

PROPOSAL OF NEW LEGISLATION TO
SUPPORT GREEN CITY PLANNING
DECISION-MAKING PROCESS

(Establishment of Vietnam Green City Planning
Decision Support System)

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ABBREVIATION

MOC	Ministry of Construction
MPI	Ministry of Plan and Investment
PW	Public Work
SW	Solid waste
ĐMC	Strategic Environmental Assessment
HTKT	Infrastructure
KCN	industrial area
MĐXD	Building density
NVQH	Planning tasks
NUUP	National Urban Upgrading Program
QCXDVN	Vietnam Construction Standards
QHC	General planning
QHCHT	General urban planning
QHĐT	Urban planning
QHXD	Construction planning
QHV	Zoning
TCXDVN	Vietnam Construction Standards
TDTT	Sports
TTCN	Handicraft
VSMT	Environmental sanitation

I FORWARD

For Vietnam taking rapid steps in the context of globalization, institutions for urban planning has been established and have been adjusted in line with the status on socioeconomic development of Vietnam. In such conditions, the promulgation of the 2012 national green growth strategies and 2014 action plans has become a big turning point in the urban planning system. This has led to multiple research on urban development models such as smart city, green city, liveable city, eco city, low carbon city in Vietnam.

Regarding green city planning, Article 33 of the Law on Urban Planning states that green space, water surface and gardens are necessary for planning projects. Article 58(2) of the Law provides in the principle of management of urban space, construction and landscape, approval from competent management authorities should be obtained in taking measures affecting trees and Article 68 mentions the management of trees, parks and natural landscape and water surface in terms of urban greenery.

With regard to this matter, Article 15 (5)b of the Decree No. 37/2010/ ND-CP on Planning, Evaluation, Approval and Management of Urban Planning mentions that the content of basic planning projects of centrally-run cities determining green parks, greeneries and water surface suggests the orientation of spatial development of urban areas. Article 17 of the Decree provides that a general plan of a township or class-V urban center not yet recognized as townships should require the determination of parks and open space of urban areas in the direction of

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spatial development.

Also, the detailed plans in Article 20 of the Decree state that public trees, gardens, street trees and water surface are identified to be planning areas. The Enforcement Rules No. 34 of the Ministry of Construction (2009. 9. 30.) contain some provisions on urban greenery. The regulations on green parks suggest two greenery standards of urban greenery index (5-15m² per capita) and public greenery space (3-7m² per capita) to be used as basic data for classification of urban technical infrastructure system and urban areas.

However, the norm of green city in Vietnam is relatively new and many people still think that cities with many trees and water surface are green cities. Also, some urban areas of Hanoi and Ho Chi Minh known as eco cities have stopped the process of urban development. Issues of risks of reduction of ecological environment, loss of biodiversity and loss of quality and value of natural landscape and planning system have not been addressed in a rapidly changing society and the lack of integration of green space in urban planning is still unresolved in today's urban planning.

With these issues, the limitations of green city planning in Vietnam can be summarized into the followings:

- (1) Official definition of green city planning and establishment standards and principles under the legal framework in Vietnam is absent due to delayed implementation of establishment of green city and new urban ecology.
- (2) Urban planning is incomplete and causes waste of resources, environmental pollution and energy consumption.

- (3) Rapid urbanization and absence of plans have led to numerous urban issues such as lack of clean water and technical infrastructure. Environmental pollution, reduction of per capita space and reckless waste generation—especially solid wastes and drinking water—have worsened the conditions of habitats.
- (4) Conflict between industrialization and environmental protection; conflict between historical preservation and urbanization; conflict between renovation of existing villages and new town development
- (5) Unregulated development, imbalance of land use structure in case of conversion of agricultural farms into land for urban construction, change of industrial structure with difficulty in management
- (6) Budget for construction of necessary works (infrastructure, treatment facility to prevent environmental pollution, etc.) is still insufficient, becoming initial obstacles for creation and development of green cities.
- (7) Lack of human and physical resources in the sector of environmental protection
- (8) Low awareness on environmental protection and limited investment budget for environmental protection

In awareness of such issues, the Green City Planning Technical Support Project of Vietnam (Decision No. 984/Q-TTg) has been confirmed in 2016 with the approval of the Prime Minister to reinforce the establishment of green city planning. This project aims to support to serve as the exemplary case of green city through reduction of greenhouse gas emissions, climate change response, green gro

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with for sustainable goals and creation of eco-friendly cities. To implement such goals, this project has been conducted by setting the following scope and targets.

a) Scope of Project

- . Related to Green City Planning: Establishment of green city indicators and indexes
- . Support for Green City Planning: Establishment of green city planning decision support system
- . Securement of Implementation Capacity of Green City Planning: Commenting on enactment and amendment of legislation and provision of guideline
- . Securement of Implementation Capacity through Pilot Application: Application of green city master plan to Yen Binh city of Thai Nguyen Province and Rach Gia city of Kien Giang Province

b) Project Goals

- . Securement of substantive implementation capacity of national green growth strategies and action plans and sustainable development strategies and support for strengthening capacity of green city planning
- . Specification of norms, indexes and indicators of green city
- . Strengthening of capacity of using and analyzing relevant data on green city planning by using electronic systems and securement of rationality of preemptive climate change response and decision making process and objectivity

of decisions

- . Support for correcting and supplementing green city master plans of Yen Binh city of Thai Nguyen Province and Rach Gia city of Kien Giang Province, nationwide promotion of green city planning and enhancement of implementation goals
- . Reflection of results of actual research and establishment of legal framework for securement of implementation capacity of green city planning <introduction of guideline>

This report aims to support green city planning decision making process of Vietnam through commenting on support for amendment of legal documents for green city planning of Vietnam and proposal of new system. To this end, contents of recommendation have been suggested based on legal documents on current urban planning such as laws, decrees, enforcement rules, decisions and standards, along with suggestion of new systems. This is crucial legislative matters for Vietnam to respond to the currently pursued sustainable urban development and the urban paradigm shift.

II CONTENT PROPOSING THE INSTITUTIONAL ASSISTANCE FOR GREEN CITY PLANNING DECISION SUPPORT

1. LAW(NATIONAL ASSEMBLY)

1) Background

- Several legal documents have been issued relating to urban planning such as Urban Planning Law No. 30/2009/QH12; Construction Law No. 50/2015/QH13; Planning Law No. 21/2017/QH14 and some other relevant laws on urban planning. Under the Legislative Development Program, the Law on Urban Development Management is also being drafted. Laws have undergone many innovations as important legal instruments for orienting and controlling national and regional development. Therefore, the promulgated documents set out many guiding principles.
- However, in the context of sustainable development, almost all documents do not specifically mention the orientation of green city development, so there are no legal documents to support the implementation of urban planning in the green city model.
- Therefore, it is necessary to amend the Law on Urban Planning No. 30/2009/ QH12, suggesting some modifications in line with development requirements. Green city models in the future feature orientation for the development of green city model integrated in the Law on Urban Development Management currently being drafted.

2) Purpose

- To improve the system of legal documents, facilitate the development of multiple urban models in line with the trend of sustainable development for climate change response
- To serve as a tool for orientation and management for urban planning and development in the green city model

3) Concerned Provisions and Content of Recommendation

(1) For Urban Planning Law No 30/2009/QH-12

o *Article 1. Scope of regulation*

- This Law provides urban planning activities including elaborating, evaluating, approving and adjusting urban planning; organizing the implementation of urban planning and managing urban development according to approved urban planning.
- *Content of Recommendation: Expansion or integration of application scope including green city planning into urban planning*

o *Article 3. Interpretation of terms*

- *Content of Recommendation: Inclusion of norms on green city planning and green city plans*

o *Article 5. Principle of compliance with urban planning*

- Organizations and individuals shall comply with the regulation on implementat

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ion of programs and plans on urban construction and development, specialized plans within urban centers, urban land use plans and management of other construction projects and management of urban planning and architecture.

- Content of Recommendation: Integration of the principle of development and management for green city-oriented climate change response, reduction of greenhouse gas emissions and efficient use of resources into the principle of urban planning compliance

o *Article 6 Requirements on urban planning*

1. To concretize the orientation of the master plan on the national system of urban centers and related regional plans; to comply with the objectives of the strategy and master plan on socio-economic development, defense and security; to ensure consistency with branch development plans within urban centers; to ensure publicity and transparency and harmonious combination of the interests of the nation, communities and individuals;
2. To make scientific forecasts, meet practical requirements and be in line with the urban development trend; to observe urban planning regulations and other related ones;
3. To protect the environment, prevent catastrophes affecting the community, improve landscape, conserve cultural and historical relics and local traits through strategic environmental assessment in the course of urban

- an planning;
4. To rationally exploit and utilize natural resources, restrict the use of agricultural land, economically and efficiently use urban land in order to create resources for urban development, economic growth, assurance of social welfare, defense and security and sustainable development;
 5. To ensure synchronism in architectural space, system of urban social and technical infrastructure and underground space; to harmoniously develop different areas in urban centers;
 6. To meet the needs for houses, health, educational, cultural, sports and trade facilities, parks, trees, water surface and other social infrastructure facilities;
 7. To meet the needs for technical infrastructure including systems of roads, energy supply, public lighting, water supply and drainage, waste treatment, information and communication, and other technical infrastructure facilities; ensure smooth connection of technical infrastructure systems within urban centers and compatibility with regional, national and international technical infrastructure facilities.
- Content of Recommendation: Reflection and stipulation of green city-oriented matters such as reduction of greenhouse gas emissions, climate change response, green growth for sustainable goals, creation of eco-friendly cities into demands for urban plans

o *Article 8 Rights and responsibilities of competent agencies, organizations an*

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d individuals in commenting on and supervising urban planning activities

1. Domestic organizations and individuals have the right to comment on and supervise urban planning activities;
 2. Organizations and individuals have the duty to comment on issues related to their operations in urban planning activities;
 3. Agencies and organizations responsible for urban planning activities shall create conditions for commenting on and supervising urban planning activities;
 4. Comments of organizations and individuals on urban planning activities must be summed up, studied and publicized.
- Content of Recommendation: Reflection and integration of matters on green city planning activities into the rights and responsibilities of agencies, organizations and individuals to contribute comments and supervise urban planning toward green cities

○ *Article 13 Contents of state management of urban planning*

1. Formulating, and directing the materialization of, urban development orientations and strategies.
2. Promulgating, and organization the implementation of, legal documents on management of urban planning.
3. Issuing regulations and standards on urban planning, and regulations on management of urban planning and architecture.
4. Managing urban planning activities.

5. Propagating, disseminating and educating in the law and information on urban planning.
 6. Organizing and managing the training and retraining of human resources, research and application of science and technologies in urban planning activities.
 7. Conducting international cooperation in urban planning activities.
 8. Examining, inspecting and settling complaints and denunciations and handling violations in urban planning activities.
- Content of Recommendation: Reflection and stipulation of matters on orientation of green city planning, necessary standards for planning activities, nurturing and training human resources, international cooperation, etc. into the content of national management of urban planning

o *Article 14 State management responsibilities for urban planning*

1. The Government shall perform the unified state management of urban planning nationwide.
2. The Ministry of Construction shall take responsibility to the Government for performing the state management of urban planning; assume the prime responsibility for, and coordinate with state agencies in, performing the state management of urban planning.
3. Ministries and ministerial-level agencies shall, within the ambit of their tasks and powers and according to the assignment of the Government, coordinate with the Ministry of Construction in performing the state m

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anagement of urban planning.

