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A Proposed Masterplan for the Development of the Emerging Urban Growth Corridor along San Pascual, Batangas New By-Pass Road through Polycentric Linear Planning Approach

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ABSTRACT

Looking at the most beautiful towns and cities, we are amazed by how they have organized the built environment. It may not only be about the size of development but by how the systems work and relate with each other and when issues are being addressed and user convenience is at the top of its planning priorities. Master planning is an effective approach where development zones, massing, relationships of physical infrastructures, access and circulation will be planned in a way that outcome may be defined with optional responses to possible issues along the way. For the Municipality of San Pascual, a town in the middle of developed cities and municipalities, planning the development of the new by-pass road as an extension of the expressways from Manila & Calabarzon would maximize the town's potentials and enhance the utilization of its vast resources and lands. The study tackles a dynamic long-term plan that provides a conceptual guide for San Pascual's new by-pass urban growth corridor's future development to connect zones, social settings, and their surrounding environments. The proposal will include analysis, recommendations, and master plan for the site's population, economy, housing, transportation, community facilities, and land use based on public input, surveys, planning initiatives, existing development, physical characteristics, and social and economic conditions.

Keywords: San Pascual By-Pass Road, master plan, urban design, urban planning, growth corridor

INTRODUCTION

The opening of the Batangas City – San Pascual - Bauan New By-Pass Road, which acts as a major transportation artery connecting various towns and cities is one of the main forces behind the rapid urbanization and population growth in the Municipality of San Pascual, Batangas. As a result, the area along this corridor that was formerly rural is quickly becoming an expanding urban growth corridor. The Municipality of San Pascual being located along the industrial coast of South Luzon and centralized location in the province of Batangas with its land area mostly relatively flat would attract long term ventures in the Agro-Industrial Industry. Investments in heavy industry, real estate development, housing, food manufacturing and tourism would help in filling in the industries lacking along the newly opened by-pass road connecting Batangas City and Bauan, passing through San Pascual. The ten-kilometer linear corridor would mean at least 3000 hectares of urban land waiting to be developed, a revenue that would boost San Pascual economy on all fronts and with the quality of land and proximity to Batangas International Port at around 10-15 minutes only, it qualifies as an investment hub being eyed by local and international companies. Large and relatively flat open spaces present opportunities for township development, educational institutions, provincial or regional sports and recreation facilities, malls, agro industrial parks and a wide variety of mixed-use themed developments. A thorough and well-organized master plan is urgently needed to direct future development of the San Pascual's urban

expansion while seizing the chances for development and expansion in a sustainable way. Through this, a comprehensive examination of the urban corridor's current situation will be done, taking into account elements including population growth, land use patterns, infrastructure development, economic activity, and environmental effect. The master plan will be created through thorough research and consultations with relevant stakeholders to identify important development zones, prioritize infrastructure investments, suggest sustainable housing options, and put policies for traffic management and environmental protection into place. It will not only assist in coordinating community, business, and local government efforts, but it will also act as a roadmap for deciding on development initiatives and resource allocation. The master plan will also place a strong emphasis on inclusivity, ensuring that underprivileged communities and other groups of the population receive an equitable share of the advantages of growth.

Overall, the creation of a diligently prepared master plan for the new urban growth corridor along the San Pascual New By-Pass Road is essential for laying the groundwork for sustainable development, improving quality of life, and fostering a strong and resilient community through a holistic and collaborative approach.

LITERATURE REVIEW

Planning in its origins had an implicit premise that a well-designed, comprehensively planned city would be a socially ameliorative one. In other words, it tended toward environmental determinism. The goals of planning have subsequently become more modest, and the belief that the physical environment can profoundly affect social behavior has diminished. Nevertheless, planning as practice and discipline relies upon public policy as an instrument for producing a more equitable and attractive environment that, while not radically altering human behavior, nonetheless contributes to improvements in the quality of life for a great number of people (Feinstein, 2022).

Urban Form

The arrangement of a built up area. This arrangement is made up of many components including how close buildings and uses are together; what uses are located where; and how much of the natural environment is a part of the built up area (ASBEC, 2015). The term “urban form” is used to describe a city’s physical characteristics. It refers to the size, shape, and configuration of an urban area or its parts. How it will be understood, structured, or analyzed depends on scale. Characteristics of the urban form range from, at a very localized scale, features such as building materials, facades, and fenestration to, at a broader scale, housing type, street type, and their spatial arrangement or layout. The concept of urban form encompasses also nonphysical aspects such as density (Anderson et al., 1996).

Below are elements of urban form to be used in the proposal:

- *Zoning* – the legislative method of controlling land use by regulating such considerations as the type of buildings (*e.g.*, commercial or residential) that may be erected and the population density. Applied primarily to urban areas, it is accomplished by dividing land area into zoning districts, each having specific conditions under which land and buildings may be legally developed and used. In combination with other city-planning techniques, zoning is a major instrument for gaining greater physical order in cities (Britannica, 2023).
- *New towns* – concerned with what they regarded as too much density within urban areas, governments constructed these new towns as a means of capturing the overspill from cities within planned developments rather than allowing haphazard exurban growth. Most of them, except in the Soviet Union, were primarily residential suburbs, although some British

towns such as Milton Keynes did succeed in attracting both industry and population within low-rise conurbations (Feinstein, 2022).

