



CHAPTER 4

GENERATION AND SELECTION OF ALTERNATIVE SPATIAL STRATEGIES

This chapter seeks to characterize in spatial terms, the solutions required to realize the aspirations of the people of Orion (as stated in Chapter 2) and at the same time taking into consideration development constraints and potentials (as identified in Chapter 3). The objective of this chapter of the CLUP therefore is to present the process by which alternative spatial strategies or urban forms were generated in order to come up with the best option to be adopted as the “preferred strategy”.

These alternative urban forms serve as a framework or guide for detailed allocation of space and location of various activities and facilities for a given plan period. These alternatives range from the “do-nothing” scenario to the different development scenarios conceptualized by the TWG.

The process of generating spatial strategies for Orion involved three (3) sets of activities: 1) projection of urban land requirements; 2) generation and characterization of alternative urban forms; and 3) evaluation and selection of the preferred strategy.

4.1 Present Land Use and Land Use Shifts

A more detailed discussion of the present land use and land use shifts is presented in the Ecological Profile. Shown in Figure 4.1 is the present land use of Orion and in Figure 4.2, a map of Orion circa 1950's. In comparing these two maps, we can surmise the following development trends:

- There were fewer barangays then, and over the years, the original barangays were subdivided into smaller units to accommodate the increase in population. Even the names of some of the barangays show a hint of this (i.e. Daan Bago).
- Urban core grew from around 4-5 barangays in the 1950's clustered near the National Road to the present-day total of 12 barangays, extending all the way to the eastern shoreline. The fishing grounds immediately to the east of the original urban core were eventually converted to residential purposes.
- Fishing grounds immediately to the north of the urban core in barangays Balut and Sto. Domingo were eventually converted to agricultural lands.
- The creation of the port in Puting Buhangin and the construction of the Roman Highway after the 1950's spurred for new settlement areas outside of the urban core.
- As the urban core grew denser, newer population set up their residences in the then unoccupied northern barangays.
- In comparing the eastern and western sections of Orion, the western part of Orion is mostly “untouched” of developments, while the eastern front is dotted with built-up areas.
- Commercial establishments are mostly concentrated around the junction of Manrique Street and National Road, since Manrique Street is the main connecting road between Roman Highway, the National Road and the eastern coastline.
- There are not much industrial areas within Orion, while institutional areas are generally scattered throughout the area east of the Roman Highway.
- Road network within the urban core is pretty much developed and interconnected already, with some few dead ends. The road network outside of the urban core, however, is still undeveloped and not interconnected with each other.



Figure 4.1: Present Land Use Plan of Orion, Bataan (2000)

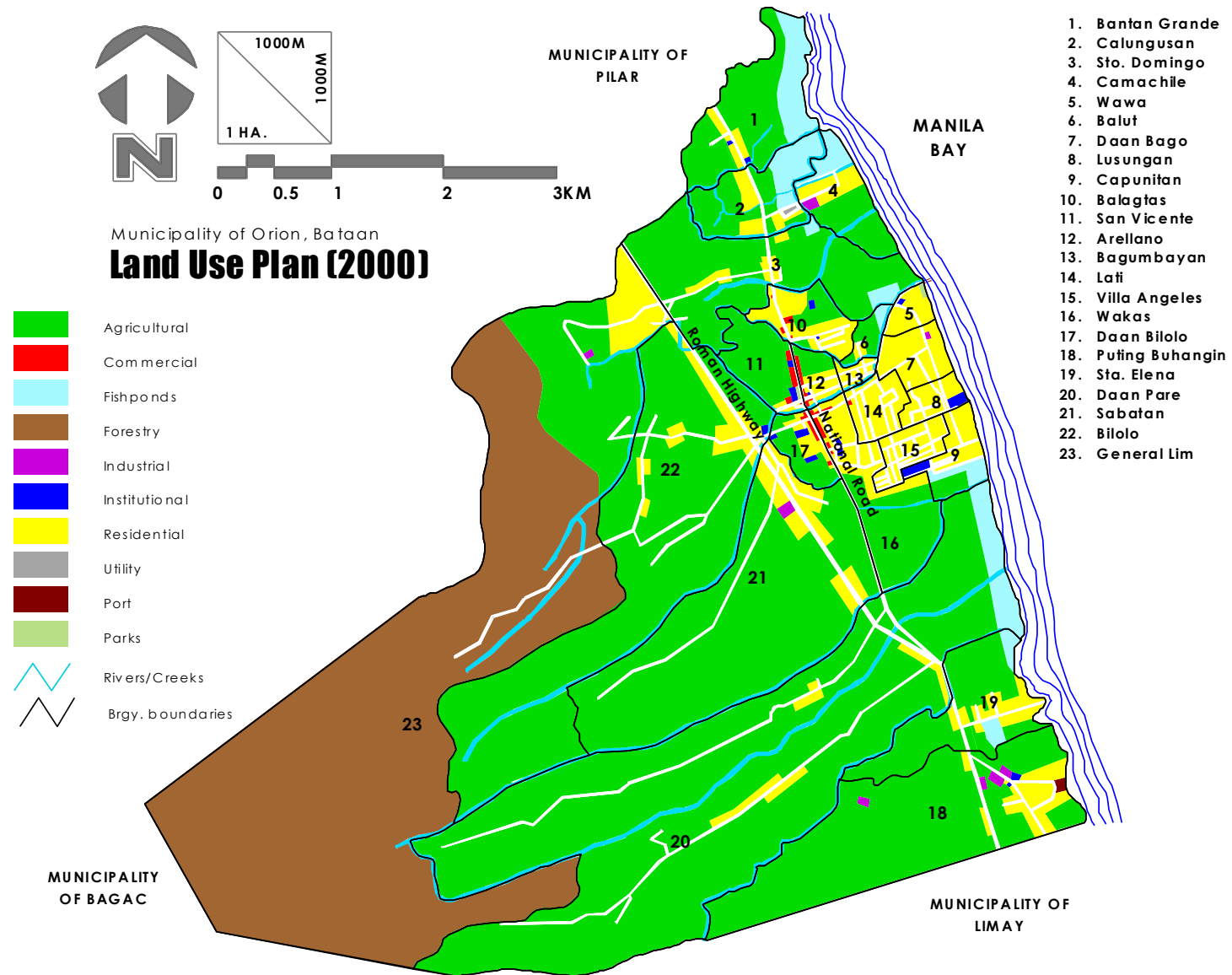
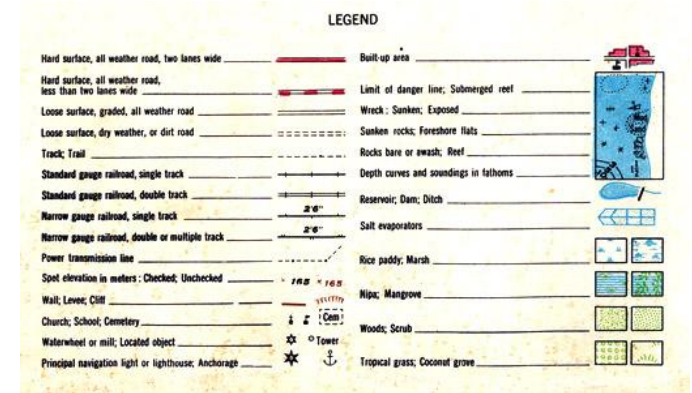