4. The People's Committees at all levels shall perform the state management of urban planning in localities as decentralized by the Government.

- Content of Recommendation: Stipulation of green city planning into state management responsibilities on urban planning to spread green city planning nationwide for management under the state urban structure

o *Article 17 Orientations of the master plan on the national system of urban centers*

1. Orientations of the master plan on the national system of urban centers are formulated to determine the national network of urban centers as a basis for urban planning.

2. The Ministry of Construction shall base itself on the strategy and master plan on social, economic development, defense and security to formulate orientations of the master plan on the national system of urban centers and submit to the Prime Minister for approval.

- Content of Recommendation: Reflection of matters on orientation of green city planning based on green growth strategies and action plans into orientation of establishment of plans on state urban structure

o *Article 19 Urban planning responsibilities*

1. The Ministry of Construction shall assume the prime responsibility for, coordinate with the People's Committees of provinces and centrally run

cities in, organizing general planning for new urban centers of a planning for new urban centers with a projected population equal to that of urban centers of grade III or higher, and other planning assigned by the Prime Minister.

2. The People's Committees of provinces and centrally run cities shall organize general planning for centrally run cities, general planning for new urban centers, specialized technical infrastructure planning for centrally run cities, zoning planning and detailed planning for zones of a scope related to the administrative boundaries of two or more rural and/or urban districts, areas in new urban centers and areas of importance, excluding urban planning stated in Clause 1 and Clause 7 of this Article.
3. The People's Committees of provincial cities and towns shall organize general planning for provincial cities and towns, zoning planning and detailed planning within the administrative boundaries under their management, excluding urban planning stated in Clauses 1, 2 and 7 of this Article.
4. The People's Committees of urban districts shall organize zoning planning and detailed planning within the administrative boundaries under their management, excluding urban planning stated in Clauses 1, 2 and 7 of this Article.
5. The People's Committees of rural districts of a centrally run city shall organize general planning and detailed planning for townships, zoning

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planning and detailed planning within the administrative boundaries under their management, excluding urban planning stated in Clauses 1, 2 and 7 of this Article.

6. The People's Committees of rural districts of a province shall organize general planning and detailed planning for townships, excluding urban planning stated in Clauses 1, 2 and 7 of this Article.

7. Investors of construction investment projects shall organize detailed planning for areas assigned to them for investment.

- Content of Recommendation: Reflection of matters on green city planning into responsibilities of urban planning

○ *Article 22 Requirements on urban planning tasks*

1. Urban planning tasks must determine development viewpoints and objectives in response to the requirements of each urban center and each planned area as a basis for conducting studies to make urban plans;

2. Urban planning tasks must be approved by competent agencies under Articles 44 and 45 of this Law.

- Content of Recommendation: Reflection of visions and goals of green city planning into urban planning task

○ *Article 23 Contents of urban planning tasks*

1. General urban planning tasks must determine the nature and role of urban centers, basic requirements on studies to exploit the development potential, driving force and orientations, urban expansion, arrangement of

- the systems of urban social and technical infrastructure facilities in inner areas and suburbs; and requirements on strategic environmental assessment;
2. Zoning planning tasks must determine the boundary, area and nature of the planned area, the expected norms on population, land use and social and technical infrastructure; requirements and basic principles of zoning to ensure conformity in terms of architectural space and connection of technical infrastructure with the approved general planning and suitability with adjacent areas; and requirements on strategic environmental assessment;
 3. Detailed planning tasks must determine the limits of land use and population: requirements and principles of organization of architectural space, social and technical infrastructure in the planned area, ensuring conformity with approved general planning and zoning planning and suitability with adjacent areas; requirements on strategic environmental assessment;
 4. In case of planning the renovation and refurbishment of urban centers, planning tasks must identify requirements on studies to assure balanced and stable development of urban centers or planned areas, preserve architectural space and characteristics of urban centers and improve the people's living conditions;
 5. In case of planning new urban centers or urban quarters, planning tasks must identify requirements on studies to ensure synchronism and comple

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teness of the systems of social and technical infrastructure facilities in urban centers and connection with technical infrastructure outside urban centers, and modern architectural space and living environment.

- Content of Recommendation: Inclusion of content of green city planning tasks such as minimization of greenhouse gas emissions, green urbanization for environmentally sound and sustainable development and minimization of disaster damage induced by climate change into content of urban planning task

o *Article 24. Bases for making urban plans*

1. Strategies and master plans on socio-economic development, defense and security, orientations of the master plan on the national system of urban centers, regional construction planning and higher-level urban planning already approved.
 2. Approved sector planning.
 3. Approved urban planning tasks.
 4. Urban planning standards and sectoral standards.
 5. Topographic maps made by specialized survey and measurement agencies.
 6. Socio-economic documents and data on related localities and sectors.
- Content of Recommendation: Reflection of green growth strategies, green city urban planning tasks, green city index on green city planning, standards on green city planning and sectoral standards onto grounds for establishment

○ *Article 39 Content of strategic environmental assessment*

1. Strategic environmental assessment is part of a general plan, zoning plan, detailed plan and specialized technical infrastructure plan;
2. The content of strategic environmental assessment of an urban plan covers as follows:
 - a) Assessment of the present situation of the urban environment regarding hydrometeorological conditions; quality of water, air and ecosystem, geology; soil erosion; solid wastes, wastewater and noise; exploitation and utilization of natural resources; climate change; social issues, landscape, culture and heritage sites, as a basis for putting forward urban planning solutions;
 - b) Forecasts about environmental development in the course of realizing urban planning;
 - c) Comprehensive solutions to preventing, reducing and remedying environmental impacts and making environmental monitoring plans.
3. The Government shall specify the content of strategic environmental assessment of an urban plan.
 - Content of Recommendation: Reflection of strategic environmental assessment onto green city planning and inclusion of content of strategic environment assessment into prediction of environmental changes

○ *Article 43 Contents of evaluation of urban planning tasks and urban plans*

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1. Evaluation of urban planning tasks covers:
 - a) Compliance of urban planning tasks with socio-economic development, defense and security requirements and higher-level urban planning;
 - b) Content requirements for each type of urban planning tasks specified in Article 23 of this Law.
 2. Evaluation of an urban plan covers:
 - a) Eligibility of urban planning consultancy organizations as prescribed in Article 10 of this Law;
 - b) Grounds for making urban plans prescribed in Article 24 of this Law;
 - c) Compliance of urban plans with urban planning tasks and requirements prescribed in Article 6 of this Law and content requirements for each type of plan prescribed in Sections 3, 4 and 5, Chapter II of this Law.
- Content of Recommendation: Reflection of content of meeting goals of green city planning

(2) For Urban Development Management Law(Being Drafted)

- Content of Recommendation:
- The Law currently being drafted is designed for urban development and management which means urban plans cannot directly be reflected. However, it pursues directions of sustainable urban development where urban models such as smart cities, eco cities and green cities can be reflected.
 - New norms such as green city should be supplemented in the explanation of

terms.

- Urban development planning and management should be supplemented to promote green development planning and management with reflection of green growth.

2. LEGAL DOCUMENTS - DECREE

1) Background

- Where specific norms of establishment and implementation of green city planning are determined, the Law on Urban Planning will be amended to reflect such norms into general and universal legal norms of urban planning. Accordingly, Decree No. 37/2010/ND-CP which stipulates the detailed matters on planning, appraisal and approval of green city planning needs to be amended. In such a case, the matters and contents of the process of planning, evaluation and approval of green city planning should be supplemented in the regulations and content of the current Decree.
- However, for the Law on Urban Development Management currently being drafted to obtain the approval from the national assembly, how the matters on green city is connected and reflected onto regulation on urban development and management becomes a legislative issue.
- In consideration of such legislative issues, Decree No. 37/2010/ND-CP should be able to preemptively reflect green city planning and green city development models.

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2) Purpose

To harmonize institutional documents, facilitate the formal application of green city planning in Vietnam

3) Concerned Provisions and Content of Recommendation

(1) Decree No. 37/2010/ND-CP dated 7 April 2010

o *Article 14 Principles of formulating urban planning*

1. General planning shall be formulated for centrally run cities, provincial cities, towns, townships and new urban centers in line with orientations of the master plan on the national urban system:
2. Zoning planning shall be formulated for zones within cities and towns in order to concretize general planning, serving as a basis for determining construction investment projects and formulating detailed planning.
3. Detailed planning shall be formulated for zones within cities, towns and townships when making construction investment in order to concretize general planning and zoning planning, serving as a basis for elaborating construction investment projects and licensing construction
4. For a construction work built by a single investor on an area smaller than 5 hectares (or smaller than 2 hectares for investment projects to build apartments), a construction investment project may be elaborated without a detailed planning. General plan drawings, work architectural plans and technical infrastructure solutions in the concept design must comply with the zoning planning, ensure technical infrastructure connec

tivity and suit the architectural space of surrounding zones.

- Content of Recommendation: Reflection and integration of the principles of urban development and management such as green city-oriented climate change response, reduction of greenhouse gas emissions, efficient use of resources into the principle of urban planning

o *Article 15 Contents of a general plan of a centrally run city*

1. Analysis and evaluation of natural conditions and the present socio- economic situation; population and labor; land use; existing technical and social infrastructure facilities and environment of the whole city and each urban area
2. Identification of development characteristics, objectives and driving force
3. Identification of the population size, labor, area of urban construction land; land and social and technical infrastructure criteria for the whole city and each urban area to meet development requirements of different periods of 10 years and 20-25 years and the development trend over the next 50 years
4. Expected land use of the whole city to meet development requirements of each period
5. Urban space development orientations, covering:
 - a) Identification of a development model and spatial structure for the whole city:
 - Development orientations of the urban system in the city: size, functions and scope of the central area; locations, sizes, characteristics

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ics, functions, scope and development principles of other urban areas;

- Orientations of other functional areas throughout the city (industrial, agricultural, forestry, tourist, ecological, conservational and others): characteristics, area, scope and development principles;
- Development orientations of rural residential areas: locations of centers of commune clusters and commune centers; concentrated rural residential points and development models;
- Development orientations of spatial axes and urban development corridors of the city: characteristics and development principles.

b) Spatial development orientations for the central area, covering:

- Urban development and expansion directions;
- Identification of boundaries and areas of functional areas; areas to be converted in function; existing areas restricted from development; areas to be refurbished, renovated, conserved and embellished, new development areas, no-construction areas; and reserve areas for development;
- Identification of population density and land use criteria for urban planning and development principles for functional areas;
- Identification of the system of administrative centers, trade and service centers, public, physical training and sports centers; parks and open-space areas in the city; and municipal-level specialized centers;

- Identification of areas planned for the construction of underground works;
- Identification of architectural and scenic areas, central zones and gateways of the city, main spatial axes, major squares, tree areas, water surface areas and prominent spots in the city and proposed principles and requirements for spatial and architectural organization in these zones.