- *Linear Settlements* – one form of human settlement is the linear form. It is made up of a village along a road, the coastline or a waterway. The road functions as the spine along which all functions in the village occur: habitation, manufacture, storage and trade. The linear character is often a spontaneous one dictated by external factors that affect building conditions, such as the already mentioned road, a river or a valley. Linear urban areas have appeared long before the concept of linear cities was theorized (Furundzic & Furundzic, 2012; Lynch, 1981).
- *Polycentric Urban Models* – the spatial pattern of development of urban structures is quite complex. Now we observe more polycentric urban structures that have replaced mono centric. For example, the functional area of Barcelona has poly nuclear structure, with the main core city of Barcelona, surrounded by peripheral cities. While the main city provides practically all goods and services that are available in this network of cities, the peripheral cities have a particular specialization (Yegorov & Trullen, 2003).

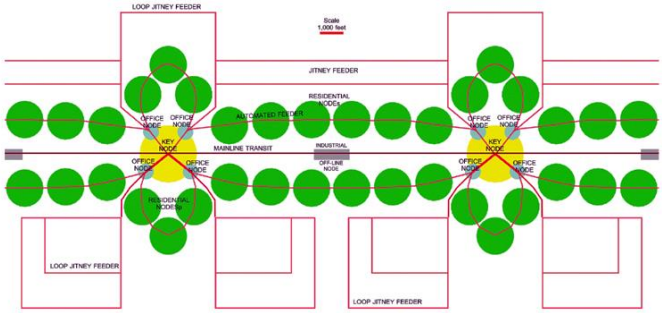

Figure 1. Polycentric Linear City Model – A prototype for transit based human settlement

Source: Yegorov & Trullen (2003)

Master Planning

A master plan is a dynamic long-term planning document that provides a conceptual layout to guide future growth and development. Master planning is about making the connection between buildings, social settings, and their surrounding environments. A master plan includes analysis, recommendations, and proposals for a site's population, economy, housing, transportation, community facilities, and land use. It is based on public input, surveys, planning initiatives, existing development, physical characteristics, and social and economic conditions. Master planning can assume some or all of these roles:

- Develop a phasing and implementation schedule and identify priorities for action
- Act as a framework for regeneration and attract private sector investment.
- Conceptualize and shape the three-dimensional urban environment.
- Define public, semiprivate, and private spaces and public amenities.
- Determine the mix of uses and their physical relationship.
- Engage the local community and act as builder of consensus.

Master plans can have an important role in determining the shape of the urban environment. If not well conceived, they can lead to problems in the future. For instance, one of the criticisms of Santiago's master plan was that it was too flexible in setting standards for beautification and building volume design. Hence, the quality of these buildings in terms of architectural design and construction materials was considered one of the weaknesses of the repopulation program. The residents also criticized the unpleasant contrast of the high tower buildings with the existing historic urban fabric, as well as the fact that the new towers are

not well integrated within the traditional neighborhoods. All of these issues could have been addressed well in advance as part of the master plan (The World Bank, n.d.).

The Linear City

The linear city – pioneer proposal by Soria y Mata, had many proponents and opponents during the twentieth century. Modern infrastructure corridors revive attention for linear concept in this century. The essential characteristic of a linear city and a corridor is: a line. Regardless of linear form strict conditions and certain contradictions, linear concept demonstrates adaptability. The chief characteristic of linear concept is rapid and efficient movement of people and goods. Linear city represents important concept in urbanism and spatial planning. The idea of linearity, being utopian and without significant realizations in the past, become promising and applicable to modern infrastructure corridors. Analogous to linear city, infrastructure corridor is a spine of elongated urban formation – which can expand without growing wider (Furundzic & Furundzic, 2012).

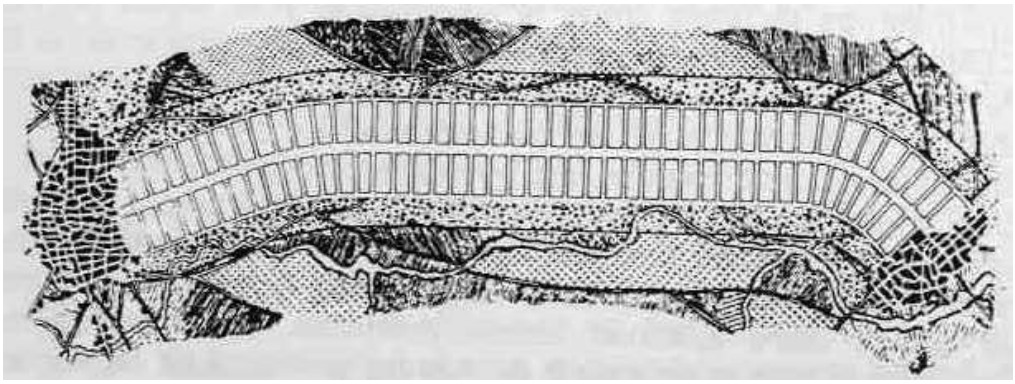

Figure 2. The Linear City – Pioneer proposal by Soria y Mata
Source: Furundzic & Furundzic (2012)

