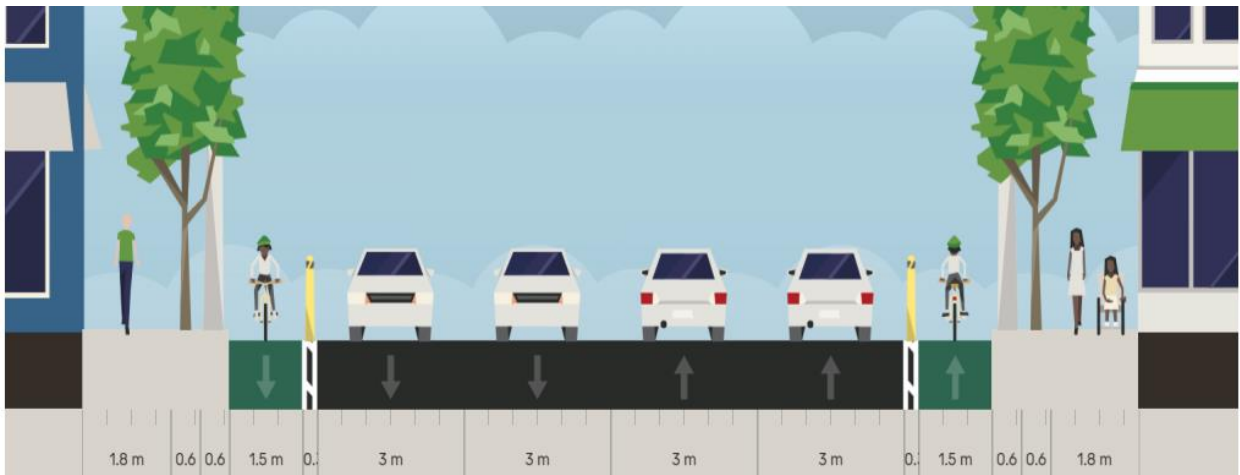


Figure 18: Illustration of cross-section for roads 15.0 meters and wider – Bicycle lanes are separated using physical measures (bollards, flowerpots, parking bays, etc.)

7 Public bike sharing

Public bike-sharing is an integral part of the bicycle development program.

Given its excellent accessibility and considering the high flexibility of other public transport modes (such as buses and urban railways, with high speed), bicycles can provide great support to the public transport system. They should be regarded as an indispensable mode of the modern public transport system that Hue is striving for.

This serves as the basis for the establishment of the public bike-sharing system "Hue Smart Bike." Investing in the development of bicycle infrastructure and the public bike-sharing system should be seen as an investment in the modern public transport system. This is intended to enhance convenience, expand transportation options for residents, and promote a shift in their daily commuting preferences within the city.

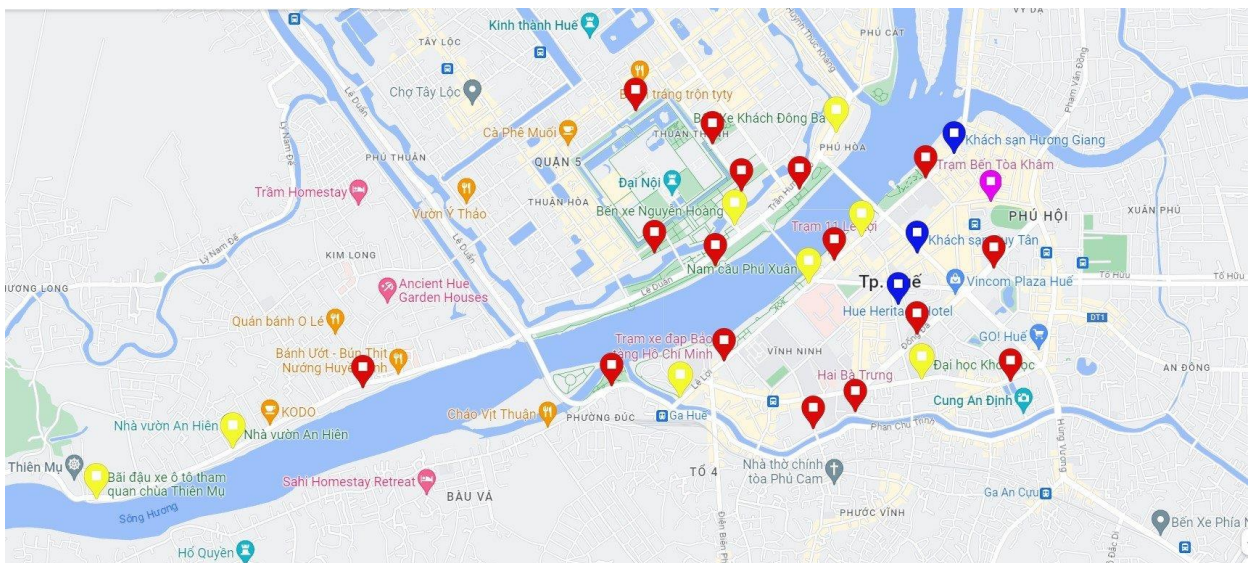


Figure 22: Proposed layout of Hue Smart Bike parking stations in Phase 2 (VietsoftPro, 2023).