6. Development orientations for urban technical infrastructure:

- a) Development orientations for technical infrastructure in the whole city, covering:
 - General evaluation and selection of land for urban development: evaluation of topography and geological calamities, identification of non-construction areas and areas restricted from construction, identification of water basins and main drainage basin zones; water drainage directions and locations and sizes of water drainage works; identification of standard ground floor levels for the city and each of its zones;
 - Identification of the external transport network, including roads, railways, waterways and airways; locations and sizes of airports, seaports, river ports and railway stations; road routes, urban railway (overhead, on the ground and underground); identification of locations and sizes of external coach terminals;
 - Identification of reservoirs, water and power reserves, demands and

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supply sources; total volumes of wastewater and garbage; locations, sizes and capacities of key works and transmission and distribution routes of water and power supply, lighting, communication and water drainage networks; locations and sizes of solid waste treatment sites, cemeteries and other works for urban areas and other functional areas of the city.

b) Development orientations for technical infrastructure in central areas, including:

- Determination of water drainage basins, identification of rainwater drainage networks and standard ground floor levels in each area;
- Identification of major urban transport networks, urban railway routes and stations (overhead, on the ground and underground); organization of the mass transit system and the system of car terminals and parking lots (overhead, on the ground and under the ground); identification of red-line boundaries of urban trunk roads and the system of technical trenches and tunnels;
- Identification of locations and sizes of key works and major distribution networks of water supply, power supply, lighting, communication and water drainage systems.

7. Strategic environmental assessment

a) Evaluation of current conditions:

- Natural urban environment, hydro-meteorological, ecological and geological conditions, land erosion, natural resource exploitation and

- utilization and climate change;
 - Quality of water sources, air, solid waste, wastewater and noise;
 - Population, social, cultural and heritage issues.
- b) Analysis and forecast of positive and negative impacts on socio- economic development and urban environment; proposed system of environmental protection criteria for putting forward optimal solutions to spatial and technical infrastructure development.
- c) Proposed comprehensive solutions to preventing, reducing and remedying impacts on and risks to the population; natural ecosystem; water sources, air and noise in the course of implementation of urban planning.
- d) Formulation of environmental monitoring programs and plans regarding environmental observation, management and techniques.
8. Proposed priority development investment programs and implementation resources.
9. A 1:25,000- or 1:50,000-scale spatial and technical infrastructure development orientation map of the whole urban area for each period; a 1:10,000- or 1:25,000-scale spatial and technical infrastructure development orientation map of the central area for each period.
- Content of Recommendation:
 - Integration of contents oriented towards achieving green city targets in architectural planning and technical infrastructure planning
 - Request for strategic environmental assessment on green city indicators a

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nd formulation of policies and regulations to achieve green city targets in such areas

- Detailed Content of Recommendation:

1) Requirements for forecasting in the planning project

- Projections on population, labor, land, social infrastructure, technical infrastructure and other socio-economic contents must be based on the data series with the minimum period of the latest 5 years. The population projection must include the forecast of the current population.

- Forecasts should address issues related to natural disasters, the environment, climate change and sea level rise.

- The zoning planning and detailed planning must comply with and specify the forecasts of the entire urban center.

- The results of the forecast must be consistent with the tolerance and satisfaction of land, social infrastructure, technical infrastructure and environment.

2) Requirements for the organization of urban space and functional areas

as in urban areas

(1) Urban Space

- To ensure the convenient connection between central cities and other urban centers and special functional areas for cities with multi-city structures; To ensure the maintenance of buffer zones and ecological zones among urban centers;

- The planning must determine the boundaries of urban and regional development areas, which are limited (or not limited) to urban development and urban boundaries must be based on projections of population size, land and infrastructure .
- For urban areas planned to be expanded, urban boundaries must be based on the forecast of size, land and infrastructure and meet the requirements for land use.
- Urban space must suit the socio-economic conditions and land and infrastructure characteristics of each urban center and region to create a good and safe living environment for the population and maximize the advantages of natural conditions to preserve and promote the traditional and cultural identity.
- Land for urban development must be calculated and forecasted according to its development potential according to each planning stage. Civil land targets must be calculated according to the characteristics of each urban area, ensuring the principle of economical and efficient use of land.
- The scale of land categories other than civil use must be proved and calculated according to actual demands in combination with specialized planning; Industrial establishments and warehouses must be planned in safe locations, without polluting the environment.

(2) Urban Green Space Planning

- Green spaces in urban areas, including natural green spaces (forest

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s, hills, mountains, riverine vegetation, lakes and coastal areas) and artificial green spaces (parks, flower gardens, water surfaces) must be linked together into a continuous system.

- Natural green spaces need maximum protection and artificial green space must be appropriately distributed to ensure the convenience of use.
- Land use of green space in urban centers or areas defined in zoning planning must satisfy the objectives of the planning and suit the particularities of each urban center. Also, green space must be planned to ensure to be accessed and use by the public.
- Priority should be given to the use of indigenous trees, typical of regions and suitable to urban areas, and to protect rare and precious trees. The types of trees in urban centers must not affect the traffic safety and works including both underground and above ground and should not produce toxic or attractive insects that affect residential areas.

(3) Technical Infrastructure Planning

- The planning of technical infrastructure works must meet the needs of the region, in line with the forecasts of urban and rural development and other functional areas.
- The forecast of technical infrastructure works must be based on areas with current status data, projects, areas with similar conditions or selected criteria.

- Technical infrastructure planning must take into account the impacts of climate change and sea level rise.

o *Article 16 Contents of a general plan of a provincial city or town*

1. Analysis and evaluation of natural conditions and the present socio-economic situation; population and labor; land use; current situation of the construction of technical and social infrastructure facilities and urban environment.
2. Identification of development characteristics, objectives and driving force, population size, labor, area of urban construction land, land and social and technical infrastructure criteria for the city or town to meet development requirements of different periods of 10 years and 20-25 years.
3. Projected land use of the city or town to meet development requirements of each period.
4. Urban space development orientations, including:
 - a) Urban development model and directions;
 - b) Identification of scopes or sizes of functional areas in the city or town; existing areas restricted from development; areas to be refurbished, renovated, conserved and embellished; areas to be converted in function; new development areas, no-construction areas; and reserve areas for development; and areas planned for the construction of underground works for urban centers of grade III or higher;
 - c) Identification of population density and land use criteria for urban

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- planning and development orientations and principles for each functional area;
- d) The system of administrative centers, trade and service centers, public, physical training and sports centers; parks and tree and open-space areas; and specialized urban centers;
 - e) Development orientations for rural residential areas;
 - f) Identification of architectural and scenic areas, main spatial axes, public squares, gateways and prominent spots in the city or town; and proposed spatial and architectural organization in these zones.
5. Development orientations for urban technical infrastructure, covering:
- a) General evaluation and selection of land for urban development: evaluation of topography and geological catastrophes, identification of non-construction areas and areas restricted from construction, identification of water basins, flow division and main drainage directions; locations and sizes of water drainage works; identification of standard ground floor levels for the city or town and each of its zones;
 - b) Identification of the external transport network, urban roads, locations and sizes of such key transport works as airports, seaports, river ports and railway stations; external coach terminals; organization of the mass transit system and system of car stations and parking lots; identification of red-line boundaries of trunk urban roads and the system of technical trenches and tunnels;
 - c) Identification of water and power demands and supply sources; total vol

umes of wastewater and garbage; locations, sizes and capacities of key works and transmission and distribution networks of water and power supply, lighting, communication and water drainage and wastewater treatment facilities; locations and sizes of solid waste treatment sites, cemeteries and other works.

6. Strategic environmental assessment: as stipulated in Clause 7, Article 15 of this Decree.

7. Proposal of priority development investment works and implementation resources.

8. Spatial and technical infrastructure development orientations for the city or town for different periods, demonstrated on 1:10,000- or 1:25,000-scale maps.

- Content of Recommendation:

- Integration of contents oriented towards achieving green city targets in architectural planning and technical infrastructure planning
- Reflection of demands for strategic environmental assessment on green city indicators
- Establishment of detailed contents to achieve green city targets in the demands for strategic environmental assessment

o *Article 17 Contents of a general plan of a township or class-V urban center not yet recognized as townships*

1. Analysis and evaluation of natural conditions and the present socio-ec

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onomic situation; population and labor; land use; current situation of the construction of technical and social infrastructure facilities and environment in the township or urban center.

2. Identification of development objectives and driving force; population characteristics and size, labor, area of urban construction land; and social and technical infrastructure criteria for different periods of development.
3. Projected land use of the township or urban center in each planning period.
4. Urban space development orientations, including:
 - a) Urban development directions
 - b) Identification of scopes or sizes functional areas in the township or urban center; areas to be refurbished, renovated and conserved; new development areas, no-construction areas; and reserve areas for development
 - c) Identification of population density and land use criteria for urban planning and development orientations for each functional area
 - d) Identification of the administrative center, trade and service centers, public centers; parks and open-space areas in the township or urban center
 - e) Orientations for spatial organization, architecture and landscape for functional areas in the township or urban center, and main spatial axes
5. Development orientations for urban technical infrastructure, covering:

- a) General evaluation and selection of land for urban development; identification of standard ground floor levels for the whole township or urban center and each of its zones.
 - b) Identification of the external transport network, urban roads, locations and sizes of key transport works; identification of red-line boundaries of trunk urban roads and the system of technical tunnels.
 - c) Identification of water and power demands and supply sources; total volumes of wastewater and garbage; locations, sizes and capacity of key works and transmission and distribution networks of water and power supply, lighting, communication and water drainage; locations and sizes of solid waste treatment facilities, cemeteries and other works.
6. Strategic environmental assessment: As stipulated in Clause 7, Article 15 of this Decree.
7. Proposed priority investment projects and implementation resources.
8. Urban spatial and technical infrastructure development orientations for different periods, demonstrated on 1:5,000- or 1:10,000-scale maps.
- Content of Recommendation:
- Integration of contents oriented towards achieving green city targets in architectural planning and technical infrastructure planning
 - Reflection of demands for strategic environmental assessment on green city indicators
 - Establishment of detailed contents to achieve green city targets in the demands for strategic environmental assessment

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○ *Article 19 Contents of a zoning plan*

1. Analysis and assessment of natural conditions, real status of construction land, population, society, landscape architecture, technical infrastructure and the provisions of general planning related to the planning area.
2. Determining land use criteria for urban planning, social infrastructure and technical infrastructure for the whole planning area.
3. Master plan of land use:
 - a) Identification of functional areas in the planning area;
 - b) Identification of urban land use criteria for construction density, land use coefficients, and height for each street block; backward construction of the road axis; location and scale of underground works (if any).
4. Determining the principles and requirements for the organization of space, architecture and landscapes for each functional zone, main roads, open spaces, landmarks, central areas and conservation zones (if any).
5. Planning the system of urban technical infrastructure
 - The urban technical infrastructure system shall be arranged to the regional road network, covering the following contents:
 - a) Determining the construction level of each street quarter;
 - b) Identification of traffic networks, cross-sections, red-line boundaries and construction boundaries; Determining and concretizing the

general planning on the position, size of wharves, parking lots (overhead, above ground and underground); lines and subway stations; technical trenches and tunnels;

- c) Identification of water needs and sources; location, size of the plant, water pump station; water supply pipeline network and detailed technical specifications;
- d) Determining the use demand and power supply sources; location and size of distribution stations; medium-voltage power line and urban lighting system;
- e) Identification of information needs and networks;
- f) Determining the total amount of wastewater and waste; drainage network; and the location and scale of wastewater and waste treatment works.