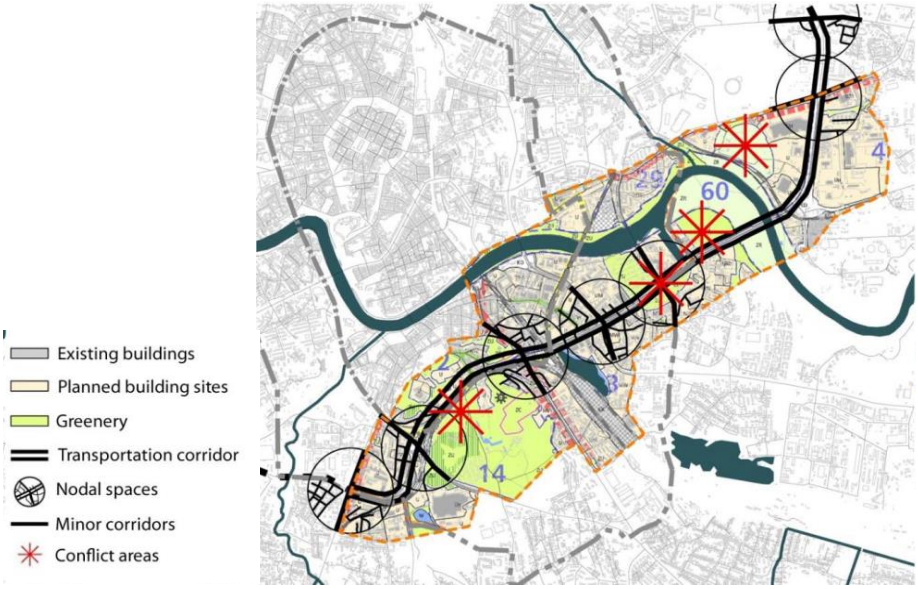

Figure 3. Model of spatial structure of Krakow – Vision for year 2030-50. Planning Preconditions and directions of development for chosen corridor – interpretation, synthesis.
Source: Gyurkovich et al. (2017) & Ogrodnik (2019)

MATERIALS AND METHODS

The study used qualitative methodology of naturalistic inquiry, specifically the descriptive and analytical case study methods to identify common perceptions of the planning process. Documentary research, field survey and collecting community knowledge and ideas shall be utilized to come up with the most effective research and in coming up with the resolution effective enough for the proposal. The figure below presents and discusses the following variables involved in developing the project and how they were put together as individual parts of the system.

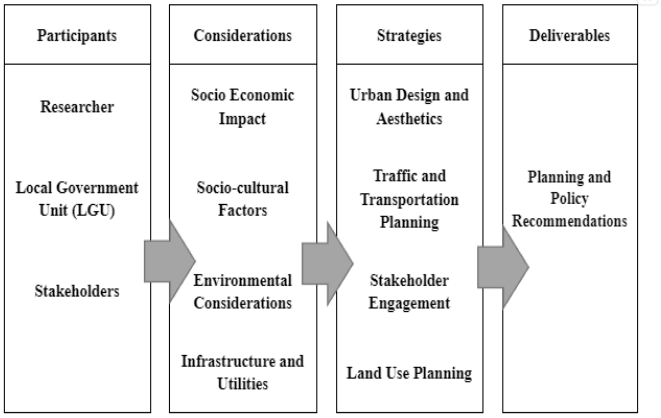

Figure 4. Research Model

Research Instruments

- *Questioning Technique* was the most helpful process undergone due to its personal relation to the study itself. Interviews, questionnaires, checklists are the tools that will be used by the proponent for conducting extensive research upon the internal and practical data. Structured method of questionnaire will be used.
- *Data Gathering* from the internet, magazines, related books, articles & technical books are a source of factual and proven data which are essential for the supporting facts of the study.
- *Experiences and observations* along the new by-pass road are very useful for the study. Site inventory checklist will be done in order to have more precise and concise results to achieve the needed facts available.

Statistical Treatment of Data

The data obtained will be organized in accordance with the requirements of the study as follows:

Stakeholder Analysis: Analyze information on stakeholders' preferences, issues, and areas of interest to ensure that the development master plan fits the demands of the neighborhood, its immediate context and the local economy.

Forecasting: Using forecasting tools, anticipate future patterns in land use changes, access opening and widening, economic development, and population growth. For the planning of the corridor's development, these forecasts are crucial.

Spatial Analysis: Given that it is a corridor for urban growth, spatial study is essential. Visual Communication tools such as images, graphics, maps, plans, diagrams and perspectives shall be used to convey study results using Sketch up, Photoshop and Autocad technologies and other softwares available to gain important insights into the development of forms and connections between different nodes and components of the master plan.

RESULTS

Stakeholder Engagement

The Local Government Unit (LGU), Government Agencies like the Department of Public Works and Highways (DPWH), Barangay Leaders, businesses, residents, community organizations, and environmental groups' forms part of a diverse range of stakeholders involved in this project where each group's interests, concerns, and influence have been taken into account. Public participation has been encouraged through various means, including meetings and surveys, clearly articulating and demonstrating to stakeholders how their concerns and interests will be addressed in the plan. The following engagements has been taken:

- Meeting with San Pascual Municipal Planning Coordinator Ms. Rona Romasanta gathering her insights on the vision and development direction of the municipality, CLUP and available maps.
- Discussion with Hon. Mayor Antonio Dimayuga and presented the proposal to him and how it will be able to help in the municipality's urban development. A request through a letter was also given (See Appendix 1) to be able to conduct research and approach local government departments and affected barangay councils for information and documents relating to the proposal.
- A letter, meeting and response received from Department of Public Works and Highways (DPWH) District II to request for information such as maps, drawings, documents and other studies related to the project.
- A letter sent to the Department of Public Works and Highways (DPWH) Region IV-A to request for information such as maps, drawings, documents and other studies related to the project.

Figure 5. (Left to Right) Ar. Edmon Mendoza meeting with San Pascual Municipal Mayor Hon. Antonio Dimayuga and Ms. Rona Romasanta, Municipal Planning & Development Coordinator

Presentation of Data and Analysis

In order to create a sustainable and prosperous master plan for the new by-pass corridor, a multifaceted strategy will be the most effective approach to maximize the municipality's urban development potentials by carefully taking into account infrastructure, land use, environmental concerns, economics, and social factors.