Figure 4.2: Map of Orion (1950's)



Source: NAMRIA



4.2 Projection of Urban Land Requirements

Basing on past population data, the average population growth is computed to be 2.43. Using this rate, the doubling time for the population was computed to be 30 years. Shown in the table below is the projected population for 2030.

Table 4.1: Projected population for the year 2030

YEAR	2000	2030	REMARKS
Population	44,067	85,917	
Number of households	8,735	17,031	
Household Size	5.045	5.045	* household size assumed to be equal

Because of the lack of availability of historical data on land use, no accurate projection of land use requirement can be made. Instead, the TWG projected the land requirements based on the different standards set by different NGA's and existing laws. Shown in the tables below are the projected land requirements for the different land uses.

Table 4.2: Projected land requirements of Orion for the next 30 years

RESIDENTIAL REQTS.		QUANTITY	AREA REQ (MIN) (Units in ha)		AREA SIZE (MIN) (Units in ha)	AREA REQ (AVE) (Units in ha)		AREA SIZE (AVE) (Units in ha)
Housing Type	% distribution							
Single detached	0.913	15,549	0.0022	BP 220	34	0.0100	PD 957	155
Duplex	0.087	1,482	0.0080	PD 957	12	0.0096	PD 957	14
TOTAL (Dwelling units only)		1	17,031		46			170

SOCIAL INFRA (EDUC.)	% DISTRIBUTION	QUANTITY	AREA REQ (MIN) (SQ. M.)		AREA SIZE (MIN) (SQ. M.)
Pre-school	9.18%	7,890.40	1.5	per child	11,836
Elementary	6.49%	5,578.06	1.0	per student	5,578
Secondary	4.38%	3,762.90	1.0		3,763
Vocational	10.64%	9,142.10	2.0		18,284

SOCIAL INFRA (HEALTH)	QUANTITY	AREA REQ (MIN) (BEDS)	AREA SIZE (MIN) (BEDS)	AREA REQ (MAX) (BEDS)	AREA SIZE (MAX) (BEDS)
Health Care Facility	1.15	25	29	100	115

SOCIAL INFRA (OPEN SPACE)	QUANTITY	AREA REQ (MIN) (HA)		AREA SIZE (MIN) (HA)
Parks	85.917	0.50	per 1,000 pop.	43
Playfield/Athletic Field	85.917	0.50	per 1,000 pop.	43

ECONOMIC INFRA	% DISTRIBUTION	QUANTITY	AREA REQ (MIN) (HA)		AREA SIZE (MIN) (HA)	AREA REQ (MAX)		AREA SIZE (MAX) (HA)
COMMERCIAL								
Urban population	39.11%	33,600.96	0.2	per 1000 urban pop.	6.72	0.5	per 1000 urban pop.	16.80
Rural population	60.89%	52,314.86						
INDUSTRIAL								
Urban population	39.11%	33,600.96	0.4	per 1000 urban pop.	13.44	1.5	per 1000 urban pop.	50.40
Rural population	60.89%	52,314.86						



4.3 Alternative Spatial Strategies

This section presents the four spatial strategies presented for the Municipality of Orion. These are the “Do-Nothing-Scenario”, “Linear Growth” Strategy, the “Tripolar Growth” Strategy and the “Multi-Nodal Growth Strategy”. The general descriptions, as well as the possible implications if the corresponding spatial strategy was chosen are also presented.

4.3.1. Do-Nothing Scenario

Under this scenario, the concentration of the urban growth will expand naturally based on present trends, without conscious intervention on the government’s part. Hence, the term “Do-Nothing”.

Description

Barangays Daan Bago, Wawa, Lusungan, and Capunitian will be act as residential-cum-fishing community zones, as well as areas in Bantan Grande, Calungusan and Camachile, since these are the areas which are already heavily involved in fishing activities. The area around the port (i.e. Barangays Sta Elena and Puting Buhangin) is expected to turn into an industrial area with some commercial developments to capitalize on the presence of the port. Some fishing grounds in the area may eventually be converted into built-up areas to accommodate the demand.

The northern brangays Bantan Grande, Calungusan, Sto. Domingo and Camachile will continue to be Orion’s “dormitory complex” as future settlers will set up their residences in the area because of the already dense built-up area in the urban core. Following the present trend, most of these residences in this area would be in the form of pockets of subdivisions.

Linear growth is expected to continue to develop along the National Road, as well as along the Roman Highway. This linear growth will mostly grow two lots deep from the road, once development cannot extend anymore along the road due to natural or man-made barriers

(i.e. another road, river, steep lots, existing built-up areas). Open agricultural lands in between existing built-up areas will most likely be converted into built-up areas to accommodate the growing population.

Commercial establishments would most likely grow linearly from the junction of Manrique Street and National Road. Commercial establishments and other built-up areas are also expected to mushroom around the area of the Orion Public Market. Aside from the industrial areas near the port area, not much industrial establishments are expected to be developed in the other parts of Orion.

