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Sangguniang Panlalawigan



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**SIPI SA KATITIKAN NG KARANIWANG PULONG BLG. 34 NG IKA-10 SANGGUNIANG
PANLALAWIGAN NG BULACAN NA IDINAOS SA PAMAMAGITAN NG ZOOM ONLINE
APPLICATION NOONG HUWEBES, AGOSTO 26, 2021**

DUMALO:

Igg. Wilhelmino M. Sy-Alvarado

----- Pangalawang Punong Lalawigan
at Pinunong Tagapangulo

Igg. Bernardo B. Ople, Jr.

----- Kasangguni, Unang Distrito
Junior Majority Floor Leader
(Pansamantalang Nangulo sa Hapag)

MGA KASANGGUNI NG SANGGUNIANG PANLALAWIGAN

UNANG DISTRITO

Igg. Allan P. Andan
Igg. Romina D. Fermin

IKALAWANG DISTRITO

Igg. Abgdo. Ramon R. Posadas

IKATLONG DISTRITO

Igg. Romeo V. Castro, Jr.
Igg. Abgda. Emelita I. Viceo

IKA-APAT NA DISTRITO

Igg. Enrique A. Delos Santos, Jr.
Igg. Alexis C. Castro
Igg. Allan Ray A. Baluyut

MGA KINATAWAN NG LIGA

Igg. Ramilito B. Capistrano
Igg. William R. Villarica

----- Liga ng mga Barangay
----- Liga ng mga Kagawad ng
Sangguniang Bayan/Panlungsod

Igg. Robert John Myron A. Nicolas
Igg. Liberato P. Sembrano

----- Sangguniang Kabataan (SK)
----- Indigenous Cultural Communities/
Indigenous Peoples (ICCs/IPs)

HINDI NAKADALO:

Igg. Abgda. Erlene Luz V. Dela Cruz

----- Kasangguni, Ikalawang Distrito

KAPASIYAHAN BLG. 391-T'2021

**KAPASIYAHAN NA PINAGTITIBAY ANG KAPASIYAHAN BLG. 193 NG
SANGGUNIANG BAYAN NG GUIGUINTO, "APPROVING THE REVISED
COMPREHENSIVE LAND USE PLAN (CLUP) OF THE MUNICIPALITY OF
GUIGUINTO, BULACAN: PART I – PLANNING ENVIRONMENT AND
PART II – COMPREHENSIVE LAND USE PLAN (CLUP) 2014-2021", AT
INA-ADOPT ANG REKOMENDASYON NG RESOLUTION NO. 2020-04 NG
PROVINCIAL LAND USE COMMITTEE (PLUC) NA PAGBABAGO NG
PLANNING PERIOD NG NASABING CLUP HANGGANG 2019-2027.**

SA PAGTATAGUYOD NI: SP MEMBER ALLAN RAY A. BALUYUT

**SAPAGKAT, ayon sa Seksyon 447(2)(vii), ng RA 7160, binibigyan ng kapangyarihan
ang mga lokal ng Sanggunian na magpatibay ng Comprehensive Land Use Plan sa kanilang
nasasakupan:**

*(vii) Adopt a comprehensive land use plan for the municipality: Provided, That the
formulation, adoption, or modification of said plan shall be in coordination with the approved
provincial comprehensive land use plan;*

----- X

SAPAGKAT, ang Sangguniang Bayan ng Guiguinto ay nagpatibay ng kanilang Comprehensive Land Use Plan (CLUP) 2014-2021 sa bisa ng kanilang Kapasiyahan Blg. 193 na isinumite para sa pagrerepaso at pagsusuri ng Sangguniang Panlalawigan ng Bulacan;

SAPAGKAT, matapos ang panimulang pagsusuri ng Committee on Land Use, Urban Planning and Housing ng Sangguniang Panlalawigan sa mga isinumiteng dokumento, ang mga ito ay itinukoy para sa teknikal na pagsusuri ng Provincial Land Use Committee (PLUC) ng Pamahalaang Panlalawigan ng Bulacan na siya ring nag-rekomenda sa pagpapatibay ng mga ito, kung saan ay kabilang sa rekomendasyon ang pagbabago ng planning period nito, mula sa dating 2014-2022 tungo sa 2019-2027, sa tinalima naman ng Bayan ng Guiguinto upang umakma sa mga pagbabago ng datos at pag-agapay sa paglakad ng panahon at kaunlaran;

SAPAGKAT, ang pagbabalangkas ng CLUP ay minamandato ng batas na patuloy na isagawa upang maging gabay at batayan ng bawat yunit ng pamahalaang lokal sa paggamit ng kanilang lupain, sa pasubali na ang mga pangangailangan sa pagkain, tirahan at industriya ay isasaalang-alang, at ang gayon ay tinalima ng Pamahalaang Bayan ng Guiguinto;

DAHIL DITO, sa mungkahi ni Kasangguni, Igg. Allan Ray A. Baluyut, Tagapangulo ng Committee on Land Use, Urban Planning and Housing, na pinangalawahan nina Kasangguni, Igg. Allan P. Andan at Igg. Romina D. Fermin,

IPINASIYA, gaya nang dito'y ipinasisiya, na **PAGTIBAYIN** ang *Kapasiyahan Blg. 193 ng Sangguniang Bayan ng GUIGUINTO*, "Approving the Revised Comprehensive Land Use Plan (CLUP) of the Municipality of Guiguinto, Bulacan: Part I – Planning Environment and Part II – Comprehensive Land Use Plan (CLUP) 2014-2021", at *ina-adopt* ang rekomendasyon ng Resolution No. 2020-04 ng Provincial Land Use Committee (PLUC) na pagbabago ng *planning period* ng nasabing CLUP hanggang 2019-2027.


PINAGTIBAY.

Pinatutunayan ko na ang kapasiyahan sa itaas nito ay pinagtibay ng Sangguniang Panlalawigan.


MA. PERPETUA R. SANTOS

Kalihim ng Sangguniang Panlalawigan

PINAGTIBAY:


BERNARDO B. OPLE, JR.
Kasangguni, Unang Distrito
Junior Majority Floor Leader
(Pansamantalang Nangulo sa Hapag)

PINAGTITIBAY:


DANIEL R. FERNANDO
Punong Lalawigan



*Republic of the Philippines
Province of Bulacan
Municipality of Guiguinto*



OFFICE OF THE SECRETARY TO THE SANGGUNIANG BAYAN

EXCERPT FROM THE MINUTES OF THE ONE HUNDRED TWENTY FIRST REGULAR SESSION OF THE 10TH SANGGUNIANG BAYAN OF GUIGUINTO, BULACAN HELD ON OCTOBER 25, 2021 AT THE GEN. GREGORIO DEL PILAR HALL.

PRESENT:

HON. ELISEO B. SANTOS, JR.	.....	MUNICIPAL VICE MAYOR
Hon. Evangeline V. Villanueva	.....	SB Member
Hon. Estrelita P. Aballa	.....	SB Member
Hon. Romeo D. Tonog	.....	SB Member
Hon. Albert L. Estrella	.....	SB Member
Hon. Randall B. Pingol	.....	SB member
Hon. Julius V. Figueroa	.....	SB Member
Hon. Larra Monica S. Ventura	.....	SB Member
Hon. Annabelle A. Garcia	.....	SB Member
Hon. Landrei Joseph S. Cerdon	SB Member-President SK Federation

ABSENT:

Hon. Cezar L. Mendoza	SB Member-President- Liga ng mga Barangay
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RESOLUTION NO. 485

Series of 2021

Sponsored by : Coun. Julius V. Figueroa
(Committee on Land Use)

RESOLUTION

APPROVING THE MUNICIPAL DEVELOPMENT COUNCIL (MDC) RESOLUTION NO. 011-S-2021 ENTITLED "RESOLUTION APPROVING THE ENDORSEMENT OF THE COMPREHENSIVE LAND USE PLAN (CLUP) 2019-2027 OF THE MUNICIPALITY OF GUIGUINTO TO THE SANGGUNIANG BAYAN"



WHEREAS, RA 7160 otherwise known as the Local Government Code of 1991 provides that the Local Government Units (LGUs) shall continue to prepare their respective Comprehensive Land Use Plans (CLUP) enacted through Zoning Ordinance which shall be the primary and dominant bases for the future use of land resources. Accordingly, the code provides the share with the national government the responsibility in the management and maintenance of ecological balance in its territorial jurisdiction (Section 2a, 15 and 31i). Further, as directed by the constitution... "to regulate the acquisition, ownership, use, and disposition of property;

WHEREAS, the Provincial Planning and Development Office, as part of the Technical Working Group of the Provincial Land Use Committee, recommended during the presentation of the CLUP on August 2018 that the planning environment of the CLUP and the planning period must be updated as well because the previous proposed CLUP 2014-2022 is nearing its expiration yet has remained unapproved;

WHEREAS, the Technical Working Group of 2019-2027 Comprehensive Land Use Plan Committee of the Municipality of Guiguinto has integrated the revisions required by the Provincial Land Use Committee as stated in the PLUC Minutes of the Meeting sent to MDC Secretariat on October 2018 embodying the proposed programs, projects, policies, and strategies in consonance with the trust of the national and provincial government;

WHEREAS, the Municipality of Guiguinto has completed the formulation of its Comprehensive Land Use Plan 2019-2027 through the Municipal Planning and Development Office and the Technical Working Group of the 2019-2027 Comprehensive Land Use Plan Committee;

WHEREAS, the Municipality of Guiguinto has complied with the prescribed documentary and procedural requirements in the formulation process;



OFFICE OF THE SECRETARY TO THE SANGGUNIANG BAYAN

Page 2-Resolution No. 485-S-2021

NOW THEREFORE:

On motion of Coun. Julius V. Figueroa and duly seconded by all members present;

RESOLVED, as it is hereby **resolved**, to approve the Municipal Development Council (MDC) Resolution No. 011-S-2021 entitled "Resolution approving the endorsement of the Comprehensive Land Use Plan (CLUP) 2019-2027 of the Municipality of Guiguinto to the Sangguniang Bayan".

APPROVED.

Ayes:


Hon. Evangeline V. Villanueva
Hon. Estrelita P. Aballa
Hon. Romeo D. Tonog
Hon. Albert L. Estrella
Hon. Randall B. Pingol
Hon. Julius V. Figueroa
Hon. Larra Monica S. Ventura
Hon. Annabelle A. Garcia
Hon. Landrei Joseph S. Cerdon

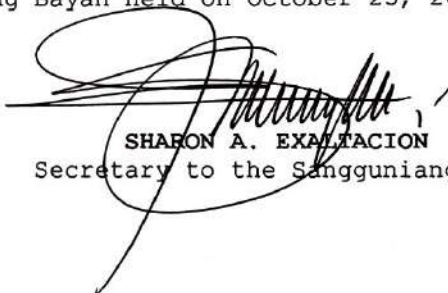
Nay(s):

None

I hereby certify the correctness of this excerpt from the minutes of the regular session of the Sangguniang Bayan held on October 25, 2021.

ATTESTED:


ELISEO B. SANTOS, JR.
Municipal Vice Mayor


SHARON A. EXALTACION
Secretary to the Sangguniang Bayan





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PAMBAYANG KONSEHO SA PAGPAPA-UNLAD

HALAW MULA SA KATITIKAN NG PAG-UUSAP AT NAPAGKASUNDUAN NG PINAGSAMANG PAMBAYANG KONSEHO SA PAGPAPAUNLAD AT LOCAL FINANCE COMMITTEE NA GINANAP NGAYONG IKA-26 NG AGOSTO 2021 SA GUIGUINTO, BULACAN.

MGA KASAMA SA PAG-UUSAP:

IGG. AMBROSIO C. CRUZ JR.
Atty. Agatha Paula Cruz
G. Elmer C. Alcanar
Igg. Evangeline Villanueva
Igg. Cezar L. Mendoza
EnP. Ritta Dianne G. Ramos-Borlongan
Engr. Ailyn Bondoc
Igg. Gregorio P. Sagala
Igg. Apolinario SM. De Armas
Igg. Jose Darsee V. Alvarez
Igg. Marvin S. Azores
Igg. Manuel Z. Bernardo
Igg. Leo Ramos
Igg. Jose Figueroa
Igg. Emmanuel Joson
Igg. Ponciano Pingol
Igg. Apollo Robles
Igg. Jerwin Lombres
Igg. Dante Sillano
Igg. Ronald Mercado
Gng. Loreta Copon
Gng. Irene A. Agustin
Gng. Anielyn Barnes
G. Avelino P. Aparente
Gng. Elizabeth Daluyo
Gng. Carmelita V. Dela Cruz
Bb. Glaiza P. Teodoro
G. Job Gayta
Bb. Rosario B. Ignacio
Gng. Guillerma DL. Garrido
Gng. Ofelia O. Estrella
Gng. Ma. Teresa V. Jose
Inh. Arcadio Leover P. Sulit
Peter John T. Vistan
Inh. Sudan C. Carreon
Gng. Vilma DL. Gonzales
Emelita B. San Agustin
Dra. Prima Lea L. Chua
Dra. Fiela V. Panganiban
Artuto Palileo III
Dr. Cezar H. Mejia
Inh. Renz Kevin Panganiban
Lucky Jun-Jun P. Bautista
Lovelydel E. Lambo

***** Punong Bayan /Tagapangulo
***** Chief Executive
***** Municipal Administrator
***** SB Member / Miyembro
***** SB Member-LnB / Miyembro
***** Pinuno MPDO/ Kalihim
***** MLGOO
***** PB Cutcut / Miyembro
***** PB Daungan / Miyembro
***** PB Ilang-Ilang / Miyembro
***** PB Panginay / Miyembro
***** PB Poblacion / Miyembro
***** PB Pritil / Miyembro
***** PB Pulong Gubat/ Miyembro
***** PB Sta. Cruz / Miyembro
***** PB Sta. Rita/ Miyembro
***** PB Tabang / Miyembro
***** PB Tabe / Miyembro
***** PB Tiaong / Miyembro
***** PB Tuktukan / Miyembro
***** CSO – GUPA / Miyembro
***** CSO – GRL / Miyembro
***** CSO – TMMRI / Miyembro
***** CSO – ABCMC / Miyembro
***** CSO – WSL / Miyembro
***** CSO – GLikha / Miyembro
***** CSO – LKBPI / Miyembro
***** CSO – MLHOA / Miyembro
***** CSO – MAFC / Miyembro
***** LFC/MTO
***** LFC/MBO
***** LFC/OMA
***** MEO
***** MDRRMO
***** MENRO
***** HARO
***** PESO
***** MHO
***** MHO
***** MHO
***** ONG
***** MPDO
***** MPDO
***** MPDO

**RESOLUTION NO. 011
Series of 2021**

**RESOLUTION APPROVING THE ENDORSEMENT OF COMPREHENSIVE LAND USE
PLAN (CLUP) 2019-2027 OF THE MUNICIPALITY OF GUIGUINTO TO THE
SANGGUNIAN BAYAN**

WHEREAS, Republic Act 7160 otherwise known as the Local Government Code of 1991 provides that Local Government Units (LGUs) shall continue to prepare their respective Comprehensive Land use Plans enacted through Zoning Ordinance which shall be the primary and dominant bases for the future



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PAMBAYANG KONSEHO SA PAGPAPA-UNLAD

use of land resources. Accordingly, the code provides the share with national government the responsibility in the management and maintenance of ecological balance in its territorial jurisdiction (Section 2a, 15 and 3i). Further, as directed by the Constitution... "to regulate the acquisition, ownership, use, and disposition of property..." (Article XIII, Section 1);

WHEREAS, the Provincial Planning and Development Office as part of the Technical Working Group of the Provincial Land Use Committee recommended during the presentation of the CLUP on August 2018 that the planning environment of the CLUP and the planning period must be updated as well because the previous proposed CLUP 2014-2022 is nearing its expiration yet has remained unapproved;

WHEREAS, the Technical Working Group of the 2019-2027 Comprehensive Land Use Plan Committee of the Municipality of Guiguinto has integrated the revisions required by the Provincial Land Use Committee as stated in the PLUC Minutes of the Meeting sent to MDC Secretariat on October 2018 embodying the proposed programs, projects, policies, and strategies in consonance with the thrust of the national and provincial government;

WHEREAS, the Municipality of Guiguinto has completed the formulation of its Comprehensive Land Use Plan 2019-2027 through the Municipal Planning and Development Office and Technical Working Group of the 2019-2027 Comprehensive Land Use Plan Committee;

WHEREAS, the Municipality of Guiguinto has complied with the prescribed documentary and procedural requirements in the formulation process;

WHEREAS, the Provincial Land Use Committee has approved and has favorably endorsed the Comprehensive Land Use Plan 2019-2027 of the Municipality of Guiguinto to the Sangguniang Panlalawigan;

NOW, THEREFORE:

On motion of BC Jerwin Lombres of Barangay Tabe and duly seconded by Ms. Rosario B. Ignacio of CSO-Municipal Agricultural and Fishery Council, Mrs. Loreta Copon of CSO-GUPA, and all members present;

RESOLVED, as it is hereby resolved to approve the Endorsement of Comprehensive Land Use Plan 2019-2027 of the Municipality of Guiguinto to the Sangguniang Bayan.

APPROVED.

Pinatutunayan ko ang kawastuhan ng halaw na nakatitik sa itaas nito, mula sa katitikan ng pagpupulong ng Pambayang Konseho sa Pagpapaunlad na ginanap noong ika-26 ng Agosto 2021.

EnP. RITTA DIANNE G. RAMOS-BORLONGAN
Pinuno ng Tanggapan sa Pagpapalano at Pagpapaunlad

PINAGTIBAY

AMBROSIO C. CRUZ, JR.
Punong Bayan



ITINATAG MEMXV PAMAHALAANG BAYAN NG GUIGUINTO

SECTORAL STUDIES

Comprehensive Land Use Plan 2019-2027

Part I

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Chapter I - Physical Features and Demographic Trends

1.1. Brief History

Guiguinto began as a barrio of Bulacan town, the former provincial capital of Bulacan. It is said that Spaniards set up an army post in the barrio to serve as a resting place for forces going to Northern Luzon. In those days, travel throughout Guiguinto was difficult and slow down to cross single file over a narrow bamboo bridge. Their Filipino guides would cry out, "*Hinto*" (stop). The Spaniards thought this was the name "*Hihinto*". The Spaniards substituted "*Gui*" (with hard "g") for the Tagalog "*Hi*". The place has since been called Guiguinto. On the other hand, old timers say that on moonlight nights, a golden bull emerges from the church and goes down to the nearby river to quench his thirst. It then returns to the church, ascends at the altar and disappears. The elders' aid that there are buried jars of gold in town, as indicated by the bull, and that is why the town was called Guiguinto.

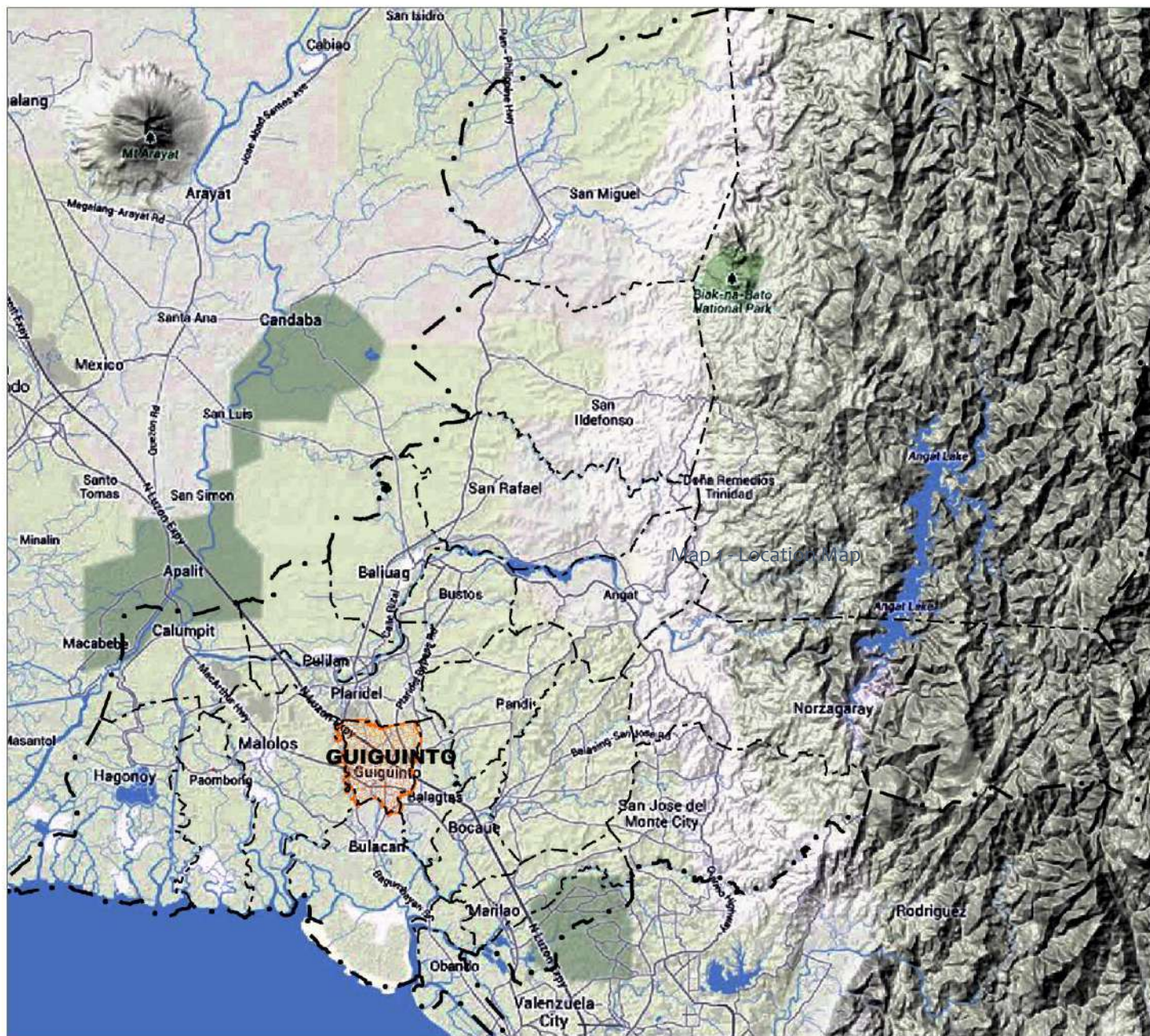
In 1800, a Spanish priest erected a small chapel in what is now barrio Sta. Rita. In 1873, roads were constructed in barrio Malis. The people barrios of Pritil, Tabe, and Kutkut even those days were mostly farmers. During Holy Week, villagers of barrio Tuktukan held contest for the hardest egg shells (*chicken, duck, or goose by knocking eggs together (Tuktukan)*). The women tried to help each other in singing the "*Panica*".