Table 1. 2030 Projected Population of Affected Barangays

Barangay	Participation Rate	Base 2020	Projected Population 2030
Affected Areas Total	**16.65%**	**11,494**	**15,942**
Banaba	4.05%	2,792	3,232
Bayanan	4.46%	3,080	3,566
Laurel	3.59%	2,480	2,871
Mataas Na Lupa	3.30%	2,277	2,636
Palsahingin	1.69%	1,169	1,353
San Mateo	2.86%	1,973	2,284

Source: San Pascual CLUP Vol. 3

The vision for the project should be in line with the Municipality of San Pascual, Batangas Comprehensive Land Use Plan for 2021 – 2030 vision stated below:

"A premier center for commercial and industrial trade in the Province of Batangas and an Agro-industrial hub that is investor-friendly, with hardworking, law-abiding, empowered, and healthy citizenry, supported by top-class, adequate resilient infrastructure, governed by transparent, morally upright, responsible, gender-sensitive, God-centered leaders and workforce who strive for sustainable development and ecological balance".

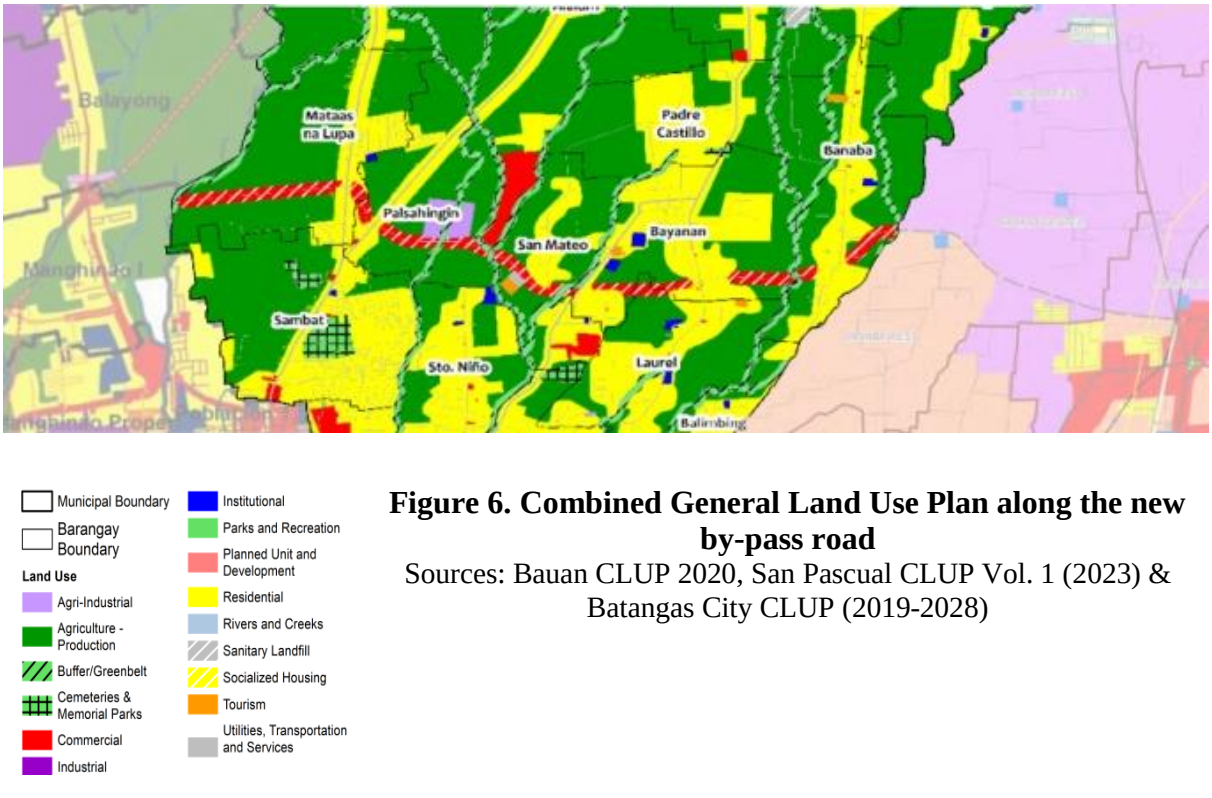

Figure 6. Combined General Land Use Plan along the new by-pass road

Sources: Bauan CLUP 2020, San Pascual CLUP Vol. 1 (2023) & Batangas City CLUP (2019-2028)

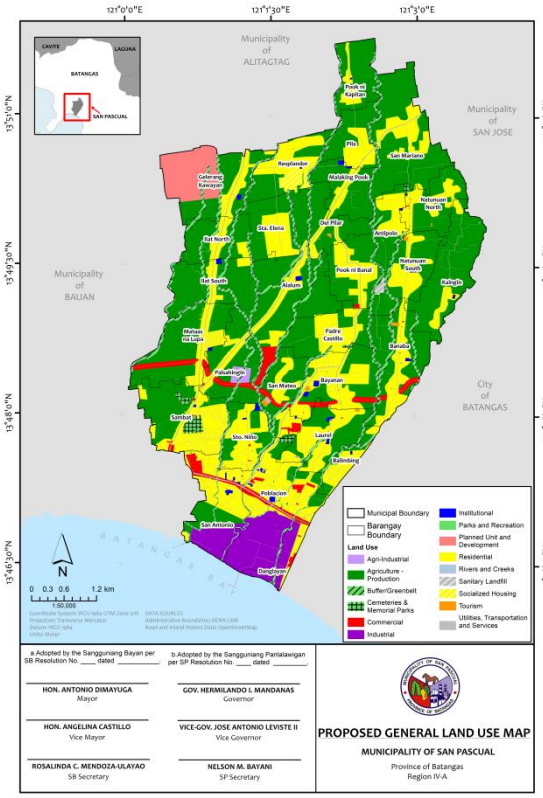

Figure 7. General Land Use Plan
Source: San Pascual CLUP Vol. 1 (2023)

