

BUILDING A SMART CITY IN BINH DUONG PROVINCE NOW – SITUATION AND SOLUTIONS

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In 2016, Binh Duong province built the Binh Duong Smart City Project with a learning model from Eindhoven City, the Netherlands. The project serves as a guideline for Binh Duong's development strategy in the current period, directly addressing the province's challenges with specific projects, creating leverage in many aspects of society. Binh Duong became the first locality in Vietnam to become a member of ICF in 2018, opening up the opportunity to establish stronger international relations with the global smart community for the purpose of exchanging information, experience and attracting high-quality human resources to work in Binh Duong. To maintain and promote those achievements, turn Binh Duong into a land of prosperity, high income, developed science and technology and to be a destination for global commercial activities, trade and services... Binh Duong needs to continue researching to overcome the shortcomings, contributing to building a synchronous, creative and practical smart city.

Keywords: *Binh Duong province; Building a smart; Socio-economic; Economic development.*

1. Introduction

Managing and improving the quality of cities requires knowing what's going on inside that city, which can only be captured through changing the way governments operate, citizen participation, as well as the involvement of stakeholders responsible for their management. Therefore, converting "Traditional City" into "Smart City" is an inevitable need. With the advent of digital technology, the Internet and mobile technology, this transformation becomes even more possible. Catching up with the trend of major cities in the world, Binh Duong province has implemented the Smart City Project, which has since achieved much success with specific projects with specific results in many fields.

To continue implementing the Smart urban project in Binh Duong province, as well as maintaining the recognition of the international community in the Top 21 ICF and progress to the Top 7 ICF and Top 1 ICF, requiring perseverance and continuing to be a great companion among all elements of society, especially three houses including the state, schools and entrepreneurs. On the other hand, after rapid economic development, Binh Duong is facing major challenges that need to be solved such as the middle-income trap, unbalanced economic development and a large gap between industry and service trade, overloaded transport infrastructure, increasing costs for investors, as well as the challenge of training and attracting human resources.

2. Research overview

The issue of smart city construction has been studied by many authors, in which the works mainly focus on analyzing the achieved results, difficulties, challenges and solutions to improve the effectiveness of the program, including some typical researches as follows: Directorate General for Internal Policies 2014, Mapping smart cities in the EU, EU Parliament, IP/A/ITRE/ST/2013-02 PE 507.480; Ha Phuong (2016) "Sustainable smart city development – concepts and challenges", Journal of Information and Communication Technology, No. 3, p.34-40; Nguyen Hong Thuc (2014), "Factors of smarter urban development in Vietnam", Journal of Construction, No. 7, p.76-79; Houbing Song, Ravi S. Srinivasan, Tamim I. Sookoor, Sabina Jeschke (2019), "Smart Cities: Foundations, Principles and Applications", Publishing House of National politics, Hanoi; Ha Minh Hiep (Editor, 2019), "Intelligent production in the industrial revolution 4.0", Publishing House of National politics, Hanoi; Tran Kim Chung (2018), "Applying public-private partnership in smart city development in Vietnam - Theory, situation and solutions", Proceedings of the workshop "Smart city development and public cooperation" June 2018; Luu Duc Cuong (2018), "Smart city – Urban planning towards smart cities in Vietnam", Proceedings of the National Lighting Science Conference 2018; Nguyen Van Thanh (2018), "Building and developing a smart city that ensures security, wellbeing and safety indicators in the context of the Fourth Industrial

Revolution”, Publishing House of National politics, Hanoi... In general, the researchs have analyzed the achievements and difficulties in building smart cities in our country over the years. However, the articles only study at a general level, not comprehensively assessing the achieved and unachieved results in smart city construction in the whole country in general and in Binh Duong province in particular, therefore, solutions and development orientations in accordance with the current practice have not been given to build a smart city in Binh Duong province in the near future. Therefore, it is necessary to study the current situation and propose solutions to develop smart cities in Binh Duong province.

3. Research Methods

The article mainly uses the method of collecting documents from reports, articles, research articles, news websites of Binh Duong province, thereby synthesizing, analyzing and making statistics of relevant information sources directly related to the research content. In particular, the author has inherited data sources from reports related to smart city development in Binh Duong province and the Document of the 11th Binh Duong Provincial Party Committee (term of 2020-2025).