6. Forecast of Priority Investment Project

7. Strategic Environmental Assessment:

- a) To assess the current environmental status of topographical conditions; natural condition; solid waste, wastewater, noise (if any); social, cultural and landscape issues;
- b) Analysis and forecast of positive and negative impacts on the environment; proposing a system of environmental protection criteria to provide optimal spatial planning solutions and technical infrastructure for the planning area;
- c) To propose solutions to minimize and remedy the impacts on the popula

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tion and the natural landscape; air, noise when implementing urban planning;

d) Environmental monitoring plan for technical, management and environmental monitoring.

8. The total land use planning and technical infrastructure system is shown on a scale of 1 / 2,000 or 1 / 5,000.

- Content of Recommendation:

- Integration of contents oriented towards achieving green city targets in architectural planning and technical infrastructure planning
- Reflection of demands for strategic environmental assessment on green city indicators
- Establishment of detailed contents to achieve green city targets in the demands for strategic environmental assessment

o *Article 31 Order and procedures for evaluating and approving urban planning tasks and plans*

1. Submitting and approving agencies

a) The Ministry of Construction shall evaluate and submit to the Prime Minister for approval urban planning tasks and plans falling within its formulating responsibility and those assigned by the Prime Minister;

b) Provincial-level People's Committees shall submit to the Ministry of Construction for evaluation and submission to the Prime Minister for

approval urban planning tasks and plans falling within the approving competence of the Prime Minister, excluding urban planning referred to at Point a of this Clause;

- c) Agencies organizing the formulation of urban planning mentioned in Clauses 3, 4, 5 and 6, Article 19 of the Law on Urban Planning shall submit to provincial-level planning management agencies for evaluation and submission to provincial-level People's Committees for approval urban planning tasks and plans falling within the approving competence of provincial-level People's Committees;
- d) Provincial-level urban planning management agencies shall evaluate and submit to provincial-level People's Committees for approval urban planning tasks and plans falling within the formulating competence of provincial-level People's Committees and urban plans formulated by investors of construction investment projects;
- e) District-level urban planning management agencies shall evaluate and submit to district-level People's Committees for approval urban planning tasks and plans falling within the formulating competence of district-level People's Committees and urban plans formulated by investors of construction investment projects;
- f) Investors of construction investment projects shall submit to provincial-level urban planning management agencies for evaluation urban plans falling within the approving competence of provincial-level People's Committees; or to district-level urban planning management agencies

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es for evaluation urban plans falling within the approving competence
of district-level People's Committees.

2. Agencies evaluating urban planning shall base themselves on opinions of related agencies, evaluation councils and contents of planning tasks and plans to send documents to submitting agencies for completing urban planning tasks and plans. After receiving complete urban planning task and plan dossiers, evaluating agencies shall report on evaluation contents to agencies with approving competence for consideration and decision.
 3. For general plans of urban centers of grade IV or higher, provincial-level People's Committees shall obtain written agreement of the Ministry of Construction before approving them.
 4. For urban plans falling within their approving competence, district-level People's Committees shall obtain written agreement of provincial-level planning management agencies before approving them.
- Content of Recommendation: Inclusion and integration of green city planning tasks and procedures of evaluating and approving written plans into urban city planning tasks and procedures of evaluating and approving written plans

o *Article 33 Dossiers submitted for evaluation and approval of urban planning tasks and plans*

1. A dossier submitted for evaluation and approval of an urban planning ta

sks comprises a written request for evaluation and approval; explanation about contents of the task; draft decision to approve the task; miniature color drawings; and relevant legal documents.

2. A dossier submitted for evaluation and approval of an urban plan comprises a written request for evaluation and approval of the plan; explanation about contents of the plan, including miniature color drawings; draft regulation on management according to the urban plan; draft decision to approve the plan; calculation annexes; color drawings of prescribed scale; and relevant legal documents.
- Content of Recommendation: Stipulation and integration of necessary documents for evaluating and approving green city planning into the scope of documents submitted for evaluation and approval

o Article 34 Contents of approval urban planning tasks and plans

1. Agencies with approving competence shall approve in writing urban planning tasks and plans, covering the following contents:

a) For general planning:

- Details of a decision approving a general planning task include the scope and boundaries covered by the general planning; characteristics of the urban center; projected basic criteria of population, land and technical infrastructure; major requirements of research into urban development directions, structure of spatial organization, key works and major solutions to organizing the system of technical

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infrastructure facilities; and a list of plan documents;

- Details of a decision approving a general plan include the scope and boundaries covered by the general planning; characteristics and functions of the urban center; population sizes and urban land areas in different periods of development; major econo-technical criteria and urban development directions; orientations for organizing urban space, projected administrative boundaries of the inner city and outskirts, structure of land use based on functions; locations and areas of main functional areas; supply sources, locations, size and capacities of key works and the main network of urban technical infrastructure (including underground works, if any); regulations on urban space, architecture and landscape; defense and security-related matters and environmental protection measures; priority investment programs and implementation resources; and matters related to the organization of implementation.

b) For zoning planning:

- Details of a decision approving a zoning planning task include the boundary, area and characteristics of the zone covered by the zoning planning; some projected basic criteria of population, land use and social and technical infrastructure; requirements and principles on spatial organization and architecture and connection of technical infrastructure facilities; and a list of plan documents;
- Details of a decision approving a zoning plan include the boundary,

area and characteristics of the zone covered by the zoning planning; basic criteria of population, land and social and technical infrastructure; structure of land use; criteria for use of planned urban land, solutions to organizing urban space, architecture and design for each street block; supply sources and solutions to organizing the technical infrastructure network to each street, solutions to organizing resettlement (if any); environmental protection measures; work items prioritized for investment and resources for implementation; and matters related to the organization of implementation.

c) For detailed planning:

- Details of a decision approving a detailed planning task include the boundary and area of the zone covered by the detailed planning; projected basic criteria of population, land and social and technical infrastructure; requirements and principles on spatial organization, architecture and landscape, connection of technical infrastructure and other research requirements; a list of works to be built in the planned zone; and a list of plan documents;
- Details of a decision approving a detailed plan include the boundary, area and characteristics of the zone covered by the detailed planning; basic criteria of population, land and social and technical infrastructure; structure of land use; criteria for use of planned urban land, solutions to organizing urban space, architecture and design for each land lot; supply sources and solutions to organizing

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the technical infrastructure network to each land lot, solutions to organizing resettlement (if any); environmental protection measures; work items prioritized for investment and resources for implementation; matters related to the organization of implementation, and a list of works to be built in the planned zone.

d) For specialized technical infrastructure planning:

- Details of a decision approving a specialized technical infrastructure plan include the boundary, economic-technical criteria, supply sources, locations, sizes and capacities of key technical works, solutions to organizing the technical infrastructure network, investment programs and projects, funding sources and implementation plan.

2. Drawings and regulations on management according to urban plan enclosed with a decision approving an urban plan shall be stamped for certification by the urban planning-evaluating agency.

- Content of Recommendation: Reflection and integration of contents to achieve green city targets in architectural plans, technical infrastructure plans and environment into contents approving urban planning tasks and plans

(2) For Establishment of New Decree in accordance with Enactment of Law on Urban Development Management

- Content of Recommendation:

- Stipulation and explanation of definitions of terms related to green city in the explanation of terms under general provisions of the decree to supplement new norms; establishment of structure of norms between the Law on Urban Planning and the Law on Urban Development Management
- For contents of newly enacted decrees, the Ministry of Construction should promote urban development planning and management to become green development planning and management with reflection of green growth and present details of the contents in the form of guidelines for nationwide application.

3. ENFORCEMENT RULES

1) Background

- o Legislative demands on urban development paradigm, etc. based on green growth strategies and action plans, sustainable development strategies and necessity of creation of future-oriented cities and establishment of implementation systems have become important. This requires the establishment of enforcement rules on green city planning in terms of legal structure with the Law on Urban Planning and the Law on Urban Development Management currently being drafted as well as the decree to guarantee substantive implementation.

2) Purpose

- o To secure the capacity to substantively implement national green growth stra

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tegies, action plans and sustainable development strategies and to strengthen the capacity of establishing green city planning

3) For Establishment of New Decree

- Content of Recommendation

- Provide basic manuals for establishment, evaluation, approval and management of green city planning
- Establish green city planning applied with green city indexes and indicators
- Secure rationality and objectivity of decision making process using decision support system in establishing green city planning

- Detailed Content of Recommendation (Guideline on Green City Planning)

1) Layout

Legal guidelines for green city planning and decision support systems consist of three main parts - General Provisions; Establishment of Green City Planning; and Establishment and Management of Decision Support Systems.

2) Content

(1) General Provisions:

- . To clarify the scope and objects of the application that affect the level of binding and validity of the guidelines
- . To clarify and concretize the meaning of green cities, green city planning, green city planning and decision support system to ensure legal stability

- . To propose general regulations that are aligned and consistent with the Law on Urban Planning to maintain compatibility of legal system and regulations on legal validity and application of electronic system

(2) Green City Planning

a) Principles of green city planning

- To ensure connectivity and sustainability with green growth policy targets, climate change response strategies and other relevant plans

b) Subjects of Green City Planning

- Centrally-run cities, provincial cities, district-level cities
- Regulatory compliance: Compliance with the Law on Urban Planning and relevant regulations

c) General Matters of Establishment Standards

- . Reflection of results comprehensively reviewed and analyzed of the current status, characteristics, contents of relevant plans, opinions of residents
- . Understanding of correlation between indicators related to population, economy, living, production activities and greenery environment and current status on greenhouse gas emissions to analyze and reflect major factors for reduction of greenhouse gas emissions
- . Understanding of correlation between indicators related to population structure, economic structure and living environment and greenhouse gas emissions in setting green city planning indicators to connect

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with forecast of greenhouse gas emissions

- . In planning development projects, analysis of status of greenhouse gas emissions by concerned development project by connecting with location and development directions and inclusion of the content on reduction of greenhouse gas emissions
 - . Creation of compact and public transport-oriented urban space
 - . Evaluation in consideration the value of energy saving
- d) Planning criteria by subject
- Centrally run cities
 - . Planning towards healthy urban environment and sustainable development
 - . Research on functional areas such as natural habitat (trees, ecosystems, forests, landscapes), water resources, conservation of fertile farmland
 - . Minimizing natural disasters on the basis of disaster risk analysis and exploration
 - Provincial and district level cities
 - . Setting objectives and strategies in line with regional characteristics and regional development directions.
 - . Maintaining the ability to preserve the current status as natural environment, ecology, green space
 - . Calculation of key indicators on population, economy, society, production and incorporation into the planning

- . Minimizing disasters by analyzing and understanding the hazards of disaster
- . Limited development in eroded coastal areas.
- e) Process of evaluation and approval of green city planning
 - . Identification of necessary matters such as evaluation criteria, evaluation matters, approving authorities, documents for submission on green city planning
- (3) Establishment and management of decision support systems
 - a) Development of decision support systems and operators
 - . The Ministry of Construction directs the construction and operation of an integrated monitoring system to standardize and systematically manage information on the preparation and implementation of green city planning, support decision making, efficient ways and local green regulations.
 - . Local government: Development and operation of a decision support system to make reasonable and objective judgments that are appropriate and effective in reducing greenhouse gas emissions and responding to climate change in the planning process of green city
 - b) Scope of database information for decision support systems
 - . Clarification of the scope and content of the database needed to connect with the green city indicator set used in the formulation and application; Adjustment, modification and implementation of green city planning