Figure 8. By-pass Road alignment and lot parcels overlay on Satellite Map
Sources: DPWH Parcellary Survey Plan and https://www.google.com/maps

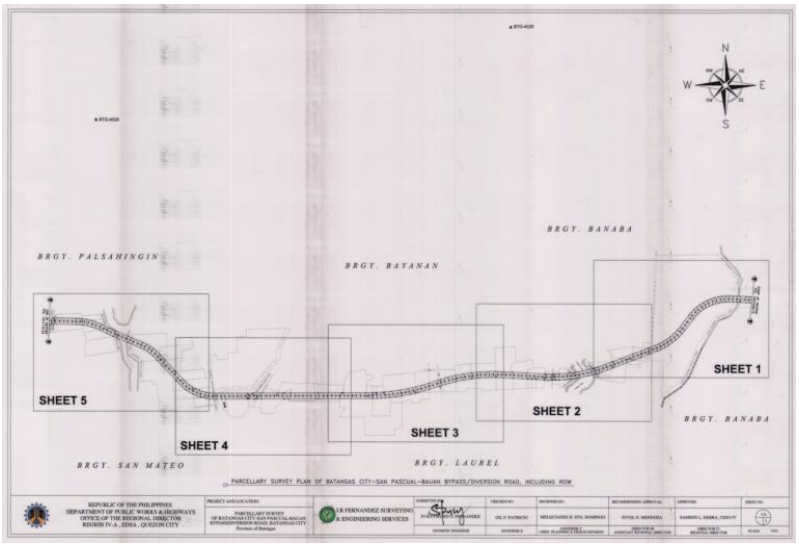

Figure 9. Right of Way Plan of the New Bypass Road
Source: DPWH Parcellary Survey Plan of Batangas City-San Pascual-Bauan ByPass

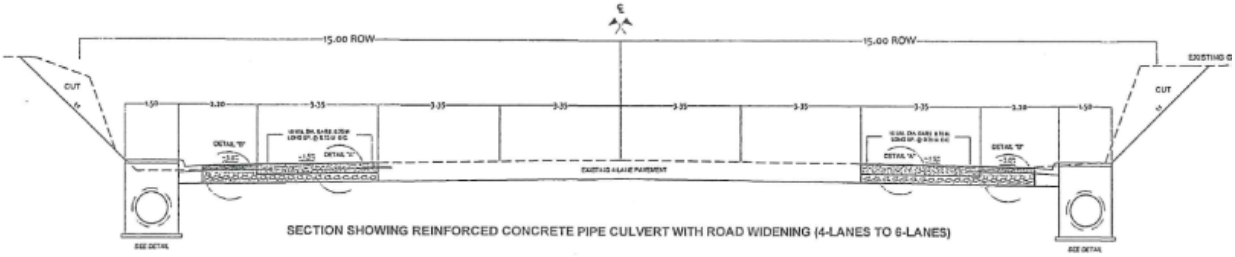

Figure 10. Typical Road Right of Way Section along the New Bypass Road
Source: DPWH Road As-Built Plan CY (2022)

Implemented since year 2017, the Bauan-San Pascual-Batangas City Bypass Road is included in the three (3)-year Rolling Infrastructure Program (TRIP) of the National Economic Development Authority (NEDA) which is the government's previously launched tool to synchronize and strengthen the link between national planning and budgeting functions/processes for infrastructure projects and programs. With the proposed budget of P1.1 billion, Congressman Abu assured the completion of the project by year 2020 with hopes of the approval of the 2019 proposed national budget. This 10.883 km bypass road now serve as a crucial road network as it aims to solve the perennial traffic congestion besetting the highways of Palico-Balayan-Batangas Road and Bauan-Mabini Road. It will also provide fast and more convenient transportation of goods and services from and to the industrial areas of Batangas City, San Pascual, Bauan and Mabini (DPWH News, 2019).