Just before the outbreak of the revolution of 1896, the town people of Guiguinto were ordered to sleep in the town at night and to work in their fields only in the day. This was said to have been suggested by the town priest to the authorities because of rumors that many of the town people were joining the secret revolutionary society, the Katipunan. Guiguinto eventually contributed many soldiers to the 1890 revolution.

Guiguinto became a municipality in 1915, with Antonio Figueroa as its first "*Municipal President*". The town's population was then about 4,000. The 1960 census placed Guiguinto's population at 10,629. Guiguinto is bounded on the East by the town of Balagtas, on the west by City of Malolos, on the North by Plaridel, and on the South by Bulacan.

1.2. Geographic Location

The Municipality of Guiguinto lies near the center of the Province of Bulacan in Central Luzon, approximately within the longitudinal points 14°51'56"N and 14°48'58"N, and within the latitudinal points 120°51'10"E and 120°53'18"E. It is accessible by land through the Manila North Road, about 33 kilometers north of Manila and 8 kilometers south of City of Malolos, the capital of Bulacan. There are four local government units surrounding the Municipality of Guiguinto and all are within the low land portion of the province. At the north of Guiguinto lies the Municipality of Plaridel; on the east, the Municipality of Balagtas; on the south lies the Municipality of Bulacan; and on the west, the City of Malolos. (*See Map 1 - Location Map of Guiguinto*)



SECTORAL STUDIES LOCATION MAP



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Municipal Planning and Development Office
Municipal Government of Guiguinto

March 2020

1.3. Territorial Jurisdiction and Barangay Subdivision

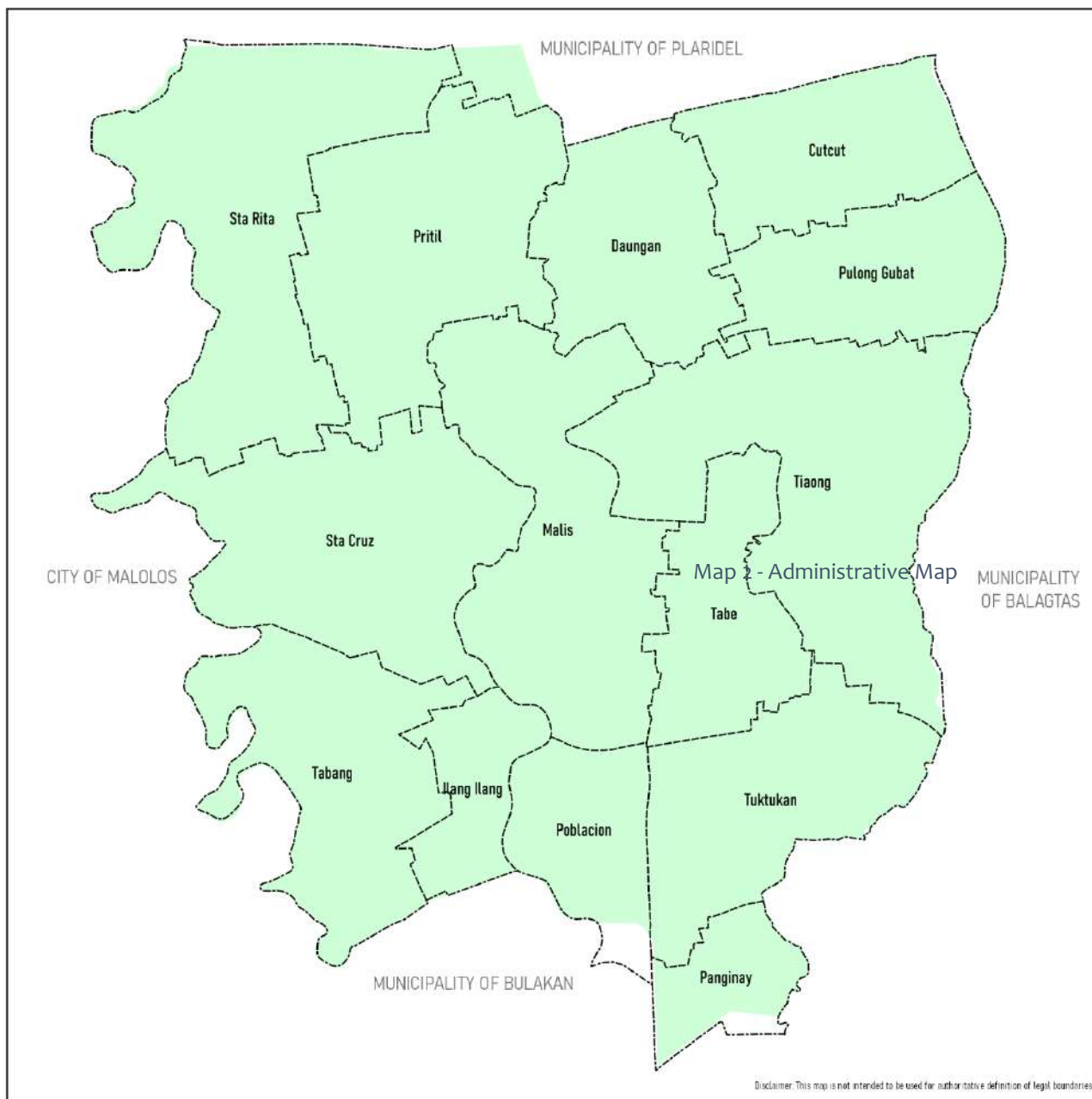
Guiguinto has a total area of 2,750 hectares based on the records of the *Land Management Bureau (LMB)* under the umbrella of the *Department of Environment and Natural Resources (DENR)*. However, as per land accounting and estimates using *Geographic Information System (GIS)*, the Municipality of Guiguinto registered a total area of 2,221 hectares following the known limits of its boundaries from the records of the Assessor's Office. Accordingly, since this area was generated using GIS, it shall be used as the primary basis in land use planning to cover the whole territorial jurisdiction of the Municipality of Guiguinto. Shown in *Table below* is the distribution of land area by barangay using the old records and the area generated using GIS.

Table 1 - Area of Barangays

NAME OF BARANGAY	LAND AREA (HAS.)	
	AS PER OLD RECORD	AS PER GIS*
Cut-cut	226	122.75
Daungan	200	130.38
Ilang-ilang	50	60.08
Malis	311	226.48
Panginay	87	52.94
Poblacion	96	84.85
Pritil	323	210.21
Pulong Gubat	151	117.58
Sta. Cruz	248	227.25
Sta. Rita	272	266.84
Tabang	219	174.66
Tabe	114	107.06
Tiaong	258	280.76
Tuktukan	195	159.59
TOTAL	2,750	2,221.43

Note: *GIS computed area was based on parcel map record of the Assessor's Office

As per inquiry with the LMB, the Municipality of Guiguinto has no record of official land area per barangay. The area shown in the second column is not supported by technical description or any other maps to justify the figures presented. Although it is being used in several existing legal documents, this plan will take an advanced step in coming up with a reliable and accurate presentation and computation of land area. As a modern tool in planning, this CLUP shall make use of the GIS. Presented in the third column, an accurate and realistic estimate of the land area per barangay was generated using GIS. The computation was automatically produced using boundaries from the records of the Assessor's Office and taking into consideration the natural boundaries as reference using satellite images as base layers. Such procedure enables an accurate presentation of the natural features of Guiguinto and spatial analysis becomes possible as well.



SECTORAL STUDIES
ADMINISTRATIVE MAP

LEGEND

- Municipal Boundary
- Barangay Boundary



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Municipal Government of Guiguinto

March 2020

1.4. Land Resource Features

1.4.1. Geology

Alluvium is the main underlying geologic structure present in the Municipality of Guiguinto (*see Map 3*). This geologic makeup is a type of sedimentary rock stems which are commonly found in the western section of Bulacan covering the lowland and coastal areas which is estimated to cover 40-50% of the province's landmass. Alluvial rock formation is the result of the deposition of weathered rock materials by rivers, creeks, and streams of low-level areas. It is a term used when the loose, unconsolidated soils, which are eroded and reshaped by water is deposited or cemented. Further, the alluvial soils are loose at the surface, well-drained, and permeable with good water-holding capacity making it mostly suitable for farming purposes. Although the south western part of Bulacan contains alluvium where deposits of ordinary earth materials such as gravel and crushed stones are found, the Municipality of Guiguinto is not engaged in any form of quarry operation.

1.4.2. Land Classification

There are two major classification of land in the province of Bulacan based on the record of the DENR, the forested area or timberland and the *Alienable and Disposable Lands (A&D)*. The forested areas are found on the eastern side of Bulacan with some protected areas in municipality of Bulacan area. These land areas should not be owned by private individual or entity and should be preserved and protected because of their function for forest purposes. The rest of the province is considered A&D comprising majority of the upland and lowland to coastal areas. These A&D lands refers to those lands of the public domain which have been the subject of the present system of classification and declared as not needed for forest purposes. The entire territory of the Municipality of Guiguinto is covered by the A&D classification of land (*Map 4*). This means that the whole land of Guiguinto is not covered by any preservation/protection laws or proclamations that would inhibit possible land developments.

1.4.3. Topography and Slope

The overall topographic configuration of Guiguinto belongs to the level ground to very gently sloping terrain or slopes ranging from 0 to 3%. Shown in *Map 5*, this slope range is normally characterized by a flat landscape wherein about 1-meter elevation difference is observed. Accordingly, the whole territory of Guiguinto is within the ideal developable slope range.

Correspondingly, the general elevation in Guiguinto falls between 5 to 6 *meters above sea level (masl)*. According to the topographic maps generated by the *National Mapping and Resource Administration (NAMRIA)*, 5 masl elevations can be found from central to northern part of the municipality including portions of barangays Pritil, Daungan, Malis, Sta. Rita, Tabe, Sta. Cruz, and Tiaong.

1.4.4. Soil

In the municipality of Guiguinto, soils have been classified into four types, namely: Batia, Quinngua, Prenza, and Tagulod.

Table 2 - Soil Series

SOIL SERIES	PERCENT FROM THE TOTAL LAND AREA OF GUIGUINTO (HAS.)
Batia	6.26
Quinngua	2.22
Prenza	0.10
Tagulod	91.42

As shown in *Table 2* and *Map 6*, Tagulod soil series comprises majority of the soil types found in the territory of Guiguinto representing 91% of its entire territory. Tagulod and Batia soil series is where the rich soil of Guiguinto can be found. This is evident by the areas' suitability for farming especially in the central to northern part of the town. Quinngua soil type can only be found at the western edge of Guiguinto along its boundary with the Municipality of Plaridel. While Prenza soil series is almost insignificant since a very small tip was taken at 0.1%.

1.4.5. River Network

Figure 1 – Guiguinto River

Guiguinto River is the only major water body that cuts across the town from north to south following the downstream direction. With Guiguinto River as one of its major water resource, flood waters are drain from its north serving the Municipality of Plaridel and Balagtas including runoff from other nearby barangays going to the Municipality of Bulakan. This river covers about 9.6 hectares or 0.36 % of the total land area of the Municipality of Guiguinto and provide substantial role in terms of socio-economic make-up of the town.

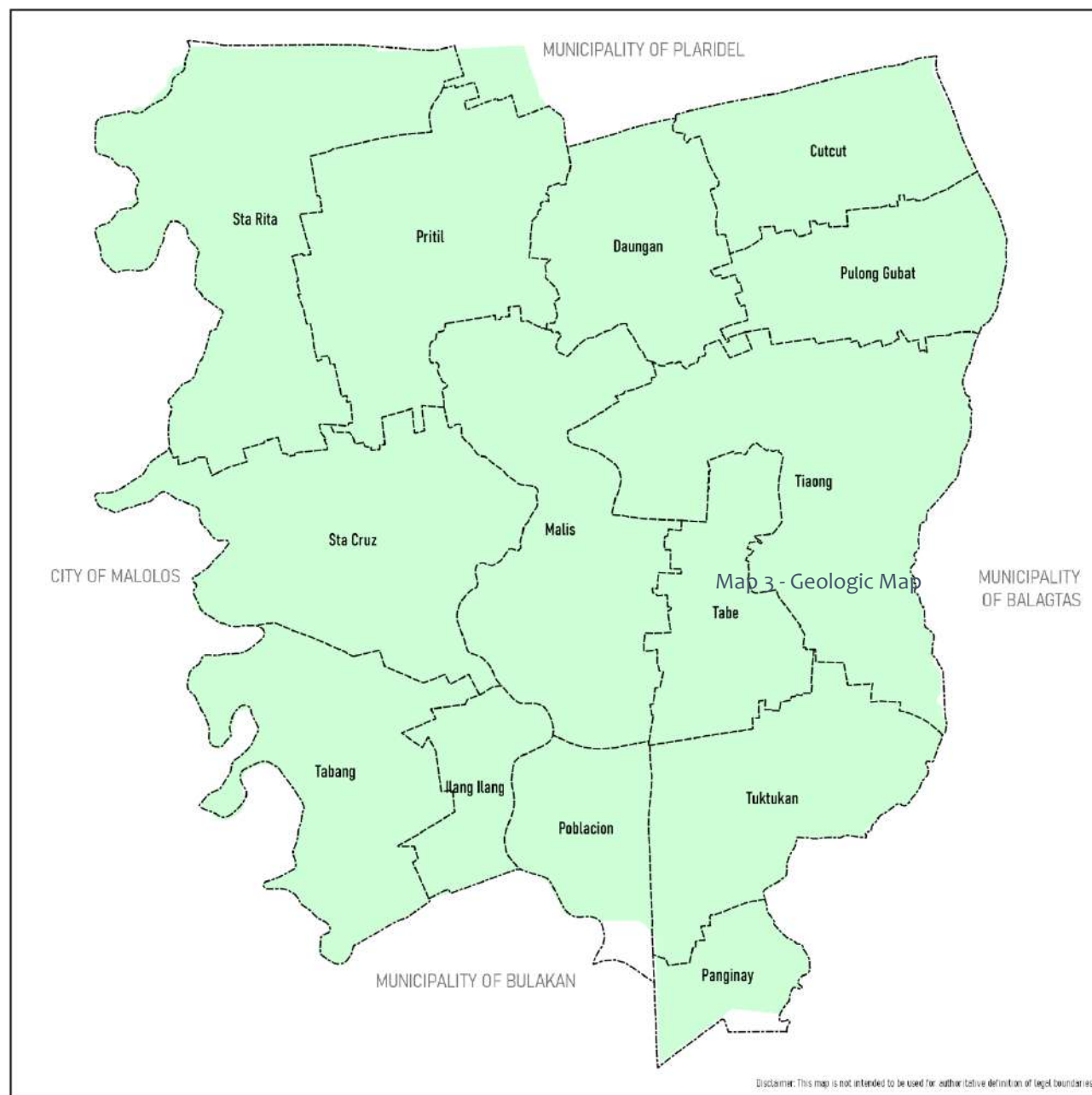




SECTORAL STUDIES
GEOLOGIC MAP

LEGEND

- Municipal Boundary
- Barangay Boundary
- Alluvium



Disclaimer: This map is not intended to be used for authoritative definition of legal boundaries



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SECTORAL STUDIES
LAND CLASSIFICATION MAP

LEGEND

- Municipal Boundary
- Barangay Boundary
- Alienable & Disposable (A & D)



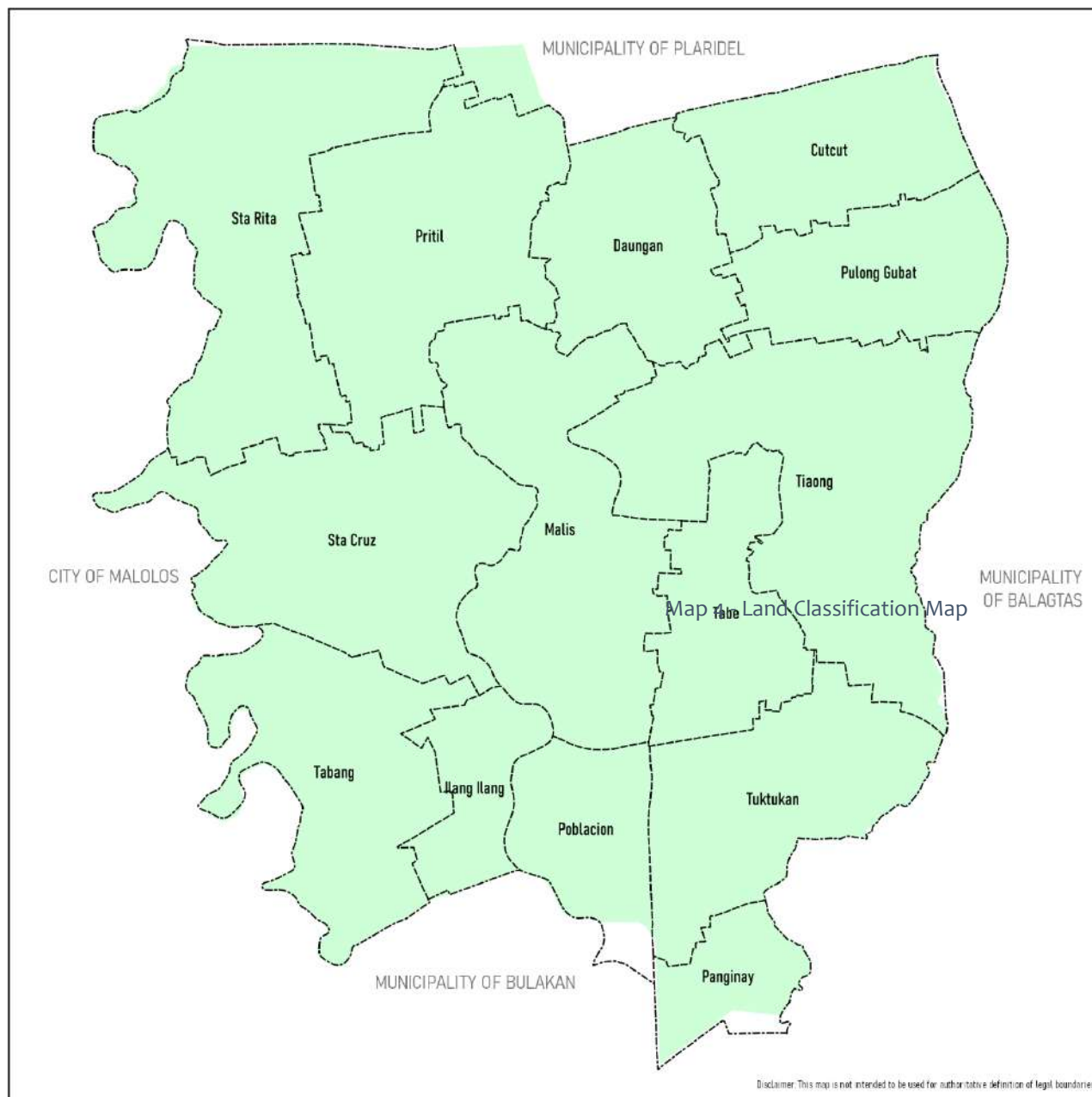
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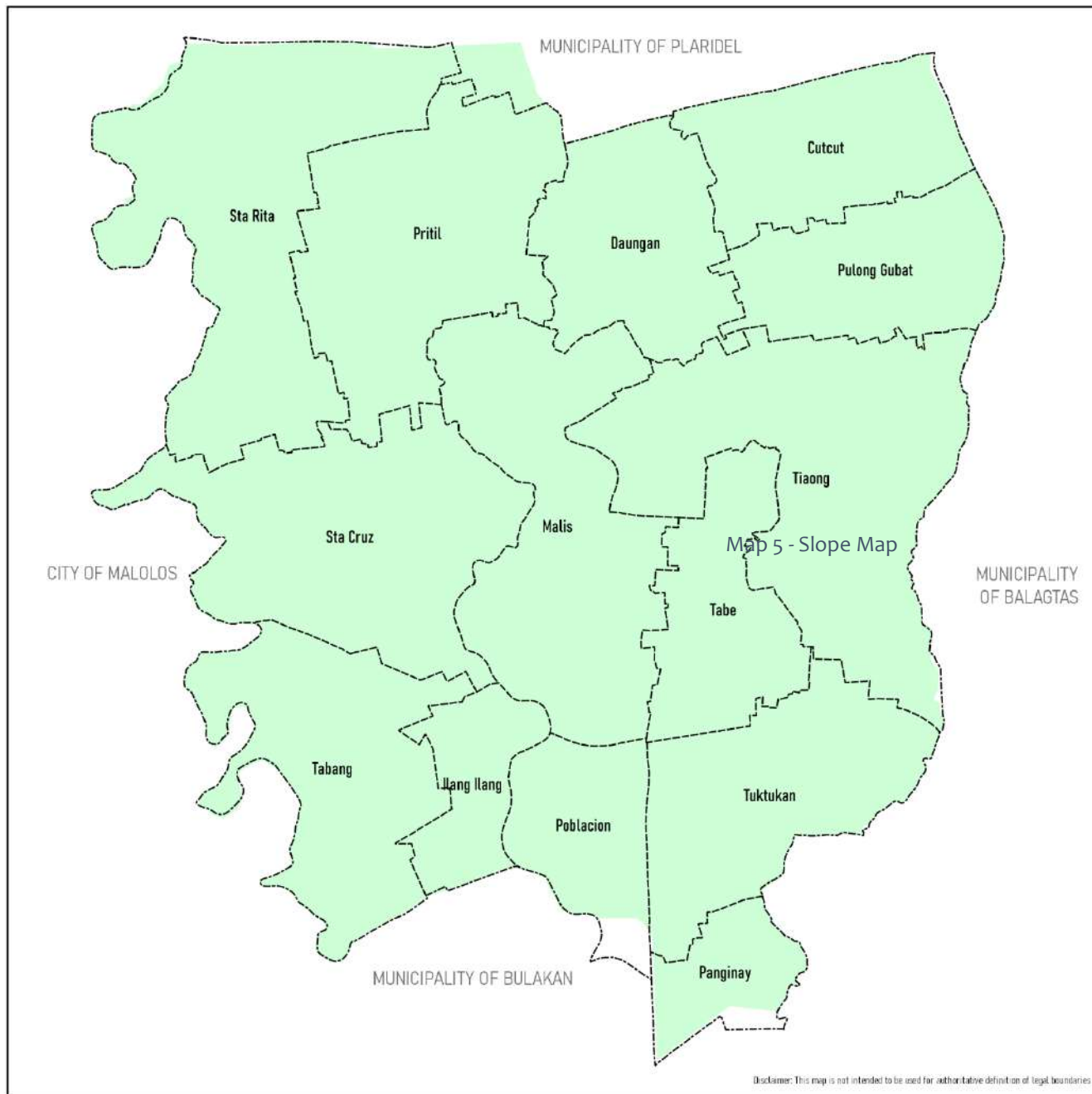
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March 2020

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SECTORAL STUDIES
SLOPE MAP

LEGEND

- Municipal Boundary
- Barangay Boundary
- Level to Very Gently Sloping (0-3%)