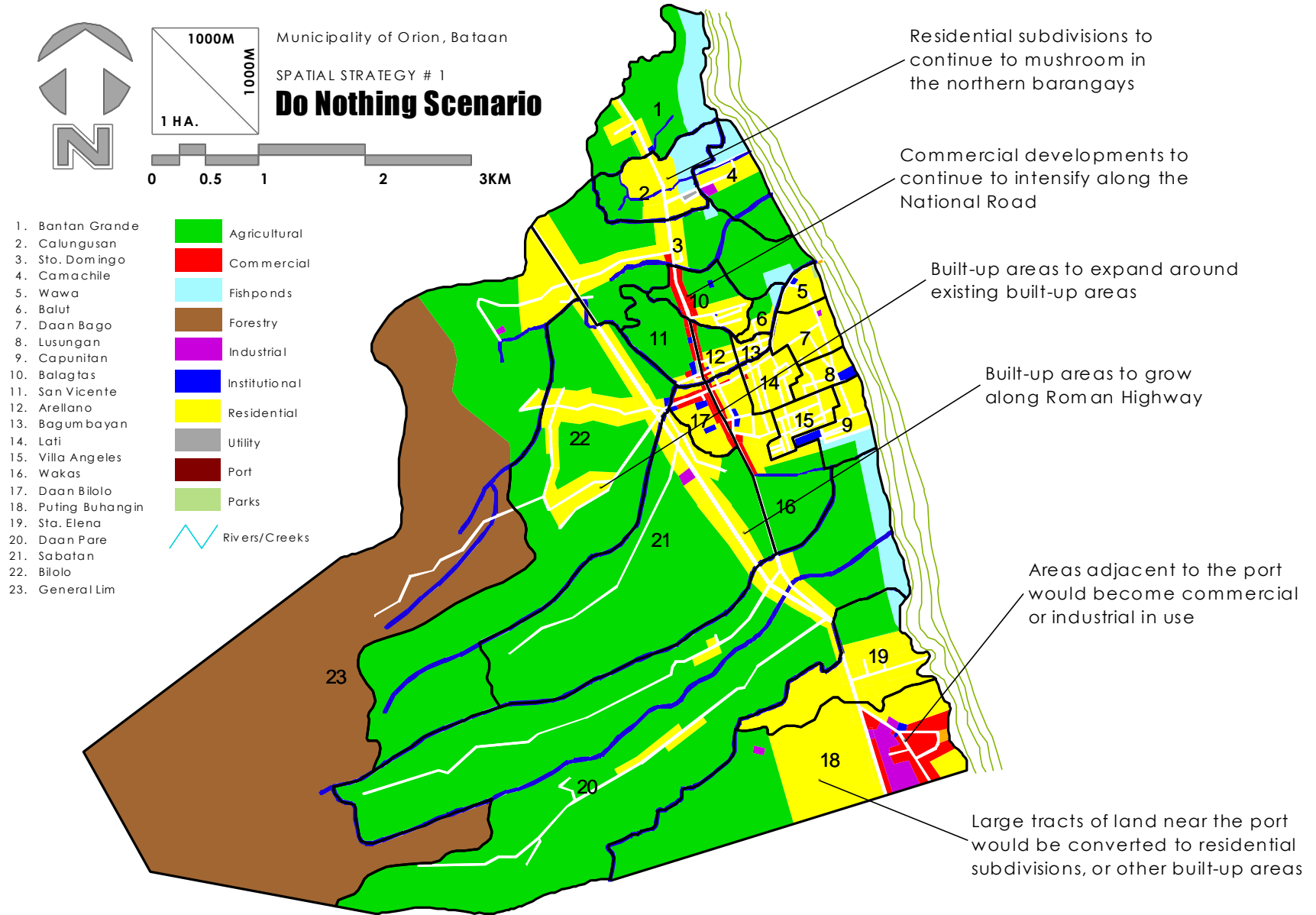
What it takes to realize the urban form

Investment required to realize this urban form would mostly come from the private sector as low to moderate investment from the public sector is expected. These investments would most likely be concentrated on port-related businesses and infrastructure. In terms of degree of land use shifts, much change is expected. Many of the agricultural lands near the existing built-up areas, the port and the highway would most be converted into built-up areas. Conversion of existing built-up areas to other uses is also expected. These would most likely in the form of conversion of residential to commercial and/or industrial uses. Some fishing grounds are also expected to be converted, most likely into agricultural uses. Not much people are expected to be relocated since there are not much illegal settlers within the municipality, and not much large-scale projects within existing settlement areas are planned.

Not much degree of involvement both from the government and the public is expected, since this is a “Do-Nothing” scenario in the first place. People’s participation would be minimal, as well as the enhancement of skills and knowledge base. On the government’s side, even if there were no strict enforcement of the regulations and laws, or linkages with the provincial government and other government entities, this particular urban form can still be realized.



Figure 4.3: Spatial Strategy 1: Do-nothing Scenario





Implications when the urban form is realized

Once this form is realized, much generation of pollution is anticipated, mainly since there are more people and there is more economic activity, since there is minimal government intervention. Similarly, there would be not much efficient and sustainable use of local resources, since the people are left to use the resources without much regulation.

In terms of impact to the communities, benefits are low to moderate, while harm or damage is high. For one, equity would not much be distributed since development and investments are still heavily biased to the urban core. Mobility and local circulation is expected to be hampered since development is denser and road infrastructure is still the same as before. Traffic problems are therefore also expected to occur.

Food sufficiency more or less would be the same, even with the conversion of agricultural lands, since there is still more than enough tracts of lands and fishing grounds to accommodate the increase in population. Incidences of crime are expected to increase, especially with the increase in economic activity, and that the number of police personnel remaining the same.

The local economy would have considerable desirable impacts, although benefits are still not maximized. For one, with the increase economic activity, not just in the port area, but also in the area outside of the port, since many businesses and commercial establishments would locate there, to take advantage of the increase in people and goods traffic. However, the potential revenues to the LGU are still not maximized, since there is not much government intervention in terms of regulation and taxation.

Overall, the impact to the town is not developed to its full potential. For one, the image of the town is not fully enhanced mainly since developments within the town are uncoordinated and occur sporadically, making for a very loose urban form. Attractiveness to investors and tourists is still minimal since infrastructure and manpower capabilities are not fully developed or improved. Lastly, the envisioned role of Orion as a Gateway of

Bataan would not be fully realized since many transportation problems would still occur to ensure smooth movement of people and goods.