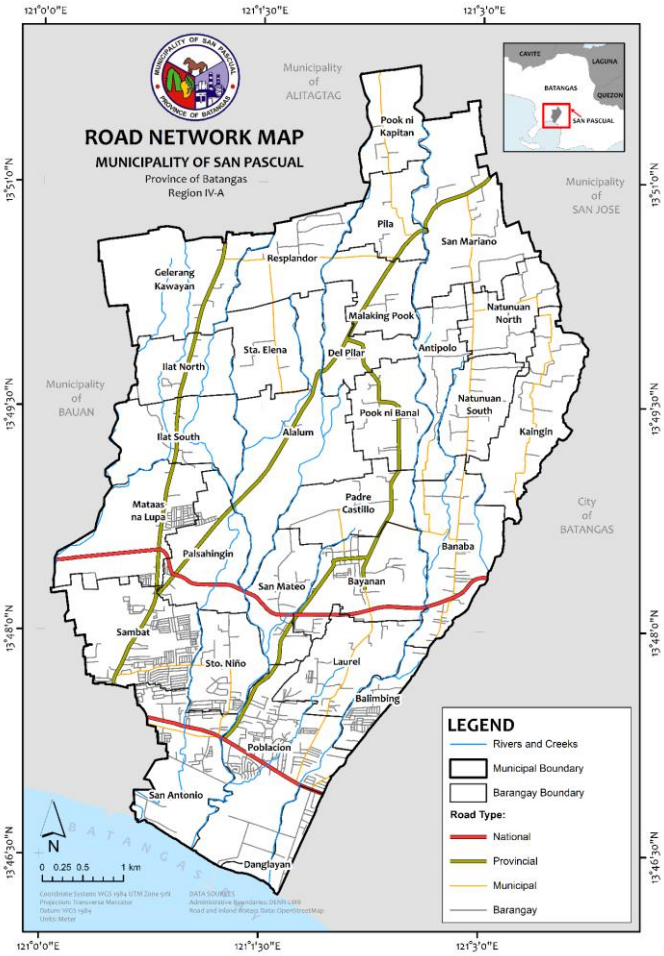

Figure 11. Road Network Map
Source: San Pascual CLUP Vol. 3 (2023)

Economic Development and Investment Promotion

Incorporating existing economic development and investment promotion plans into the proposed master plan is essential for aligning the project with broader economic strategies and attracting investments.

Table 2. Goals and Objectives for the Economic Sector

Vision	Goals	Objectives	Success Indicators	Strategies
Premier Center for Commercial and Industrial Trade in the Province of Batangas	Equitable distribution of economic returns across all sectors.	Boost the tourism industry in San Pascual. Increase employment opportunities for the residents of San Pascual. Promote MSME development.	1. Increase in number of commercial and industrial locators in the municipality. 2. Strengthened support for the MSMEs operating in the municipality. 3. Increase in tourist arrivals and tourism receipts. 4. Zero unemployment rate. 5. Increase in number of accommodations/ number of rooms.	• Tourism marketing and promotions • Development of new tourist attractions and activities • Accreditation of Tourism Enterprise Zones • Accreditation of primary tourism establishments • Encouragement of prospective investors to locate in San Pascual • Job fairs • Livelihood programs • Human resource development • Capacity development • Financing schemes for MSMEs • Strong partnership between the LGU and the MSMEs
Agro-Industrial Hub that is Investor-Friendly	Improve the standard of living of the residents of San Pascual Agriculture sector as a source of livelihood and food production	Improve the investment climate in the municipality. Increase agricultural output.	1. Established agro-industrial economic zone. 2. Fully capacitated farmers and agro-industrial businesses. 3. Adequate and fully functioning post-harvest facilities. 4. Fully implemented investment code and strong investor program that will capture the interest of prospective investors. 5. Increase in the number of business permits issued. 6. Improved business one-stop-shop.	• Implementation of an investment code • Establishment of an agro-industrial economic zone • Improvement of the business one-stop-shop • Capacity building • Farm mechanization program • Extension of credit assistance or financing schemes to farmer-households • Establishment of cooperatives and Rural Based Organizations (RBOs)

Source: San Pascual CLUP Vol. 1 (2023)

Community and Social Infrastructure

To build a thriving and inclusive community, it is essential to utilize current plans for community participation and social infrastructure. Current community engagement and social infrastructure plans serves as important blueprints in providing information on community needs, social services, and methods for promoting inclusivity in the community.

Housing

The housing sector status of San Pascual is relatively improving. The municipality has been formulating the Local Shelter Plan (LSP) to guide decision makers on policies and actions to address issues on housing. Resettlement is one of the priorities of the municipality. The municipality has a backlog of 611 units which account for the following: 1) 129 informal settler families in either privately-owned or government owned lands; 2) 153 ISFs along easements of waterways; 3) 161 households identified to be located in areas highly susceptible to flooding and/or rain-induced landslides, and 4) 168 double-up households. (San Pascual CLUP Vol. 1, 2023).

Health and Nutrition

Health services is being delivered by the Municipal Health Office. There is one (1) private hospital and one (1) There are 29 barangay health stations in the municipality, one per barangay. In terms of medical facilities, the Municipal Health Office, formerly Rural Health Unit or Health Center is the only government medical facility in the municipality. (San Pascual CLUP Vol. 1, 2023).

Education

Current data shows that the present concerns for education are the incomplete facilities in public elementary schools and the buildings in public secondary level or high schools that need repair. Maintenance of existing facilities and provision of lacking facilities in specific elementary schools should be done immediately. In terms of land requirement, a standard land area of 500 square meters of a classroom, inclusive of facilities, will occupy a total area of 25,500 square meters or 2.5500 hectares for pre-elementary level; 149,000 square meters or 14.90 hectares for elementary level and 83,000 square meters or 8.30 hectares for secondary or high school level total land requirement for education then is 257,500 square meters or 25.7500 hectares (San Pascual CLUP Vol. 1, 2023).

Social Welfare

The Municipal Social Welfare and Development Office (MSWDO) is responsible for the delivery of social welfare services to the people of the municipality. The Office is located within the municipal hall compound at Zone IV, Poblacion. There are 33 daycare centers providing substitute care to children also supervised by daycare workers while parents are working. In 2015 and 2017, San Pascual was awarded from the national the Seal for Child Friendly Local Governance, and in 2018 from the region (San Pascual CLUP Vol. 1, 2023).