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- c) Tasks of auxiliary agencies and staffs to avoid decision support system
 - . Concretization of the contents of the tasks of the management agency to periodically update necessary databases and operate the support system and effective decision
- d) Decision Support System Management
 - . Stipulation of the contents, categories of users, program management, publicity and use of digital data, user management, history of use
 - . Support of decision-making under the system in a sustainable way and restricts the use of illegal users, thereby ensuring publicity in the use of information.
- e) Usage of a stable support system
 - . Rules for data backup, disaster recovery, data recovery, user training to use and operate the support system; Monitoring and monitoring system in a stable and sustainable manner.
- f) Monitoring of support systems
 - . Establishment of monitoring systems for decision support systems for use in hunger eradication in the process of green city planning and as a basis for sustainable urban planning; Achievement of the policy objectives set

4. DECISION OF THE MINISTRY OF CONSTRUCTION

1) Background

o The introduction of many innovations in the system of the above-mentioned Law on Urban Planning and Decree cannot be implemented immediately while the model of urban planning and development is still in trial. Therefore, the Ministry of Construction should issue a number of specific directives for pilot implementation of the green city model in a number of urban areas in Vietnam as follows:

- New Decision on the pilot implementation of green city planning
- Decision to issue GCI index
- Decision on the application of Green City Planning Decision Support System (GDSS)
- Decision on GIS training and management of urban planning data
- Decision on the management and assessment of green city development in Vietnam
- Decision on the construction and use and management of the GDSS system

2) Purpose

o Institutional conditions were initially applied in pilot program areas of green city planning, which could then be replicated and improved in the process of application, and will be officially added to higher legal documents when conditions permit to ensure legal implementation capacity. In such a case, the Urban Planning Law and relevant Decree should be amended.

3) Content of the documents

- Content of Recommendation:

- . When the Ministry of Construction issues directives mentioned above, the manual of establishment, evaluation and approval of green city planning should include relevant documents such as details of green city indicators and indexes and content of GDSS us, etc.

5. Standard System

1) Purpose of the standard system, planning standards

- o To maintain consistency between functions of urban areas in urban planning, the 2008 Vietnam Building Code (QCXDVN 01:2008/BXD) has been promulgated and enforced. These standards stipulate requirements of establishment, evaluation and approval of architectural planning and serve as legal grounds for establishment and application of regulation on construction management in accordance with building code and regional development.
- o However, these standards focus on establishment and use of architectural facilities in safe and sustainable methods, revealing limitations of not having standards reflected with environmental conservation promoted in urban planning, forecast of unpredictability and uncertainty of climate.
- o To overcome such limitations and establish and complete standards systems for green city planning reflected with urban development paradigm, the Vietnam Building Code (QCVN: 01/2008/BXD) and Vietnam Building Code(QCXDVN 01:2008/BXD) should be supplemented and amended.

2) Purpose

- o To ensure consistency of urban functions by suggesting standards in line with the trend of improvement of technical standards and environmental conservation and sustainable urban development paradigm

3) Concerned Provisions and Content of Recommendation

- o 2.5.1 Requirements on structure of the system of urban service works
 - 1) Urban service works within a residential unit (school, market, etc.) must have a service radius not exceeding 500m. Particularly for areas with complicated topographical conditions, the service radius must not exceed 1.0km.
 - 2) Other service works in urban centers must be planned to suit urban structure and ensure the exploitation of their positions and links with other functional zones in urban areas.
- o 2.5.2 Requirements on planning on the system of urban service works:
 - Urban-construction general planning as well as detailed planning of 1/2,000 scale must identify the structure of planning on essential urban services in association with urban spatial development structures, including criteria for the planning on the system of service works according to the requirements in Table 1, taking into account demands of adjacent areas and nonresidents and development requirements in each period.

Table 1: Minimum requirements for basic urban-service works

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<u>Type of Works</u>	<u>Management Grade</u>	<u>Minimum Occupancy Rate for Works Use</u>		<u>Minimum Occupancy Rate for Land Use</u>	
		<u>Unit of calculation</u>	<u>Rate</u>	<u>Unit of calculation</u>	<u>Rate</u>
1. Education					
<u>a. Preschool</u>	<u>Residential Area</u>	<u>Place/1,000 persons</u>	<u>50</u>	<u>m²/1 Place</u>	<u>15</u>
<u>b. Primary school</u>	<u>Residential Area</u>	<u>Place/1,000 persons</u>	<u>65</u>	<u>m²/1 Place</u>	<u>15</u>
<u>c. Lower secondary school</u>	<u>Residential Area</u>	<u>Place/1,000 persons</u>	<u>55</u>	<u>m²/1 Place</u>	<u>15</u>
<u>d. Upper secondary school, job-training school</u>	<u>City</u>	<u>Place/1,000 persons</u>	<u>40</u>	<u>m²/1 Place</u>	<u>15</u>
2. Healthcare					
<u>a. Medical Center</u>	<u>Residential Area</u>	<u>Place/1,000 persons</u>	<u>1</u>	<u>m²/Place</u>	<u>500</u>
<u>b. Clinic Center</u>	<u>City</u>	<u>Place/City</u>	<u>1</u>	<u>m²/Place</u>	<u>3,000</u>
<u>c. General Hospital</u>	<u>City</u>	<u>Bed/1,000 persons</u>	<u>4</u>	<u>m²/Bed</u>	<u>100</u>
<u>d. Maternity Clinic</u>	<u>City</u>	<u>Bed/1,000 persons</u>	<u>0,5</u>	<u>m²/Bed</u>	<u>30</u>
3. Physical training and sports					
<u>a. Exercise ground</u>	<u>Residential Area</u>			<u>m²/person</u> <u>ha/Place</u>	<u>0,5</u> <u>0,3</u>
<u>b. Basic sports ground</u>	<u>Urban Area</u>			<u>m²/person</u> <u>ha/Place</u>	<u>0,6</u> <u>1,0</u>
<u>c. Stadium</u>	<u>Urban Area</u>			<u>m²/person</u> <u>ha/Place</u>	<u>0,8</u> <u>2,5</u>
<u>d. Physical training and sports center</u>	<u>Urban Area</u>			<u>m²/person</u> <u>ha/Place</u>	<u>0,8</u> <u>3,0</u>
4. Culture					
<u>a. Library</u>	<u>Urban Area</u>			<u>ha/Place</u>	<u>0,5</u>

<u>b. Museum</u>	<u>Urban Area</u>			<u>ha/Place</u>	<u>1.0</u>
<u>c. Showroom Centers</u>	<u>Urban Area</u>			<u>ha/Place</u>	<u>1.0</u>
<u>d. Cinema</u>	<u>Urban Area</u>	<u>Place/1,000 persons</u>	<u>5</u>	<u>ha/Place</u>	<u>1.0</u>
<u>e. Cultural Center</u>	<u>Urban Area</u>	<u>Place/1,000 persons</u>	<u>8</u>	<u>ha/Place</u>	<u>0.5</u>
<u>g. Circus</u>	<u>Urban Area</u>	<u>Place/1,000 persons</u>	<u>3</u>	<u>ha/Place</u>	<u>0.7</u>
<u>h. Children's Center</u>	<u>Urban Area</u>	<u>Place/1,000 persons</u>	<u>2</u>	<u>ha/Place</u>	<u>1.0</u>
5. Market	<u>Residential unit</u> <u>Urban Area</u>	<u>Place/Residential Area</u>	<u>1</u>	<u>ha/Place</u>	<u>0.2</u> <u>0.8</u>

- Content of Recommendation:

- Use of transport modes can be decreased through rational organization and placement of urban service works
- Urban land requirements per capita related to land use in green environment sectors. Service centers should be organized through urban service centers nearby arterial roads and establishment of pedestrian roads, improvement of land use efficiency, less energy consumption, reduction of infrastructure expenses, establishment of urban green corridors and reduction of urban heat island effects should be achieved.

o 2.6.3. Regulations on the area of public-use greenery land in urban areas

- Public-use greenery land outside residential units in urban areas embraces parks, flower gardens serving one or more residential unit, the whole urban area or region (including theme parks); water surface area within premises of park

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s and flower gardens, of which water surface area converted into greenery land area per person must not exceed 50% of total area of public-use greenery land outside residential unit, excluding special-purpose greeneries.

- For mountainous and island urban areas, public greenery land area may be smaller but must not be less than 70% of that specified in Table 2.

Table 2: Public-use greenery land occupancy outside residential units in urban areas

<u>Urban-area Grade</u>	<u>Occupancy (m²/person)</u>
<u>Special</u>	≥ <u>7</u>
<u>I and II</u>	≥ <u>6</u>
<u>III and IV</u>	≥ <u>5</u>
<u>V</u>	≥ <u>4</u>

- Content of Recommendation:

- This requirement is the most crucial requirement among the green city requirements in the green environment sector. This contributes to the reduction of greenhouse gas emissions. Greenery and park planning in urban areas should be connected to natural environment.
- Solar parks, wind farms, eco parks should be organized and new and renewable and LED materials should be utilized.
- Greenery axis and water surface are planned to be parks and wet lands are planned by utilizing farmlands to create natural water surface.

o Forecast of Land Demand

1. Just like population forecast, the forecast on land demand (area size) is conducted based on the practical application of mathematical models as well as actual data and other data (characteristics of urban areas, population size, land use requirements, etc.).
 - The general planning feature unchangeable demonstration such as area size(S), population size(P) and land use requirements(c) as the fundamental factors ($S = P \times C$). Change of one factor does not alter the value of other factors.
 - Requirements for land use according to construction technical standards (land for residential areas, greenery and transportation, etc.) are mostly minimum requirements. Therefore, confirming such requirements depends upon experiences of policy makers and planner.
 - Generally, planners suggest the limitation proportionate to the level of socio-economic development (high, medium, and low) of urban areas and determine the most appropriate value along with competent organizations.
2. In the case of urban areas with limitation for development land (mountainous area, coastal area, island area), the demand on land for urban area is directly dependent upon land possible for development.
3. For other urban areas, the forecast of demand for development land of urban areas is conducted based on the following factors.
 - Development vision, characteristics and goals of urban areas

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- Forecast of population size
- Land use requirements or ratio
- Based upon relevant experience and reality of Vietnam urban area master plan, the land use requirements are generally as follows:

Table 3: Urban Area Land Use Requirements

<u>Urban-area Grade</u>	<u>Land Use Requirements(m²/person)</u>		
	<u>Urban Area</u>	<u>Private Area</u>	<u>Residential Area</u>
<u>Special, Grade I - II</u>	<u>90-120</u>	<u>40-60</u>	<u>25-30</u>
<u>Grade III - IV</u>	<u>100-150</u>	<u>60-80</u>	<u>35-45</u>
<u>Grade V</u>	<u>>120</u>	<u>>80</u>	<u>45-55</u>

Source: Approved General planning

o Spatial Organization in Urban Construction Master Plan

1) Selection of Land for Urban Development

- Land selected for urban development should comply with the following demands:
 - It holds advantages of economic, social, technical and environmental infrastructure.
 - It holds natural conditions where construction is possible (topography, geography, floodgate, climate) and does not belong to regions with phenomena of erosion, landslide, karst, corrosion, earthquakes,

etc.