4.3.2. Linear Development

Description

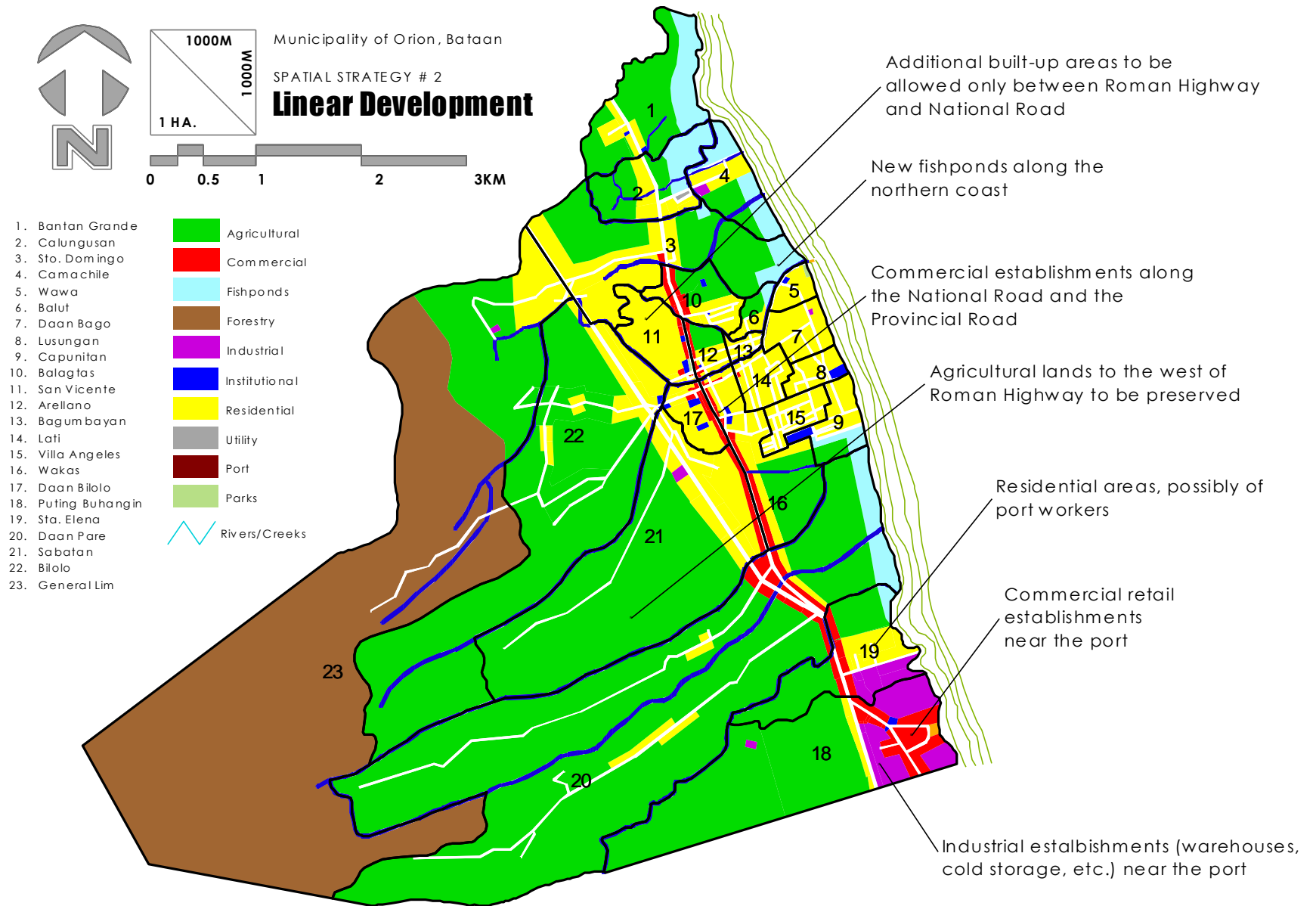
In the Linear Urban Form, development would be limited along the corridor bounded by the National Road and Roman Highway. Except for already existing built-up areas, no future built-up areas would be permitted in the areas outside of the specified development zone. Much of the additional built-up areas in this corridor can be found in the barangays of Sto. Domingo, San Vicente, and Daan Bilolo. Portions of Balagtas, Bilolo, Sabatan and Daan Pare would also be filled with additional built-up areas. Permissible land uses in this area would be limited to residential, commercial and institutional uses.

Two corridors of economic activity would run parallel to the settlement corridor. One corridor would run along the National Road and then extend to the Provincial Road. This would be the commercial corridor wherein commercial establishments would be located to a maximum of one lot deep from the road. These establishments can be purely commercial in nature or a mixed-use type of development, combining commercial and residential uses.

The other corridor would be the fishing corridor running along the coastline, broken in the middle by the built up areas in the barangays of Wawa, Daan Bago, Lusungan and Kapunitan. The northern fishing corridor would be composed of the shorelines of barangays Bantan Grande, Calungusan, Sto. Domingo and Camachile, and extending a little inward along San Vicente River into Barangay Balut. The southern fishing corridor is composed of the shorelines of the barangays Kapunitan, Daan Pare, and Sta. Elena. This fishing corridor aims to provide a venue wherein the fisherfolks of Orion can have a stable source of economic opportunities.



Figure 4.4: Spatial Strategy 2: Linear Development





At the southeastern end of the municipality, around the area of Port Capinpin, commercial and industrial uses would be encouraged and initiated by the municipal government. This would be the main economic activity center of the municipality. Commercial activity and industrial uses permitted here would be those complimenting the port activities, like food and souvenir shops, business services, warehousing, and cold storage. Some settlement areas would also be permitted here, hosting mainly the families of workers in the port area.

What it takes to realize the urban form

Medium to high level of investments both from the government and the private sector is necessary to realize this urban form. One of these major investments would be the construction of coast-side infrastructure such as wharfs, seawalls and docking areas, as well as the improvement of the existing port facilities in Barangay Wawa and Puting Buhangin. Dredging operations are also necessary to improve the mobility of the boats along the coasts and the inland waters.

Investment around the area of Port Capinpin is also necessary to maximize its economic potential. Public investment here would be in the form of widening of roads leading to the port, and the provision of power, communication, water and sanitary facilities. After these public investment are properly laid out, private investments in the form of setting up of business and establishments are then necessary for economic activity to be initiated.

Land conversion (i.e. agricultural land conversion, non-agricultural to other forms) is necessary. These conversion would mostly be from agricultural to residential uses, and existing residential uses to commercial uses. Some agricultural areas near the coast would also be converted to fishing grounds so as to have a continuous line of fishing corridor, instead of a broken one. This conversion may, however, entail relocation of some of the present settlers in the area.

The strict enforcement of laws and regulations, as well as the linkages of the municipality with other local government needs to also be strengthened to ensure that these projects and programs are properly implemented, and zoning ordinance properly enforced. This would

then entail also additional manpower for the LGU, as well as the enhancement of the LGU personnel's capabilities.

Additionally, participation of the citizenry of Orion is also needed to ensure the realization of this form. This participation can be either direct or indirect. Direct participation would be in the actual involvement in the different development programs and projects, while indirect participation would be through compliance with the government's policies, and the enhancement of one's skills and knowledge base. This enhancement of people's capability is necessary so that they will be better equipped for employment once the commercial and business establishments are already in place.