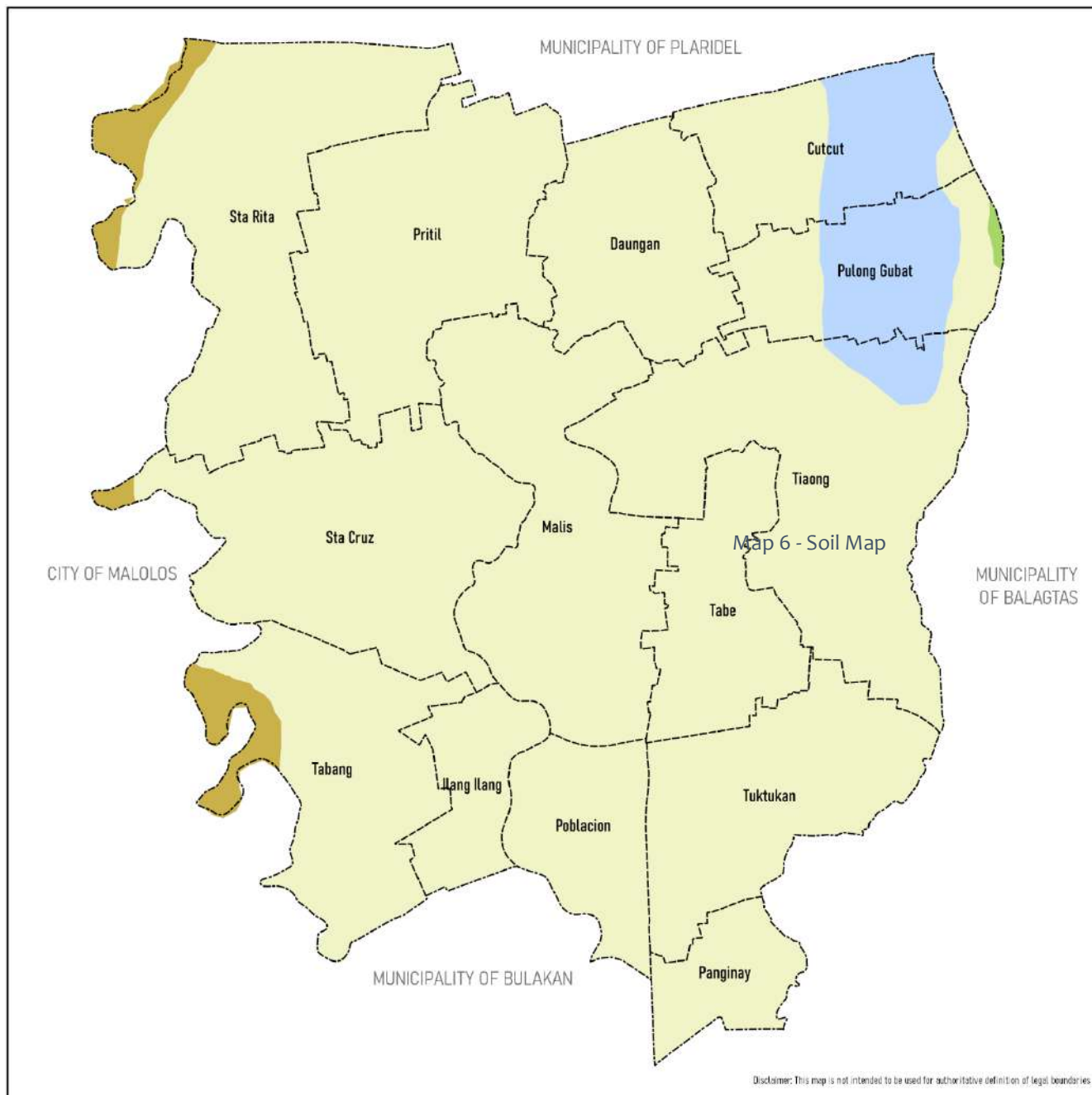


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March 2020



SECTORAL STUDIES
SOIL MAP

LEGEND

----- Municipal Boundary

----- Barangay Boundary

SOIL TYPES

Quingua

Tagulod

Batia

Prenza

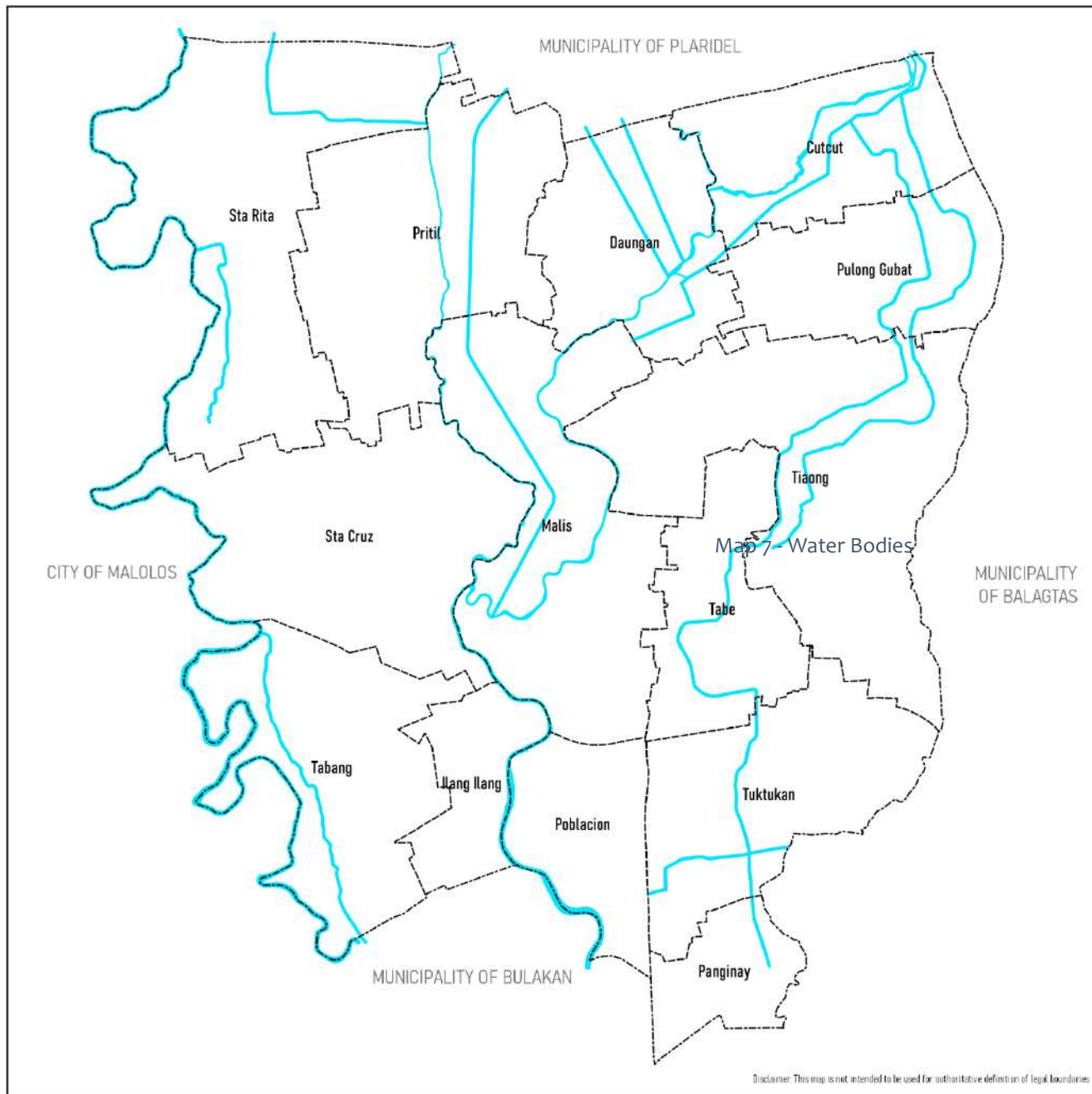


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March 2020



SECTORAL STUDIES
WATER BODIES MAP

LEGEND

- Municipal Boundary
- Barangay Boundary
- River Network/Creeks/Canals



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Municipal Planning and Development Office
Municipal Government of Guiguinto

March 2020

1.5. Demographic Trends

Guiguinto is classified as a 1st class municipality effective in 2005. It is composed of fourteen (14) barangays.

As of the latest Census conducted in 2015, Guiguinto has a total of 99,730 inhabitants with average annual growth rate of 1.87 percent. This figure is about 3.03 percent of the total Bulacan population, ranking the Municipality of Guiguinto 14th among the 24 municipalities and cities in the province in terms of population count.

Barangay Malis has the greatest share of the total population at 16.27 percent, followed by Sta. Rita and Sta. Cruz at 13.72 percent and 12.25 percent respectively. On the other hand, barangays Panginay and Daungan has the least share at less than 4 percent which is equivalent to less than 4,000 inhabitants as of Census 2015. In terms of population growth rate, barangays Daungan and Panginay are the fastest growing barangays in terms of population at 5.13 percent and 5.41 percent respectively, higher than the Province of Bulacan and the country's APGR from 2010 to 2015. Slowest on the other hand is barangay Pulonggubat that actually marked a decrease in population from 2010 to 2015 due to migration and natural population indicators.

Table 3 - Census of Population by Barangay, (2010 & 2015)

Barangay		2010 Total Population	2015 Total Population	%	APGR 2010-2015
Province of Bulacan		2,924,433	3,292,071	100.00	2.28
GUIGUINTO		90,507	99,730	3.03	1.87
1	Cutcut	2,701	2,940	2.95	1.63
2	Daungan	1,384	1,800	1.80	5.13
3	Ilang-Ilang	4,436	5,628	5.64	4.64
4	Malis	13,957	16,223	16.27	2.91
5	Panginay	1,159	1,528	1.53	5.41
6	Poblacion	3,852	4,099	4.11	1.19
7	Pritil	4,165	5,172	5.19	4.21
8	Pulong Gubat	3,186	1,879	1.88	-9.57
9	Santa Cruz	11,639	12,216	12.25	0.93
10	Santa Rita	13,163	13,687	13.72	0.75
11	Tabang	7,332	8,832	8.86	3.61
12	Tabe	7,204	8,310	8.33	2.76
13	Tiaong	7,279	7,640	7.66	0.93
14	Tuktukan	9,050	9,776	9.80	1.48

Age Structure. According to the 2015 Census, the proportion of male to female population of the Municipality of Guiguinto is similar with those of the province and the country. Male population is a little larger than female population at 50.15 to 49.85 ratio. Meanwhile, a little less than a third of the population is member of the labor force which means more than two thirds the population are dependent.

Table 4 - Age and Sex Structure, Census 2015

Summary	Male	Female	Total
Children 0-5 years old	5,918	5,326	11,244
Children 6-12 years old	6,788	6,165	12,953
Member of the labor force	27,211	17,185	44,396
Total Population	50,016	49,714	99,730
Age Group	% from total age group	% from Total Population	
Children 0-5 years old	52.63	47.37	11.27
Children 6-12 years old	52.40	47.60	12.99
Member of the labor force	61.29	38.71	44.52
Total Population	50.15	49.85	100.00

Population Projection. The Municipality of Guiguinto has the possibility to double its current population (2020 projection) in 2035 according to the projections conducted by the Philippine Statistics Authority. This population projection is computed using the 2010-2015 annual population growth rate of Guiguinto at 1.87 percent. Population growth in the municipality is the combination of the natural births and deaths and the in-migration of the people due to the development of residential areas in Guiguinto.

Population Density. Population density in the Municipality of Guiguinto has increased by more than 1,000 persons per square kilometer of land from 2010 to 2015. Significant changes in density include those of barangay Daungan and barangay Panginay which increased by more than double of its density in 2010. On the other hand, barangay Pulonggubat has decreased its density by more than 1,500 persons per square kilometer of land and this may be attributed both by natural deaths of its inhabitants and out-migration due to the development of residential areas in nearby barangays.

Table 5 - Population Density, 2010 and 2015

Barangay	As per Old Record (Has)	As per GIS (Has)	2010 Population	2015 Population	Old		GIS		% Change
					Density (2010)	Density (2015)	Density (2010)	Density (2015)	
GUIGUINTO	2,750	2,221.43	90,507	99,730	32.91	36.27	40.74	44.89	10.19
1 Cutcut	226	122.75	2,701	2,940	11.95	13.01	22.00	23.95	8.85
2 Daungan	200	130.38	1,384	1,800	6.92	9.00	10.62	13.81	30.06
3 Ilang-Ilang	50	60.08	4,436	5,628	88.72	112.56	73.83	93.68	26.87
4 Malis	311	226.48	13,957	16,223	44.88	52.16	61.63	71.63	16.24
5 Panginay	87	52.94	1,159	1,528	13.32	17.56	21.89	28.86	31.84
6 Poblacion	96	84.85	3,852	4,099	40.13	42.70	45.40	48.31	6.41
7 Pritil	323	210.21	4,165	5,172	12.89	16.01	19.81	24.60	24.18
8 Pulong Gubat	151	117.58	3,186	1,879	21.10	12.44	27.10	15.98	-41.02
9 Santa Cruz	248	227.25	11,639	12,216	46.93	49.26	51.22	53.76	4.96
10 Santa Rita	272	266.84	13,163	13,687	48.39	50.32	49.33	51.29	3.98
11 Tabang	219	174.66	7,332	8,832	33.48	40.33	41.98	50.57	20.46
12 Tabe	114	107.06	7,204	8,310	63.19	72.89	67.29	77.62	15.35
13 Tiaong	258	280.76	7,279	7,640	28.21	29.61	25.93	27.21	4.96
14 Tuktukan	195	159.59	9,050	9,776	46.41	50.13	56.71	61.26	8.02

Table 6 - Population Projection, 2016-2035

Barangay	2010 Population	2015 Population	APGR	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
GUIGUINTO	90,507	99,730	1.87	101,591	103,486	105,416	107,383	109,386	111,427	113,506	115,623	117,780	119,977
1 Cutcut	2,701	2,940	1.63	2,995	3,051	3,108	3,166	3,225	3,285	3,346	3,409	3,472	3,537
2 Daungan	1,384	1,800	5.13	1,834	1,868	1,903	1,938	1,974	2,011	2,049	2,087	2,126	2,165
3 Ilang-Ilang	4,436	5,628	4.64	5,733	5,840	5,949	6,060	6,173	6,288	6,405	6,525	6,647	6,771
4 Malis	13,957	16,223	2.91	16,526	16,834	17,148	17,468	17,794	18,126	18,464	18,808	19,159	19,517
5 Panginay	1,159	1,528	5.41	1,557	1,586	1,615	1,645	1,676	1,707	1,739	1,772	1,805	1,838
6 Poblacion	3,852	4,099	1.19	4,175	4,253	4,333	4,414	4,496	4,580	4,665	4,752	4,841	4,931
7 Pritil	4,165	5,172	4.21	5,268	5,367	5,467	5,569	5,673	5,779	5,886	5,996	6,108	6,222
8 Pulong Gubat	3,186	1,879	-9.57	1,914	1,950	1,986	2,023	2,061	2,099	2,139	2,178	2,219	2,260
9 Santa Cruz	11,639	12,216	0.93	12,444	12,676	12,913	13,153	13,399	13,649	13,903	14,163	14,427	14,696
10 Santa Rita	13,163	13,687	0.75	13,942	14,202	14,467	14,737	15,012	15,292	15,578	15,868	16,164	16,466
11 Tabang	7,332	8,832	3.61	8,997	9,165	9,336	9,510	9,687	9,868	10,052	10,239	10,431	10,625
12 Tabe	7,204	8,310	2.76	8,465	8,623	8,784	8,948	9,115	9,285	9,458	9,634	9,814	9,997
13 Tiaong	7,279	7,640	0.93	7,783	7,928	8,076	8,226	8,380	8,536	8,695	8,858	9,023	9,191
14 Tuktukan	9,050	9,776	1.48	9,958	10,144	10,333	10,526	10,723	10,923	11,126	11,334	11,545	11,761
Barangay	2010 Population	2015 Population	APGR	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
GUIGUINTO	90,507	99,730	1.87	122,216	124,496	126,818	129,184	131,594	134,049	136,550	139,097	141,692	144,335
1 Cutcut	2,701	2,940	1.63	3,603	3,670	3,739	3,808	3,879	3,952	4,025	4,101	4,177	4,255
2 Daungan	1,384	1,800	5.13	2,206	2,247	2,289	2,332	2,375	2,419	2,465	2,511	2,557	2,605
3 Ilang-Ilang	4,436	5,628	4.64	6,897	7,026	7,157	7,290	7,426	7,565	7,706	7,850	7,996	8,145
4 Malis	13,957	16,223	2.91	19,881	20,252	20,629	21,014	21,406	21,806	22,212	22,627	23,049	23,479
5 Panginay	1,159	1,528	5.41	1,873	1,907	1,943	1,979	2,016	2,054	2,092	2,131	2,171	2,211
6 Poblacion	3,852	4,099	1.19	5,023	5,117	5,212	5,310	5,409	5,510	5,612	5,717	5,824	5,932
7 Pritil	4,165	5,172	4.21	6,338	6,456	6,577	6,699	6,824	6,952	7,081	7,214	7,348	7,485
8 Pulong Gubat	3,186	1,879	-9.57	2,303	2,346	2,389	2,434	2,479	2,526	2,573	2,621	2,670	2,719
9 Santa Cruz	11,639	12,216	0.93	14,970	15,250	15,534	15,824	16,119	16,420	16,726	17,038	17,356	17,680
10 Santa Rita	13,163	13,687	0.75	16,773	17,086	17,405	17,729	18,060	18,397	18,740	19,090	19,446	19,809
11 Tabang	7,332	8,832	3.61	10,823	11,025	11,231	11,440	11,654	11,871	12,093	12,318	12,548	12,782
12 Tabe	7,204	8,310	2.76	10,184	10,374	10,567	10,764	10,965	11,170	11,378	11,590	11,806	12,027
13 Tiaong	7,279	7,640	0.93	9,363	9,537	9,715	9,896	10,081	10,269	10,461	10,656	10,855	11,057
14 Tuktukan	9,050	9,776	1.48	11,980	12,204	12,431	12,663	12,899	13,140	13,385	13,635	13,889	14,148

Chapter II - Social Sector

Part of exercising the powers of a local government unit for efficient and effective governance is the promotion of health, keeping the peace and order in the community, and promotion of the general welfare of its constituents within its territorial jurisdiction as stipulated in the Local Government Code of 1991. Given such functions, this chapter will present the current situation of the Municipality of Guiguinto in terms of health and nutrition, education, housing, social welfare services, peace and order, and sports and recreation. This aims to facilitate the formulation and crafting of sound developmental goals and objectives relative to the current situation and needs of the social sector of the municipality.

2.1. Health and Nutrition

Human resource is the best asset of the society, thus, ensuring the good condition of health and nutrition of the people is imperative in the development agenda of a local government unit. In this regard, the following indicators illustrate the situation to the health sector in the municipality of Guiguinto.

2.1.1. Health Status

The general health situation of the people in the Municipality of Guiguinto as presented in Figure and Table below, shows that for the past five years (2014-2018), the average crude birth rate was 11.24 while the average crude death rate was 4.38. The lowest birth rate was registered in 2016 at 7.86 while the highest was in 2017 at 13.16.

On the other hand, the highest crude death rate was registered in 2017 at 5.1 while the lowest was in 2016 at 3.5. The registered birth rate of 7.86 and the death rate of 3.5 of Guiguinto in the year 2016 are considered low compared to the data from the 2016 Philippine Health Statistic. The Province of Bulacan has a rate of 15.7 for birth rate and 5.7 for the death rate.

Figure 2 - Crude Birth & Death Rates (2014-2018)

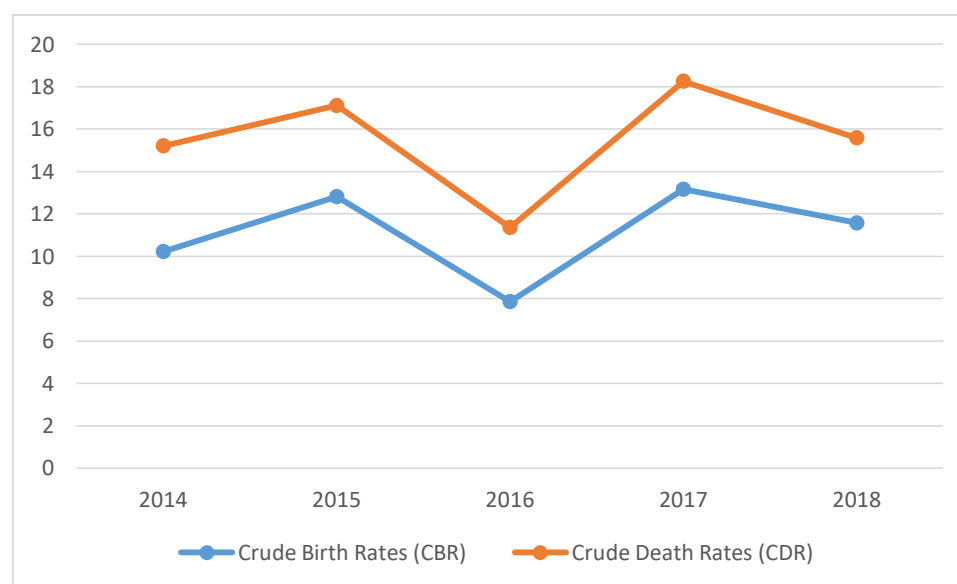


Table 7 - General Health Situation for the Last Five (5) Years - Municipality of Guiguinto

HEALTH INDICATOR	2014	2015	2016	2017	2018	AVERAGE
<i>Fertility</i>						
Crude Birth Rates (CBR)	10.22	12.81	7.86	13.16	11.57	11.24
Total Fertility Rate (TFR)	10.22	12.81	7.86	13.16	11.57	11.24
<i>Mortality</i>	507	52	218	533	428	465
Crude Death Rate (CDR)	4.99	4.3	3.5	5.1	4.02	4.38
Infant Mortality Rate (IMR)	3.85	0.75	8.77	2.21	1.62	3.44
Maternal Mortality Rate (MMR)	0	0	0	0	0	0

Source: Municipal Health Office, Local Civil Registry / Hospital Records

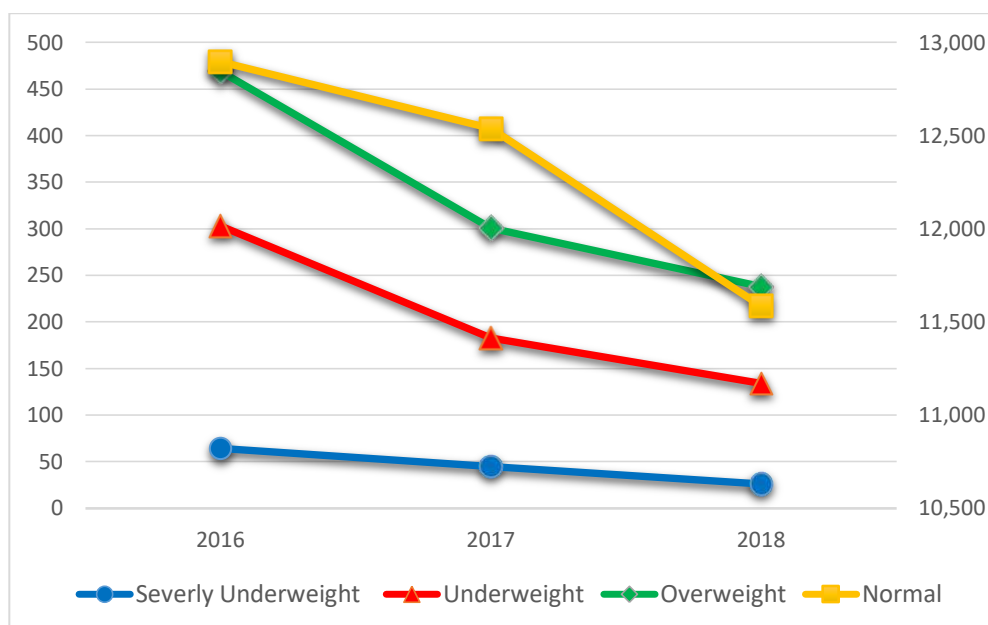
Severely underweight children under five years old had decreased from 2016 to 2018. Specifically, there was a total of 135 severely underweight children registered from 2016 to 2018. At the same time, children who fall under the underweight and overweight category also decreased the number from the year 2016 to 2018.