4. Research results

During the period from 2016 to now, through the policies of the central and local governments on building a smart city, Binh Duong province has achieved specific results:

4.1. *About smart city construction and management*

The province has put into operation the Binh Duong Provincial Startup Support and Community Initiative Center (BIIC) to support the formation of a strong and sustainable creative startup ecosystem in Binh Duong, increasing the number of innovative businesses, scientific and technological enterprises; promoting local economic growth in depth on the basis of increasing contributions of science and technology; strengthening public-private cooperation, promoting three-house linkage in the direction of Binh Duong’s smart city development (Department of Science and Technology, 2020).

In the transportation sector, the Becamex Tokyu bus system has been deployed using clean fuel (CNG gas); automatic toll collection does not stop on National Highway 13. The BRT bus system connecting Suoi Tien station has been approved by the Prime Minister for a pre-feasibility study report. Planning to study railways, logistics serving connecting industrial zones to ports and airports to transport goods, reduce the number of trucks, reduce congestion and traffic accidents on roads.

Implement the route toll collection for road use services in the form of automatic electronic

non-stop for BOT stations in the province. Up to now, BOT businesses in the province have installed and completed the equipment for non-stop toll collection, it is expected that in 2020, BOT businesses will coordinate with the Directorate for Roads of Vietnam to deploy non-stop toll collection (Department of Science and Technology, 2020).

Projects on LED lights, smart lighting and energy saving have been widely implemented by the government and businesses in the province. Typically, such as installing LED lighting system in Di An1, setting up a project to innovate solutions to manage and operate the public lighting system in Thu Dau Mot city according to the intelligent control method, taking into account the Replace existing high pressure Sodium lamps with LED 2 lamps. Housing development projects in the province are installed by investors with energy-saving LED lighting systems.

4.2. *About providing smart urban utilities*

Implementing the plan of the Provincial People’s Committee, the Provincial Department of Construction organized the implementation of the conversion to apply the quality management system according to TCVN ISO 9001: 2015.

A number of breakthrough information technology related projects are also being promoted, such as the geographical information management system (GIS) phase 01 in Thu Dau Mot city, the phase 2 geographic information project in the province’s administrative area has been completed and put into use by APP applications, websites, has provided planning information and study, search functions, reporting incidents,... to people.

Deploying the project on geographic information system and specialized software for Construction (GIS - phase 2), the project has been completed and to be preparing the procedures to hand over the project to the users. To maintain the update of the database, the Provincial Department of Construction has submitted to the Provincial People’s Committee for approval of the implementation budget in 2020 and the following years. Up to now, the initial application of the project has achieved positive results, including the application of planning information, housing projects, technical infrastructure projects, false reflections of construction violations,... based on mobile applications. This is to support people, individuals and organizations who want to look up information by phone to save time and look up quickly.

Some localities also actively contribute to the smart city trend of the province, typically Thu Dau Mot City has issued a decision to conduct research on information technology infrastructure in the field of urban management, environment and public administration such as: App Mobile application to

manage violations of urban order, construction order, land and environmental sanitation.

Binh Duong province has put into exploitation and operation the hotline system “1022” in Binh Duong province in order to receive, process and promptly reflect the recommendations of individuals and organizations living, working and operating in the province.

Many solutions to improve the living environment are being studied and proposed: such as developing a package of technical solutions to improve road traffic safety; building a set of indicators of good cities in Binh Duong; implementing the project to promote a clean green environment in the period of 2017-2030; initiating research to build an environment of culture, sport, smart tourism,...

4.3. About smart administrative reform

Transparency and friendly administrative reform, building an effective e-government are the key tasks of the Binh Duong Smart City Project to improve management efficiency and meet the increasing needs of the people, businesses and create driving force for socio-economic development.

The application of information technology in handling administrative procedures has been gradually expanded and upgraded towards transparency, openness, utility and efficiency such as: Deploying software for an inter-level one-stop system at provincial level, assessing the satisfaction of people and organizations about the service of administrative agencies. Open the public administrative information page, which provides 100% public administrative procedures at all levels and online public services. Providing online payment via bank for a number of online administrative procedures, integrating postal services and public services.

Piloting traffic impact assessment in the province for construction works and projects in the province (Industrial parks, apartment buildings, schools, commercial centers, hotels,...).