Implications when the urban form is realized

With increased economic activity and motorized traffic, air and water pollution levels, as well as wastes generation, will naturally increase, but can be minimized with proper government intervention and citizen's cooperation. Also, with proper management and regulation by the government, local resources can be use efficiently, although its use is not fully maximized, since some of the other resources are not incorporated into the development plan (i.e. uplands / mountain areas, agricultural communities). Also, benefits to the fishing community are not fully maximized since there are some problems with the accessibility to and from the fishing coastline.

Comparing with the previous spatial strategy, benefits would be distributed to a larger population, since the fishing communities on the eastern part are incorporated into the development plan. The communities on the western part living in the uplands, however, are not. Food sufficiency is generally the same with the first spatial strategy since the area of the production areas are more or less the same.

Traffic problems are expected to occur since the corridor along National Road would become more congested due to the increase of built-up areas and commercial areas along this area. Similarly, mobility and local circulation would be hampered because of these problems, and additionally because no new addition or improvement to the existing road network are initiated. Still, people would still have good



access to social services since satellite institutional buildings would be placed for each residential zone or subdivision.

There are potentially many job opportunities with the Linear Urban Form. However, the opportunities are most likely limited to the eastern side where much of the developments are taking place. There would be the danger of the western side being left out of the development. With a much more vibrant and controlled urban form, there exists much potential revenues for the LGU. However, other sources potential sources are not fully tapped or maximized.

With this spatial strategy, the town would have a more concrete image and be more attractive to investors and tourists. However, since the overall transportation system is not fully integrated and developed, the desired role of Orion as a Gateway may not be realized to its full potential.

4.3.3. Tripolar Development

Description

The "Tripolar Growth" spatial strategy would focus development in three (3) identified major poles or nodes, with each having their own unique identity. These are the: 1) the institutional node in San Vicente; 2) the residential (suburb) node in Sto. Domingo; and 3) the commercial and industrial node in Puting Buhangin.

The main node would be institutional node located at the heart of Orion in Barangay San Vicente. The center of this node would be the Municipio, and developments would then radiate from this centroid to the axis along the National Road and Manrique Street.

This institutional node would be the main city center, which would house the main institutional centers of the Municipality, such as municipal offices, and regional offices of national government agencies (NGA's). It would also contain the main public assembly and recreational area in Orion, while commercial developments would radiate from the Municipio.

Located at the junction near the Roman Highway, the second node would be the residential node located in the north which would include barangays Calungusan, Camachile, Sto. Domingo and Bantan Grande and parts of Genreal Lim and Bilolo as its influence areas. This node would primarily act like a satellite center, having its own community center, containing, among others, a large commercial retail shop, health center, recreational center, and park. Because also of its proximity with the fishing grounds in the north, this node can also serve as the wholesale and retail center of the fish products. Supporting infrastructure, like wider roads or navigable waterways, must be put in place to provide easier access between these two areas.

The idea behind this satellite center is to provide the growing residential population in the north with easier and faster access to community services, so that the people in these areas do not have to go to the urban core anymore, and thereby reducing congestion along the roads. Also, by reducing vehicular travel, pollution levels brought about by the exhaust fumes would also decrease.

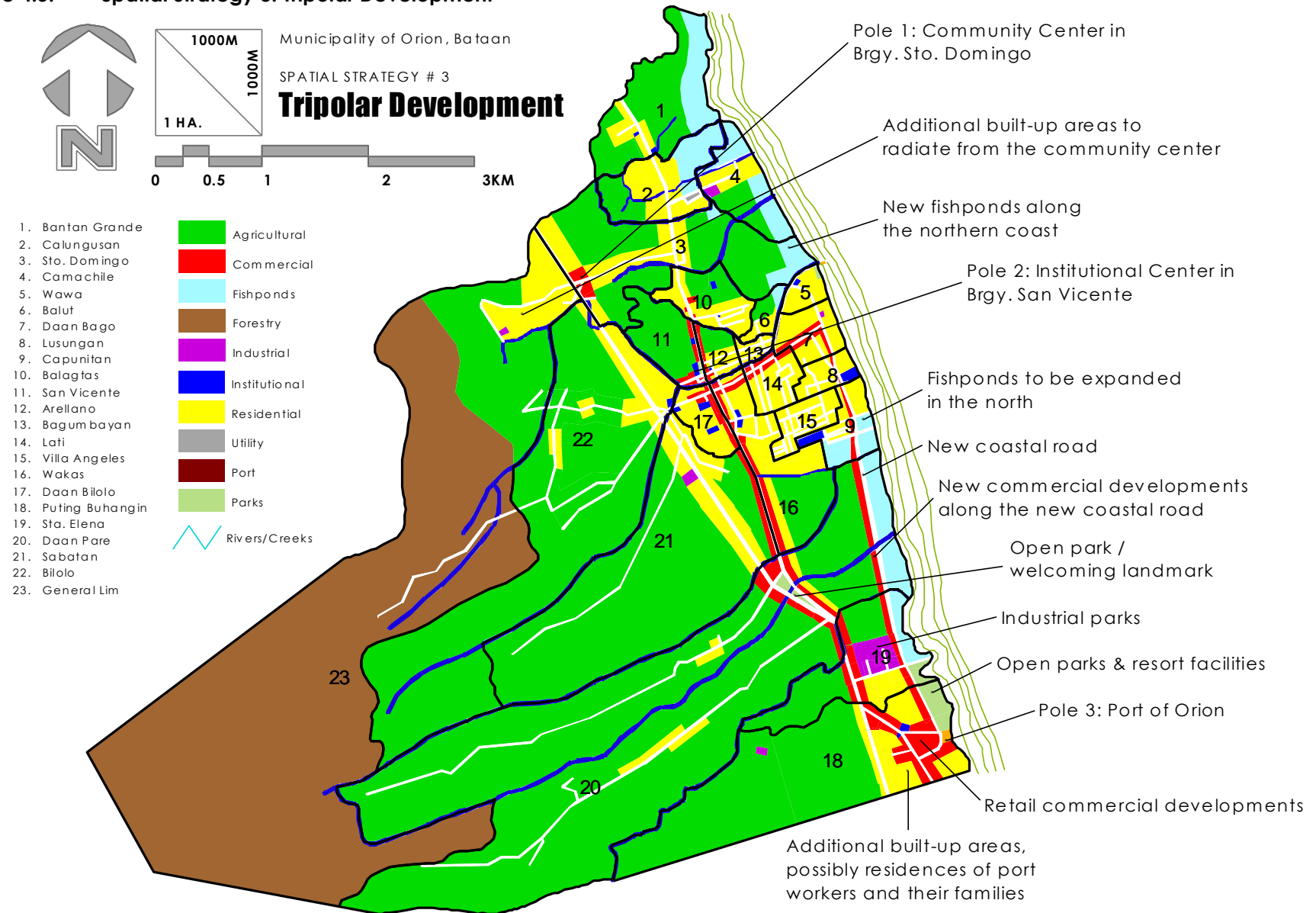
The last node would be the commercial and industrial node of the Municipality located in Barangay Puting Buhangin. This would be the main economic activity center of the Municipality, anchoring on the Port of Orion. Aside from the same characteristics and components of the port from the two previous spatial strategies (like the presence of commercial and industrial establishments, plus residential clusters), some additional features are added for a more complete provision of services and better integration with the other nodes.