Table 8 - Malnourished Children (0-71 months old) for the Last Three (3) Years

DEGREE OF MALNUTRITION	2016		2017		2018	
	#	%	#	%	#	%
Severely Underweight	64	0.48	45	0.36	26	0.2
Underweight	239	1.85	138	1.02	108	0.9
Overweight	166	1.24	118	0.92	104	0.88
Normal	12,896	97.4	12,538	98	11,585	98
TOTAL WEIGHTED	13,365		12,839		11,823	

Meanwhile, children with normal weight have an average of more than 98 percent of the total weighted children for the last three years. It can only show that the Municipality of Guiguinto did a great job by decreasing the number of malnourished children from the year 2016 to 2018 and should continue doing all the nutrition programs and activities until they achieve the zero percent of malnourished children.

Figure 3 - Nutritional Status of Children (0- 71 months old) for the Last Three Years



On the other hand, the leading cause of morbidity in Guiguinto from 2016 to 2018 was registered as Acute Respiratory Infections (ARI) as shown in the Table below. This illness is infectious and remarkably dangerous for children, older adults, and people with immune system disorders. It is also worth noting that hypertension which is considered as lifestyle disease has been consistently on the top three causes of morbidity in the community. Other causes of morbidity were environmental-related illnesses like a wound, skin rashes, and diarrhea.

Table 9 - Ten Leading Causes of Morbidity (2016-2018)

CAUSES	NUMBER OF CASES (2018)	RATE	CAUSES	NUMBER OF CASES (2017)	RATE	CAUSES	NUMBER OF CASES (2016)	RATE
ARI	16,156	15.33	ARI	9,081	8.78	ARI	9,003	9.03
Hypertension	6,665	6.32	Hypertension	4,954	4.79	Hypertension	1,878	1.88
Anemia	3,061	2.9	Wound (all kinds)	2,268	2.19	Wound (all kinds)	1,461	1.46
Wound (all kinds)	1,923	1.82	Anemia	2,105	2.03	Influenza	1,323	1.33
Skin Disease	1,464	1.39	UTI	1,821	1.76	Skin Disease	1,261	1.26
Influenza	976	0.93	Skin Disease	1,553	1.5	Anemia	706	0.71
Diarrhea	871	0.83	Influenza	1,166	1.13	Asthma	627	0.63
Dental Problem	729	0.69	Diarrhea	902	0.87	Headache	604	0.61
Tonsilitis	570	0.54	Dental Problem	787	0.76	Diarrhea	523	0.52
UTI	567	0.54	Asthma	729	0.7	Bronchitis	404	0.41

Source: Municipal Health Office

Meanwhile, causes of death of the people in Guiguinto have been classified by health experts as lifestyle related illnesses such as Disease of the Heart, Chronic Obstructive Pulmonary Disease (COPD), Diabetic Mellitus, and among others. These illnesses were the leading cause of mortality for the past three years as shown in Table below. Nevertheless, prevention of such diseases is possible when serious lifestyle changes will be made.

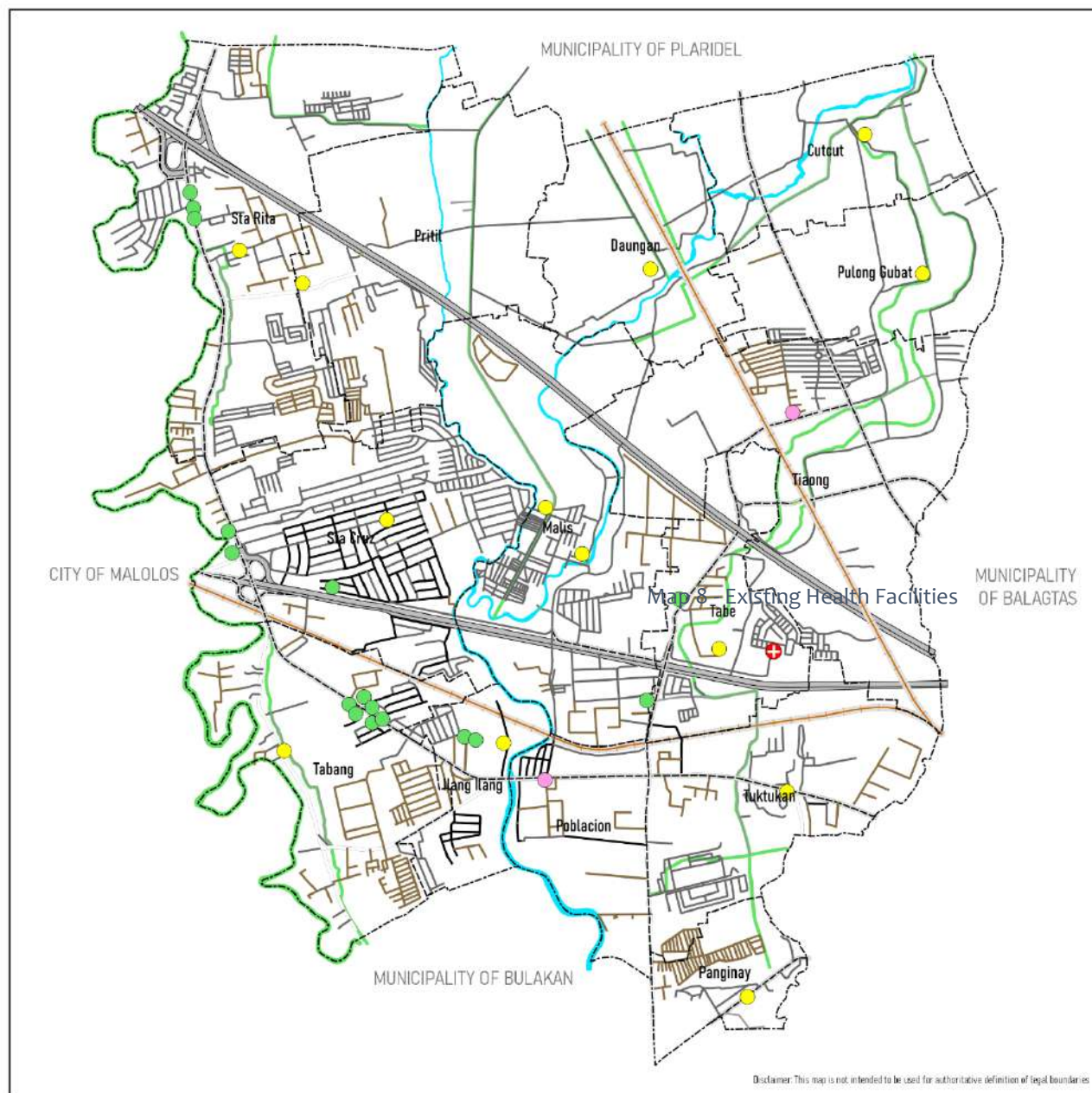
Table 10 - Ten Leading Causes of Mortality (2016-2018)

CAUSES	NUMBER OF CASES (2018)	RATE	CAUSES	NUMBER OF CASES (2017)	RATE	CAUSES	NUMBER OF CASES (2016)	RATE
Disease of the Heart	139	0.13	Disease of the Heart	444	0.43	COPD	45	0.04
Disease of the Vascular System	77	0.07	Traumatic Injury/Accidents	39	0.04	Diabetic Mellitus	35	0.03
Pneumonia	59	0.06	Malignant Neoplasm	10	0.01	Cancer (all forms)	27	0.03
Malignant Neoplasm	41	0.04	Fetal Death/Still birth	9	0.008	Traumatic Injury/Accidents	28	0.03
Traumatic Injury/Accidents	29	0.03	Disease of the Vascular System	8	0.007	Pneumonia	23	0.02
COPD	26	0.02	COPD	6	0.005	Cardio vascular disease	10	0.01
Diabetic Mellitus	25	0.02	Nephritis	5	0.004	Chronic renal disease	9	0.008
Nephritis	22	0.02	Pneumonia	3	0.003	PTB	7	0.007
Other Disease of the Respiratory Syndrome	5	0.005	Diabetic Mellitus	1	0.001	Septicaemia	5	0.005
Tuberculosis	5	0.005	Other Disease of the Respiratory Syndrome	1	0.001	Gastroenteritis	1	0.001

Source: Municipal Health Office

2.1.2. Health Facilities

Health facilities are fundamental in the delivery of health services whether public or privately owned facilities. In the municipality of Guiguinto, 13 Barangay Health Stations are present in different barangay for the delivery of primary health care services such as basic consultation, health education, and referral to Rural Health Units (RHU) and core referral hospital. The RHUs on the other hand, are strategically located one at Barangay Poblacion and the other unit at Barangay Tiaong for the referral facility of the Barangay Health Stations and for other primary health care services such as consultation, basic treatment, dental care, and referral facilities of complicated cases to the next level hospital. It should be noticed that health facilities are strategically located to cater the residents of the respective barangay. The health services in the locality are complemented by private facilities situated in the municipality. There are fourteen (14) diagnostic clinics, two (2) private hospitals, and one (1) public hospital presently operating in the area.



SECTORAL STUDIES EXISTING HEALTH FACILITIES MAP

LEGEND

- Municipal Boundary
- Barangay Boundary
- ===== North Luzon Expressway
- National Road
- Provincial Road
- Municipal Road
- Barangay Road
- NIA Road
- Private Road
- Railroad Right of Way
- ===== River Network/Creeks
- ===== Irrigation Canal
- HEALTH FACILITIES**
- + Public Hospital
- Private Hospital/Clinic
- Barangay Health Station
- Rural Health Unit



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Prepared by:

Municipal Planning and Development Office
Municipal Government of Guiguinto

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2.1.3. Health Manpower

Primary health care services are being delivered to the people in the locality by the municipal government through its public health service workers deployed across barangays. Specifically, Barangay Health Workers (BHWs) in every barangay help the assigned midwives in the Barangay Health Station. Meanwhile, the doctors, nurses, and other health workers are assigned to the RHU for the delivery of health services to its constituents. Based on the standards in the required RHU personnel to population prescribe in RA 1082, Guiguinto falls under Category VIII with a catchment population of 50,001 and over. In this category, the required number of health workers is two (2) doctors, four (4) nurses, four (4) midwives, and three (3) sanitary inspectors. The next Table shows that as of 2017, the municipal government is compliant with the required number of health workers except for sanitary inspectors.

Table 11 - Public Health Service Workers (2016-2018)

PUBLIC HEALTH SERVICE WORKERS	2016	2017	2018
Barangay Health Workers	113	115	111
Doctors (MD/MHO/RHP)	2	2	2
Public Health Nurses	3	4	5
Rural Health Midwives	16	15	15
Sanitary Inspectors	2	2	1
Medical Technologists	2	2	2
Dentists	2	2	2
Dental Aides	2	2	2
Nutritionists	0	0	0
Non-Technical Personnel	5	6	7

2.2. Water and Sanitation

Access to potable water and sanitary toilet facilities are the practical measures for the preservation of public health. Below are the present situation on the access of household to water and sanitation.

2.2.1. Household with Access to Safe Water and Sanitary Facilities

With regards to the access of the households to safe water, the Table above shows that using the 2018 projected number of households as its base year, the municipality has recorded a grand percentage of 69.18% for 14 barangay. It only means that still, 30% of households in the municipality needs to have access to safe water. On the other hand, the top three barangay with the least percentage of households with access to safe water in 2018 are Pulonggubat, Cut-cut, and Sta. Rita. While, the three barangay with a high percentage of households with access to safe water are Panginay, Pritil, and Tabang.

Table 12 - Households with Access to Safe Water and Sanitary Facilities (2018)

BARANGAY	PROJECTED NUMBER OF HOUSEHOLDS (2018)	2018			
		WITH ACCESS TO SAFE WATER	%	WITH ACCESS TO SANITARY FACILITIES	%
1. Cut-cut	721	462	64.08	513	71.15
2. Daungan	441	320	72.49	336	76.11
3. Ilang-Ilang	1,380	979	70.93	1,041	75.42
4. Malis	3,979	2,787	70.05	2,903	72.96
5. Panginay	375	279	74.45	287	76.59
6. Poblacion	1,005	695	69.14	709	70.53
7. Pritil	1,268	930	73.32	949	74.82
8. Pulong Gubat	461	195	42.32	197	42.75
9. Sta. Cruz	2,996	2,060	68.76	2,103	70.19
10. Sta. Rita	3,357	2,253	67.12	2,348	69.95
11. Tabang	2,166	1,586	73.22	1,602	73.96
12. Tabe	2,038	1,453	71.30	1,483	72.77
13. Tiaong	1,874	1,289	68.79	1,315	70.18
14. Tuktukan	2,398	1,633	68.11	1,702	70.99
TOTAL	99,730	16,921	69.18	17,488	71.50

Conversely, the level of service of safe water in Guiguinto is generally Level III, which define as with complete piped water system coming from different water company resources. Based on the 2015 Community Based Monitoring System more than 61 percent of the households in Guiguinto have an individual household connection and the 4 percent are still taking their safe water in a Level II service or also known as communal faucet system. While the remaining 34 percent of the households have Level I service of safe water that is simply deep well/shallow well with an outlet but without a distribution system.

Table 13 - Households with Access to Level I Service of Water

MUNICIPALITY	# OF HHs	LEVEL I	%	LEVEL II	%	LEVEL III	%	TOTAL # WITH ACCESS TO SAFE WATER	% WITH ACCESS TO SAFE WATER	TOTAL # WITHOUT ACCESS TO SAFE WATER	% WITHOUT ACCESS TO SAFE WATER
GUIGUINTO	20,320	6,964	34.27	824	4.05	12,510	61.56	20,298	99.89	68	0.33

Source: CBMS 2015

2.2.2. Waste Disposal System

The waste disposal system of the Municipality of Guiguinto is schedule collection and disposal *Material Recovery Facilities (MRF)*. Four (4) barangays have MRF for waste management. Barangay Ilang-Ilang has the biggest land area of 500 sq. m. for waste management.

Table 14 - Disposal System (2011)

DISPOSAL SYSTEM	SUPERVISED BY	LOCATION	AREA (SQ.M.)
Materials Recovery Facilities	LGU	Tuktukan (<i>Composting Area</i>)	200
		Tiaong	200
		Ilang-Ilang	500
		Panginay	200

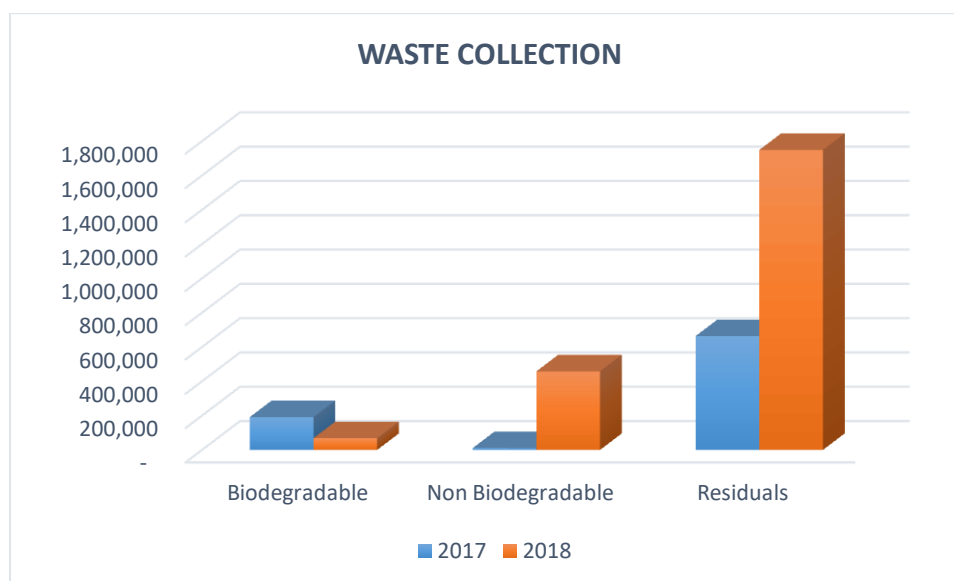
In 2017, a total of 865,769 metric tons of waste were collected within the municipality; it includes biodegradable, non-biodegradable, and residuals from different residential households, commercial establishments, and most especially industrial/manufacturing sites. While in 2018, the collected number of waste totaled to 2,275,642 metric tons, which were above higher than previous year's collections. This shows that the volume of garbage in the municipality has a big chance to rise after a year. However, the government can still lessen the waste volume for the next few years by strengthening the compliance of single-use plastics.

The table below shows who among the 14 barangays in town has the highest waste collection and these are barangay Malis, Tuktukan, and Sta. Rita. Besides, the three barangays have a bigger land area and population in the municipality.

Table 15 – Waste Collection (2017-2018)

BARANGAY	2017 WASTE COLLECTION IN METRIC TONS					2018 WASTE COLLECTION IN METRIC TONS				
	BIO DEGRADABLE	NON BIO DEGRADABLE	RESIDUALS	TOTAL	% SHARE	BIO DEGRADABLE	NON BIO DEGRADABLE	RESIDUALS	TOTAL	% SHARE
CUTCUT	1,663	38	9,340	11,041	1.28	934	1,259	42,366	44,559	1.96
DAUNGAN	-	-	-	-	0.00	126	314	132	572	0.03
ILANG ILANG	17,194	241	38,266	55,701	6.43	453	38,591	98,403	137,447	6.04
MALIS	57,608	3,332	239,019	299,959	34.6%	6,247	170,048	454,430	630,725	27.72
PANGINAY					0.00	2,920	632	687	4,239	0.19
POBLACION	12,668	1,522	31,307	45,497	5.26	7,806	27,889	96,901	132,596	5.83
PRITIL	5,566	784	35,040	41,390	4.78	622	17,331	111,127	129,080	5.67
PULONG GUBAT	660		3,192	3,852	0.44	-	-	6,083	6,083	0.27
STA. CRUZ	2,107	373	23,950	26,430	3.05	920	3,988	113,083	117,991	5.18
STA. RITA	33,279	1,622	73,327	108,228	12.50	12,081	57,202	239,956	309,239	13.59
TABANG	10,631	1,334	55,095	67,060	7.75	15,439	13,774	163,968	193,181	8.49
TABE	17,227	988	41,932	60,147	6.95	17,717	30,948	74,243	122,908	5.40
TIAONG	1,778	42	4,192	6,012	0.69	676	13,294	36,403	50,373	2.21
TUKTUKAN	31,006	418	109,028	140,452	16.22	2,538	82,953	311,158	396,649	17.43
TOTAL	191,387	10,694	663,688	865,769	100.00%	68,479	458,223	1,748,940	2,275,642	100.00%

Figure 4 - Waste Collection Status



2.2.3. Cemeteries and Memorial Parks

Regarding accessibility and availability of burial grounds, the town has six (6) existing cemeteries or memorial parks. Two are public and four are privately owned facilities. The public cemeteries are observed already congested while the three private facilities are flood-prone. Only the Golden Heritage Memorial Gardens is the facility that reported flood-free.

Table 16 - Existing Cemeteries and Memorial Parks (2018)

NAME OF CEMETERY/ MEMORIAL PARK	BARANGAY	OWNERSHIP (PRIVATE OR PUBLIC)	AREA (SQ.M.)	STATUS
Endless Love	Poblacion	Private	75,463	Flood Prone
Golden Heritage Memorial Gardens	Tabang/Ilang-Ilang	Private	28,159	New and Flood Free
Guiguinto Municipal Cemetery	Ilang-Ilang	Public	3,760	Congested
Roman Catholic Cemetery	Poblacion	Public	4,428	Congested
St. Peter Memorial Garden	Tabang/Ilang-Ilang	Private	21,044	Flood Prone
Sta. Rita de Casia	Sta. Rita	Private	22,464	Flood Prone

2.3. Education

The level of service to education sector in the municipality of Guiguinto is presented in the succeeding discussions on elementary, secondary, tertiary/vocational education being provided both by public and private entity.

For elementary education, fourteen (14) public Elementary Schools (ES) are accessible in Guiguinto and situated in the thirteen (13) barangays. Two public ES are situated in barangay Sta. Rita while no public ES in barangay Panginay. The existing public ES are complemented by fourteen (14) private ES located in different barangays as shown in the next Map.

On the other hand, secondary education is also accessible in the area. At present, there are four (4) public Junior High Schools (HS) and (3) public Senior High Schools strategically located at barangay Sta. Rita, Tiaong, Poblacion, and Malis. These public HS are complemented by seven (7) private HS situated in barangay Sta. Rita, Sta. Cruz, Tuktukan, Tabe, and Poblacion.

For the tertiary education, there are four colleges present in the area namely ATEC Technological Colleges, Global Alliance Technological Institute Corporation, Technical Education and Skills Development Authority (TESDA), and the Immaculate Concepcion Major Seminary.