- Land for urban development is sufficient for development of the next 20 years and the following step.
- It holds the conditions (capacity) of development of technical infrastructure system of urban areas.
- Its environment is not polluted (hazardous chemicals, radiation, noise, contagious diseases, explosives, etc.)
- It does not belong to zones for mining and environmental conservation.
- It is not within the range of construction restriction according to legislations on construction.
- Zones for underground works hold technical conditions in compliance with construction standards on underground works as well as conditions of rationally being connected to above-ground works.
- Content of Recommendation:
 - In establishing land use plans in green city planning, characteristics of each renewable energy source should be considered and emissions of greenhouse gas should be reduced by purpose of land use such as urban area (residential, commercial and industrial land), reserved land through quantitative analysis.
 - Where there exist urban development projects, measures of greenhouse gas emissions reduction should be established in connection with location and direction of such development.

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○ 2.8.5. Building set-back

- Regulations on building set-back against the planned road's building-line and work height are as follows.

Table 4: Minimum building set-back (m) according to building line's width and work construction height

<u>Building Line adjacent to the Land Lot for Work Construction (m)</u>	<u>Work Construction Height (m)</u>				
	<u>≤16</u>	<u>19</u>	<u>22</u>	<u>25</u>	<u>≥28</u>
<u>< 19</u>	<u>0</u>	<u>0</u>	<u>3</u>	<u>4</u>	<u>6</u>
<u>19 ÷ < 22</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>3</u>	<u>6</u>
<u>22 ÷ < 25</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>6</u>
<u>≥ 25</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>6</u>

- For work complexes including works' bases and top towers, regulations on building set-back apply separately to works' bases and top towers according to corresponding building stories counting from the ground surface (pavement level).

○ 2.8.6. Maximum net building density

1) Residential Units

- The maximum net building density of a land lot for the construction of groups of adjoining houses and separate houses (garden houses, villa

s, etc.) is specified as follows:

Table 5: Maximum net building density of a land lot for the construction of groups of adjoining houses or separate houses (garden houses, villas, etc.)

<u>Land Lot Area(m²/house)</u>	<u>≤50</u>	<u>75</u>	<u>100</u>	<u>200</u>	<u>300</u>	<u>500</u>	<u>≥1.000</u>
<u>Maximum Building Density(%)</u>	<u>100</u>	<u>90</u>	<u>80</u>	<u>70</u>	<u>60</u>	<u>50</u>	<u>40</u>

Table 6: Maximum net building density of urban service houses and houses with combined functions according to land lot area and work height

<u>Height of Ground-Surface Works (m)</u>	<u>Maximum Building Density (%) according to Land Lot Area</u>			
	<u>≤3,000m²</u>	<u>10,000m²</u>	<u>18,000m²</u>	<u>≥35,000m²</u>
<u>≤16</u>	<u>80</u>	<u>70</u>	<u>68</u>	<u>65</u>
<u>19</u>	<u>80</u>	<u>65</u>	<u>63</u>	<u>60</u>
<u>22</u>	<u>80</u>	<u>62</u>	<u>60</u>	<u>57</u>
<u>25</u>	<u>80</u>	<u>58</u>	<u>56</u>	<u>53</u>
<u>28</u>	<u>80</u>	<u>55</u>	<u>53</u>	<u>50</u>
<u>31</u>	<u>80</u>	<u>53</u>	<u>51</u>	<u>48</u>
<u>34</u>	<u>80</u>	<u>51</u>	<u>49</u>	<u>46</u>
<u>37</u>	<u>80</u>	<u>49</u>	<u>47</u>	<u>44</u>
<u>40</u>	<u>80</u>	<u>48</u>	<u>46</u>	<u>43</u>
<u>43</u>	<u>80</u>	<u>47</u>	<u>45</u>	<u>42</u>
<u>46</u>	<u>80</u>	<u>46</u>	<u>44</u>	<u>41</u>
<u>>46</u>	<u>80</u>	<u>45</u>	<u>43</u>	<u>40</u>

2) Educational, healthcare, cultural and physical training and sport works and markets

- The maximum net building density of such public works as educational, he

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althcare, cultural and physical training and sport works and markets in newly built areas is 40%.

3) Other urban service works and works with combined functions

- The maximum net building density of other urban service works and works with combined functions which are built on a land lot of more than 3,000 m² should be considered depending on their locations in urban areas and specific planning solutions for such land lot and be approved by competent authorities. However, this density must satisfy the requirements on the minimum distance between terraces (Section 2.8.4) and the building set-back (Section 2.8.5) and ensure the area of parking lots as prescribed, and comply with the requirements specified in the abovementioned table.
- For other urban service works and works with combined functions which are built on a land lot of less than 3,000 m², after excluding the land area for the building set-back specified at No. QCVN: 01/2008/BXD Section 2.8.5, the building density of 100% may apply to the remaining land area, ensuring the requirements on the minimum distance between terraces (Section 2.8.4) and the area of parking lots as prescribed.

Table 7: Maximum net building density of urban service houses and houses with combined functions according to land lot area and work height

<u>Height of Ground-Surface</u>	<u>Maximum Building Density (%) according to Land Lot Area</u>			
<u>Works (m)</u>	<u>3,000m²</u>	<u>10,000m²</u>	<u>18,000m²</u>	<u>≥35,000m²</u>

<u>Height of Ground-Surface</u> <u>Works (m)</u>	<u>Maximum Building Density (%) according to Land Lot Area</u>			
	<u>3,000m²</u>	<u>10,000m²</u>	<u>18,000m²</u>	<u>≥35,000m²</u>
<u>≤16</u>	<u>80</u>	<u>70</u>	<u>68</u>	<u>65</u>
<u>19</u>	<u>80</u>	<u>65</u>	<u>63</u>	<u>60</u>
<u>22</u>	<u>80</u>	<u>62</u>	<u>60</u>	<u>57</u>
<u>25</u>	<u>80</u>	<u>58</u>	<u>56</u>	<u>53</u>
<u>28</u>	<u>80</u>	<u>55</u>	<u>53</u>	<u>50</u>
<u>31</u>	<u>80</u>	<u>53</u>	<u>51</u>	<u>48</u>
<u>34</u>	<u>80</u>	<u>51</u>	<u>49</u>	<u>46</u>
<u>37</u>	<u>80</u>	<u>49</u>	<u>47</u>	<u>44</u>
<u>40</u>	<u>80</u>	<u>48</u>	<u>46</u>	<u>43</u>
<u>43</u>	<u>80</u>	<u>47</u>	<u>45</u>	<u>42</u>
<u>46</u>	<u>80</u>	<u>46</u>	<u>44</u>	<u>41</u>
<u>>46</u>	<u>80</u>	<u>45</u>	<u>43</u>	<u>40</u>

4) For land lots of area ranging between the values specified in the above mentioned table, the maximum net building density is determined according to the following interpolate formula:

$$M_i = M_a - (S_i - S_a) \times (M_a - M_b) : (S_b - S_a)$$

Of which:

S_i : the area of land lot i (m^2);

S_a : the area of land lot a (m^2), which is equal to the lower limit area against I ;

S_b : the area of land lot b (m^2), which is equal to the upper limit area against i ;

M_i : the permitted maximum net building density of the land lot of an area of i (m^2);

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Ma: the permitted maximum net building density of the land lot of an area of a (m^2);

Mb: the permitted maximum net building density of the land lot of an area of b (m^2).

- If a work complex comprises works of different heights, the maximum building density applies depending on the average height.

5) For a work complex comprising works' bases and top towers, the regulations on the building setback, the minimum distance to the opposite terrace and the building density apply separately to works' bases and top towers according to corresponding building stories, counting from the ground surface (pavement level).

o 2.8.7. Gross building density

- The permitted maximum gross building density of a residential unit is 60%.

- The maximum gross building density of resorts is 25%.

- The maximum gross building density of public parks is 5%.

- The maximum gross building density of theme parks is 25%.

- The maximum gross building density of special-purpose greeneries (including golf courses) and natural environmental protection regions is specified depending on their functions and according to relevant regulations, which, however, must not exceed 5%.

o 2.8.8. Ratio of land for greeneries in land lots for work construction

- In land lots for work construction, the requirements on the minimum ratio of land for greeneries specified in Table 8 must be satisfied.

Table 8: Minimum ratio of land for greeneries in land lots for work construction

<u>In land lot for work construction</u>	<u>Minimum ratio of land for greeneries (%)</u>
<u>1- Residential houses:</u>	
- <u>Standalone (garden houses, villas)</u>	<u>20</u>
- <u>Groups of apartment buildings</u>	<u>20</u>
<u>2- Public houses:</u>	
- <u>Kindergartens, schools</u>	<u>30</u>
- <u>Hospitals</u>	<u>30</u>
- <u>Cultural houses</u>	<u>30</u>
<u>3- Factories:</u>	<u>20</u>
- <u>Built dispersedly</u>	<u>20</u>
- <u>Built in industrial parks or clusters</u>	<u>20</u>

- Content of Recommendation:

- Integration of standards of building density, minimum ratio of land for greeneries and construction heights to be consistent with green city indicators

o Development Direction of Urban Social Infrastructure

- 1) Residential Unit Development Direction

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(1) Residential Unit Requirements

1. The minimum area of residential unit-based land is 8m^2 /person. The average occupancy of residential unit-based land for the whole urban center must not exceed 50m^2 /person.
2. Requirements on total floor area of residential unit-based land is 15m^2 /person in 2010 and is 20m^2 /person in 2020. The quality of urban residential unit-based land will reach the national standards.

(2) Residential Unit Classification

- Residential unit classification, development size and regulations on development management, too, are crucial grounds for confirmation of type of residential unit, development organization and spatial organization.

a) Classification of residential units is as follows:

- Apartment buildings
- Adjoining residential houses
- Separate residential houses (houses with flower garden, villas, etc.)
- Mix-use buildings (residential, commercial, services, etc.)
- Eco-friendly mix-use buildings

b) Classification of building coverage ratio or residential density is as follows:

- High-density Housing Complex
- Mid-density Housing Complex

- Low-density Housing Complex

c) Classification of residential units by work height is as follows:

- High-rise Housing Complex

- Mid-rise Housing Complex

- Low-rise Housing Complex

d) Classification of residential units by housing quality is as follows:

- Luxury, high-quality Housing Complex

- Mid-quality Housing Complex

- Low-quality Housing Complex

e) For urban areas to be completed for development facing lack of development land or issue of infrastructure overload, residential units are classified according to development level or development regulations.

- Development prohibition areas or development restriction areas: Mostly central areas or downtowns

- Residential renovation areas: Mostly areas with infrastructure overload and substandard living conditions

- General residential unit development areas

- Areas for residential unit development promotion: Mostly suburban areas

f) There may be types of special residential houses such as resettlement housing complex, social housing complex (housing units for low income

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ome earners, workers in industrial complexes), eco housing complex,
public housing complex, expert housing complex.

2) Development Direction of Social Infrastructure System

- Urban service works should be planned for compatibility with the urban structure, location and connectivity with other use areas, etc.
- Structure of necessary urban service works should be confirmed in the urban master plan based on urban spatial development structure. Relevant requirements should be confirmed in the service facility system in compliance with the legislation.
- Urban service works within the residential-unit such as schools and markets have a service radius of ≤ 500 m. In the case of areas of with complex topographical features, a service radius of such works is ≤ 1 km.
- Content of Recommendation:
 - In establishing social infrastructure plans for green city development, green buildings and low-carbon construction works are promoted and change of natural environment should be minimized.
 - Possibility of connecting with streams, lakes, greenery and landscape should be reviewed and building envelope are utilized too prevent loss of heat and greening of the outer wall of buildings could achieve adjustment of building temperature.
 - Buildings energy management system on inner environment, surrounding environment and energy consumption should be introduced.