4.4. On the implementation of a spatial database of smart cities that are interconnected (GIS Project)

Binh Duong province is one of the economically dynamic localities, in which industry is the foundation. Therefore, the demand for the construction of technical infrastructure, urban areas and industrial zones is very large. This has also created a lot of pressure on urban management in the province. Therefore, on October 30th, 2015, Binh Duong Provincial People’s Committee issued Decision No. 2794/QĐ-UBND on deciding the investment policy of a number of public investment projects, including the project “Building a geographic information

system and specialized construction software” to expand the application of geographic information system to construction management in all districts and towns in the province and at the same time expand to apply to all operational processes of the Department of Construction.

On July 8th, 2013, the People’s Committee of Binh Duong province issued Document No. 1910/UBND-VX allowing the project to be implemented: “Building a geographic information system and specialized software for Construction phase 1 - pilot in Thu Dau Mot city”, this is an important first step to create a database specialized in construction and develop an application software system to serve the management of construction planning and urban technical infrastructure.

By the end of 2017, the second phase will continue to be deployed with the goal of exploiting databases and building applications for public service management and support for the people.

With more than 15 applications, on many different platforms; one point worth noting is that with applications built on smartphones, it is supported by many people with nearly 12,000 downloads, including many compliments and suggestions about the application. This is also recognized as an optimistic signal in improving public services to serve the community.

In addition to the online information channel of the Binh Duong provincial Department of Construction, people can access online at the website: Quyhoachxaydung.binhduong.gov.vn to look up information on construction planning or gisxd.binhduong.gov.vn for more information on technical infrastructure and construction projects in Binh Duong province.

For applications on mobile phones, people can download (download) directly from application stores such as Appstore and CH Play with keywords such as “Binh Duong construction planning” to download supporting applications to look up construction planning information or keywords “Reporting Binh Duong Incident”, “Binh Duong Construction Mistake” to download an application to support people to reflect information about technical infrastructure incidents and construction mistakes.

Especially in order to be transparent and help people have access to legal information about real estate projects that have been and are being built in the province, the application “Binh Duong - Housing Real Estate” was built and also put up 02 stores above. At the present time, with just a smartphone, people can access most of the necessary information related to the construction field.

The functions and applications of the GIS system have basically served for each function and task of

the units under the Department, providing databases on planning, technical infrastructure, housing information and real estate, high-rise buildings, mineral mines and reflections on violations in the field of construction,... In the coming time, we will continue to research and apply modern technologies, pioneering industry development orientations such as 3D, AI, BIM and gradually integrate BIM + GIS to improve management quality and efficiency.

Besides the achievements, the development of smart cities in Binh Duong province still has some difficulties and obstacles in the implementation process, specifically:

- The state management mechanism in the area still has many shortcomings, has not promoted dynamism, creativity, autonomy and self-responsibility in mobilizing resources for development.

- Traffic infrastructure has been invested in a methodical and quality way, but traffic in Binh Duong is now showing signs of overload, especially in traffic routes connecting the region, connecting to seaports and international airports. Traffic congestion directly affects the retention of old investors, as well as attracting new investors, at the same time indirectly destroys the province's geographical competitive advantage.

- Challenges of training and attracting human resources in the process of smart city development in Binh Duong province.

5. Discussion

In order to continue to promote the achieved results, overcome the limitations and difficulties in the process of smart city development, in addition to inheriting the solutions that have been implemented in the coming time, Binh Duong province needs to study, clarifying some issues as follows:

5.1. Overcoming the middle income trap

Speeding up the approval of specific projects in the Binh Duong Smart City project:

Promoting the innovation ecosystem, especially in Thu Dau Mot whose heart is Binh Duong New City - Innovation Regional Center: In order to build a culture of innovation in the province, promote and attract startups to Binh Duong, create and present ideas, contribute to solving social problems, investor's problem, projects such as business nurseries, Fablab, Techlab, to be the initial foundations to create an innovation ecosystem for Binh Duong. Binh Duong People's Committee has also issued Project 826, with specific programs and regulations to support startups, along with the establishment of the BIIC Center for Community Initiatives and Startup Support, which is opening an important legal corridor for the province on innovation. The innovation ecosystem in Binh

Duong has now joined the global innovation start-up chain, through cooperation with Block71, the National University of Singapore. These are very important steps, confirming the maturity of the innovation ecosystem in the province, thereby directly contributing to training and attracting human resources for Binh Duong province.