The public bike-sharing network needs to have sufficient density and broad coverage, ensuring effective connections with transportation hubs (railway stations, airports, parking facilities), public transport stops, tourist attractions, and densely populated areas like hotels, offices, schools, etc.

The public bike-sharing service should be regarded as an integral component of the public transport system, and the city should implement supportive policies, such as tax incentives and free station spaces, to encourage its development.

The Hue Smart Bike public bike-sharing service is planned to expand its coverage to 27 stations with 500 bicycles in phase 2 (2023-2024), followed by 1,000 bicycles with 50 stations by 2025, Further expansion will be determined upon the actual situation.

8 Solutions and activities for coordination and support

Bicycle transportation has many benefits, such as: freeing up public spaces for people and social activities, reducing traffic congestion and air pollution, creating a livable city, boosting tourism appeal, enhancing human health, and more. Some of these benefits can be monetized, but others are harder to measure in monetary terms. To realize these benefits, the city will implement various solutions and activities for coordination and support. Appendix 3 provides more details.

8.1 Policy development

8.1.1 *Develop policies to promote bicycle transportation*

The important role of bicycles, as well as the equality of bicycles compared to motor vehicles, will be included in Hue city's urban development policies and investment in transport infrastructure development. For instance, bicycle-friendly infrastructure will be part of zoning and detailed plans, as well as new and improved road projects. Based on this, the city will make clear plans and budgets for projects to build bicycle lanes and improve cycling safety.

8.1.2 *Develop policies for traffic safety and limit the use of personal motor vehicles*

In addition to investing in infrastructure and implementing policies to promote bicycle use, the city will also develop policies and integrate safe speed management programs to improve overall traffic safety level and restrain the use of personal motor vehicles in urban areas into new road construction investment projects and road improvement and upgrading projects. This will aim to encourage the shift of mobility modes in the city, from personal motor vehicles to bicycles and other modes of sustainable transport.



Figure 19: Streets prioritize bicycles (Source: MoC, 2023a)

To limit personal motor vehicle use, the city may: (i) divide one-way roads, ban vehicles from certain roads and areas with cones or signs to prohibit or restrict access to licensed vehicles during specific hours; (ii) develop parking policies and fees, organize parking efficiently, and prevent cars and motorbikes from occupying bicycle space. This will make bicycles more competitive.

8.1.3 Develop financial schemes

In addition, the city will also build a mechanism to mobilize financial resources and provide financial support for bicycle development. They include charging car parking fees to fund bicycle infrastructure, lowering taxes for bicycle service providers, allocating tourism revenue for bicycle projects.

The city supports businesses and organizations that promote bicycle use by offering tax incentives. For example, businesses and stores that provide free or safe bicycle parking for customers, or lend bicycles to customers for free, can benefit from lower taxes. Moreover, by encouraging customers to use bicycles, organizations and businesses such as restaurants, hotels, and supermarkets can save parking space. Restaurants, hotels and supermarkets can provide fee bicycle parking and reduce their service prices for their bicycle-using customers.

These policies will motivate people to choose bicycles over motorized vehicles.

8.2 Develop safe and convenient bicycle infrastructure

8.2.1 Improve bicycle traffic safety

The city will enhance traffic safety for cyclists by creating priority lanes for bicycles on main roads and implementing other solutions, such as: raised intersections and crossings, speed humps, bumps, and buffers, bicycle priority signals and signs, paved roadbed and bicycle boxes, narrower lanes (3.0 m or less). These measures are suitable for Zone 30 areas and shared roads with a width of less than 10.5 m. By improving bicycle safety, the city will encourage more people to cycle more often and comfortably.

8.2.2 Increase trees and shades

Planting trees and creating shade for pedestrians and bicycle users plays a very important role in encouraging people to use these two modes of transportation.

8.2.3 Arrange bicycle garages and bicycle racks

The city will provide bicycle racks and garages at public locations, crowded places, and public transport sites to protect bicycles from theft and weather damage. Some agencies and schools already have safe covered parking for bicycles.

Bicycle racks will be available on sidewalks, at bus stations, parking lots, restaurants, hotels, supermarkets, and other transit points.

The city will also ensure that bicycle parking is well-organized and orderly, to prevent people and tourists from leaving their bicycles randomly, which can harm the urban beauty, traffic flow, and business activities.

8.2.4 Organize parking properly

On roads with designated bicycle lanes, car parking will be arranged after ensuring enough space for bicycles and space for vehicles to circulate. For roads located in the Zone 30 area, cars are allowed to park, but parking space will be arranged after ensuring space for vehicles to circulate.

8.3 Improve enforcement and handling of violations

The city will enforce the law to protect cyclists from motor vehicles that invade or block bicycle lanes. Cars and motorbikes that stop or park in bicycle lanes will face fines.

Effective law enforcement will make cyclists feel safe and confident on the road, parents will allow their children to bike to schools, and encourage more people to use bicycles.

8.4 Strengthen communication and increase public support

The city will communicate its bicycle policies effectively, based on its successful investment in infrastructure and law enforcement that ensure bicycle safety.