Sports, Recreation, Arts, and Culture

Sports and recreation services is being delivered by the Sangguniang Kabataan in every barangay and the Federated Municipal Association of Sangguniang Kabataang Barangay or the Pambayang Samahan ng mga Sangguniang Kabataan (PSSK) headed by an elected Chairman from among all the SK Presidents from the barangays. There are presently, five (5) barangays with multi-purpose covered court being utilized also as sports and recreational facility in said barangays and its neighboring barangays. These are in barangays Sambat, Bayanan, San Mariano, Ilat South, and Poblacion (San Pascual CLUP Vol. 1, 2023).

Protective Services

The San Pascual Municipal Police Station is housed in its own building at the back of the Municipal Hall within the municipal hall compound at Zone IV, Poblacion. The Station is manned by 32 personnel headed by an Acting Police Chief with the rank of Police Chief Inspector. As recorded in the CBMS 2017, the total number of victims of crime is 28 persons out of the 55,551 population and the frequency of fire in San Pascual is about 3 times a year (San Pascual CLUP Vol. 1, 2023).

Planning and Development Framework

To ensure that the plan conforms to all pertinent laws, regulations, and guides, a careful study of the planning and development framework must be done and take into account the procedures that are already in place serving as essential guide for the project.

- Sustainable Development Goals (2015-2030)
- AmBisyon Natin 2040
- The Philippine Development Plan (2017-2022)
- The National Framework for Physical Planning (2001-2030)
- CALABARZON Regional Physical Framework Plan (2017-2046)
- Batangas PDPFP (2014-2022)

DISCUSSION

The study conducted provides insightful information and potential outcomes across various aspects of the proposal and will direct the development process in addressing the numerous needs and difficulties while maximizing promising potentials of the development with the outcomes and approaches that will be presented below:

Spatial Analysis and Zoning

The master plan's fundamental component will be spatial analysis, which will involve a thorough examination of the corridors' current features and infrastructure, including evaluations of the topography, land use patterns, transportation systems, and environmental factors. The framework for zoning will strive to achieve a balance between defined zones like residential, commercial, and industrial regions while taking ecological preservation and open green spaces into consideration. Additionally, mixed-use zones will receive special attention in order to encourage a walkable urban environment and efficient mobility systems.

Infrastructure Development

The growth and vitality of the corridor are partially supported by the development of the infrastructure and continuous construction and improvement of transportation networks, which will improve connection, anticipate effects of congestion, and enable effective mobility. Additionally, the community's safety and well-being are ensured by carefully chosen locations for public amenities, emergency services, and healthcare facilities and thorough waste management programs must be included in the plan to preserve the environment.

- Roadways And Bridges
- Water And Sanitation
- Power And Energy
- Information And Communications Technology
- Waste Management

Housing and Residential Areas

The plan is to build vibrant, sustainable communities by positioning residential areas within the development corridor by careful planning to accommodate a range of demographics and income levels. Based on context and features of the corridor, housing and residential zones shall adopt different typologies as below:

- Gated Community and Single Family Residences
- Mixed-Use Developments and Mid-Rise Apartments
- Townhomes, Row houses and affordable housing

Commercial and Business Zones

The development corridor's ability to support business and commercial zones is essential to promoting job creation, economic expansion, and vibrant urban environment. These space allocations promote trade and creativity while enhancing the corridor's overall sustainability with mixed land use such as a mix of offices, retail stores, and service establishments. Supporting both larger firms and small and local businesses can also guarantee economic diversification and community involvement where these areas have the potential to evolve into centers of innovation and economic activity, boosting the development corridor's expansion and vibrancy and offering locals and tourists a variety of goods and services.

- Mixed-Use Office And Retail Complex

- Entertainment, Leisure and Hospitality Areas
- Agritech Hub and Farmers Market
- Transportation and Logistics Hub

Institutional Zones

Educational Institutions and Innovation Districts

Integrating educational facilities like training centers, colleges, and schools into the development corridor - learning and a knowledge-based economy can be promoted throughout the municipality being strategically located and accessible to nearby cities and municipalities..

Healthcare and Medical Facilities

The strategic positioning of healthcare facilities along the linear corridor improves the capacity to respond to emergencies and availability of medical facilities is of utmost importance in emergency situations, as it guarantees prompt medical aid to both residents and businesses, thereby addressing important needs effectively.

Government Services Complex

Government offices, administrative buildings, and public service facilities along the corridor, citizens are afforded convenient access to vital services and resources. Law enforcement agencies, emergency services, and disaster response teams frequently establish a centralized facility to facilitate prompt and synchronized reactions during emergency situations.

Light Industrial Zones

The development corridor is strategic for distribution facilities, warehouses, and light industrial zones, especially as they are near transportation hubs and sea ports. Within this configuration, light industrial zones flourish, deriving advantages from efficient transportation infrastructures and close proximity to technological centers.

Green Spaces and Environmental Considerations

The growth corridor shall be a model of an environmentally conscious and aesthetically beautiful destination for locals and tourists, improving overall quality of life while protecting the environment, by placing a high priority on green areas and environmental consciousness.

CONCLUSION

The planning solution has been creatively and technically crafted using a thorough and collaborative methodology with due consideration to existing site potentials. This includes involving key stakeholders, assessing important data, and creating a visionary framework to direct the development of the corridor. The proposed solution was dynamic, sustainable, and integrated with the most practical planning approach including maximizing land use, and advancing accessible transportation networks. The adoption of a polycentric linear planning solution for the San Pascual By-Pass Corridor is seen as a transformational approach that promotes sustainable and equitable urban growth. Through the implementation of a polycentric approach, the corridor has the potential to transform into a system of varied and interconnected hubs, strategically dispersing mixed use, commercial, residential, institutional, industrial and recreational activities along its entire span. The linear planning concept maximizes the efficiency of land use and connectivity by establishing a sequence of hubs that specifically address the community's needs. The polycentric linear planning approach effectively address issues related to road capacity and development magnitude, while also fostering an urban environment that is more vibrant, dynamic and flexible. The adoption of the polycentric linear planning approach aims to establish the By-Pass Corridor as the model of sustainable growth in the region in accordance with the Municipality of San Pascual’s Vision and Goals.