- Natural ventilation system and lighting could be utilized. The percentage of renewable energy use should take up 10% of the entire energy consumption volume.
- Social infrastructure facilities should be put in place considering accessibility, connectivity, convenience and efficiency.

○ 4.3.2 Urban Transport System Planning

1) Common Demand of Urban Transport System

- Urban road systems should be planned to be consistent in order to maintain the connectivity and safety with all urban use areas and connectivity with external transport facilities and use areas and other residential areas.
- Industrial complexes, roads for warehouse, outer city transport and inner city transport system should be classified.
- For cities with Grade III or higher grade, urban centers accessible through public passenger transportation system such as buses, express buses and subways, national railways, external railways, airways and waterways.
- Forecasting cargo and passenger transportation demands and means of urban transport in order to determine the land fund for the future development of means of transport. For urban centers of grade III or higher grade, to anticipate development prospects and organize modern mass transit networks such as urban railways, express buses, combined st

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ations between national railways, suburb railways and urban railways,
and hubs connecting to motorways, waterways and airways.

- Urban transport service works must meet urban development requirements and ensure convenience for entities joining in traffic; and satisfy the requirements specified in the work construction regulation in order to ensure the disabled people's access and use.
- Urban road networks must be planned into a connected system to ensure fast and safe connections between all functional zones in urban centers; connect with outbound transport works, suburb functional zones and other residential areas.
- Identifying market shares of public passenger transportation according to modes of transportation in order to determine future means of mass transit. For urban centers of grade III or higher grade, to organize mass transit networks such as buses, express buses, urban railways, hubs connecting to national railways, suburb railways, urban railways, motorways, waterways and airways.
- Urban roads must be classified based on their transport functions and calculated speeds suitable to criteria for inner-city roads.

2) Regulations on Urban Roads System

- pedestrian road: pedestrian roads should maintain the minimum width in the following regulations.
- For urban roads and streets connecting to accesses to trade centers, markets or cultural centers:6.0m;

- For regional roads: 4.5;
 - For sub-regional roads: 3.0m;
 - Roads in groups of residential houses: Roads with pavements are not required but traffic safety assurance solutions are required and green trees must be planted along roads.
 - Road parts for bicycles: Along roads of regional or higher grade, separate road parts for bicycles must be arranged with median strips or lines against motorways. On roads of other kinds, bicycles and motor vehicles may use the same road parts. The width of road parts for bicycles must be at least 3.0m.
 - Inner-city roads must satisfy specialized technical criteria (see Appendix 15).
 - The ratio of land for traffic and static traffic within land for urban construction must be at least:
 - 6%, counted to inter-regional roads;
 - 13%, counted to regional roads;
 - 18%, counted to sub-regional roads.
- 3) Urban Transport- Mass transit network
- Public transport should be developed to help mobility for citizens in cities with Grade III or higher grade.
 - The distance between mass transit routes must be between 600m and 1,200m; in urban centers, this distance must be at least 400m.
 - The distance for pedestrians to go from their residential or working p

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- laces to public car parks must not exceed 500m.
- Types of means of mass transit depend on types of urban centers and amounts of passengers. For urban centers with a calculated population of more than one million, to study the construction of urban railway systems (systems of subways, tramcars or sky trains).
 - Mass transit network density depends on urban planning structure, which must be at least 2.0km/km² of land for urban construction. The distance between transit stations in urban centers must be:
 - Not more than 600m, for bus stops and tramcar stations;
 - At least 800m, for bus stops, express-tramcar stations, express subways or sky trains.
 - At intersections between highways and roads passed by means of mass transit, to locate transshipment stations with a road length for pedestrians of less than 200m.
 - Bus stops and tramcar stations on trunk roads with signal lamp or posts must be located at least 20m far from intersections. The length of a one-route or one-direction station must be at least 20m; on multiple-direction routes, specific calculation is needed, but this length must not be less than 30m. The station width must be at least 3m.
 - The final terminal of a route must have a service house for workers and a waiting lounge for passengers.
 - On expressways and express bus stops, special parking stations with speed change strips outside the traffic lane should be located.

4) Urban railway system

- Outside-street urban railway system is the system of express railways, including subways and tramcars. Based on mass transit demands, to determine locations of outside-street railway stations and routes. Subway stations must be connected, synchronous and safe for underground works and between underground works and ground-surface works.
- The width of the red line planned for tramcar routes along urban routes must take into account railway system. The tramcar corridor's width must be at least 10m.

o 4.3.3 Planning on works in service of urban traffic

- Urban centers, residential units and groups of residential houses must reserve land for garages and parking lots. Industrial parks and warehouses must have parking lots and garages with repair services.
 - Parking lots and cargo loading grounds must be located near markets, cargo stations, commercial centers and other works having great transport needs.
 - In renovated urban areas, streets prohibited for circulating vehicles and roads with traffic lane larger than their designed capacity may have parking lots for cars. The width of a parking space must be at least 3m if vehicles park along the road or at least 6m if vehicles park at an angle of 45°- 60°.
 - Public ground or underground parking lots must be located near trade, se

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rvices, sports and recreational centers and be interconnected with street networks. The maximum walking distance is 500m. Underground parking lots and garages shall be connected in a way that ensures compatibility, uniformity and safety among underground works and between underground and ground works.

- Bus terminals and garages must be located at first and final stops of bus routes and their sizes shall be determined based on specific demands.
- Locomotive tram depots shall be arranged at first and final stops and linking points of tram routes for repair services.
- Parking Space: The minimum single parking space for some vehicles in a parking lot is specified as follows:
 - 25m², for cars
 - 3m², for motorcycles
 - 0.9m², for bicycles
 - 40m², for buses
 - 30m², for trucks
- Works must meet requirements on minimum parking space specified in the Table below:

Table 9: Minimum parking space for cars

<u>Types of buildings</u>	<u>Minimum car parking space requirements</u>
---------------------------	-----------------------------------------------

<u>Types of buildings</u>	<u>Minimum car parking space requirements</u>
<u>- Hotels of three-star or higher grade</u>	<u>4 rooms/single parking space</u>
<u>- Luxury offices, offices of foreign relation agencies</u>	<u>100m² of use floor/single parking space</u>
<u>- Supermarkets, big stores, and conference, exhibition and showroom centers</u>	<u>100m² of use floor/single parking space</u>
<u>- Luxury apartment buildings</u>	<u>1 apartment/1.5 single parking space</u>

Source: No. QCVN: 01/2008/BXD Vietnam Building Code- Section 4.3.3, Chapter 4

- Under-three-star hotels, offices and service works must have parking space $\geq 50\%$ of the levels specified in the above table.
- Content of Recommendation:
 - Requirements for current urban transport plans do not include regulations on number of personal transport modes and public transport modes, ratio of public transport use, ratio of use of clean energy-powered transport modes and limitation of hazardous gas emissions such as CO, CO₂, NO₂.
 - These are crucial requirements in green transport of the green environment sector related to reduction of greenhouse gas emissions and use of renewable energy.
 - For green transport system planning, measures to reduce air pollution should be established including introduction of ecofriendly public t

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transport and car sharing system. Such measures also include introduction of green energy buses and classification of roads by function into principal arterial roads, minor arterial roads, collector roads, local roads, pedestrian roads and bicycle roads and introduction of bicycle complex centers and public bicycle system.

○ 5.3.1 Urban water supply planning

1) Forecast of urban water use must ensure the following requirements.

(a) Water users: Urban water supply systems must satisfy requirements on quality, pressure and flow of water for supply to meet urban use demands, including:

- Water for daily life of urban inhabitants (including inner-city and suburban inhabitants);
- Water for daily life of non-residents;
- Water for public works and services: $\geq 10\%$ of the volume for daily life;
- Water for tree watering and road cleaning: $\geq 8\%$ of the volume for daily life;
- Water for small production and industries: $\geq 8\%$ of the volume for daily life;
- Water for industrial parks shall be determined based on the types of industry, but must ensure a minimum of 20m³/ha/day for at least 60% of the area;

- Reserve and leaking water must not exceed 30% of the total volume for the above demands, for upgraded water supply systems, and 25%, for new water supply systems;
 - Water for water treatment works must be at least 4% of the total volume mentioned above.
- (b) Water supply for daily life must satisfy requirements specified in Table 10.

Table 10: Water supply for daily life

<u>Urban-area grade</u>	<u>Water use demands</u>			
	<u>First stage (10 years)</u>		<u>Long-term (20 years)</u>	
	<u>Water supply rates (% of population)</u>	<u>Standards (liter/person/day) (*)</u>	<u>Water supply rates (% of population)</u>	<u>Standards (liter/person/day)</u>
<u>Special</u>	<u>≥90</u>	<u>≥180</u>	<u>100</u>	<u>≥200</u>
<u>I</u>	<u>≥80</u>	<u>≥150</u>	<u>≥90</u>	<u>≥180</u>
<u>II</u>	<u>≥80</u>	<u>≥120</u>	<u>≥90</u>	<u>≥150</u>
<u>III, IV, V</u>	<u>≥80</u>	<u>≥80</u>	<u>≥90</u>	<u>≥100</u>

- Content of Recommendation:

- In establishing green city planning, rainwater should be reserved in parks, playgrounds, squares, parking lots and buildings and wastewater should be reused for landscape, cleaning the toilet.

o 6.1.1 Wastewater System Planning

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1) Provisions on wastewater collection

- Wastewater from daily life shall be collected at $\geq 80\%$ of the norms on water supply for daily life.
- Industrial wastewater shall be collected at $\geq 80\%$ of the norms on water supply for industries (depending on types of industries).
- Prior to collection, industrial wastewater shall be classified (contaminated, uncontaminated, or for hazardous water) and be treated separately.

○ 3.1.3. Requirements on rainwater drainage system planning

- The rainwater drainage system must ensure the drainage of rainwater in the whole basin under planning into lakes, rivers, streams or irrigation drainage systems. Depending on urban-center grades, the nature of functional zones and the area of water drainage basin, to study the network of sewers and works in the system based on appropriate rain cycles.
- Regulations on rainwater collection:
 - 100% of inner-city roads must have rainwater drainage systems;
 - At least 60% of roads in vicinities must have rainwater drainage systems;
 - For roads of 40m or more in width, to arrange rainwater drainage systems along two roadsides.
- Content of Recommendation:
 - In establishing green city planning, the wastewater management system of the target areas should be expanded and the response ability of se

parate sewer systems in cases of heavy rain should be strengthened, reducing pollution.

- Sewer sludge should be utilized as fuel and resources.
- To prevent flooding, detention basins should be put in place and water should be discharged through use of natural slope.

o 6.1.2. Planning on solid waste management

1) General provisions

- Planning on solid waste management is specialized construction planning, covering investigation, survey and detailed forecast of sources and total volume of ordinary and hazardous solid wastes; determination of locations and scales of solid waste treatment establishments on the basis of proposing appropriate treatment technologies; formulation of plans and preparation of human resources for collection and complete treatment of solid wastes;
- Planning on solid waste management includes inter-provincial planning and provincial planning. Interprovincial planning on solid waste management only takes into account urban areas, industrial parks, economic zones, tourist resorts, historical-cultural sites of inter-provincial significance which promote regional development.
- Hazardous solid wastes shall be collected, transported and treated separately in accordance with the law on environmental protection.