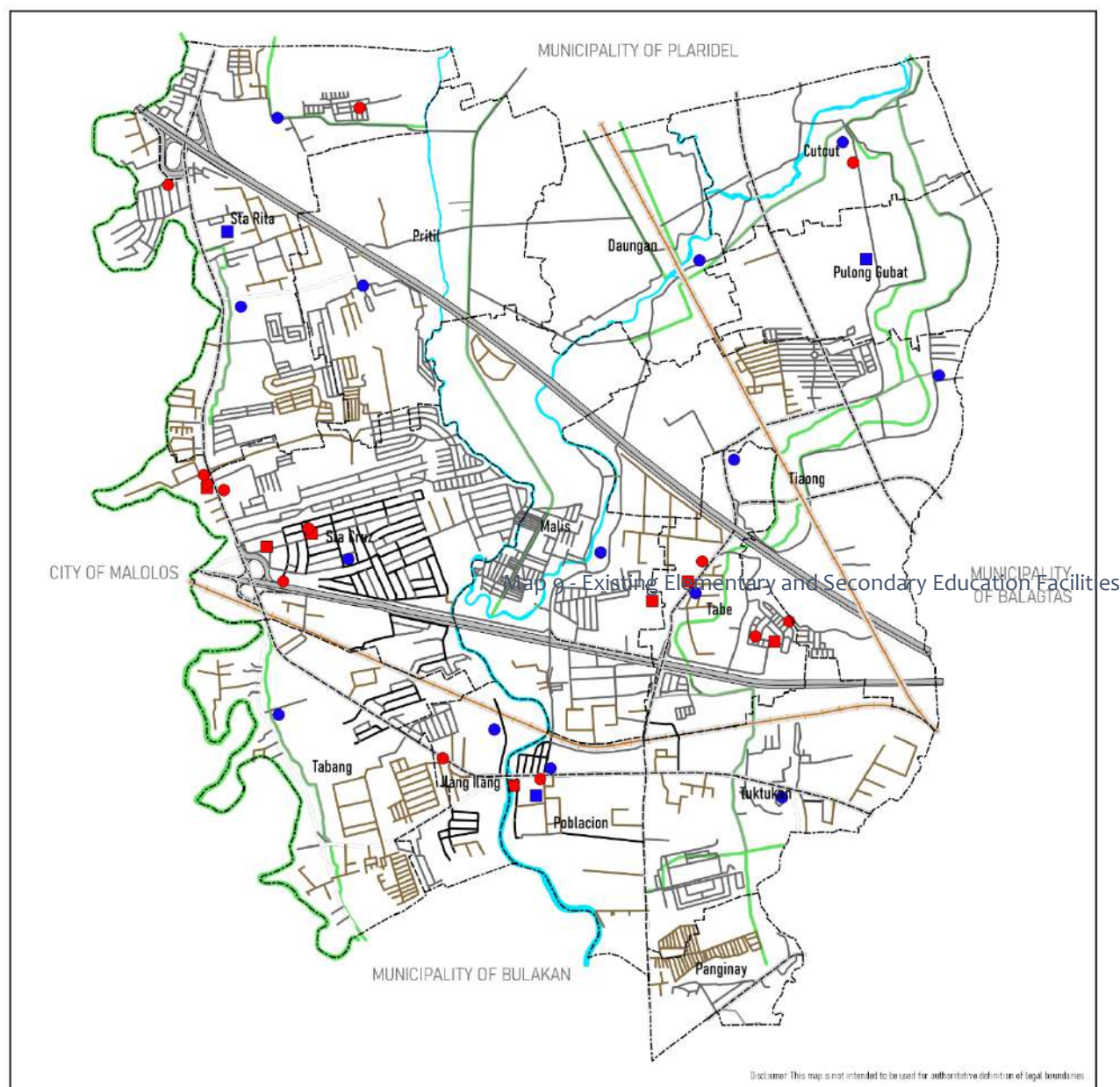
Most of the public school buildings in Municipality of Guiguinto are made of concrete and can be used as an additional Evacuation Center during the unexpected disaster but still some of the classrooms and facilities requiring major repair and rehabilitation.

Regarding the adequacy of school classrooms and teachers based on the standard ratio of the Department of Education (DepEd) of 1:35 student-teacher and student-classroom ratio in elementary, while 1:40 student-teacher and student-classroom ratio for secondary level, Table below show that private schools have complied with the standard, On the other hand, both elementary and secondary public schools have complied with the standard student-teacher ratio but still, there is a classroom shortage for elementary level.



SECTORAL STUDIES

EXISTING ELEMENTARY & SECONDARY EDUCATION FACILITIES MAP



LEGEND

- Municipal Boundary
- Barangay Boundary
- ===== North Luzon Expressway
- National Road
- Provincial Road
- Municipal Road
- Barangay Road
- NIA Road
- Private Road
- Railroad Right of Way
- ===== River Network/Creeks
- ===== Irrigation Canal

BASIC EDUCATION FACILITIES

- Public Elementary Schools
- Private Elementary Schools
- Public Secondary Schools
- Private Secondary Schools



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Municipal Government of Guiginto

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Table 17 - Student-Teacher and Student-Classroom Ratio by Level (SY 2018-2019)

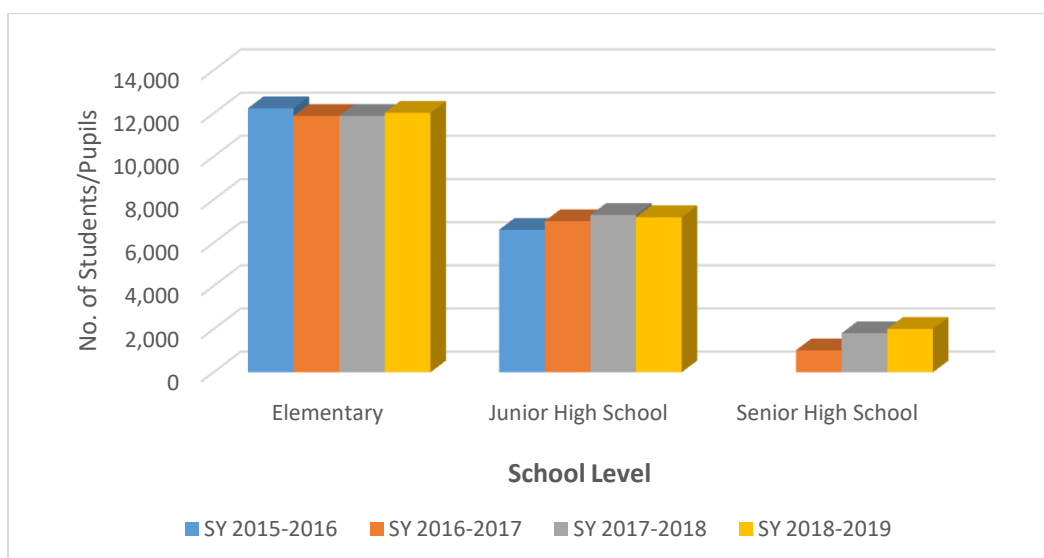
TYPE/ LEVEL	NUMBER OF ENROLEES			TOTAL NUMBER OF TEACHERS	TOTAL NUMBER OF CLASSROOMS	STUDENT-TEACHER RATIO	STUDENT-CLASSROOM RATIO
	MALE	FEMALE	TOTAL				
Private							
Pre-Elementary			2480	146	130	1:17	1:19
Elementary							
Secondary			685	65	45	1:10	1:15
Public							
Pre-Elementary	984	879	12,031	343	240	1:35	1:50
Elementary	5,216	4952					
Secondary							
Junior High School	3,625	3,547	7,172	365	180	1:20	1:40
Senior High School	1,034	973	2007	79	53	1:25	1:37

Conversely, the historical records on enrolment in public schools by level as shown in Table below that the enrolment in public elementary fluctuates for the past three school years while the enrollees in public junior and senior high school increase every school year except for the junior high school in the school year 2018-2019. The change in the enrolment by school year at the elementary level may be ascribed to the presence of different private schools as an option of the families in sending their children to school.

Table 18 - Historical Enrolment in Public Schools by Level for the Last Four School Years

LEVEL	SY 2015-2016	SY 2016-2017	STATUS	SY 2017-2018	STATUS	SY 2018-2019	STATUS
Elementary	12,234	11,884	(2.86)	11,881	(0.02)	12,031	1.26
Junior High School	6,601	7,002	6.07	7,288	4.08	7,186	(1.40)
Senior High School		1,021 (first year of implementation)		1,813	77.57	2,007	10.70

Figure 5 – Historical Enrolment in Public Schools by Level for the Last Four School Years



Meanwhile, the table below shows the average drop-out rate of the 14 elementary schools in the Municipality was registered at 0.77 percent for the SY 2016-2017 and 1.22 percent for the SY 2017-2018. There is an increase of 0.58 percent equivalent to 54 drop-outs of the 11,883 average number of enrollees for the SY 2016-2018. It can be noticed that there are more male student dropped-outs than females.

Table 19 - Drop-out Rate in Public Elementary Schools (SY 2017-2018)

SCHOOL	GENDER	SY 2016-2017			SY 2017-2018		
		AVERAGE DROPOUT RATE	TOTAL DROPOUTS	TOTAL ENROLMENT	AVERAGE DROPOUT RATE	TOTAL DROPOUTS	TOTAL ENROLMENT
Cut-cut Elementary School	Male	0.00	0	209	3.25	7	215
	Female	0.00	0	171	1.67	3	180
	SUB TOTAL	0.00	0	380	2.53	10	395
Daungan Elementary School	Male	0.00	0	120	0.00	0	118
	Female	0.00	0	103	0.00	0	96
	SUB TOTAL	0.00	0	223	0.00	0	214
Doña Escolastica Aldaba Punongbayan Elementary School	Male	1.74	4	230	0.46	1	218
	Female	1.55	3	193	0.49	1	204
	SUB TOTAL	1.65	7	423	0.47	2	422
Guiguinto Central School	Male	0.34	3	872	0.32	3	932
	Female	0.25	2	807	0.00	0	827
	SUB TOTAL	0.30	5	1,679	0.17	3	1,759
Dra. Ruperta G. Caluang Elementary School	Male	0.00	0	331	4.01	13	324
	Female	0.00	0	292	2.22	6	270
	SUB TOTAL	0.00	0	623	3.18	19	594
Malis Elementary School	Male	2.14	23	1,077			1058
	Female	1.89	20	1,059			1041
	SUB TOTAL	2.01	43	2,136	2.86	60	2,099
Pritil Elementary School	Male	0.70	2	285	0.00	4	290
	Female	0.00	0	245	0.00	4	242
	SUB TOTAL	0.38	2	530	1.50	8	532

SCHOOL	GENDER	SY 2016-2017			SY 2017-2018		
		AVERAGE DROPOUT RATE	TOTAL DROPOUTS	TOTAL ENROLMENT	AVERAGE DROPOUT RATE	TOTAL DROPOUTS	TOTAL ENROLMENT
Pulong Gubat Elementary School	Male	2.02	2	99	0.00	0	91
	Female	0.00	0	98	0.00	0	88
	SUB TOTAL	1.02	2	197	0.00	0	179
Sta. Cruz Elementary School	Male	0.00	0	468	0.66	3	449
	Female	0.00	0	427	0.22	1	438
	SUB TOTAL	0.00	0	895	0.45	4	887
Sta. Rita Elementary School	Male	1.74	12	691	1.50	11	733
	Female	0.97	7	723	0.70	5	712
	SUB TOTAL	1.34	19	1,414	1.11	16	1,445
Tabang Elementary School	Male	2.22	9	406	0.99	4	405
	Female	0.82	3	365	0.83	3	363
	SUB TOTAL	1.56	12	771	0.91	7	768
Tabe Elementary School	Male	0.00	0	286	0.00	0	264
	Female	0.35	1	283	0.00	0	281
	SUB TOTAL	0.18	1	569	0.00	0	545
Tiaong Elementary School	Male	0.00	0	418	0.00	0	428
	Female	0.23	1	437	0.00	0	427
	SUB TOTAL	0.12	1	855	0.00	0	855
Tuktukan Elementary School	Male	0.00	0	632	1.88	12	637
	Female	0.00	0	557	0.91	5	550
	SUB TOTAL	0.00	0	1,189	1.43	17	1,187
TOTAL		0.77	92	11,884	1.22	146	11,881

Among the public junior high schools, the Guiguinto National Vocational High School had the most number of dropouts registered last SY 2017-2018 with 128 students. The average drop-out rate in the said school year was recorded at 3.22 percent.

Table 20 - Drop-out Rate in Public Junior High Schools (SY 2017-2018)

SCHOOL	SY 2017-2018	
	AVERAGE DROPOUT RATE	TOTAL DROPOUTS
Felizardo C. Lipana Memorial High School	5.67	94
Guiguinto National Vocational High School	3.22	128
Tiaong National High School	8.57	57
Guiguinto National Vocational High School (<i>Annex</i>)	0.00	0
TOTAL	4.36	279

On the other hand, the new curriculum for senior high school was implemented last school year 2015-2016, the average drop-out for three (3) senior high school for SY 2017-2018 was

registered at 0.77 percent as presented in the next Table. Guiguinto National Vocational High School had the highest dropouts with 17 senior high school students.

Table 21 - Drop-out Rate in Public Senior High Schools (SY 2017-2018)

SCHOOL	SY 2017-2018	
	AVERAGE DROPOUT RATE	TOTAL DROPOUTS
Felizardo C. Lipana Memorial High School	0.34	1
Guiguinto National Vocational High School	1.23	17
Tiaong National High School	0.76	1
TOTAL	0.77	19

The level of service to the education sector is assessed by the adequacy of school facilities and manpower providing the service. It is evident that as the population increases, the demand for additional classrooms and teachers increases. It should be noted, however, that the participation rate and the dropout rate in schools is an indication of the poverty situation of the community and other factors affecting the sustained school attendance of the student. Thus, this concern should be monitored in order for the government to provide possible intervention to ensure remarkable indicators not only in the level of service to the education sector but also in the participation of the citizens to basic education.

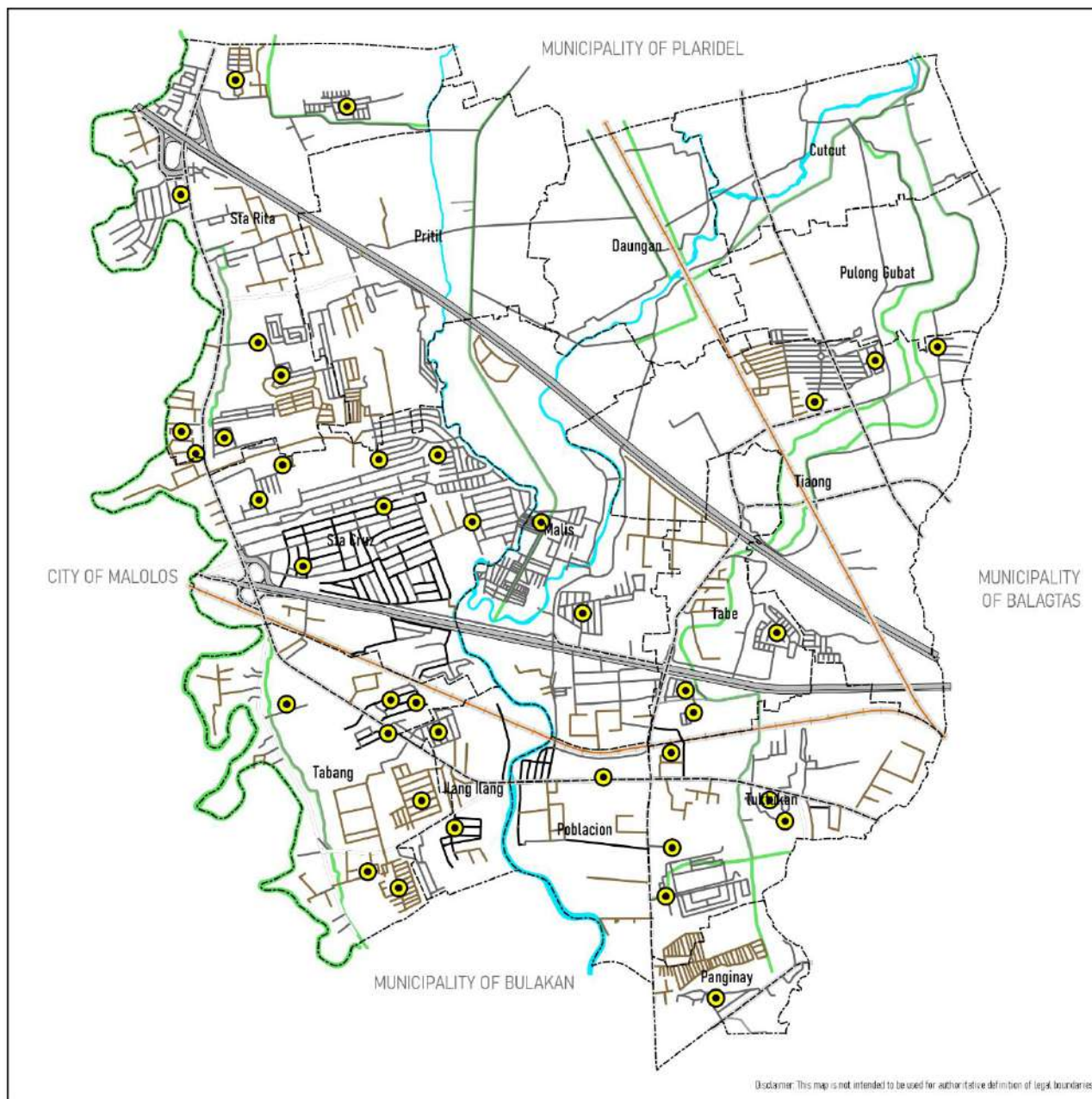
2.4. Housing

The housing facilities are being provided by several subdivisions situated in Guiguinto. As of 2018, there are around thirty-eight (38) subdivisions in the town with more than 8,800 occupied lots or units.

Table 22 - Residential Subdivision (2018)

SUBDIVISION	BARANGAY	AREA (HAS.)	NUMBER OF OCCUPIED LOTS
1. Estrella Village	Ilang-Ilang	6.84	98
2. La Aldea		13.50	411
3. St. Lorraine Subdivision		12.17	130
4. North Bel Air	Malis	10.00	83
5. Northville 7 Subdivision		11.00	1,703
6. Cefel's Park Subdivision	Panginay	2.97	58
7. Verde Residences	Poblacion	2.87	38
8. Felville Subdivision		8.49	200
9. Goldridge Subdivision Phase I, II, & III		33.47	210
10. Harcelville Subdivision		1.10	120

SUBDIVISION	BARANGAY	AREA (HAS.)	NUMBER OF OCCUPIED LOTS
11. Maunlad Homes Subdivision II		5.29	41
12. Rosaryville Subdivision Phase I & II		37.20	423
13. Sanderland	Sta. Cruz	0.95	20
14. Tierra Dayao Subdivision		1.99	48
15. Violeta Village I & II		32.36	533
16. Citta Di Oro	Sta. Rita	1.68	61
17. Doña Pilar Homes Phase		5.07	37
18. Masagana Homes Subdivision		11.96	287
19. Maunlad Homes Subdivision		3.92	114
20. Sta. Clara Estates		19.96	492
21. Sta. Rita Village I & II		4.43	183
22. Rocka Village Annex		3.24	55
23. Rocka Village III		6.03	405
24. Goldenville Subdivision	Tabang	2.13	117
25. Masagana Homes Phase I		1.48	102
26. Ylang-Ylang Homes Subdivision Phase I		0.54	75
27. Ylang-Ylang Homes Subdivision Phase II		5.16	514
28. Bliss Project I & II	Tabe	2.22	240
29. G.Y. Enriquez Subdivision (Sta. Rita Village)		3.32	202
30. Rocka Village		2.89	103
31. Villa Roma		0.64	94
32. Green Estates Subdivision	Tiaong	22.30	255
33. Green Estates North		4.23	213
34. Remar Ville		0.74	34
35. Brooklyn Heights	Tuktukan	9.95	1,137
36. Mira Verde		13.03	46
37. Peakaboo Townhouses		0.31	22
38. Oro Villas		1.45	30
TOTAL		303.61	8,879



SECTORAL STUDIES
EXISTING SUBDIVISION MAP



SCALE 1:35,000

Prepared by:

Municipal Planning and Development Office
Municipal Government of Guiginto

March 2020

However, there are still informal settlers in the town. As of 2018, all the 14 barangays in the Municipality reported with informal settlers of around 1,102 families. Most of the informal settlers were living along the riverside, streets, irrigation road of the National Irrigation Authority (NIA), and in some private lands. Barangays Malis, Tiaong, and Tabe have the most number of informal settlers recorded at 280, 198, 108, respectively.