In particular, the experimental workshop for start-ups in the field of manufacturing, smart manufacturing and industry 4.0 in New City is being formed. The experimental factory area is a model of an office combined with an experimental workshop, which is an integrated model that is more applicable and associated with industry than shared office models.

This project complements the startup and innovation ecosystem in Binh Duong New City that has been built such as Business Incubators, Fablabs, Techlabs, Smart Manufacturing Center and Block71 startup support system cooperates with the National University of Singapore,... this is a project to attract human resources and innovative activities in industry and production, contributing to narrowing the gap between development research and industry, production.

5.2. Narrowing the gap between Industry and trade and services

Binh Duong New City World Trade Center Area

Binh Duong's joining the Association of World Trade Centers in 2019 will be a lever for the development of trade and services of Binh Duong, turning Binh Duong new city into an international trading point, connecting, to be the place to organize exhibitions and events of international stature.

WTC Expo Center: to be modernly designed, according to international standards to attract and organize large, domestic and regional exhibitions. With those functions, the WTC Binh Duong New City World Trade Center complex is expected to be a pillar, starting the process of narrowing the gap between industry, trade and services in the economic structure of the province.

Approval to build a pilot zone for cross-border e-commerce: this is a project to promote trade and service development, focusing on logistics for e-commerce in Binh Duong, at the same time attracting human resources and brainpower in the field of e-commerce in Binh Duong. Along with the construction of bonded warehouses, to be the application of a technology platform with the participation of all relevant stakeholders in the field of e-commerce. Cross-border e-commerce is one of the pillars in promoting and developing e-commerce and developing the digital economy for countries.

5.3. Urban and traffic infrastructure development, technical infrastructure

Commencement of key traffic projects connecting Binh Duong with southern economic regions. Thereby connecting the whole region, reduce traffic pressure on existing roads, at the same time quickly connecting Binh Duong, Binh Phuoc and Tay Ninh provinces with current international seaports and airports as well as in the future in Ho Chi Minh City and Dong Nai.

- Urban infrastructure and traffic:

Applying the TOD model, urban planning associated with public transport, upgrading the road transport system, developing new types of transport:

Road traffic: Continue to develop important main traffic axes such as Ring road 3, Ring road 4, North Tan Uyen - Phu Giao - Bau Bang power generation road,... at the same time, continue to renovate and expand the existing arterial roads such as My Phuoc - Tan Van, National Highway 13, by solutions such as building overpasses, underpasses, parallel roads, collecting roads at intersections with high traffic volume at peak hours in order to solve the existing traffic infrastructure pressure.

River: It is necessary to develop a river port system on two river systems flowing through the province, namely the Saigon River and the Dong Nai River, in order to reduce the load on road traffic in the field of freight transport in the near future.

Railways: Advise the government, set up planning landmarks, find capital sources to implement freight railways in order to reduce the load on Binh Duong road traffic, such as the railway lines of Chon Thanh - Bau Bang - Di An - Bien Hoa - Vung Tau, connecting with North-South railway.

- Infrastructure:

Decisively deploying the Smart City Operation Center, which can connect all peripheral devices, provide data, handle emergency incidents and centrally operate according to the process of collecting information, handling information, forecasting situations and taking action in the fastest way, contributing to creating a better living and working environment for people, more effective state management.

Currently, Binh Duong is at the forefront of the country in GIS geographic information system with digitized data of planning maps across the province, while strengthening state management and sharing public and transparent information for people through the app on mobile phones about planning, housing, real estate... Besides, Binh Duong has successfully deployed the hotline 1022 providing multi-channel (telephone, Zalo, Facebook, email...) to connect people and authorities 24/7, at the same time, providing ambulance service to people with the fastest speed. The above projects are gradually creating the Smart City Operation Center phase 1,

which will soon be put into use by the end of 2021.

5.4. Human resource development

Retrain existing human resources as well as attract human resources to ensure a higher level of human resources, both understanding the skills of applying new technologies and solving data problems, as an input of the production process, of the digital economy mode of production.