The communication will focus on the following messages to the public: (i) roles of bicycles as an integral part of the urban transport system and can help achieve green, ecological, sustainable, safe, and friendly urban development by shifting mobility modes; (ii) benefits of cycling for health and environment; (iii) promote Hue as a bicycle-friendly city with many attractive bicycle tours and routes that showcase its cultural and natural heritage. The city will introduce images of Hue bicycles and bicycle tours along with other iconic images of Hue at various locations and platforms, such as airports, bus stations, tourist centers, attractions, streets, websites, and forums.

The activities will include:

- Regularly and continuously share to the public relevant information, such as the number of kilometers of bicycle lanes, the rate of bicycle uses by students and civil servants, and the number of bicycles sold in the city.
- Organize annual events to celebrate and promote bicycle culture, such as World Bicycle Day, World Environment Day, and Hue Bicycle & Ao Dai Festival.
- Launch a campaign to encourage bicycle use, starting with officials, civil servants, and students.
- Educate the public about the impacts of climate change, the goals of green and sustainable urban development, and the importance of traffic safety; highlight the benefits of bicycles and the harms of motorbikes and cars; link bicycles with tourism development and community health improvement.
- Provide education on traffic laws and culture and offer courses on safe cycling for students.
- Inform about the penalties for violating traffic rules or misusing bicycle infrastructure when riding bicycles on the road.
- Host competitions on traffic safety for cyclists, such as writing, scripting, video-making, and photography contests, with various topics to engage people from different backgrounds, ages, and genders.
- Arrange workshops, conferences, and seminars on topics related to bicycle transportation, urban planning and sustainability, urban development, and traffic safety.

8.5 Develop relevant professional capacity

The following activities will be conducted for training and capacity building:

- Collaborate with local and international organizations to hold seminars and forums on bicycle development best practices;
- Enroll officers in short-term and long-term training courses on traffic management, safety, and bicycle infrastructure development;

- Arrange study tours to other cities for relevant department officials;
- Invite researchers, planners and managers to Hue to explore, learn and exchange insights, and share information on developing green, sustainable, and safe cities;
- Communicate and exchange information and experiences with national and international cities and experts on traffic planning and management for ongoing improvement.

8.6 Statistic and research

The city will prioritize statistics and disseminate information on the city’s planning and traffic situation, including bicycles, for public awareness and research purposes. Moreover, the city will foster research and implementation of sustainable planning and traffic solutions.

9. Funding and capital sources for implementation

9.1 Investment costs

Building dedicated bicycle lanes and enhancing bicycle safety are much cheaper than investing in motor vehicle infrastructure. For instance, in Portland, USA, the cost of constructing 500 km of bicycle paths equals the cost of building 1 km of highway (Portland BOT, 2010).

Based on the reference of the investment cost of creating bicycle priority lanes in Southeast Asia, which is about 750 million - 1.1 billion VND/km (Yanocha & Mawdsley, 2022), and in Hoi An, which is about 350-400 million VND/km (in 2019), the cost of separating bicycle priority lanes in Hue is estimated at about 400 million - 1.0 billion VND/km. This depends on whether bicycle lanes are separated by paint lines or physical barriers. Additionally, management and measures to enhance bicycle visibility and safety, such as humps, speed bumps, signs, signal lights, trees, etc., are also considered. Therefore, the cost of building 1 km of urban road (about 10-12 billion VND/lane/km) can be sufficient to build 10-30 km of bicycle priority lanes (Ministry of Construction, 2023b; Hong Khanh, 2023).

Table 4: (Estimated) Investment cost for development of a bicycle lane network in Hue city

No.	Activities	Unit	Period 1 (2024- 2025)	Period 2 (2026- 2028)	Total	Note
A	Infrastructure	Billio n VND	73	105	178	
1	Dedicated bicycle lane (roads of more than 10.5 m wide)	Km	42	15	57	Costs for painting, signs, trees, bicycle signals (separated by paints or protected barriers), improvement of intersections.
		Billio n VND	42	15	57	
2	Shared road, safety improvement (width of 7.0-10.5 m)	Km	25	73	98	Wide raised crossings, speed bumps, signs.
		Billio n VND	11	30	41	
3		Km	50	153	203	

	Roads in zone 30 (width of less than 7,0 m)	Billio n VND	20 tỹ	60 tỹ	80 tỹ	Applying some measures to improve safety
4	Landscape bicycle routes (under the Province's investment projects)					The city is constructing several landscape bike and walking routes along the river, on the Upper Citadel and around the Citadel. These routes are for walking and cycling only. Other vehicles are prohibited. The investment budget is from the provincial projects, not included in this budget.
B	Communication	Billio n VND	9.5	14.2	23,7	
1	Cost for writing about bicycles, climate changes, green urban development	Billio n VND	0.1	0.15	0,25	Two articles per month
2	Organize annual cycling events	Billio n VND	6.0	9.0	15,0	03 events per year. Each event is one billion dong.
3	Bicycle-related activities of officials, students, and youth groups	Billio n VND	2.4	3.6	6,0	Each event/ group/ month
4	Costs for organizing training on Road Traffic Law, safe cycling for students	Billio n VND	0.96	1.44	2,4	4 schools/ month
C	Capacity building	Billio n VND	0.8	1.0	1,7	
1	Training, experience exchanges	Billio n VND	0.05	0.075	0,125	Once per six months
2	Workshops, conferences on bicycle development, traffic	Billio n VND	0.2	0.3	0,5	Once per six months

	safety, sustainable urban development					
3	Study tours to other cities in the country	Billio n VND	0.1	0.15	0,25	Three officials/ year
4	Study tours to other cities in other countries	Billio n VND	0.4	0.6	1,0	Two officials/ year
Total		Billio n VND	83,2	120.2	203.4	

Note: This estimated budget does not include roads in new residential areas which are under the investors' management and have not been handed over to the city government.