Figure 12. Proposed Masterplan

Figure 13. Aerial View from Bauan

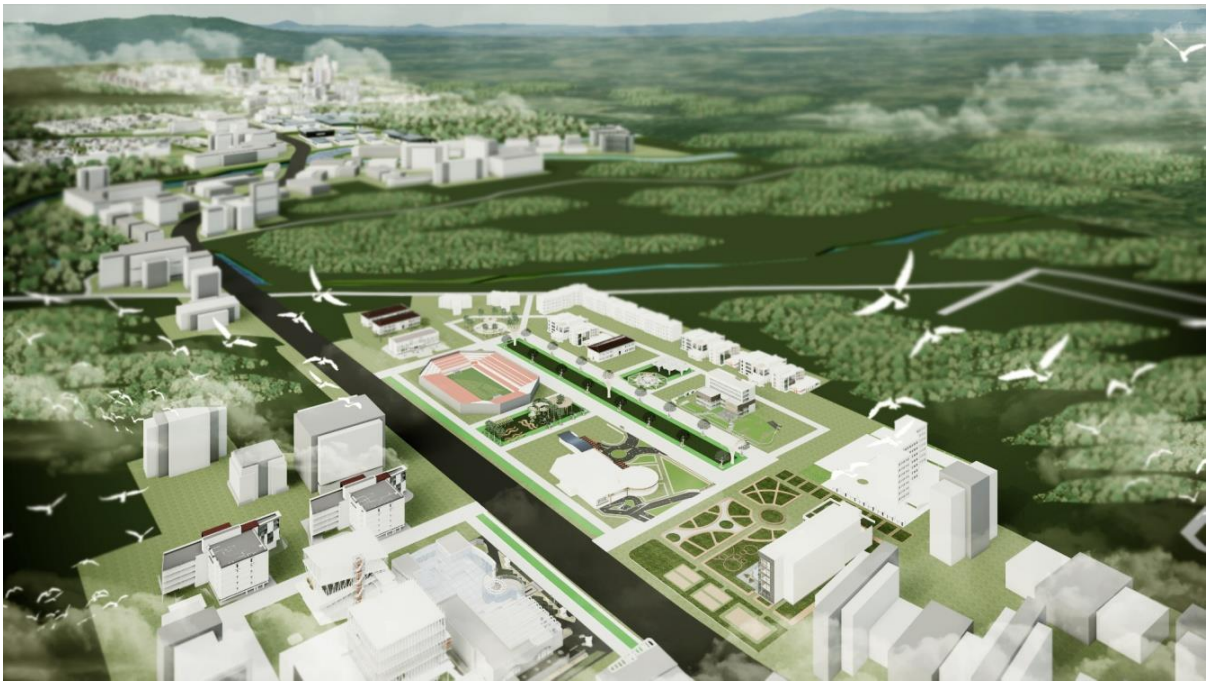

Figure 14. Conceptual Perspective of Institutional Zone located in close proximity and with direct access to the existing San Pascual Municipal Hall and strategically positioned to ensure convenient access for residents

Figure 15. Conceptual Aerial Perspective of the proposed development showing growth centers along the new by-pass road planned using Polycentric Linear Planning Approach

REFERENCES

Anderson, W.P., Kanargoglou, P.S., & Miller, E. (1996). Urban form, energy and the environment: a review of issues, evidence and policy. *Urban Stud, 33,* 17–35. https://link.springer.com/referenceworkentry /10.1007/ 978-3-319-71063-1_78-1

DPWH News (February 8, 2019). *DPWH-R4A pushes to complete the P1.1 billion bypass road in Batangas 2nd Legislative District.* https://www.dpwh.gov.ph/dpwh/news/15516

Feinstein, S. S. (13 May. 2022). Urban planning. *Encyclopedia Britannica,* https://www.britannica.com/topic/urban-planning

Furundzic, D. S., & Furundzic, B. S. (2012). *Infrastructure Corridor as Linear City.* In 1st International Conference on Architecture and Urban Design, Tirana, Albania.

Lynch, K. (1981). *A theory of good city form.* Cambridge, MA: MIT Press. 514 p.

Municipality of San Pascual (2023). *Comprehensive Land Use Plan 2021-2030 "Volume 2 – The Zoning Ordinance".* San Pascual, Philippines.

Municipality of San Pascual. (2023). *Comprehensive Land Use Plan 2021-2030 "Volume 1 – The Comprehensive Land Use Plan".* San Pascual, Philippines.

Municipality of San Pascual. (2023). *Comprehensive Land Use Plan 2021-2030 "Volume 3 – The Sectoral Studies".* San Pascual, Philippines.

The Editors of Encyclopedia Britannica (Jun 30, 2023). Zoning. *Encyclopedia Britannica,* https://www.britannica.com/money/zoning-land-use

The World Bank (n.d.). Master Planning. https://urban-regeneration.worldbank.org/node

Yegorov, Y. & Trullen, J. (Feb 2003) *Polycentric Urban Models.* DOI: 10.13140/RG.2.1.1194.9607