Table 23 - Informal Settlement Areas (2018)

LOCATION OF INFORMAL SETTLER	BARANGAY	NUMBER OF FAMILIES
Aguinaldo St.	Cut-cut	1
Aquino St.		9
Balagtas St.		1
Bonifacio St.		5
Del Pilar		5
Quezon St.		5
Rizal St.		18
SUB-TOTAL		44
Purok 1	Daungan	12
Purok 2		1
Purok 3		4
Purok 4		4
Purok 5		22
Bicol		11
SUB-TOTAL		54
Zone I	Ilang-Ilang	10
Zone II		35
Zone III		5
Zone V		20
Zone VI		1
Zone VIII		19
SUB-TOTAL		90
Northville 7	Malis	97
Hulo		12
Look		56
Tuklas		19
Maganda St.		2
Purok 4		11
San Jose		12
Tabing Ilog		1
Bicol Region		4
Purok 2		1
Purok 4		12
Sitio Malis		1
Tabon		14
Trese		27
Bungad		1
No Street		10
SUB-TOTAL		280
Lopez St.	Panginay	6
NIA Road		2

LOCATION OF INFORMAL SETTLER	BARANGAY	NUMBER OF FAMILIES
Pingol		1
SUB-TOTAL		9
Mañalac St.	Poblacion	17
Sitio Cabay		28
Pingol St.		1
SUB-TOTAL		46
Ibayo	Pritil	4
No Street		13
SUB-TOTAL		17
Purok 1	Pulong Gubat	2
Purok 3		5
SUB-TOTAL		7
Masagana	Sta. Cruz	12
Maunlad		63
San Isidro		8
Maligaya		3
Rosaryville		2
Mc Arthur Highway		3
San Lucas		1
SUB-TOTAL		92
Kabilang Bacood	Sta. Rita	16
Hangga		1
Riverside		4
Mariwasa St.		4
Lawlawan St.		2
Maunlad		3
El Canto		2
El Canto II		1
Recoleta II		6
Doña Pilar		2
Sta. Rita Village		1
Sitio Lazo		1
Cagayan Valley Road		3
Masagana		1
Hilario Compound		1
SUB-TOTAL		48
Tabang 1st	Tabang	3
Purok 4		10
Purok 5		1
Purok 7		3
La Aldea		1
Mc Arthur Highway		2
SUB-TOTAL		20
A. Jose St.	Tabe	1
Gonzales St.		8
JB St.		21
NIA Road		15
Purok 2		18

LOCATION OF INFORMAL SETTLER	BARANGAY	NUMBER OF FAMILIES
Purok 3		12
Purok 5		13
Purok 6		3
RIS Compound		1
C. Mercado St.		2
Mercado St.		8
Sta. Rita Village		2
Bliss		1
Lopez St.		1
No Street		2
SUB-TOTAL		108
Labas	Tiaong	44
Bakood		9
Ugong		71
Loob		10
Lawa		45
Bicol Region		6
Fantasy		5
Libis		1
No Street		7
SUB-TOTAL		198
San Agustin	Tuktukan	4
San Juan		52
San Lucas		10
San Pedro		7
Tiwala		2
C. Mercado		3
No Street		11
SUB-TOTAL		89
GRAND TOTAL		1,102

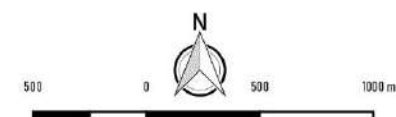
Source: CBMS 2015 & Manila Bay Database



SECTORAL STUDIES
LOCATION OF INFORMAL SETTLERS

LEGEND

- Municipal Boundary
- Barangay Boundary
- ===== North Luzon Expressway
- National Road
- Provincial Road
- Municipal Road
- Barangay Road
- NIA Road
- Private Road
- Railroad Right of Way
- Blue River Network/Creeks
- Green Irrigation Canal
- Green Circle Informal Settlers

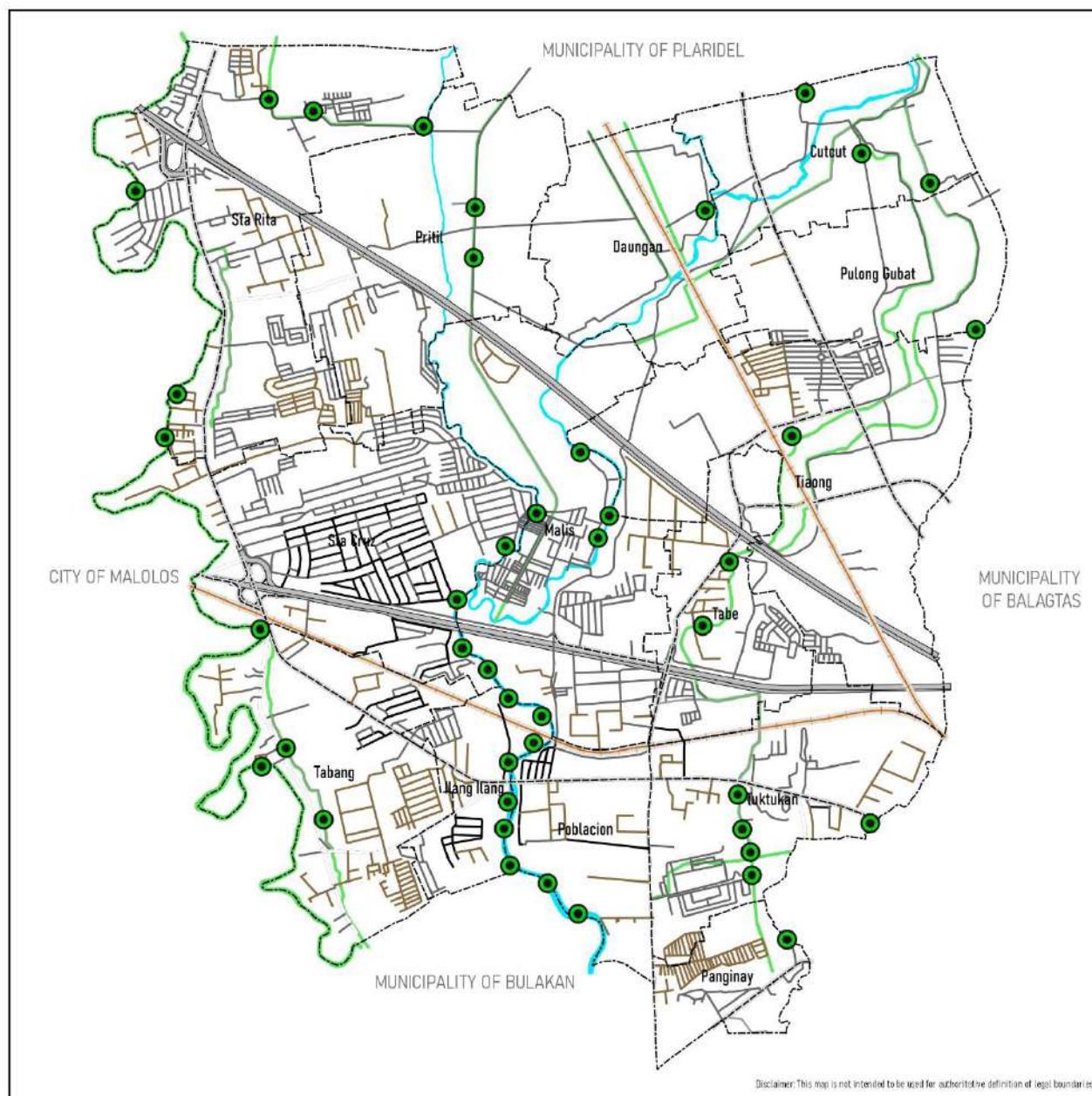


SCALE 1:35,000

Prepared by:

Municipal Planning and Development Office
Municipal Government of Guiguinto

March 2020



Despite the presence of a number of housing subdivisions and housing units in Guiguinto, the significant number of informal settlers recorded is a challenge to the municipal government in its mandate of providing the general welfare of the people.

2.5. Social Welfare Services

The level of service in social welfare sector of the municipal government may seem sufficient in the latest inventory of the facilities and services for the delivery social services to its constituents. As of 2018, Day Care Centers are present in every barangay and 11 barangay has a Senior Citizen Centers. The Municipality also built a new Senior Citizen Office to cater all SC from other barangay who still do not have an existing facility. The provision of social services such as Day Care Services, Supplemental Feeding, Medical Services, Burial, Financial Assistance, Counselling, and referrals are made possible in the said facilities. All the facilities are in good physical condition and have necessary staff for the operation and management of services.

Table 24 - Social Welfare Facilities, Service, and Clientele (2018)

BARANGAY	FACILITIES	PHYSICAL CONDITION	SERVICES	TYPE OF CLIENTELE	NUMBER OF CLIENTELE	STAFF COMPLIMENT
1. Cut-cut	Day Care Center	Good	Day Care Services, Supplemental Feeding	3-4 years old	57	2
	Senior Citizen Center		Medical, Burial, and Financial	60 years old & above	368	5
2. Daungan	Day Care Center	Good	Day Care Services, Supplemental Feeding	3-4 years old	53	2
	Senior Citizen Center		Medical, Burial, and Financial	60 years old & above	171	5
3. Ilang-Ilang	Day Care Center	Good	Day Care Services, Supplemental Feeding	3-4 years old	110	2
	Senior Citizen Center	Good	Medical, Burial, and Financial	60 years old & above	503	5
4. Malis Northville 7	Day Care Center I	Good	Day Care Services, Supplemental Feeding	3-4 years old	140	2
	Senior Citizen Center		Medical, Burial, and Financial	60 years old & above	1037	5
	Day Care Center II		Day Care Services, Supplemental Feeding	3-4 years old	140	2
5. Panginay	Day Care Center	Good	Day Care Services, Supplemental Feeding	3-4 years old	52	2
	Senior Citizen Center		Medical, Burial, and Financial	60 years old & above	115	5
6. Poblacion	Day Care Center I	Good	Day Care Services, Supplemental Feeding	3-4 years old	111	2
	Day Care Center II				67	1
7. Pritil	Day Care Center	Good	Day Care Services, Supplemental Feeding	3-4 years old	110	2
	Senior Citizen Center		Medical, Burial, and Financial	60 years old & above	236	5
8. Pulong Gubat	Day Care Center	Good	Day Care Services, Supplemental Feeding	3-4 years old	54	1
	Senior Citizen Center		Medical, Burial, and Financial	60 years old & above	144	5
9. Sta. Cruz	Day Care Center I	Good	Day Care Services, Supplemental Feeding	3-4 years old	65	2

BARANGAY	FACILITIES	PHYSICAL CONDITION	SERVICES	TYPE OF CLIENTELE	NUMBER OF CLIENTELE	STAFF COMPLIMENT
	Day Care Center II				61	2
	Senior Citizen Center		Medical, Burial, and Financial	60 years old & above	1470	5
Maligaya	Day Care Center III		Day Care Services, Supplemental Feeding	3-4 years old	55	2
Maunlad	Day Care Center IV				56	2
10. Sta. Rita	Day Care Center I	Good	Day Care Services, Supplemental Feeding	3-4 years old	113	2
	Senior Citizen Center		Medical, Burial, and Financial	60 years old & above	1508	5
Kabilang Bakood	Day Care Center II		Day Care Services, Supplemental Feeding	3-4 years old	82	2
11. Tabang	Day Care Center	Good	Day Care Services, Supplemental Feeding	3-4 years old	103	2
12. Tabe	Day Care Center	Good	Day Care Services, Supplemental Feeding	3-4 years old	65	2
Rocka Village	Day Care Center				54	2
13. Tiaong	Day Care Center I	Good	Day Care Services, Supplemental Feeding	3-4 years old	122	2
	Senior Citizen Center		Medical, Burial, and Financial		715	5
Tiaong Lawa	Day Care Center II		Day Care Services, Supplemental Feeding		52	1
14. Tuktukan	Day Care Center I	Good	Day Care Services, Supplemental Feeding	3-4 years old	76	2
	Day Care Center II				50	2
	Senior Citizen Center		Medical, Burial, and Financial	60 years old & above	767	7
Cruz	Day Care Center III		Day Care Services, Supplemental Feeding	3-4 years old	92	2
All Barangays			Counselling, Referrals, Medical, Burial, Financial, Balik Probinsya	PWD, FHONA (Family Heads & Other Needy Adult) Disadvantage, Neglect, Abandon		11 (MSWD O Staff)

Source: City/Municipal Social Welfare and Development

The provision of social welfare and development services is guided with the overall framework of promoting and protecting the social well-being and best interest of the people in the locality. The presence of Day Care Centers and Senior Citizens Centers in the municipality of Guiguinto is compliant with the related laws on social welfare services for the total development and protection of children and senior citizens mandated in the RA 6972, RA 7876, and RA 8980.

2.6. Peace and Order

The capability of the municipal government in promoting peace and order in the locality is measured by the availability and sufficiency of personnel and equipment/facilities in providing

protective services down to barangay level. Below are the indicators on the condition of peace and order situation in Guiguinto.

2.6.1. Police Protective Services

The Municipal Government has one (1) Main Police Station, one (1) Compact Police Station, one (1) Fire Protection Unit, and Peace Keeping Barangay Patrol/Tanod in every barangay. The minimum standard ratio of police officer to population is 1:1,000 and 1:2,000 for fire officer. As of 2018, the police officer and fire officer to population ratio are 1:2,571 and 1: 6,588, respectively. This shows that more police officer and fire officer are needed to ensure provision of protective services.

Table 25 - Protective Services by Facilities and Equipment (2018)

TYPE OF SERVICES	NUMBER OF PERSONNEL	PERSONNEL TO POPULATION RATIO (2018 POPULATION)	FACILITIES/EQUIPMENT	
			VEHICLE	OTHERS
Guiguinto Municipal Police Station	41 PNP (2 PCO AND 39 PNCO)	1:2,571	6 (3 Patrol vehicles and 3 motorcycles)	11 Long Firearms, 44 Short Firearms, 1 Telephone, 5 Handled Radio, 2 Base Radio
Fire Protection	13 Fire officer	1:6,588	2 (1 local truck) (1 under repair)	Fire Helmet, Fire Boots, Fire Coat, Fire Trousers, Fire Gloves, Fire Hose (1 and half, 2 and half), and Fire Nozzle
Barangay Peace Keeping Patrol/Tanod	366 Barangay Tanod	1:238	42 Patrol Vehicles	

Source: Source: SEP Online – Guiguinto Dataset and DILG Guiguinto

2.6.2. Crime Statistics

Crime statistics on the other hand, shows that there were 73 index crimes and 398 non-index crimes reported in 2018 with an average monthly crime rate of 38.04. Presented also in the following *Table is that* crime solution efficiency rate in 2018 was 81.95 which is considered above par.

Table 26 - Crime Statistics (2018)

ITEM	DESCRIPTION/VALUE
Number of Index Crimes	<i>Included in this category are the following crimes: crimes such as murder, physical injury, robbery, theft and rape. -73</i>
Number of Non-Index Crimes	<i>Crimes against persons (parricide/infanticide, maltreatment, kidnapping); crimes against property (estafa and falsification, malicious mischief and damage to property); crimes against morals and order (prostitution, vagrancy, alarm and scandal, assault/resistance to authority, corruption of public official, gambling, slander and libel, threat and coercion and trespassing), crimes against chastity (abduction, seduction, lascivious acts) and other crimes (illegal possession of firearms, explosives and ammunition, concealment of deadly weapons, smuggling, carnapping and prohibited drugs). - 398</i>
Number of Solved Cases	386
Number of Unsolved Cases	85
Crime Solution Efficiency Rate	81.95
Average Monthly Crime Rate (per 100,000 Population)	38.04

Note: Based on Unit Crime Periodic Report (UCPER System) Source: PNP Guiguinto

Promoting peace and order in the area is significant in boosting the socio-economic activities in the locality. The reported high crime solution efficiency may be an indication of a great level of protective services of the municipal government.

It should be noted further, that the number of crimes are limited to the incidents reported to the precincts. Thus, another challenge to the municipal government is to increase the level of confidence of the people in authorities to make reporting crimes to the police will be done on reflex.

Table 27 - Children in Conflict with the Law, 2018

BARANGAY	NUMBER OF CASES
1. Malis	5
2. Poblacion	2
3. Sta. Cruz	2
4. Sta. Rita	5
5. Tabe	2
6. Tuktukan	1
TOTAL	17

Moreover, the number of children in conflict with law is also a challenge for the municipal government for it is generally known that the youth is the hope of the future. Out of the fourteen (14) barangays of the municipality, six (6) barangays have recorded children in conflict with the law. In 2018, there were about seventeen cases registered and need social assistance from the government.

2.7. Sports and Recreation

The municipal government's level of service in providing social development and recreational facilities is shown in the following Table.

Table 28 - Existing Recreational Facilities (2018)

BARANGAY	LOCATION	RECREATION FACILITIES	OWNERSHIP
1. Sta. Cruz	Violeta Village	Municipal Ecopark, Playgrounds, Parks	Municipal Government
2. Poblacion	Municipal Building	Municipal Library, Museums	

However, based on the upcoming plans, the municipal government decided to turn the Municipal Ecopark in Violeta Village into an "Animal Shelter" and "Bahay Pagbabago" the said facility will help all drug-dependent to rehabilitate themselves and have a second chance to live a decent life.

On the other hand, sports and recreational facilities are also available in every barangay in the town. As of 2018, there are 45 sports facilities for basketball, badminton, volleyball, tennis games or simply for other outdoor play across barangays. The 12 facilities are owned by the barangay government and 33 facilities are owned by a private group.

Table 29 - Existing Sports and Recreational Facilities, by Barangay (2018)

BARANGAY	SPORTS FACILITIES	AREA (SQ.M.)	LOCATION	OWNERSHIP
1. Cut-cut	Basketball, Volleyball, etc. (Covered Court/Whole Court)	420	Rizal St.	Government
	Basketball Court (Half Court)	210	Purok I	Private
			Balagtas St.	
			Del Pilar St.	
	Playground	150	Rizal St.	
2. Daungan	Basketball Court (Whole Court)	420	along PNR road	Government
3. Ilang-Ilang	Basketball, Volleyball, etc. (Covered Court/Whole Court)	420	Ilang-Ilang	Government
	Basketball Court (Whole Court)		Pag-Asa Subdivision	Private
	Badminton Court	106		
4. Malis	Basketball Court (Whole Court)	420	Northville	Private
	Basketball Court (Half Court)	210	North Bel Air	
			Trese	
			Tabon	
			Purok II	
			Tuklas	
5. Panginay	Basketball Court (Whole Court)	420	Cefel St.	Government
	Basketball Court (Half Court)	210	Ibayo	Private
	Playground	150		
6. Poblacion	Basketball Court (Whole Court)	420	Mañalac St.	Government
7. Pritil	Basketball Court (Whole Court)	420	Angeles Village	Private
8. Pulong Gubat	Basketball Court (Whole Court)	420	Purok I	Government
	Basketball, Volleyball, etc. (Whole Court)		Purok II	
			Purok I (Highschool)	
			Purok I (Elementary)	
9. Sta. Cruz	Basketball Court (Whole Court/Covered Court)	420	Violeta	Government
	Basketball Court (Whole Court)		Rosaryville	Private
	Basketball Court (Half Court)	210	Maligaya	
	Basketball Court (Whole Court)	420	Tierra Dayao	
			Goldridge	
10. Sta. Rita	Basketball Court (Whole Court)	420	Rocka Ville III	Private
			Masagana	Government
			Sitio Laso	
			Maunlad	
	Basketball Court	210	Hangga	Private

BARANGAY	SPORTS FACILITIES	AREA (SQ.M.)	LOCATION	OWNERSHIP
	(Half Court)	106	Sta. Rita Village	
	Volleyball, Badminton Court		Rocka Ville III	
11. Tabang	Basketball Court (Half Court)	210	Purok I	Private
			Purok II	
			Purok V	
			Purok VII	
	Basketball Court (Whole Court)	420	Purok VI	
	Basketball, Volleyball, etc. (Whole Court)		Purok IV	
12. Tabe	Basketball Court (Half Court)	210	Sta. Rita Village	Private
			Sitio Bacood	
			Lambac	
			J. Lopez St.	
			Villavicencio St.	
	Basketball, Volleyball, etc. (Whole Court)	420	Rocka	Government
	Basketball, Volleyball, etc. (Covered Court/Whole Court)		Bliss	
	Basketball Court (Whole Court/Covered Court)		Bernabe St.	Private
	Basketball Court (Whole Court)		Tabe Rd.	
13. Tiaong	Basketball Court (Whole Court)	420	Tiaong Loob	Government
			Ugong	
	Basketball Court (Half Court)	210	Centro	Private
			Bacood	
	Tennis Court	551	Green Estates	
14. Tuktukan	Basketball Court (Whole Court)	420	Tiaong Loob	Private
			Tiaong	
			C. Mercado St.	Government
			Cruz	
			Pag-Asa St.	
			San Antonio St.	Private
			San Lorenzo St.	
			Pag-Asa St.	
	Basketball Court (Half Court)	210	C. Mercado St.	Government
	Tennis Court	551	C. Mercado St./Mira Verde	Private

Source: 2018 Socio Economic Profile

To provide quality sports and engaging recreational facilities in the locality especially for the youth, the monitoring and improvement of existing facilities should always do from time to time. In doing this, the participation of the community in sport and recreation programs will increase.

2.8. Development Needs

Based on the presented statistics on the situation of the social sector in the municipality, the following are the identified development concerns that should be taken into consideration:

- ❖ Infectious disease as the leading cause of morbidity
- ❖ Increasing cases of lifestyle related illnesses as leading cause of mortality
- ❖ HHs without access to potable water and sanitary facilities
- ❖ Lack of Sanitary Inspectors in the Municipality
- ❖ High volume of waste collections every year
- ❖ Additional Material Recovery Facilities (MRF) in other barangays
- ❖ Presence of Informal Settlers in every barangay
- ❖ Lack of Housing Project units to support the needs of informal settlers
- ❖ Classroom Backlog in public elementary schools
- ❖ High drop-out rate in Junior High School
- ❖ Poor accessibility of private and public burial grounds
- ❖ Congested public cemeteries
- ❖ Inadequate number of policemen and firemen for protective services
- ❖ Increasing number of children in conflict with the law

To address the above cited development needs, the goal, objectives, and strategies will be as follows:

Goal: Improve access to quality basic social services

OBJECTIVES	STRATEGIES
1. Increase to 85% the proportion of households with access to safe drinking water	<ul style="list-style-type: none"> • Conduct HHs profiling • Improve local water system • Strengthen health monitoring system • Formulate preventive measures to reduce non-communicable diseases • Strengthen <i>National Health Insurance Program (NHIP)</i> • Strengthen health information system, including research • Strengthen the Universal Health Care approach • Focus on marginalized groups or at risk of malnutrition in the delivery of social services
2. Increase to 85% the proportion of households with access to sanitary toilet facilities	
3. Reduce by 85% the incidence of non-communicable diseases	
4. Reduce by 90% the incidence of infectious diseases	
5. Reduce by 90% the number of malnourished children under five years old	
6. Ensure that, by 2023, children in Guiguinto, boys and girls alike, will have access to education and will be able to complete a full course of basic education and other special programs	<ul style="list-style-type: none"> • Address classroom backlog • Establish strong partnership with various stakeholders • Support to basic education • Strengthen ALS
7. Achieve housing needs by 2023	<ul style="list-style-type: none"> • Expansion of identified housing site • Establish strong partnership with various stakeholders
8. Address the human capital shortage for protective services.	<ul style="list-style-type: none"> • Enhance recruitment to increase resources for protective services • Strengthen force multipliers • Formulate programs for peace and order

OBJECTIVES	STRATEGIES
9. Reduce by 90% number of children in conflict with the law	<ul style="list-style-type: none">• Formulate program for children in conflict with the law• Legislative support for social services

Chapter III - Economic Sector

Local economy is generally divided into three sectors with inter-related functions, namely primary, secondary, and tertiary sectors. The primary sector is made up of agriculture, fishery, livestock, and forestry. The secondary sector is composed of mining and quarrying, manufacturing, construction, and energy generation and/or distribution. The tertiary sector consists of all service activities like trade and commerce, real estate, personal and community services, and transportation and communications.

Guiguinto has a very strong economy based on tertiary sector activities like commerce, real estate and personal and community services. The municipality is fast becoming as an industrial hub for light, medium, and heavy industries, due mainly to its central position in the province of Bulacan as well as its relative proximity to Metro Manila.

On the other hand, the primary sector is still present given the agricultural and livestock productions. Due to the efforts of the present local government to develop the thriving ornamental plants business in the municipality, horticulture has been included as an important part of the primary sector. However, much of the activities related to the secondary sector are absent in Guiguinto such as mining, quarrying, and energy generation.

3.1. Primary Sector

The following table shows the basic agricultural profile of the Municipality of Guiguinto as of 2018.

Table 30 – Agricultural Demographics, 2018

Primary source of Agri-livelihood:	Paddy-agriculture, Agri-livestock
Number of Farmers – Rice and other crops:	413
Number of Livestock & Poultry raisers:	394
Number of Fisher folks:	13
Major Sources of Income:	IRA, Local Taxes and Fees
Annual Income:	PhP470 Million (Source: Municipal Treasury Office)
Poverty Incidence:	5.66% (Source: PSA, 2015 Municipal and City Level Poverty Estimates)
Rice Production (IRRIGATED):	
Total Production:	1,695.01 MT
Area Harvested:	387.87 Has.

Source: Municipal Agriculture Office

3.1.1. Agricultural Crops

Rice remains as the primary crop planted in the Municipality of Guiguinto. As of 2018, almost all agricultural areas are planted with rice. About 41 of the 413 farmers are also engaged to other crops farming. However, no specific crops are planted throughout the year as it varies on the season and seedlings given by Agricultural Office. In addition, these crops are minimal and merely for household consumption.