The estimated investment cost for the bicycle road network development in Hue from 2024 to 2028 is about 200 billion dong, divided into two phases: 83 billion dong for phase 1 (2024-2025) and 120 billion dong for phase 2 (2026-2028). This budget covers the costs of separating bike lanes, enhancing bike lane visibility, and implementing safety measures such as humps, speed bumps, signs, signal lights, and greenery. It also includes the costs of communication and capacity building activities.

Appendix 1 shows the list of investment projects and estimates.

9.2 Capital sources

9.2.1 Local budget

Funding to implement the Hue City Bicycle Transportation Development Plan is mobilized mainly from the city budget.

9.2.1.1 Development investment capital (public investment), planned annually

This capital source will be used to incorporate bicycle lane separation (for roads with a width of 10.5 m or more) and traffic safety and signal measures for bicycles in new road construction or sidewalk improvement projects (about 60-70 billion dong/year, based on total investment).

9.2.1.2 Transportation budget

This capital source (about 20 billion dong/ year) will be used to integrate safety improvement in Zone 30 (raised crossing, raised intersections, speed humps and bumpers) and paint to separate bicycle lanes (for roads wvth a width of more than 10.5m in regular improvement of the road.

9.2.1.3 Environment budget:

The city will include funding for building bicycle parking spots, bicycle racks, installing speed limit signs and priority lanes for bicycles in tree planting projects, building information Kiosks, and public restrooms, etc.

9.2.1.4 Toursm budget

The city requested funding support from Thua Thien Hue province for constructing bicycle and walking routes for tourism and recreation, and major roads under provincial management. These projects can utilize tourism revenue to build bicycle paths for the industry.

9.2.1.5 Preventative health budget

Bicycle development promotes health benefits and reduces medical expenses for people, so some of the preventive health budget can be allocated to bicycle investment.

9.2.1.6 Other budget sources from taxes and fees

Taxes and fees such as environmental fees, parking fees, and road fees can be used to fund bicycle infrastructure development.

9.2.1.7 Other funding sources

A small budget can be allocated from the Department of Culture and Information, public service units, and ward-level People's Committees for communication, training, and initiating campaigns of unions and local communities to support bicycle development.

9.2.2 Capital sources from the society

The city plans to mobilize capital sources from the society for a number of categories to fostering the autonomy, innovation, and adaptability of organizations, businesses, communities, and individuals.

9.2.2.1 Capital sources from businesses

Businesses and individuals can contribute fund and can be allowed to have their advertisement signs along bike routes.

9.2.2.2 Resources from local communities and residents

Local communities can contribute their opinions to designing concept, contribute to planting flowers and trees to create landscape for bike routes, contribute spaces for bicycle parking, etc.

9.2.3 International funding sources

Bicycles are an eco-friendly, sustainable, and safe way of traveling, which lowers GHG emissions. Therefore, many international organizations offer technical assistance for bicycle development. Hue should utilize these valuable resources (knowledge, expertise, and global connections) and access the support budget of up to 1-3 million USD per city. Some potential funding sources for bicycle infrastructure in Hue are: <https://sustainablecitieschallenge.org> và <https://bloombergcities.jhu.edu/bici>

Besides, the city is carrying out several projects with ODA from the Asian Bank (ADB), the Government of Japan (JICA), and South Korea (KOICA), among others, for water environment and Green City initiatives. The city can request these donors to include bicycle lane segregation and safety measures in their infrastructure funding.

Moreover, the Vietnamese Government is actively encouraging the establishment of a carbon credit market (Ngọc Hiền, 2023; Quang Thế, 2023; Thái Sơn, 2022; Thu Trinh, 2023). One carbon credit (equal to 1 ton of CO₂) is valued at around 5 USD (VTV, 2023). Based on the assumption that an average cyclist who travels 7.5 km/day can generate 1 carbon credit/year (Dutch Cycling Embassy, 2018), Hue city can earn over 300,000 \$US annually if 10% of its residents use bicycles for daily commute. Hence, investing in bicycle infrastructure will surely result in substantial income from carbon credit sales.