For one, parts of the coast near the port fronting the coast would be cleared of obstructions to allow for a clear view of Manila Bay. In its place would be parks and open areas with light-intensity commercial shops and stalls to create an ambience suitable for tourism. Some transient housing may also be established here to provide housing for short-term tourists.

A new road is also proposed to be placed parallel to the coast, linking the Port of Orion to Barangay Wawa up north, and then eventually linking to the Manrique Street and then the Institutional Center. This would then make for a continuous line linking the three major nodes, allowing for a more efficient circulation for the identified development



Figure 4.5: Spatial Strategy 3: Tripolar Development





zones. Also, by the construction of this road, congestion along the National Road would decrease, since there is an alternative road for the local traffic to use.

Commercial developments would be located along this road network to ensure vibrancy along this corridor. These commercial developments would range from shops and stores catering to tourists (souvenir, food and beverage, business services, financial, housing) to post-harvest facilities to be used by the farmers and fishermen. However, these commercial developments would be limited only to the west side of the road, as the east side would remain as unobstructed as possible to preserve the view of the sea. Only fishing grounds would be permitted on the east side of the road.

What it takes to realize the urban form

Huge investments are needed to realize this urban form, both from the government and the private sector. For one, the facilities at the Port of Orion need to be upgraded so as to be able to attract and accommodate tourists and investors. This includes improvement of the present passenger facilities, construction of cargo facilities, and expansion of the ship docking area. The infrastructure immediately outside of the port needs also to be upgraded, which includes widening of roads and laying-out of utility lines.

Corollary to these huge investments is also the degree of land use changes the municipality would experience. Many of the agricultural lands and fishing grounds near the port would be converted to residential, commercial and industrial uses. Some of the existing built-up areas may also be converted to these same uses. However, these conversions would be offset by the conversion of some of the built-up areas into open areas and fishing grounds.

The construction of the proposed new road and the development of the area around the port would entail massive rights-of-way acquisition to ensure that the desired urban form would be realized. This would also mean that a number of settlers in the area would have to be relocated.

In all of this, the LGU has to have a very active role, not only in the strict enforcement of the regulations and laws, but also in talking with the various stakeholders to ensure smooth implementation of the plan. This include talking with NGA's, like DPWH, PPA and DOT, for possible funding and tie-ups ; talking with the present settlers to convince them to relocate to an identified relocation site; and talking with the Orion population in general to follow the prescribed zoning plan and support the different programs and policies.

Implications when the urban form is realized

Once the form is realized, pollution levels are expected to increase because also of the increase in population, vehicular traffic and construction. The LGU would have to be very vigilant in the enforcement of laws and providing mitigating measures, so that these negative effects are minimized. With the creation of satellite growth centers, resources are tapped more efficiently since the use of the resources would be distributed according to the exact needs of their respective influence areas.

Also, the preservation of large tracts of agricultural lands and the incorporation of local assets into the overall development plan, like the fishing grounds and the coastline, allows for a more sustainable use of the environment. The preservation of agricultural lands and fishing grounds, as well as the establishment of the post-harvest and processing facilities, also ensures food security for the municipality in the long run.

Access to social services is also improved with the creation of new roads and the creation of satellite institutional centers in the growth areas. Many employment opportunities are provided by the different growth centers and development corridors, especially by the port and the planned fishing and tourism corridor along the coast. These all translate to considerable potential revenues for the LGU if the government can properly plan, implement and monitor the development.

In spite of the increase in vehicular traffic arising from the developments, traffic problems are not expected to worsen much since new roads would be developed. Because also of the new roads



and the improved overall transportation system, mobility and circulation would be enhanced.

However, although more barangays would be benefited by the developments, there are still some which would be left out. These would be the barangays located on the western part of the municipality since the developments are mostly concentrated on the eastern part. Also, incidences of crimes are also expected, although it can be properly contained to select areas because of the dispersed type of development.

With a more coherent pattern of development and a clear hierarchy of growth centers, the image of the town will also be enhanced. Additionally, with well-developed infrastructure, facilities and tourist attractions, the municipality would become attractive to tourists and investors. Lastly, Orion's role as the Gateway of Bataan would be fulfilled.

4.3.4. Multi-nodal Development

Description

The Multi-nodal Development is actually an extension of the Tripolar Development, the only difference being that it has more nodes, and that these nodes have a hierarchy between one another. In this spatial strategy, there are two major nodes, four minor nodes, and three development corridors all of these growth centers. The two major nodes are the Institutional Center in Barangay San Vicente, and the commercial and industrial center in the Barangay Puting Buhangin, anchoring on the Port of Orion. The four minor nodes are: 1) the Community Center in Barangay Calungusan; 2) the ARC Center in Barangay Bilolo; 3) the Recreational and Parks Center in eastern Barangay Daan Pare; and 4) the Eco-tourism Center in western Daan Pare. The development corridors are the Roman Highway Corridor, the National Road Corridor, and the Coastal Road Corridor.

The characteristics of the major nodes — the Institutional Center and the Port of Orion — are generally the same as those from the third spatial strategy. The only difference would be the intensity of the development, meaning that comparatively more resources would be

used in developing these two nodes, as compared to the four other minor nodes.

Also, since these two areas are defined as major nodes, they would play the additional role of supporting the minor nodes. The Institutional Center would support the minor nodes of the Calungusan Community Center to its north, and the ARC Center to its west. The Port of Orion, on the other hand, would support the Daan Pare Recreational Center and the Daan Pare Eco-tourism Center.

The features of the Calungusan Community Center are more or less the same as those of the Community Center in the third spatial strategy. The only difference would be the location of the node. Whereas the location of the node in the Tripolar Development is at the junction of the Roman Highway, in the Multi-nodal Development, the node would be at the junction of the National Road. The reason being so is that it would not be too near the ARC Center in Barangay Bilolo, and thus would not overlap in terms of influence areas.