Table 31 –Major agricultural crops grown by Municipality, 2018

Major Crop	Area (ha)			Volume of Production (MT)			Number of engaged Farmers
	2017	2018	% Increase/ Decrease	2017	2018	% Increase/ Decrease	
Rice	415.08	387.87	-0.07	1,811.99	1,695.01	-0.07	413
Other crops	-	-	-	-	-	-	41

Source: Municipal Agriculture Office

The Municipality of Guiguinto produced a yield of one thousand six hundred ninety five and 1/100 (1,695.01) metric tons of rice for the year 2018. About three hundred eighty-seven and eighty-seven (387.87) hectares are devoted to rice production. It is equivalent to 17.42 percent of crop production area to municipal land area. *2,221.43 has. as municipal land area These are located in barangay Cutcut, Daungan, Pritil, Pulonggubat and Tiaong.

In order to yield high rice production, the Municipality continuously provides high yielding varieties of rice farmers. Agricultural Technologies of the Municipality are supervising and monitoring the different activities in the field in order to ensure good harvest.

Although there are agricultural support facilities that support production such as irrigation system, out of 1,152.4 has. irrigable area, merely 26 percent equivalent to 298.93 has. are irrigated. Aside from the decreasing rice production area and harvests, the Municipality lacks post-harvest facilities such as multi-purpose drying pavements, rice mills and warehouses.

A reduction of twenty seven and twenty one (27.21) hectares equivalent to seven percent decrease in agricultural crop areas was recorded from 2017 to 2018. This is due to the conversion of formerly irrigated rice lands in barangay Tiaong, Pulonggubat, Daungan, and Cutcut to allow investments in commercial developments such as residential subdivision, industrial warehouse, and commercial establishments.

The effect of this change on agricultural crop areas is minimal considering that Guiguinto is not a major producer in terms of agricultural production. On the other hand, the increased investments in commercial development activities is expected to create non-farm employment opportunities and boost local government receipts from taxes and fees.



On the other hand, various regular activities being done by the Municipality for the year 2017 to 2018 are the following:

- ❖ Distribution of Certified Seeds and full subsidy on Hybrid Seeds for 119 farmers during dry season
- ❖ Conducted specialized training on Pests Management for Farmers and Agricultural Extension Worker (AEW)
- ❖ Conducted orientation on Soil Mapping in Guiginto agricultural areas to identify soil fertility and soil suitability on various commodities
- ❖ Provision of Php500.00 subsidy for each bag of Certified Seeds given to farmers
- ❖ Distribution of 315 zinc phosphate to farmers with zinc deficient rice fields
- ❖ Distribution of 1490 organic fertilizers to 149 farmers
- ❖ Conducted Farmers Field School (Palay Check) with 25 farmers at Barangay Daungan
- ❖ Distribution of three water pumps from Regional Field Office III to Barangay Sta. Rita, Malis, and Tiaong.
- ❖ Distribution of 200 packs of zinc phosphide for crop protection program (rat infestation)

3.1.2. Vegetable Program

- ❖ Distribution of assorted vegetable seeds to different organizations, farmers, schools, and walk-in clients
- ❖ Distribution of knapsack sprayer to Guiginto Vegetable Growers Federation
- ❖ Distribution vegetable seed to all elementary schools

3.1.3. Organic Agriculture Program

- ❖ Seminars and trainings on organic agriculture and urban gardening to promote gardening and planting despite the continuous urbanization
- ❖ Orientation and hands-on seminar on organic fertilizer
- ❖ Support establishment of organic agriculture cooperative in Barangay Cutcut

3.1.4. Livestock Program

Swine production takes most of the livestock inventory in the Municipality of Guiguinto. As of December 2018, all commercial livestock producers are hog raisers while most of the backyard livestock producers are in poultry industry.

Table 32 – Major Poultry and Livestock Raised, 2018

Type of Poultry & Livestock	Inventory (head) as of December 2018			Volume of Production (MT meat)	Number of Raisers/ Ranchers	
	Backyard	Medium Commercial	Total		Backyard	Medium Commercial
Carabao	2	0	2	n/a	1	0
Cattle	55	0	55	n/a	14	0
Hogs	1,091	20,276	21,367	n/a	149	3
Goat	316	0	316	n/a	48	0
Poultry	11,417	0	11,417	n/a	307	0

Source: Municipal Agriculture Office

Table 33 – Major Poultry and Livestock raised by Product Classification, 2018

Type	Barangay	No. of heads	Product Classification	Product Market	No. of Tenants
Livestock					
Carabao	Malis	2	Backyard	Local	1
Cattle	Daungan	10	Backyard	Local	5
	Malis	7	Backyard	Local	1
	Panginay	14	Backyard	Local	1
	Sta. Rita	7	Backyard	Local	3
	Tabang	8	Backyard	Local	2
	Tiaong	9	Backyard	Local	2
Hog	Cutcut	10,169	31 Backyard, 1 Medium commercial	Local	32
	Daungan	10,107	14 Backyard, 1 Medium commercial	Local	15
	Ilang-Ilang	61	Backyard	Local	9
	Malis	158	Backyard	Local	32
	Panginay	40	Backyard	Local	5

Type	Barangay	No. of heads	Product Classification	Product Market	No. of Tenants
Goat	Pritil	38	Backyard	Local	2
	Sta. Cruz	23	Backyard	Local	5
	Sta. Rita	105	Backyard	Local	16
	Tabang	173	Backyard	Local	5
	Taba	261	Backyard	Local	4
	Tiaong	66	Backyard	Local	14
	Tuktukan	166	12 Backyard, 1 Medium commercial	Local	13
	Cutcut	21	Backyard	Local	5
	Daungan	2	Backyard	Local	1
	Ilang-Ilang	39	Backyard	Local	5
	Malis	23	Backyard	Local	4
	Panginay	21	Backyard	Local	1
	Sta. Cruz	26	Backyard	Local	5
	Sta. Rita	96	Backyard	Local	14
	Tabang	49	Backyard	Local	8
	Taba	4	Backyard	Local	1
	Tuktukan	35	Backyard	Local	4
Poultry					
Chicken	Cutcut	2,765	Backyard	Local	22
	Daungan	3,337	Backyard	Local	33
	Ilang-Ilang	506	Backyard	Local	24
	Malis	783	Backyard	Local	102
	Panginay	263	Backyard	Local	8
	Pritil	56	Backyard	Local	2
	Sta. Cruz	225	Backyard	Local	35
	Sta. Rita	125	Backyard	Local	14
	Tabang	603	Backyard	Local	32
	Taba	419	Backyard	Local	13
	Tiaong	146	Backyard	Local	6
	Tuktukan	2,189	Backyard	Local	16

Source: Municipal Agriculture Office

Table above shows the number of active livestock and poultry in Guiguinto. For the year 2018, Municipal Agricultural Office reported a total inventory of 21,740 heads for livestock composed of carabaos, cattles, hogs and goats while 11,417 heads for poultry composed of chickens, turkeys, geese and ducks.

Livestock and poultry production is one of the



livelihoods in the Municipality that provides alternative source of income. However, it continues to be a backyard activity basically for household consumption. The Municipality has no large scale commercial livestock production.

Meanwhile, in Barangay Pritil, which is known as the center of hogs trading in the Municipality, only two backyard hog raisers with 38 hogs are recorded in 2018. Most of the traders are hog dealers or in buy and sell basis.

Although Guiguinto was the last Municipality in Bulacan confirmed by the Department of Agriculture to have been affected by the African Swine Fever (ASF) virus, this buy and sell transaction in Barangay Pritil was also seen as one of the problems during outbreak. Hogs that were transported might be the ones that have been spreading the virus to other areas. Yet, ASF outbreak was effectively managed by the Municipality of Guiguinto.



Affected hogs were culled in exchange of piglets and cash aid for affected hog raisers and dealers.

On the other hand, the Municipality provided veterinary drug and medicines for the treatment of livestock and poultry diseases while for the prevention of rabies, foot and mouth disease (*FMD*) in the Municipality, rabies and FMD vaccine are given.

- ❖ Distribution of 20 bottles of assorted antibiotic drugs and 500ml deworming in livestock raisers
- ❖ Provision of veterinary treatment and services for walk-in clients
- ❖ Distribution of hog cholera vaccines to backyard raisers
- ❖ Distribution of 2,500 New Castle Disease (NCD) vaccines to backyard poultry raisers

3.1.5. Cooperatives

Table below shows the registered cooperatives in the Municipality based on the R.A. 9520 or the Data Coordinator Development Authorities (DCDA) for the year 2018.

Table 34 – Enabling Mechanisms – Registered Cooperatives, 2018

NO.	NAME OF COOPERATIVE	LOCATION
1.	Sugod Multi-Purpose Cooperative	Sta. Rita
2.	Blue Moon Multi-Purpose Cooperative	Tiaong
3.	AMARPRO Producers Multi-Purpose Cooperative	Tuktukan
4.	Bulacan Transport Service Cooperative	Tuktukan

NO.	NAME OF COOPERATIVE	LOCATION
5.	869 Multi-Purpose Cooperative	Sta. Rita
6.	Travel Expert Multi-Purpose Cooperative	Sta. Rita
7.	North Luzon Tollways Employees Multi-Purpose Cooperative	Sta. Rita
8.	Ligas Kooperatiba ng Bayan sa Pagpapaunlad	Sta. Rita
9.	Guiguinto Employees Multi-Purpose Cooperative	Malis
10.	St. Martin of Tours Credit & Development Cooperative	Malis
11.	Garden City Multi-Purpose Cooperative	Malis
12.	Balikatan sa Tiaong	Tabang
13.	Guiguinto Farmers Multi-Purpose Cooperative	Tiaong
14.	GNVHS Teachers and Employees Multi-Purpose Cooperative	Poblacion
15.	Gintong Kusina Producer Cooperative	Sta. Cruz
16.	ABC Cooperative	Sta. Cruz
17.	Immaculate of Heart Multi-Purpose Cooperative	Malis

Source: Municipal Agriculture Office

- ❖ Conducted seminar workshop on cooperative development for Guiguinto Tricycle Drivers Association
- ❖ Conducted seminars regarding Fundamentals of Cooperatives Seminar, Governance and Management of Cooperative Seminar, and Internal Control Seminar by Municipal Cooperative Development Council sponsored by Department of Agriculture
- ❖ Conducted regular MCDC monthly meeting

Table 35 – Enabling Mechanisms – Rural and Commercial Banks

	TYPE OF BANK / NAME OF BANK	LOCATION
	Rural Banks	
1.	Rizal Bank, Inc.	Violeta Village, Sta. Cruz
2.	Rural Bank of Plaridel	Mac Arthur Hiway, Sta. Rita
3.	Sta. Maria Rural Bank	Mac Arthur Hiway, Tuktukan
	Commercial Banks	
4.	Asia United Bank	Mac Arthur Hiway, Ilang-Ilang
5.	Banco De Oro	Cagayan Valley Rd., Sta. Rita
6.	Banco De Oro	Waltermart, Ilang-Ilang
7.	Bank of the Philippine Islands	Cagayan Valley Rd., Sta. Cruz
8.	China Bank	Mac Arthur Hiway, Sta. Rita
9.	PNB Savings Bank	Mac Arthur Hiway, Sta. Rita
10.	Metropolitan Bank and Trust Corporation	Puregold Compound, Cagayan Valley Rd., Sta. Cruz
11.	Producers Saving Bank, Inc.	Rocka Bldg., Poblacion

TYPE OF BANK / NAME OF BANK		LOCATION
	Other Financing institutions (e.g. Money Remittance Center, Pawnshop, Lending Investor, Credit Union, Money Changer/ Foreign Exchange, Insurance, etc.)	
1.	7R Finance Corp.	Mac Arthur Hiway, Sta. Rita
2.	AT Alliance & Holdings Company, Inc.	KM 35 Mac Arthur Hiway, Tabang
3.	Atadero Pawnshop	Cagayan Valley Rd., Sta. Cruz
4.	Baba Charan Das Lending & Trading Corporation	Violeta Village, Sta. Cruz
5.	Baba Kahan Dass Jl 108 Lending Corporation	Masagana Homes, Tabang
6.	Carbon-J Payment & Remittance Center	Masuso St., Sta. Cruz
7.	Cebuana Lhuillier Pawnshop (Sta. Rita)	Cagayan Valley Rd., Sta. Rita
8.	Core Pacific Money Exchange	Waltermart, Ilang-Ilang
9.	Country Bankers Insurance Corp.	Cagayan Valley Rd., Sta. Cruz
10.	Everyday Lending Corporation	GD Plaza, Ilang-Ilang
11.	Farmers Savings & Loan Bank Inc.	Cagayan Valley Rd., Sta. Cruz
12.	First Inner Trade Credit Corporation	Mac Arthur Hiway, Tabang
13.	FJK Bayad Center	Tiaong
14.	Frewill Finance Corporation	Cagayan Valley Rd., Sta. Rita
15.	Fundline Finance Corp.	Cagayan Valley Rd., Sta. Rita
16.	Fundline Finance Corp.	Golden Green Bldg., Tabang
17.	Gabay Alay Credit Inc.	Cagayan Valley Rd., Sta. Rita
18.	Goldstar Lending Investor Inc.	Cagayan Valley Rd., Sta. Rita
19.	JCM Insurance Services	Mac Arthur Hiway, Tabang
20.	Kasapi-Kaagapay Sa Pangkabuhayan Lending Inc.	Mac Arthur Hiway, Sta. Cruz
21.	M. Lhuillier Pawnshop & Jewelry	Poblacion, Sta. Rita, Sta. Cruz
22.	Maunlad Pawnshop	Mercado St., Poblacion,
23.	Metrogold Star Pawnshop Inc.	Cagayan Valley Rd., Sta. Rita
24.	Microventures Phils. Financing Company Inc.	Mac Arthur Hiway, Sta. Cruz
25.	Milador Pawnshop	Cagayan Valley Rd., Sta. Cruz
26.	ML Kwarto Padala	Sta. Rita, Poblacion
27.	Motchi Marketing Business	Cagayan Valley Rd., Sta. Rita
28.	Pacific Union Insurance Company	Golden Green Bldg., Tabang
29.	Peacock Direct Loans, Inc.	Goldenville Subd., Tabang
30.	QCredit Corp.	Cagayan Valley Rd., Sta. Rita
31.	Sinag Pawnshop	C. Mercado St., Tuktukan
32.	Stronghold Insurance Company, Inc.	Mac Arthur Hiway, Tabang
33.	Villarica Pawnshop	Sta. Rita and Poblacion

Source: Municipal Agriculture Office

3.1.6. Fisheries

Being a landlocked municipality, fisheries in Guiguinto are not widespread and do not merit as much importance as agriculture and livestock farming among farmers, compared to other towns like Hagonoy and Bulacan - where two of their major produce include tilapia and milkfish. In fact, there are no sufficient data available on aquaculture in the Municipality, albeit the presence of 7,950 square meters fishing waters and backyard fishponds in barangay Daungan, Pritil, Sta. Rita, Tabang, Tabe, and Tuktukan is noted, productions from these are considered minimal and are not considered for commercial consumption. However, efforts from the Municipality of Guiguinto are evident through the programs for fisheries such as technology training on aquaculture production and dispersal of tilapia fingerlings and other materials for fishing.

Table 36 – Fisheries Production, 2018

Fishing Grounds	Barangay	Production			Post Harvest Facilities			Product Market
		Volume	Value	Type	No.	Capacity (sq. m)	Status	
Inland	Daungan			Tilapia	2	600	Operational	Local
	Pritil			Tilapia	1	250	Operational	Local
	Sta. Rita			Tilapia	2	1,300	Operational	Local
	Tabang			Tilapia	1	200	Operational	Local
	Tabe			Tilapia	4	2,200	Operational	Local
	Tuktukan			Tilapia	3	3,400	Operational	Local

3.1.7. Horticulture

For more than twenty years, Tabang-Sta. Cruz Cloverleaf, a 1.42 hectare commercial area owned by the Municipal Government of Guiguinto have been a popular destination for garden enthusiasts, landscapers, and horticulturists for their ornamental plants market. It is considered as a reception area of the Municipality due to its location connecting the North Luzon Expressway and two other national highways making it a strategic area to promote the booming horticulture industry in Guiguinto.



It houses display and propagation areas of gardeners, most of which are members of the prominent garden cooperative in Guiguinto – the Garden City Multipurpose Cooperative (GCMC). And for more than twenty years, members of the GCMC have been occupying the area free of charge in support of the Municipal Government in the sustained development and promotion of Guiguinto being the Garden Capital of the Philippines.

About 41.23 percent of DTI-Registered horticulture related business in Bulacan and 13.26 percent in Luzon are from Guiguinto. They are also observed to be the major producer of ornamental plants not only in Bulacan but also in the neighboring provinces such as Laguna, Batangas, Cavite, and even in National Capital Region. Some of which also cater landscaping needs of largest corporations and hotels in Visayas and Mindanao.

3.2. Tertiary Sector

The impetus for economic activities in Guiguinto mainly involves wholesale & retail trade and personal & community services with the financial help of existing banks and non-bank institutions in the locality. This is where *Small and Medium-sized Enterprises (SMEs)* come in of which is recognized as the key sector for generating employment opportunities and growth in any local economy. Presence of adequate modes of transportation, telecommunication connections will likewise boost the tourism of the area.

3.2.1. Public Employment Service Office (PESO)

The Public Employment Service Office facilitates the delivery of employment service and information regarding Department of Labor and Employment programs. In 2018, the office recorded the number of job vacancies for local employment with a total of seven thousand seven hundred forty four (7,744). While the total job applicants registered for local employment is three thousand six hundred twenty nine (3,629) wherein two thousand seven hundred ten (2,710) are hired to private companies such as Flavor Foods, Waltermart, Puregold, fast food chains, and others warehouses.

3.2.1.1. Skills Training

The establishment of Municipal Skills Training Center as part of the livelihood and employment program has been realized in 2018. It will serve as specialized training facility with heavy equipment since one of the most in demand jobs in the labor market is equipment operator. The said facility will also house other skills training programs such as virtual assistant, web development, and social media marketing.

3.2.1.2. Sustainable Livelihood

In 2018, more than 500 are provided with entrepreneurial skills and 3,000 are given livelihood trainings and seminar. Livelihood Starter Kits amounting to PhP750,000.00 and Pangkabuhayan Starter Kits amounting to PhP130,000.00 are received by 85 Guiguinteños and 13 OFWs, respectively.

Assistance to Small and Medium-sized Enterprises (SMEs) through additional capital was provided to 2,582 beneficiaries. A total of PHP2,955,000.00 was provided as additional capital since the program started in 2015.

3.2.1.3. Tulong Pangkabuhayan para sa Ating Disadvantaged Workers and Workers Hiring Infrastructure Project

In order to provide employment for non-skilled workers, Tulong Pangkabuhayan para sa Ating Disadvantaged Workers (TUPAD) and Workers Hiring Infrastructure Project (WHIP) are conducted. The PESO recorded 257 TUPAD beneficiaries and 89 WHIP beneficiaries in 2018.

3.2.1.4. Pre-Employment Seminars

About 2,349 future job seekers whether applying for local or overseas employment are assisted and benefited from various seminars such as Pre-Employment Orientation Seminar, Labor Education for Graduating Seminars, and Anti-Illegal Recruitment/Trafficking-In-Person.

3.2.1.5. Career Guidance

Given the increasing number of students and mismatch between educational qualification and industry needs, the provision of Career Guidance Orientation Seminar to graduating senior high school students was seen beneficial. In 2018, about 34 sessions with 2,775 attendees are conducted to Public High Schools in Guiguinto to address the above-mentioned issue. Students are guided in choosing educational track in Senior High School and course in College.

3.2.1.6. Special Program for the Employment of Students

In compliance to Republic Act No. 9547, 113 students are hired during academic vacation through Special Program for the Employment of Students (SPES). The program aims to provide additional funds to support education expenses of students and prepare them in the world of employment.

3.2.2. Business Establishments

For the year 2018, the Business Permit and Licensing Office (BPLO) are able to register a total of 2,425 of businesses, 593 of which are new businesses and 1,832 are renewal businesses. This resulted to generation of additional 3,413 job opportunities. Table below shows the number of business according to its type.

Table 37 - Number of Establishment per Owner Type, 2018

TYPE	NEW	RENEWAL	TOTAL
Single	474	1,283	1,757
Partnership	12	20	32
Corporation	103	497	600
Cooperative	3	21	24
Foundation	1	11	12
TOTAL	593	1,832	2,425

Source: BPLS

Table below shows the total amount collected based from business permit fees and tax from different business establishments.

Table 38 - Amount of Collection for the year 2018

FEES	AMOUNT
Business Tax	PhP 145,424,353.96
Business Tax Interest	PhP 1,070,517.42
Mayor's Permit	PhP 2,069,972.00
Regulatory Fees	PhP 9,925,835.09
BENRO	PhP 331,290.00
TOTAL	PhP 158,821,968.47

Source: BPLS

3.2.3. Tourism

Every 23rd day of January, Guiginto foundation is celebrated through Halamanan Festival which became the brand of the Municipality of Guiginto. It was established in the year 1999 by Mayor Ambrosio C. Cruz, Jr. It demonstrate talents and potentials that promote the realization of the vision of the Municipality of Guiginto which is to be the Garden Capital of the Philippines.

Grand Street Dancing participated by various dancers from barangays of Guiginto wearing festival costume that represents the flourishing horticulture industry in Guiginto. The festival also signifies the capabilities and "Galing ng Guiguinteño" in various fields of horticulture such as landscaping, plant propagation, plant seedling and nursery, flower cutting, arranging, interior decorating, dish gardening and bonsai artistry.