9.3 Fund mobilization mechanism

Table 5: Expected funding sources

T T	Items	Capital sources				Notes
		City budget	Businesses	Organizations, unions and individuals	International organizations	
1	Creating separate bicycle lanes on main roads	x	x		x	Bussineses and individuals can contribute funds and can be allowed to hang their advertisement boards along the routes. Cities can apply for international funding on bicycle development, traffic safety improvement, green transportation development, green-house emission reduction .
2	Building new bicycle routes for tourism which run through neighborhoods, villages, fields.	x	x	x	x	The city can support large item such as bridges and drainages, land allocations, site clearance; individuals can contribute lands; local enterprises, unions and inividucals can also contribute fund.
3	Organizing traffic, improve traffic safety (speed management measures, installation of bicycle signals, traffic signs and speed reduction measures, and traffic cameras)	x				Bussineses and individuals can contribute funds and can be allowed to hang their advertisement boards along the routes
4	Building bus stations, parking areas for cars and motorbikes (to prioritize roadbeds for bicycle lanes)	x	x			Encourage small-scale parking lots invested and operated by private businesses; Businesses 50%.
5	Public bike sharing system		x		x	Invested and operated by private enterprises or funded by international organizations. The city will support through tax policies and allocation of

						land for the bike sharing stations.
6	Building parking lots for bicycles, bicycle racks, roofed bicycle parking areas, or Xây dựng các bãi để xe đạp, giá để xe đạp, nhà để xe đạp, rain shelters		x	x		Encourage restaurants, hotels, supermarkets provide bicycle parking areas and free, bicycle parking;
7	Planting trees, green shades	x	x	x		Mobilize all resources in planting trees and creating shades on roads and along bicycle routes in particular.
8	Bicycle maps	x	x			Mobilize resources from tourism enterprises and individuals.
9	Communication	x				
10	Organizing workshops for experience exchange among countries, bicycle events	x			x	

10. Evaluation of the implementation results

The city will need to measure and evaluate Hue City's Bicycle Transportation Development Plan periodically, using the specific indicators and evaluation methods. Based on the measurement results, the city will adjust the implementation plan accordingly.

10.1 Evaluation indicators for final outcomes



Copenhagen, Đan Mạch: Máy đếm xe đạp trên cầu Nørrebrogade theo dõi lượng người đi xe đạp mỗi ngày và mỗi năm ở thành phố có 45% số hành trình đi làm hoặc đi học được thực hiện bằng xe đạp.

Copenhagen, Denmark: The bicycle counter on Norebrogade Bridge tracks the number of cyclists each day and each year in the city where 45% of the journeys to work or school are made by bicycle.

Figure 20: Sign indicating daily number of bicycle users in Copenhagen, Denmark (GDCl, 2023)

The final outcome of the bicycle development policies must be shown by the increase in the number of bicycle users on the road over time (month, quarter, year).

Hue aims to increase the rate of bicycles on the road from 1.5% in 2023 to 3% in 2025 and 5% in 2028, above 10% in 2030 and continue to increase in the following years.

To have comparable data, measurements will be carried out annually using the same method.

10.2 Intermediate indicators

A number of intermediate indicators can be used to evaluate each part of the implementation process, summarized in Table 7. For details, see Appendix 2.

The city will conduct a survey in 2024 to get the value of the initial indicators (2024). On that basis, the city will set goals for each stage.

Table 6: Evaluation indicators of the Plan implementation

TT	Indicators	Unit	Methods	Responsible departments
A	Final indicators			

1	Percentage of bicycle users on the roads (including electric assist bikes (hybrid bikes))	%	Counting at rush hours of working days from 16:00 to 18:00 at specific main roads, eg. Trần Hưng Đạo, Lê Lợi, vv. Methods: using cameras and counting when watching the record. Collecting data once at the same period each year, eg. every June.	Urban Management Department
B	Intermediate indicators			
1	Bicycle infrastructure			
	a. Number of km of dedicated bicycle lanes (commuting bicycles)	km	Collecting data from projects which are completed in the city. Collecting once at the same period each year, for example every June.	Urban Management Department
	b. Number of km of shared roads which are improved for bicycle safety (creating raised crossings, speed bumps, speed restriction signs, vv)	km		
	c. Number of intersections which are improved for traffic safety, have bicycle signals, and bicycle boxes	Intersection		
	d. Số km đường xe đạp cảnh quan, thể thao, giải trí (đi bộ kết hợp xe đạp)	km		
2	Use of bicycles at schools and offices			
2.1	Number of bicycle users at offices (%)	%	Administrative departments collect data and send to Urban Management Department. Collecting once at the same period each year, for example every Apr - June.	Urban Management Department
2.2	Number of bicycle users at primary schools (%)	%	Management Boards of the schools collect data once at the same period each year, for example every Apr, and send them to the Department of Education.	Department of Education
2.3	Number of bicycle users at secondary and high schools (%)	%		
3	Bicycle use for tourism			
3.1	Number of bicycle use by tourists	Tourists	Hospitalities collect data and send them to the Department of Information and Culture. Collecting	Department of

3.3	Number of hospitalities that have bicycle renting services	Hospitalities	data once at the same period each year, for example every Apr – Jun.	Information and Culture
3.2	Number of bicycle tours	tour	Department of Information and Culture collect data from tourism companies. Collecting data once at the same period each year, for example every Apr – Jun	
4	Public sharing bike system (number of stations and bicycles)	Bicycles, stations	Data from the operator. Collecting data once at the same period each year, for example every Apr – Jun.	Department of Information and Culture
C	Communication and capacity building			
1	Number of articles relevant to bicycles and infrastructure improvement for bicycles on the media (TV, newspapers, radios)	Articles, report ages	Department of Information and Culture collects data on the media	Department of Information and Culture
2	Number of events, activities on bicycles (including movements by students, youth unions, ...)	Events	Department of Information and Culture collects data on the media and from the unions.	Department of Information and Culture
3	Number of workshops, conferences relevant bicycle traffic safety.	Workshops	Department of Information and Culture collects data from units, organizations.	Department of Information and Culture
4	Number of officials participating in study tours on bicycle infrastructure, bicycle safety at home and abroad.	Persons	Department of Urban Management collects data from units, organizations.	Department of Urban Management

The city will conduct an annual survey using a consistent method to measure the progress against the assessment milestones. Based on the survey results, the city will adjust its goals, mobilize resources, and implement measures to achieve the desired outcomes.