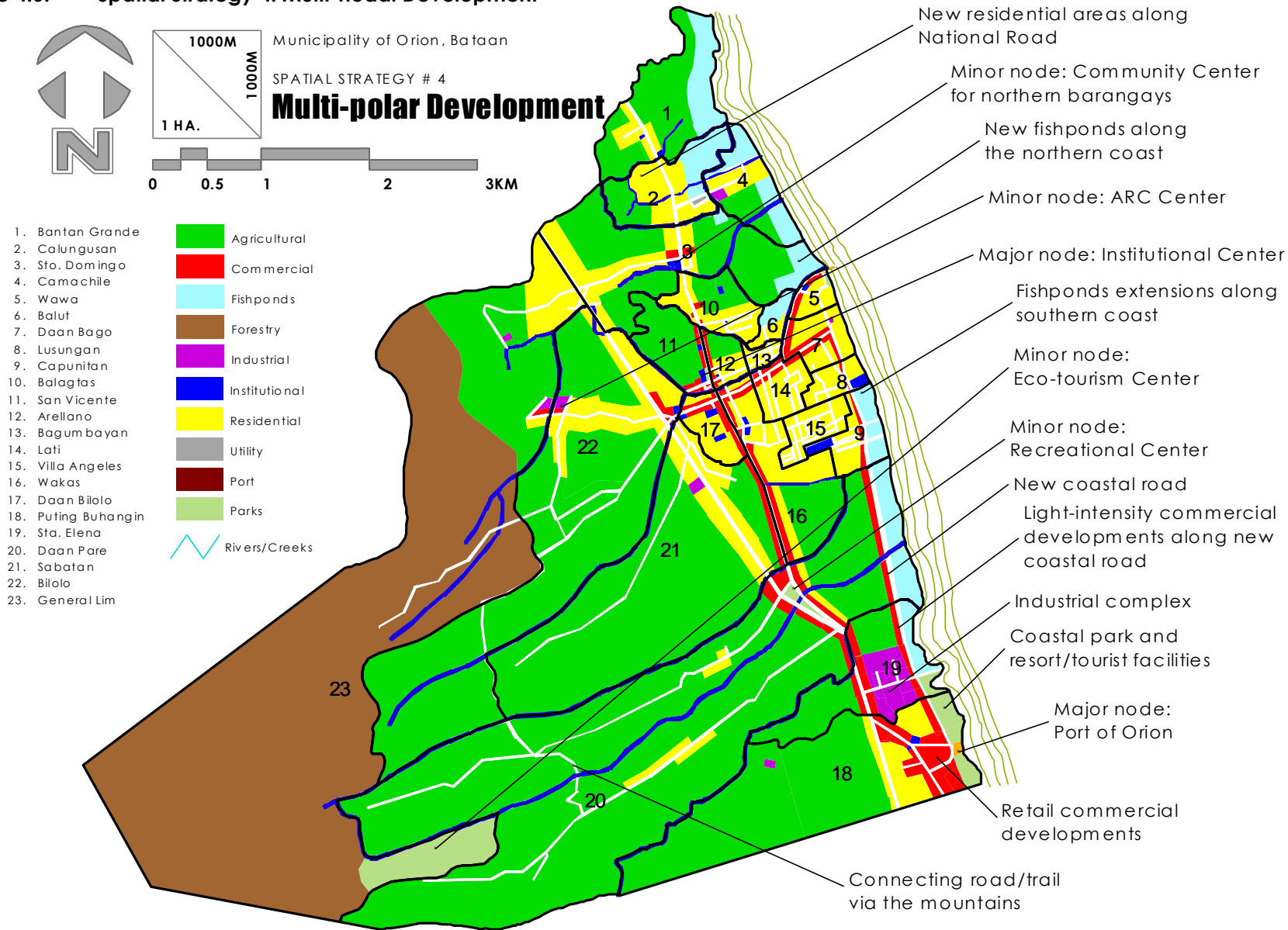
The second minor node is the ARC Center located at the tip of the extension of Manrique Street to the west in Barangay Bilolo. This node plays the important role of being the agricultural nerve center of Orion, and as such, would host all agriculture-related activities. This would include a rice processing plant, a packaging and storing facility, and other post-harvest facilities. It would also have a meeting hall where cooperatives can use for their gatherings, and a training center where farmers can learn new techniques in improving their harvest.

The third minor node is the Recreational and Parks Center which is located in Daan Pare in the junction of the three major roads in Orion — the Roman Highway, the National Road and the Provincial Road. As the name states, this Recreational and Parks Center would basically host the major recreational and sports activities in Orion. As such, it would have multiple playing courts—both covered and uncovered, and playgrounds.

A large, open park would also be located here, complete with landscaping elements like plants, pathways, benches and pavillions. This would answer the need of Orion of a big, open, green recreational space, as most of the open recreational areas in Orion are concrete in material. Since it is located at the junction of the three



Figure 4.6: Spatial Strategy 4: Multi-nodal Development





major roads in Orion, this park would be also be appropriate as the welcoming landmark for visitors coming to Orion via the Port. It can also be a leisurely stop-over for guests or motorists before continuing their journey either to the north, south or to Metro Manila.

Located in the uplands, the last minor node would be the Eco-tourism center in the western part of Daan Pare, which would answer the lack of some sort of development in the western part of Orion. It would house, among others, resort facilities, an observation deck, and camping grounds. It can also serve as a base camp for hikers and mountaineers going to Mount Samat and Mount Mariveles.

To have an integrated pattern of development and to have a mutual supporting system between all of these nodes, development corridors are also layouted, physically linking all of these nodes to each other. The first development corridor would be the Roman Highway Corridor, which would connect the ARC Center with the Institutional Center. Although it is termed as developed corridor, this corridor, in terms of characteristics, is not really a development corridor. For one, no major large-scale developments would be allowed along the Roman Highway since the Roman Highway is a high-speed, arterial road. Only residential uses with appropriate setbacks will be permitted here.

The second corridor would be the corridor along National Road and Provincial Road, which would primarily be a commercial corridor, hosting middle-scale retail shops. It would connect the major node that is the Institutional Center with the Community Center in the north and the Recreational Center in the South, and further down to the Port of Orion.

The third corridor would be along the proposed new Coastal Road, which would also be a commercial corridor, but lighter in terms of intensity. Commercial activities here would be related to tourism, such as restaurants, souvenir shops, and business and financial services. Some transient housing facilities may also be located here. Located also along this corridor would be fishing grounds to sustain the fishing industry of Orion.

What it takes to realize the urban form

As can be surmised from the above descriptions, this multi-nodal development entails heavy capital and non-capital investments both from the LGU and the private sector, and possibly even the provincial government and the NGA's. These capital investments would mostly be put in the construction and improvement of roads, and the establishment of new utility lines. The non-capital investments, on the other hand, would be in the form of additional manpower and increased capability to manage the expected development.