2) Solid waste collection

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a) Rates of solid waste collection are specified in the following table.

Table 11: Rates of solid waste collection

<u>Urban-area grade</u>	<u>Arising volume of solid wastes (kg/person/day)</u>	<u>Rates of solid waste collection (%)</u>
<u>Special, I</u>	<u>1.3</u>	<u>100</u>
<u>II</u>	<u>1.0</u>	<u>≥95</u>
<u>III-IV</u>	<u>0.9</u>	<u>≥90</u>
V	0.8	≥85

Source: No. QCVN: 01/2008/BXD Vietnam Building Code- Section 6.1.2, Chapter 6

- Content of Recommendation:

- When establishing solid waste management in green city planning, waste discharge volume should be minimized through recycling promotion. Unrecyclable solid wastes should be incinerated to minimize landfilling.
- Wastes should be sorted out and collected in residential areas. Measures to collect 100% wastes generated should be established.
- Prevention of redundant investment through creation of waste integration centers and effective use of resources should be promoted and flammable gas should be used as fuels for combined heat and power plants.

o 7.3.1. General planning on electricity supply

1) Load

- In urban construction plans, load includes load for daily life, public works and services, and (industrial, agricultural) production in urban areas. Each kind of load shall be projected based on electricity supply norms.
- General plans on urban construction must comply with the minimum electricity supply norms specified in Tables below.
- Norms of electricity supply for industry (industrial production, warehousing): Demand for electricity supply for existing industrial parks shall be estimated based on current actual demands or plans on expansion. To-be-built industrial parks with identified construction land size and unidentified size and capacity of each plant or enterprise therein must comply with norms specified in Table 14.

For industrial parks and clusters where the capacity of each plant or enterprise is identified, demands for electricity supply shall be projected based on the specific electricity consumption per product unit.

2) Power source: Power plants and source transformer stations of 110KV or higher.

3) Power grids are planned according to grades of urban areas as follows:

- For urban areas of grade I to special grade, power grids of 110KV or higher shall be planned for the entire areas and those of 22KV or higher

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er shall be planned for each district.

- For other urban areas, power grids of 22KV or higher shall be planned for the entire areas.

Table 12: Norms of electricity supply for daily life (per person)

No.	Norms	First Period (10 years)				Long-term Period (after 10 years)			
		Special grade urban areas	Grade-I urban areas	Grade II-III urban areas	Grade IV-V urban areas	Special grade urban areas	Grade-I urban areas	Grade II-III urban areas	Grade IV-V urban areas
1	Electricity (KWh/person/year)	1400	1100	750	400	2400	2100	1500	1000
2	Time of highest capacity use (h/year)	2800	2500	2500	2000	3000	3000	3000	3000
3	Load (W/person)	500	450	300	200	800	700	500	330

Table 13: Norms of electricity supply for public works

Types of Urban Areas	Special grade urban areas	Grade-I urban areas	Grade II-III urban areas	Grade IV-V urban areas
Electricity for public works (% of load for daily life)	50	40	35	30

Table 14: Norms of electricity supply for industrial production and warehousing

No.	Industries	Norms (KW/ha)
1	Heavy industries (pig-iron refining, steel refining, automobile and machine manufacture, petrochemistry, chemicals, fertilizer), cement production	350
2	Other construction material industries, mechanical engineering	250
3	Foodstuff and food processing, electronics, computer, textile industries	200
4	Leather footwear, garment industries	160
5	Small industrial clusters, cottage industries	140
6	Handicraft production establishments	120
7	Warehousing	50

o 7.3.2. Detailed planning on electricity supply

1) Electricity supply planning

- Load includes load for daily life, every public work, production (if any), parks-greeneries and public lighting. Load shall be calculated based on electricity supply norms which must not be lower than the norms specified in the following Tables:
- Electricity supply shall be determined according to approved master plans on urban construction.
- Power grids: To adopt planning on high-voltage, 22KV medium-voltage a

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- and 0.4KV low-voltage power grids, power grids for lighting of streets, parks, flower gardens, outside surfaces of special architectures, and cultural and art works (monuments, fountains, bridges spanning big rivers) and decorative illumination of streets, parks and flower gardens.
- 2) Urban lighting includes lighting of urban roads, parks, flower gardens, decorative illumination (of streets, trees, lawns, bridges spanning big rivers), lighting of surfaces of architectures, monuments, fountains (art illumination, illumination for advertisement, information and signals).
- Lighting of urban roads includes lighting of streets, squares for motor vehicles, sidewalks and ways for cyclists and pedestrians.
 - + Pavements with a cross section of less than 5m shall be lighted together with roads and those with a cross section of more than 5m shall be lighted separately.
 - + All kinds of urban roads with a cross section of roadway of 1.5 m or more shall be lighted artificially.
 - + Roads for motor vehicles with a cross section of roadway of 3.5 m or more must meet requirements on minimum luminance specified in Table 17.
 - + Lighting of roads for cyclists and pedestrians, and pavements with a cross section of over 5m must meet minimum illuminance requirements specified in Table 18.

- Lighting of parks and flower gardens includes lighting of entrance and exit gates, grounds for outdoor activities, pathways in parks and flower gardens. Minimum illuminance for parks and flower gardens is specified in Table 19.
- For lighting of surfaces of architectures, the luminance specified in Table 15 applies.
- Decorative illumination shall only be applied to a number of trunk roads and public places such as parks, flower gardens, squares on festive days.

Table 15: Electricity supply norms for daily life (per household)

Characteristics of Residential Areas	Norms (kW/household)
Low residential buildings (1÷2 doors), renovated or newly built	2
Adjoining residential buildings or 4÷5 storeyed apartment buildings	3
High apartment buildings (≥ 9 floors)	4
Villas	5

Table 16: Electricity supply norms for public works and services (when work construction sizes have been projected)

No.	Electric Consumers	Electricity Supply Norms
1	Offices - Without air conditioners	20W/m ² of floor

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No.	Electric Consumers	Electricity Supply Norms
	- With air conditioners	30W/m ² of floor
2	Schools - Preschools + Without air conditioners + With air conditioners - General education schools + Without air conditioners + With air conditioners - Universities + Without air conditioners + With air conditioners	0.15kW/child 0.2kW/child 0.1kW/pupil 0.15kW/pupil 15W/m ² of floor 25W/m ² of floor
3	Shops, supermarkets, markets, trade and service centers + Without air conditioners + With air conditioners	20W/m ² of floor 30W/m ² of floor
4	Guest houses, hotels - Guest houses, one-star hotels - Two- or three-star hotels - Four- or five-star hotels	2kW/bed 2.5kW/bed 3.5 W/bed
5	Healthcare (healthcare works) - National-level hospitals - Provincial/municipal-level hospitals - District-level hospitals	2.5kW/bed 2kW/bed 1.5kW/bed
6	Theaters, cinemas, circuses	

No.	Electric Consumers	Electricity Supply Norms
	+ With air conditioners	25W/m ² of floor

Table 17: Luminance and illuminance for roads of different types

Road levels	Types of Roads	Designed Speeds (Km/h)	Minimum Luminance (cd/m ²)	Minimum Illuminance (Lx)
Urban level	1. Expressway			
	- Grade 120	120	1,5	
	- Grade 110	100	1,2	
	- Grade 80	80	1,0	
	2. Urban axial roads	80÷100	1,2	
	3. Urban trunk roads	80÷100	1,0	
Sectional level	4. Inter-sectional roads	60÷80	0,8	
	5. Sectional trunk roads	50÷60	0,6	
Internal level	6. Sectional roads	40÷50	0,4	
	7. Sectional division ways	40	0,2÷0,4	
	8. Adits	20÷30		5

Table 18: Illuminance for roads for cyclists and pedestrians

No.	Types of Roads	Illuminance (Lx)
1	Pedestrian walkways in urban centers	5
2	Roads for cyclists and pedestrians in other areas with traffic flow being:	

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No.	Types of Roads	Illuminance (Lx)
a	- High	3
b	- Medium	1, 5
c	- Low	1
3	Sidewalks with a cross section of over 5m	3

Table 19: Illuminance for parks, flower gardens

No.	Objects to be Illuminated	En (lx)	
		Parks	Flower Gardens
1	Gateways		
	- Main entrance	7	-
	- Sub-entrance	5	-
2	Walkways		
	- Main walkways	5	3
	- Sub-walkways, walkways with trees	2	1
3	Grounds for outdoor activities	5	5

- Content of Recommendation:

- Strengthening the inspection on implementation of compulsory standards on energy saving and greenhouse gas emission reduction
- Exchange of information and strengthening cooperation for international standardization on energy saving and greenhouse gas emission reduction
- Active usage of international standards for integration of national st

standards, making efforts to standardization for energy saving and greenhouse gas emission reduction

- Public lighting system covers street lighting, transport works, parks, flower gardens, decoration, festivals, construction and arts works and should meet the requirements of lighting works, safety and energy saving. In such a case, the public lighting system should comply with QCVN 07-7:2016/BXD.

III Conclusion and Subsequent Legislative Matter

1. Conclusion

- Renovation of the institutional system for a new developmental direction, such as the green city development model in Vietnam, is very necessary in line with the country's green growth strategy. Institutionalization of planning tasks should be conducted one step ahead and this is a valuable documentation base and direction for phased adoption of the green city planning and development model in Vietnam in the process of shift of urban paradigm.
- To this end, the content of proposal in this report, though the scope is limited, is to create substantive implementation effects of national green growth and sustainable green city development strategies. Also, transparency of the decision making process using the green city planning indicators and master plans and electronic decision making support system could be enhanced. Especially, in establishing green city planning, validity and reliability of decision making process using data usage and analysis, unlike existing methods, could be secured.
- Such legislative activities for establishment of green city planning and decision support system would eventually realize green society and contribute to improvement of quality of life for citizens.
 - However, as stated earlier, it should be reminded that the proposals in this report are limited to minimum institutional proposals for green ci

ty planning in Vietnam since it has been a part of “the Establishment of Green City Planning and Decision Support System”. Therefore, consistent research on legal framework is required.

2. Subsequent Legislative Matter

- The establishment of legal framework for the green city planning and decision support system is a crucial legislative model for phased adoption of implementation of green growth strategies and paradigm shift of urban development in Vietnam. However, to substantively activate such legislative models, the institutionalization of system for establishment and support of policy support mechanism to implement green city planning such as development and management of database supplemented with green growth programs and urban green growth indicators.
- For this matter, early institutionalization of establishment and management of data for establishment of green city planning, system of sectoral cooperation, system of promoting green city planning and development, system of strengthening capacity of design and management of green city planning and system of supporting organizations executing green city planning management tasks would be crucial.
- This aims to contribute to realization of the rule of law and improvement of quality of life for citizens which are ultimate targets of legal framework through promotion of application of green city planning-related models and, at the same time, legislative support for sustainable urban develop

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pment.



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Report on green city indicators

Report on the planning of Rach Gia city in Kien Giang province towards green

Report on the application of GDSS to support decision making for green city
planning

Current legal documents

- Laws, Decrees, Enforcement Rules, Standards and Related Standards
- The Korean Experience on Law and Urban Energy Efficiency