11. Organization for implementation

The City People’s Committee delegates tasks to relevant units for the successful implementation of the Hue City Bicycle Transportation Development Plan as follows

- The Department of Urban Management will:
 - o Manage and coordinate the implementation and monitoring of the Hue City Bicycle Transportation Development Plan;

- Perform tasks related to investment management and development of bicycle infrastructure and traffic organization, such as: bicycle paths, signal lighting systems, trees, signs, traffic organization, parking organization and management, organization of traffic flows, and development of public transport and public bicycles;
- Supervise the integration of bicycle lane planning in zoning plans, new construction investment projects and street upgrading and renovation projects;
- Propose changes and adjustments to laws and regulations to suit the development of bicycle transportation, in the direction of encouraging people to use bicycles and protecting the rights of bicycle users;
- Coordinate with the provincial Department of Transport, Department of Construction, Department of Tourism and related units in integrating bicycle lanes in road construction investment projects;
- Report regularly to the City People's Committee on the implementation progress, challenges and problems, and recommendations for adjustment and supplementation from departments, branches and localities;
- The Department of Culture and Information will:
 - Lead and collaborate with relevant agencies and units to advise the City People's Committee on communication and dissemination of bicycle-related events and activities;
 - Promote bicycle tours to tourists and local people, in coordination with organizations/individuals;
- The Center for International Relations will:
 - Collaborate with international organizations and donors to organize seminars and events related to bicycle development;
 - Share lessons learned from bicycle development in other countries;
- The Department of Natural Resources and Environment will perform tasks related to planning, land management, and site clearance for bicycle transportation development;
- The Park and Greenery Center will: Plant and care for green trees, shade, and landscape for bicycle routes;
- The Department of Education and Training will:
 - Communicate and encourage students to use bicycles and walk to school, contributing to the image of Hue city as green, clean, beautiful, safe, and friendly;
 - Coordinate with parents in picking up and dropping off students to ensure safety and traffic order at school gates;
 - Collaborate with the Urban Management Department, City Police, local authorities, and relevant parties to ensure security and traffic safety in school areas, reducing the need for parents to use cars or motorbikes to drop off and pick up students.
- The Finance and Planning Department will develop financial plans and allocate fund to bicycle development activities;
- The City Police will ensure security and install security cameras; guide road users to the correct road section and ensure traffic safety; manage parking;
- Socio-political organizations (youth union, women's union, elderly association, etc.) will organize cycling movements and bicycle use activities; mobilize members to participate in activities to ensure cleanliness, safety, and greenery on bicycle routes;

- The People's Committees of wards, communes, and other professional departments and divisions will Implement assigned responsibilities and tasks;

12. Pilot projects

12.1 Goal of the pilot projects

Before the wide implementation of the Plan in phase 1 (2024-2025), the Department of Urban Management will collaborate with relevant units to select some road sections for pilot. The pilot aims to:

- Improve the capacity and knowledge of officials in relevant departments in applying design solutions to improve safety and organize traffic with separate lanes for bicycles.
- Evaluate the impact of design solutions and adjust them to suit the actual conditions;
- Engage relevant parties, people, and local communities to create social support for future activities.

12.2 The pilot details

The pilot details will consist of:

- Pilot separating bicycle lanes from road spaces for motor vehicles.
- Coordinating the separation of bicycle lanes with the parking organization for wide roads.
- Piloting some solutions to improve safety and speed management for shared roads. Organizing uninterrupted bicycle traffic at intersections.
- Collaborating with traffic police to maintain traffic order during the pilot period.
- Monitoring and evaluating impacts before and after intervention.

12.3 Pilot forms

12.3.1 Design work

- Organize a mini workshop/technical meeting.

At the workshop/ meeting, HealthBridge experts will give a presentation, summarizing the principles of bicycle infrastructure design and successful solutions at home and abroad. The Urban Management Department will provide current status drawings (printed and digital copies) and some basic information about the proposed pilot road section. Officials of relevant units will discuss, evaluate the current status, future aspirations, and apply new knowledge to devise design solutions. Members will collaborate and finalize the design which will be applied in the field.

The Urban Management Department will coordinate with relevant parties to organize a consultation session with the local community on the design plan through a community meeting to agree/revise the plan to make it more reasonable. HealthBridge staff will attend these meetings.

12.3.2 Pilot implementation at field

Use available and low-cost temporary materials such as paint, plant pots, traffic cones, old tires, wooden stakes, etc. to implement the pilot at field.