Building vertical centers of excellence, selectively attracting world-class experts: Strategies to attract experts, professors,... reputable in the industry, in the international environment, to work and cooperation, thereby affirming the quality of the center of excellence, these individuals are also the “lighthouses” in the industry, creating prestige for the centers, thereby easily attracting more human resources. Proactively create topics, create long-term, high-knowledge-content jobs, derived from the actual needs of investors and society: Jobs with high knowledge content, through research and development projects, technology transfer,... will attract high-quality human resources to solve those problems, combined with commensurate and long-term compensation policies, through centers professional center.

5.5. Some other directions

Reducing labor-intensive factories, attracting factories that apply science and technology to increase labor productivity, thereby increasing people’s income and life.

Concentrating resources to implement digital transformation in a number of industries and fields with competitive advantages of the province, bringing new and practical values to people and businesses, promoting socio-economic development. It is necessary to move quickly from e-Government and the province’s approach to implementing digital transformation in 3 axes: digital government, digital economy and digital society.

- Continue to focus on deploying 3 factors: technology, people, management, specifically:

For technological factors: Forming intelligent data sources, control systems, information security, creating availability and accessibility of the system.

For the human factor: a specific solution is needed for the formation of a community of smart residents, with digital knowledge and skills, who can easily access and use the system’s utilities. Strengthen the trust in the system and the community’s trust in the reliability of the sharing service. On the basis of establishing mechanisms and digital solutions for the sharing of access and intellectual property in order to enhance the effective use of society’s resources.

For the governance element: Building a smart government that coordinates the various

components of a smart city in a transparent, connected and collaborative manner. Building a legal framework and monitoring solutions to ensure information security and privacy for individuals and organizations in society.

6. Conclusion

Up to this point, all countries are moving towards smart cities for effective economic management, as well as increasing people's quality of life. However, "how" is still a big question. Binh Duong's smart urban development process is reflected in the province's breakthrough development programs, the core is building the interaction between the "3 houses" including: State - scientists - enterprises. In addition, Binh Duong is coordinated and supported by the twinning city as Eindhoven,

the Netherlands. At the same time, Binh Duong province also expands cooperation with many international organizations and other developed cities of the world such as the World Association of Science and Technology Urban Areas, Daejeon City (Korea)... In the current period, on the basis of the current situation of smart city development, Binh Duong province needs to continue to implement synchronous solutions to attract into the fields of science and technology, bringing labor productivity and great value. Taking advantage of the strength of infrastructure development and methodical planning to help Binh Duong in the development of a smart city, looking for solutions to enhance utilities better to serve the lives of people and businesses as well as the government has smarter tools in the socio-economic decisions of the province.

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XÂY DỰNG ĐÔ THỊ THÔNG MINH Ở BÌNH DƯƠNG HIỆN NAY - THỰC TRẠNG VÀ GIẢI PHÁP

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Năm 2016, Bình Dương đã xây dựng đề án thành phố thông minh Bình Dương với mô hình học hỏi từ thành phố Eindhoven, Hà Lan. Đề án như kim chỉ nam cho chiến lược phát triển của Bình Dương trong giai đoạn hiện nay, giải quyết trực tiếp các thách thức của tỉnh bằng những đề án cụ thể, tạo những đòn bẩy trên nhiều khía cạnh của xã hội. Bình Dương đã trở thành địa phương đầu tiên tại Việt Nam trở thành thành viên của ICF vào năm 2018, mở ra cơ hội thiết lập quan hệ quốc tế mạnh mẽ hơn với cộng đồng thông minh toàn cầu nhằm mục đích trao đổi thông tin, kinh nghiệm và thu hút nguồn nhân lực chất lượng cao đến làm việc tại Bình Dương. Để giữ vững và phát huy những thành quả đó, đưa Bình Dương thành vùng đất thịnh vượng, có thu nhập cao, khoa học kỹ thuật phát triển, là điểm đến cho các hoạt động giao thương, thương mại và dịch vụ toàn cầu... Bình Dương cần tiếp tục nghiên cứu để khắc phục những tồn tại góp phần xây dựng đô thị thông minh đồng bộ, sáng tạo, phù hợp với thực tiễn.

Từ khóa: Tỉnh Bình Dương; Xây dựng đô thị thông minh; Kinh tế - xã hội; Phát triển kinh tế.