Also, to realize this urban form, some agricultural lands would need to be converted, although these conversions would be limited to very specific areas, which were so selected to cause as less disturbance as possible to the overall landscape of the municipality. The uses of some existing built-up areas would also be changed to accommodate the desired new developments. These changes are mostly concentrated in the areas near the port and along the proposed new coastal road. Additionally, because of these land use changes, as well as because of the construction of new roads, acquisition of the rights-of-way is necessary, which necessitates the relocation of a number of people.

To ensure that the desired urban form is successfully implemented, both the LGU, as well as the citizenry, have to take very active roles. On the LGU's part, these roles would be the strict enforcement of laws and regulations, and establishing good linkages with the different stakeholders. On the part of the citizenry, the roles would be the compliance with the regulations set by the government and the improvement of one's capabilities to suit the manpower needs and demands of the new developments.

Implications when the urban form is realized

As with any development, pollution levels are expected to increase, especially with the increase of people and traffic, and the intensity of commercial and industrial development. However, with proper mitigation and regulation by the government and citizen groups, the



negative effects can be mitigated. Also, the creation of multiple growth centers negates the need to travel much, since almost of the services are already available within each growth center. This thus reduces pollution levels brought about by vehicular travel.

Many resources from the municipality would be used, but these would be used efficiently since the utilization would be used according to the specific needs of the particular growth center. Food sufficiency within the municipality is assured, since not only a greater majority of the agricultural lands are preserved, but also with the addition of new fishing grounds along the coast, as well as the establishment of post-harvest facilities.

With the creation of many nodes and development corridors, the benefits of the development would be distributed more equitably to the entire population, which include, among others, the creation of many job and business opportunities. This can then translate into potentially huge revenues for the LGU.

Furthermore, the creation of many nodes allows for people would also have better access to social services. Local circulation is improved and traffic problems minimized with the creation of new roads and the improvement of the capacity of the existing roads. Incidences of crime are expected with the increase of development, but since the pattern of development is contained to very specific areas, they can be contained.

With a more coherent and integrated pattern of development, the image of the town would be strongly enhanced. This enhanced image of the town, coupled with the improved infrastructure, makes the town very attractive to investors and tourists. Lastly, the full development of the port, and the overall transportation network, fulfills the envisioned role of Orion as the Gateway of Orion.

Shown on the opposite page is a summary of the main features of each alternative spatial strategy with their corresponding points.

Table 4.3: Summary of main features of the alternative spatial strategies

	SPATIAL STRATEGY			
	1	2	3	4
1. What it takes to realize the form				
a. Investment and infrastructure requirements				
(1) Investments by the LGU	L	M	H	H
(2) Investments by the private sector	M-H	M-H	H	H
(3) Additional manpower for the LGU	L-M	M-H	H	H
b. Degree of land use changes				
(4) Agricultural land conversion	M-H	M	L-M	M
(5) Conversion of existing non-agricultural land uses to new uses	M-H	H	M-H	M
(6) Number of settlers to be relocated	L	M	M	H
c. Degree of involvement by government and the people				
(7) Strict enforcement of regulations & laws	L	M-H	H	H
(8) People's participation and compliance with government programs and policies	L	M	M-H	H
(9) Linkages with the provincial government, other LGU's and government agencies	M	M-H	H	H
(10) Enhancement of skills and knowledge base by the citizens	L	L-M	H	H
2. Implications when the urban form is realized				
a. Impact on the environment				
(1) Generation of air and water pollution	H	M-H	H	H
(2) Efficient & sustainable use of local resources	L	L-M	M	H
b. Impact to the communities				
(4) Distribution of equity	L	L-M	M	H
(5) Food sufficiency	M	M	M-H	H
(6) Traffic problems	M	M-H	M	M
(7) Improvement of mobility & local circulation	L	L	M-H	H
(8) Access to social services	L	M-H	M-H	H
(9) Incidences of crime	M-H	M-H	M	M
c. Impact to the local economy				
(10) Job creation	M-H	M-H	M-H	H
(11) Potential revenues for the LGU	L-M	M	M-H	H
d. Impact on the image of the town				
(12) Enhancement of town image	L-M	M	M-H	H
(13) Over-all attractiveness to investors & tourists	L-M	M	M-H	H
(14) Fulfillment of Orion's role as Gateway of Bataan	L-M	M	H	H

LEGEND: L- Low; M – Moderate; H – High



4.4 Selection of Preferred Strategy

The Goal Achievement Matrix (GAM) was the tool chosen by the TWG to select the preferred spatial strategy. The GAM allows for an objective way of inputting the subjective biases of each sector in the selection of the preferred spatial strategy.

In this tool, all the descriptors for each sector are listed, and then the participants were first asked to assign percentages or weights to each descriptor of each sector based on their own perspectives on which descriptor deserves more weight. After which, they are to assign points from -3 (reflecting that the particular spatial strategy least realizes the descriptor) to +3 (reflecting that the spatial strategy completely realizes the descriptor). The points are then multiplied to each of their relative weights to get their equivalent scores. Lastly, the points for each spatial strategy are added up to get their total score.

The GAM workshop was held on May 13, 2005 at the Orion High School after the presentation of the four spatial strategies. For the workshop, the participants were divided into six societal sectors. Shown in the table on the right is the summary of scores of the each of the spatial strategy, while the detailed scores of each societal sector are presented in Appendix B.

As can be seen from the table, the fourth spatial strategy was the one most preferred by the participants, followed by the third spatial strategy. Out of a possible 18 points, the multi-nodal growth development got 16.1 points, which means that the participants thought that this particular spatial strategy almost completely realizes the desired visions of the municipality. As can be also seen from the table, the rankings of the spatial strategies are consistent for each societal sector, which means that the preferred spatial strategy is a unanimous choice among the different societal groups.

Table 4.4: Results of the GAM Workshop

SOCIETAL SECTOR		SPATIAL STRATEGY			
		1 Do-nothing	2 Linear Growth	3 Tripolar Growth	4 Multi-nodal Growth
1	Barangay Captains	-0.380	1.440	1.530	3.000
2	Social	1.560	2.080	2.080	3.000
3	Munisipyo 2	-0.750	0.550	1.600	1.600
4	LGU	-2.290	0.750	1.650	2.700
5	Liga ng Barangay Captain	-1.240	1.700	2.800	3.000
6	Municipal Employee Group II	-0.050	1.510	2.320	2.800
TOTAL		-3.150	8.030	11.980	16.100
RANK		4	3	2	1