12.4 Pilot time

The pilot will be implemented as soon as possible, right after the Hue City Bicycle Transportation Development Plan is officially approved, expected in the first quarter of 2024.

The pilot time of each location at field will last about 1 week to 1 month, enough time to evaluate the impacts and effectiveness of the solution.

12.5 Participants to the pilot

Officials of relevant departments, sectors, communities, businesses and people in the area where the pilot will be implemented. It may include teachers and students of schools near the pilot site or using the pilot route for daily travel (affected / or benefited people).

12.6 Pilot budget

The budget for the pilot activities is not much and may include the following sources:

- Funding from international organizations and local businesses for some costs of materials used in the field, organizing meetings, etc.
- The local community and people directly participate and contribute their efforts in the project activities.
- The city budget, taken from the source of road maintenance and repair costs.

12.7 Selection of the pilot route

Table 7: Pilot projects

TT	Name of the routes	Length (km)	Pilot details
1	Kim Long-Nguyễn Phúc Nguyên Route (from Dã Viên bridge to Thiên Mụ Pagoda)	2,5 km	Separating bike lanes.
2	Đình Tiên Hoàng route (from Ngự Hà bridge to Thượng Tứ bridge)	2,0 km	Improve traffic safety, speed management in Zone 30
3	Tổ Hữu route (from Bà Triệu intersection to Đặng Thùy Trâm intersection)	1,0 km	Pilot separating bike lanes together with arranging parking properly.

Appendix 2: Logicframe “Hue Bicycle Transportation Development Plan in 2024 – 2028”

Vision/ Outcomes/ Impacts	The Hue City People’s Committee has developed a Bicycle Transportation Development Plan for Hue City, aiming to make Hue one of the first bicycle-friendly cities in Vietnam by 2030.				
Intermediate/ Outcomes	Improve the traffic environment, ensure that people and tourists of all ages can move safely, comfortably and conveniently by bicycle; Shift urban mobility modes, reduce dependence on private motorized vehicles.				
Key strategies	Policies	Infrastructure	Communication	Enforcement	Capacity improvement
Immediate results/ Objectives	- Enhance policies that encourage bicycle transportation and discourage private motorized vehicles, fostering a shift to sustainable and eco-friendly mobility modes.	- Build a safe and extensive transportation infrastructure for bicycles. - Provide utilities and support services for cyclists.	- Promote cycling awareness among residents and tourists; Enhance the image of bicycles as a distinctive and symbolic transportation mode for Hue. - Increase the participation of people, local communities and tourists in bicycle development activities such as: taking day trips by bicycle, supporting initiatives to improve bicycle safety, creating infrastructure for bicycles and bicycle tours, joining bicycle events.	- Strengthen law enforcement and handle traffic violations (especially violations of bicycle spaces and speed violations). - Strengthen social security, preserve and maintain the image of the ancient capital as safe, peaceful and friendly. (The city has no theft, robbery, or kidnapping; the streets are safe, so that parents can allow their children go out and go to school on their own,	- Enhance capacity of local technical units on organizing and managing traffic and designing safe bicycle infrastructure.

			- Grow the number of cities that support and participate in bicycle transportation development	bicycles left on the street are not stolen, etc.).	
Activities	<ul style="list-style-type: none"> Develop a traffic safety policy for bicycles, limit the use of personal motor vehicles (cars, gasoline motorbikes and electric motorbikes) by: setting the priority order for moving vehicles in urban areas, zone 30, designing solutions, regulating and managing traffic, organizing and managing parking. Establish a mechanism to mobilize financial resources and mechanisms for bicycle development. 	<ul style="list-style-type: none"> Survey and evaluate the current state of traffic and urban development, and research experiences in bicycle development in Vietnam and other countries. Develop an action plan and annual budget for bicycle development. Plan a main road network with bicycle lanes, zone 30 areas, and many shortcuts (through areas, buildings, fields, around schools, and along the water with beautiful scenery for bicycles), especially for students and tourists. Pilot a number of bicycle safety solutions on some main roads, ensuring compatibility with actual local conditions. 	<ul style="list-style-type: none"> Develop a communication program, including: (i) media training on bicycles; (ii) a communication campaign to raise awareness of residents and tourists about the importance of bicycle transportation, physical health benefits, climate change, and air pollution caused by motorized vehicles. Organize events and movements to encourage the use of bicycles among people, officials, civil servants, students, and tourists. Promote the image of Hue cycling city on mass media, create art statues of female students wearing ao dai and cycling at the airport, train station, bus stations, and city 	<ul style="list-style-type: none"> Install surveillance cameras for traffic safety and security on main roads and bike lanes. Develop and improve management procedures and deploy traffic enforcement teams (for issues such as wrong-way driving, bike lane encroachment, speeding, illegal parking, etc.). Set up local security forces, collaborate with residential groups, local communities, and youth unions to ensure safety for students on the roads near schools before school hours in the morning and after school in the afternoon, manage traffic and ease congestion. 	<ul style="list-style-type: none"> Partner with local and global consultants, universities, and research institutes to conduct training and seminars on best practices for designing safe bike infrastructure and managing traffic. Organize study tours to learn from cities in Vietnam and other countries that have successfully developed bike networks and traffic systems. Assign qualified staff to attend local and foreign training and seminars on designing safe bicycle infrastructure and organize and manage bicycle transportation systems.

		<ul style="list-style-type: none"> - Implement investments to improve infrastructure, amenities, and services for bicycles according to the Plan (e.g., priority lanes for bicycles, signage systems, direction signs, bicycle signal light systems, traffic monitoring camera system, planting trees, and sharing bicycles). 	<p>gateways. These statues will showcase the unique and symbolic transportation mode of Hue;</p> <ul style="list-style-type: none"> - Organize bicycle tours that involve the community and local residents; - Organize community discussions and idea competitions to solicit design solutions for improving traffic organization and safety for bicycles on some school routes. - Actively participate in international forums and conferences, both domestically and internationally, to expand cooperation, share bicycle development experiences with other cities, and seek donors and partners for technical support. 	<ul style="list-style-type: none"> - Encourage people and communities to: (i) follow traffic rules, respect bike lanes, and give priority to pedestrians and cyclists; (ii) contribute to security and student safety around the school; (iii) create a green and welcoming environment for bikes by planting flowers and trees. 	<ul style="list-style-type: none"> - Develop project plans to promote bicycle transportation and seek funding and technical assistance.
Implementing resources	<ul style="list-style-type: none"> - City budget, Capital construction investment, and budget for road 	<ul style="list-style-type: none"> - State budget, provincial budget, city budget for new projects, 	<ul style="list-style-type: none"> - City budget. - Budget for tourism development 	<ul style="list-style-type: none"> - City budget. - Mobilize contributions from businesses. 	<ul style="list-style-type: none"> - Funding from international organizations.

	<p>maintenance and improvement.</p> <ul style="list-style-type: none"> - International funding. 	<p>improvement and upgrading projects.</p> <ul style="list-style-type: none"> - budget for road maintenance and improvement. - International funding. - Budget for tourism development. - Non-state budget (businesses, local communities, private-public partnership). - Revenues from car parking fees, rental fees of urban infrastructure 	<ul style="list-style-type: none"> - Mobilize resources and contributions from enterprises, and tourism companies; - Mobilize participation from local communities. - Other funding sources. 	<ul style="list-style-type: none"> - Mobilize participation from local communities. 	
Các chỉ số đánh giá hoạt động	<ul style="list-style-type: none"> • # of proposed and implemented policies. 	<ul style="list-style-type: none"> • # of investment fund for bicycle infrastructure improvement. • # of projects on bicycle infrastructure improvement (# of km of bike lanes; # of km of lanes with speed limit of 30km/h, prioritized bicycles. # of intersections that are improved for bicycle safety) 	<ul style="list-style-type: none"> • # of articles support bicycle transportation. • # of communication events organized • # of movements launched • % of locals and tourists know about the plan/ support bicycle transportation. • # of bike tours. 	<ul style="list-style-type: none"> • # of solutions for bicycle safety improvement which are implemented successfully. • # of violations to traffic rules, encroachment to bicycle spaces. • # of students walking and cycling to schools. 	<ul style="list-style-type: none"> • # of workshops, training courses on designing bicycle infrastructure. • # of staff participated in training courses, study tours at home and abroad. • # of proposals on bicycle transportation development. • # of donors.

		<ul style="list-style-type: none"> • # of installed bicycle amenities (signs, instruction boards, signal lights, traffic and security cameras, trees, #km of roads with tree shades) • # of Public shared bicycles under operation, widened service network. 	<ul style="list-style-type: none"> • # of initiatives, ideas contributed to improve bicycle safety. • Percentage of local residents and tourists using bicycle everyday (especially students and government staff) 		<ul style="list-style-type: none"> • # of experience sharing meetings/ workshops • # of cities sharing information and implementing bicycle development. • # of organizations (and individuals) contributing initiatives, technical experience and partnering to improve traffic safety and bicycle safety in the city.
Immediate indicators	Policies on bicycle development approved and implemented	Safe, connected and cyclist-friendly infrastructure is invested in and expanded every year. Percentage of bicycle trips increases by time, bicycle users increase by ages.	Changes in awareness of residents. Changes of percentages of bicycle users (residents and tourists) among road users.	Changes in road users' awareness.	Changes in awareness and capacity on designing safer bicycle infrastructure.
Intermediate indicators	- % of residents (especially students and government staff) using bicycle on road, shifting from motorbikes and cars to bicycles for daily trips to office and schools. Specifically: the percentage of bicycles on main roads at rush hours increases by time; the percentage of bicycles at parking houses of schools and office increases by time; the percentage of primary and secondary students walking and cycling to schools increases by time and students picked up by cars and motorbikes decreases by time. The percentage of tourists using bicycles in Hue.				

	<ul style="list-style-type: none">- # of infrastructure/ facilities improved; # of bicycle tours; # of new residential areas, tourist attracts, tourist areas connected to the bicycle lane network/ provide safe and convenient mobility, # of hotels, homestays and tourism offices providing bicycle rental services.- # of public bike sharing systems developed and with increasing number of bicycles in accordance with plan: from 500 bicycles in 2023 to 1,000 bicycles in 2024 and 2,000 – 3000 bicycles in 2030.
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