Table 39 – Tourist Arrival, 2019

MONTH	Resort	Hotel/Apartelle	Halaman Festival	Bakeshop, café, and other food establishments
January	3,952	1,804	30,000	2,787
February	4,693	1,804	-	5,245
March	6,887	1,804	-	5,613
April	6,596	1,804	-	60
May	7,186	1,804	-	60
June	2,153	1,804	-	496
July	950	1,804	-	190
August	1,254	1,804	-	3,177
September	1,633	1,804	-	300
October	3,456	1,804	-	850
November	3,510	1,804	-	200
December	3,670	1,804	-	150
TOTAL	45,940	21,648	30,000	19,128

3.3. Development Needs

The economic sector of the Municipality of Guiguinto requires attention on the following:

- ❖ Decreasing agricultural land for rice cultivation
- ❖ Decreasing rice production area and harvests
- ❖ Lack of post-harvest facilities
- ❖ High cost of agricultural inputs, low/limited subsidy
- ❖ Lack of inter-agency cooperation for irrigation system
- ❖ No properly maintained irrigation
- ❖ Lack of reporting system on other crops production
- ❖ Under declaration of gross profit/income and other information regarding business establishments
- ❖ Absence of Central Commercial District
- ❖ Unregistered and Unregulated Businesses
- ❖ Lack of data regarding labor force
- ❖ Various livelihood programs are implemented but no impact assessment is conducted
- ❖ Only 10 percent of the total trade and commerce industries are agriculture related
- ❖ Minimal proportion and income from native/ agricultural product manufacturing and trading
- ❖ Lack of data establishing/supporting that Guiguinto is the Garden Capital of the Philippines
- ❖ Insignificant proportion of garden industry of Guiguinto with the rest of the Philippines
- ❖ Some gardeners do not file business registration
- ❖ Untapped Tourism Industry
- ❖ Lack of general system/strategies in data gathering
- ❖ Inconsistencies in data gathering that results to *non-comparable* historical data

Goal: Sustainable agricultural production to the remaining productive area of Guiguinto

OBJECTIVES	STRATEGIES
<ol style="list-style-type: none"> 1. Increase proportion and income from native/ agricultural product manufacturing and trading 2. Increase productivity of palay and other crops 3. Ensure livestock disease prevention and control 	<ul style="list-style-type: none"> • Provision of support facilities (production and post-harvest) • Address issues on irrigation system • Provide trainings on organic agriculture and urban gardening to adjust in continuous urbanization • Introduce and support agriculture technology in modern farming • Formulate strong preventive measures to reduce effect of livestock diseases • Strengthen reporting system in rice and crops production • Establish general system on data gathering • Establish strong partnership with other agencies/stakeholders • Supervision and strengthening of local agricultural associations/cooperatives

Goal: Sustain economic growth of local industries
Increase income and employment

OBJECTIVES	STRATEGIES
<ol style="list-style-type: none"> 1. Decrease underemployment and unemployment rate 2. Ensure availability of non-farm jobs 3. Increase in number of registered business 4. Increase in number of MSMEs and their gross receipts 5. Increase in number of active cooperatives, membership, and capitalization 6. Improved recruitment and job placement services 7. Increase in labor force participation rate 	<ul style="list-style-type: none"> • Research new income generating opportunities within the local industry and capabilities of Guiguinto • Establishment of strong linkages between the academe and industry • Enhance recruitment to increase employment • Establishment of support facilities for informal business and MSMEs • Strict implementation of Municipal Ordinance No. 167 Series of 2013 requiring all establishments, industrial and other business enterprises to hire fifty percent (50%) of their labor force from bona fide residents of Guiguinto

Goal: Be Recognized as the Garden Capital of the Philippines

OBJECTIVES	STRATEGIES
<ol style="list-style-type: none"> 1. Increase in proportion of garden industry of Guiguinto with the rest of the Philippines 2. Promote Guiguinto as the Garden Capital 3. Increase in proportion of local industry and production devoted to gardening/landscaping 4. Increase in employment generated by garden industry 5. Increase in number of tourist arrival 6. Increase in number of establishments/small business benefitting from tourism activities 7. To allocate/utilize areas devoted to gardening/landscaping 	<ul style="list-style-type: none"> • Construction of Innovative Tissue Culture Laboratory (iLAB) for production of conventional ornamental plants and cutflowers; production of plants without seeds; production of plants from seeds or stems that may otherwise have low chance of growing; novel hybrids; genetically modified plants with improved traits; and production of plants in sterile conditions with greatly reduced chances of transmitting disease, pests and pathogens • Development of Tabang-Sta. Cruz Cloverleaf as the center of garden industry in Guiguinto • Promotion of livelihood potential of backyard gardening • Collaboration with other government agencies and stakeholders for an integrated garden industry related council – Guiguinto as the main stakeholder • Establishment of Municipal Building/Compound as a strong example of best practices in horticulture and environment preservation • Encourage and promote Urban Greening through the creation of network of green spaces throughout Guiguinto • Enact municipal ordinance to use idle agricultural land as ornamental plant production area • Promote Halamanan Festival

Strategies

- ❖ Develop and implement post disaster epidemic outbreak management and disease surveillance
- ❖ Regulate emissions from pollutant sources
- ❖ Formulate and enforce vehicle anti-idling ordinance

Chapter IV - Infrastructure Sector

Infrastructure is the basic physical and organizational structures needed for the operation of a community, or the services and facilities necessary for an economy to function. This connects the built-environment to the open space including production and protection areas. It typically refers to the technical structures such as roads, water supply, sewers, power grids, telecommunications, and so forth. It facilitates the production of goods and services; for example, roads enable the transport of raw materials to a factory, and also for the distribution of finished products to markets.

4.1. Transportation

4.1.1. Roads

In 2019, Guiguinto has a total road length of 215.45 kilometers. About 10 kilometers are toll roads of the North Luzon Expressway, 26.31 km. are national roads, 9.93 kilometers are provincial roads, 34.01 kilometers are municipal roads, 49.09 kilometers are barangay roads and about 85 kilometers are private and unspecified classification of roads as indicated in the next Table. The toll road facility is being maintained by Metro Pacific Tollways Corporation (MPTC) and has a road right-of-way of 60 meters on the average. The Municipality of Guiguinto also hosts three (3) toll plazas that links the town from the northern and southern part of Luzon these are Tabang Toll Plaza, Sta. Rita Toll Plaza, and Balagtas Toll Plaza. The national roads on the other hand include two major highways, namely: Manila North Road or the Mac Arthur Highway and the Old Cagayan Valley Road. Most of the roads are concrete and are in fair condition.

The on-going decongestion of Metro Manila has become one of the contributing factors in road development affecting neighboring provinces and towns. Because of the proposed International Airport located at the Municipality of Bulakan all adjacent barangay and access roads connecting to said airport must be widened. The Municipal Government of Guiguinto has already taken the initiative by constructing additional road connecting Poblacion to Tuktukan with total length of 1.08 kilometer and 10.00 meter wide with drainage line on both sides. The Municipal Government of Guiguinto has also been accessing various national government projects to ensure funding on the development, improvement, and rehabilitation of existing roads.

The Municipality also has (2) two proposed Bypass road Sta. Rita to Daungan (3.52 km.) and Cutcut to boundary of Pandi and Guiguinto (0.63 km.) both roads have a minimum width of 8.00 meters. This will help lessen traffic congestion at Sta. Rita Exit during rush/peak hours. These Bypass roads will also serve as additional access roads for transporting agricultural products.

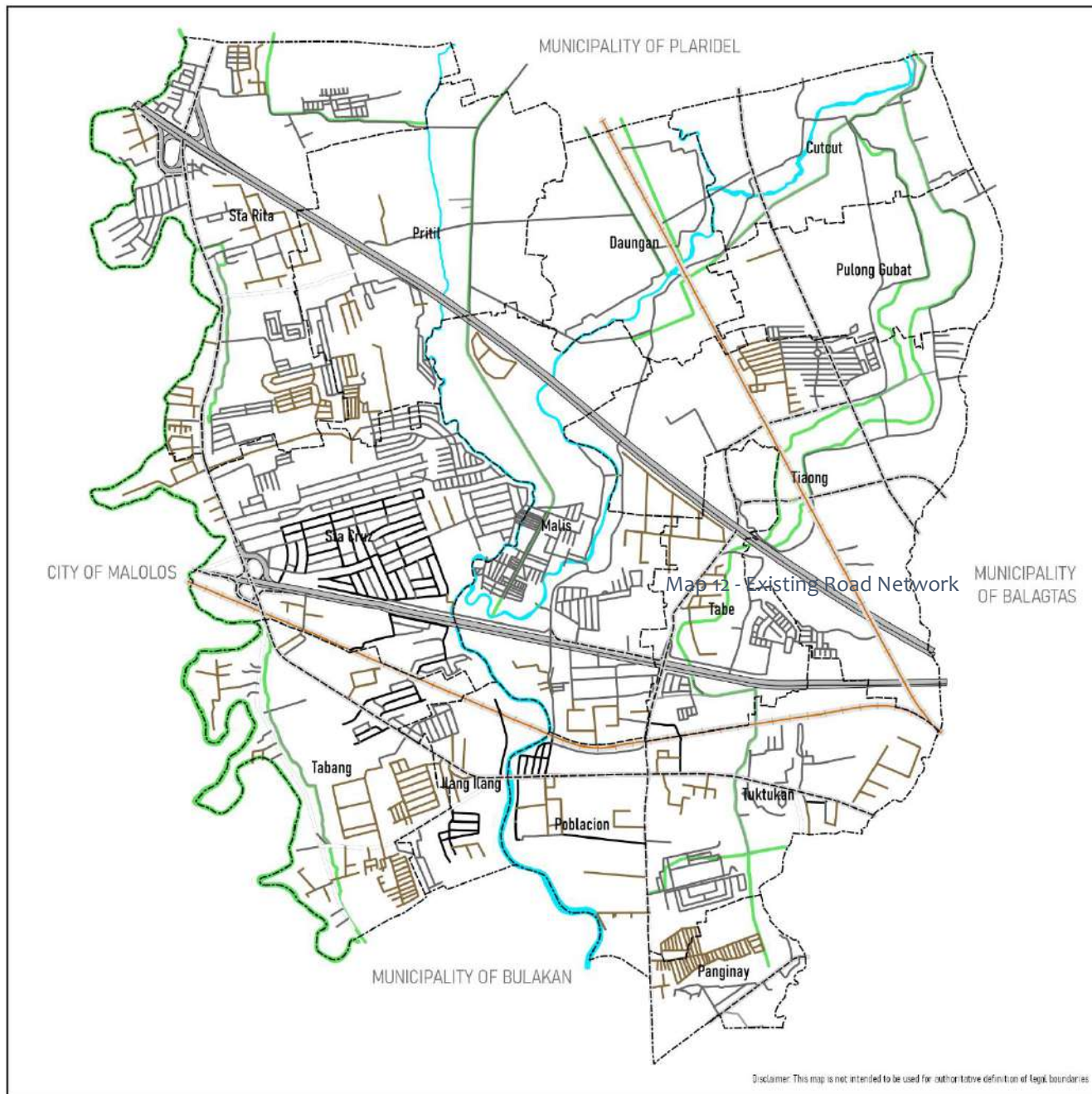
Table 40 - Inventory of Existing Roads (2019)

ROAD TYPE	LENGTH PER CATEGORY (KM.)				TOTAL LENGTH
	CONCRETE	ASPHALT	GRAVEL	EARTH	
Expressways/Toll Roads	10.00		--	--	10.00
National Roads	13.41	12.90	--	--	26.31
Provincial Roads	7.19	2.52	0.22	--	9.93
Municipal/City Roads	19.89	9.23	4.89	--	35.09
Back of Municipal Hall	1.08				
Barangay Roads	40.24	5.56	2.99	0.30	49.09
Private Industrial Roads	12.45	--	--	--	
Additional:					14.57
T12 Industrial	1.70				
Dakanay Industrial	0.42				
Private Subdivision Roads	51.55	8.00	10.00	--	69.55
Other/ Unspecified	0.912	--	--	--	0.912
TOTAL					215.45

Source: Municipal Engineering Office

Table 41 – Proposed Roads

PROPOSED ROAD	CONCRETE	ASPHALT	GRAVEL	EARTH	TOTAL LENGTH
BYPASS STA.RITA- DAUNGAN	3.52				3.52
BYPASS ROAD CUT-CUT – PANDI/ GUIGUINTO BOUNDARY	0.63				0.63
PROPOSED INDUSTRIAL ROADS	8.65				8.65
TOTAL					12.80



SECTORAL STUDIES
EXISTING ROAD NETWORK MAP

LEGEND

- Municipal Boundary
- Barangay Boundary
- ===== North Luzon Expressway
- National Road
- Provincial Road
- Municipal Road
- Barangay Road
- NIA Road
- Private Road
- Railroad Right of Way
- River Network/Creeks
- Irrigation Canal



SCALE 1:35,000

Prepared by:

Municipal Planning and Development Office
Municipal Government of Guiguinto

March 2020

It can also be noted in the inventory of roads of Guiguinto that private subdivision roads, with total length of about 69 km., measures the longest in terms of total road length. This is attributed to the presence of several private subdivisions thriving in Guiguinto that are attracted by its continuing increase in social and economic growth potentials. This is followed by barangay roads at 49.09 km., comprising 90% of the total length that are classified as all-weather road.

The current road requirement of Guiguinto for the projected population of 107,383 per NSO is about 257.72 km. Taking into consideration the standard density of 2.40 km. per 1,000 populations, there is an inadequacy in the total length of in Guiguinto, or about 42.27 km. of road is needed to commensurate its current population.

The proposed additional road with 8.65 km length linking major industrial compound will decrease the current backlog on road minimum requirements

However, the standard road requirements presented are just rough estimates to illustrate and describe the current condition of road density in Guiguinto compared to highly developed urban cities. Road requirements are still dependent foremost on the viability of a specific road project in an area in terms of economy, social, and physical aspects.

The road projected requirements for the succeeding year are as follow, computed by APGR.

Table 42 – Projected Road Length Requirements

YEAR	PROJECTED POPULATION	REQUIRED LENGTH OF ROAD (KM) as per std. density of 2.40 km/1000 population
2020	109,386	262.53
2021	111,427	267.41
2022	113,506	271.2
2023	115,623	277.44
2024	117,780	282.72
2025	119,977	287.76
2026	122,216	293.28
2027	124,496	298.80

4.1.2. Bridges

Guiguinto has a network of (20) bridges passing thru various waterways and river tributaries. Seventeen (17) of these bridges are made of concrete and three (3) are made of steel structures. All bridges are in good condition and passable at usual weather conditions.

Among all bridges, the two Bailey bridge located at Daungan and Tiaong need to be rehabilitated, and if possible be enhanced to improve the structural stability in order to accommodate heavier load vehicles.

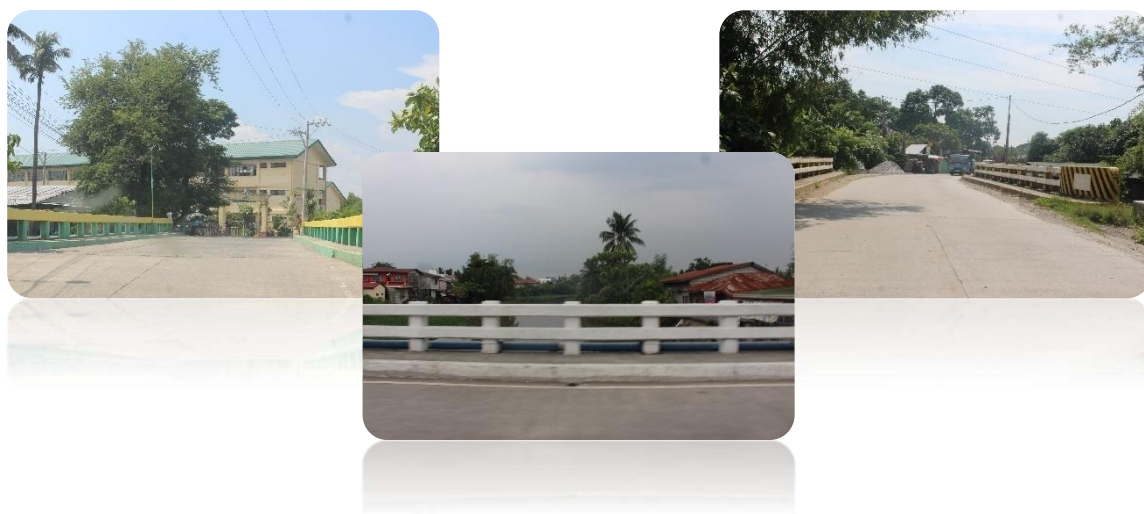
Additional bridge will be constructed at Malis and Ilang-ilang Boundary and will be used by Manila North Rail Commuter.

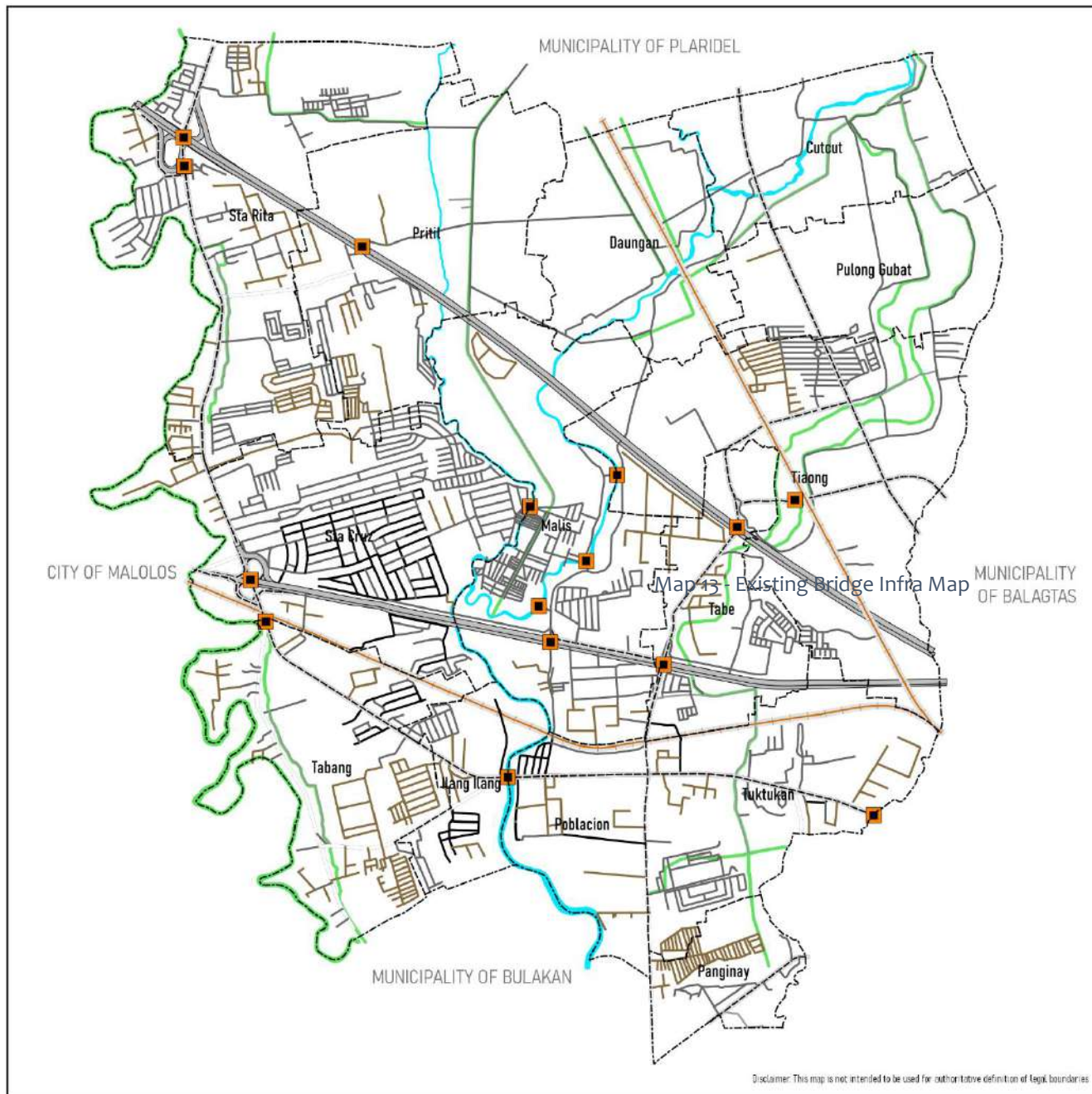
Table 43 - Inventory of Bridges (2019)

BRIDGE NAME	BARANGAY	LOAD CAPACITY (tons)	LENGTH (mts.)	WIDTH (mts.)	TYPE	PHYSICAL CONDITION
1.Guiguinto Bridge (Poblacion – San Ildefonso Church)	Poblacion	10-14 tons	75.00	16.20	Concrete	Fair
2.Tabang Overpass (Tabang- Across Northrail-PNR ROW)	Tabang	10-14 tons	25.50	11.10	Concrete	Fair
3.Tabang Overpass (Tabang –Sta. Cruz)	Sta. Cruz	10-14 tons	92.50	10.65	Concrete	Fair
4.Sta. Rita Overpass (near NLEX Sta. Rita Exit)	Sta. Rita	10-14 tons	75.20	13.60	Concrete	Fair
5.Sta. Cruz Bridge (south bound) (situated inside NLEX)	Sta. Cruz	10-14 tons	92.00	11.00	Concrete	Fair
6.Sta. Cruz Bridge (north bound) (situated inside NLEX)	Sta. Cruz	10-14 tons	92.00	11.00	Concrete	Fair
7.Tabe Overpass I (near RIS 1)	Tabe	10-14 tons	46.70	7.75	Concrete	Fair
8.Tabe- Tiaong Overpass II (near RIS 5)	Tiaong	10-14 tons	69.00	8.00	Concrete	Fair
9.Malis Overpass I (Tabon, Malis)	Malis	10-14 tons	56.00	2.60	Concrete	Fair
10.Malis Overpass II (Trece, Malis)	Malis	10-14 tons	62.90	3.00	Concrete	Fair
11.Malis Bridge (near Malis Brgy. Hall)	Malis		36.50	9.20	Concrete	Fair
12. Sitio Trece Bridge (Footbridge)	Malis		22.20	2.00	Concrete	Fair

BRIDGE NAME	BARANGAY	LOAD CAPACITY (tons)	LENGTH (mts.)	WIDTH (mts.)	TYPE	PHYSICAL CONDITION
13. Sitio Look Bridge (Footbridge)	Malis		18.00	2.40	Concrete	Fair
14. Tuklas Bridge (Steel)	Malis		10.50	2.50	Steel	Fair
15. Pritil Bridge	Pritil		17.50	3.20	Concrete	Fair
16. Pritil Overpass	Pritil		62.50	3.00	Concrete	Fair
17. Tulayin Tipanan (box culvert)	Sta. Rita		10.50	7.50	Concrete	Fair
18. Daungan Bridge (Bailey / Steel)	Daungan		37.00	3.70	Steel	Poor
19. Cut-Cot- Tiaong Bridge (Bailey / Steel)	Daungan		37.00	3.70	Steel	Poor
20. Poblacion Footbridge	Poblacion		25.50	2.75	Steel	Fair

Source: Municipal Engineering Office





Disclaimer: This map is not intended to be used for authoritative definition of legal boundaries



SECTORAL STUDIES
BRIDGE INFRASTRUCTURE MAP

LEGEND

- Municipal Boundary
- Barangay Boundary
- ===== North Luzon Expressway
- National Road
- Provincial Road
- Municipal Road
- Barangay Road
- NIA Road
- Private Road
- Railroad Right of Way
- Blue River Network/Creeks
- Green Irrigation Canal
- Orange Square Existing Bridges



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Municipal Planning and Development Office
Municipal Government of Guiguinto

March 2020

4.1.3. Ancillary Road Facilities

Ancillary road facilities are important tool to lessen both traffic and road accidents. Adequate road facilities must be provided for both pedestrians and motorists. The table below shows current inventory and status of ancillary road facilities like pedestrian crossing, traffic light and streetlights along National and Provincial Roads.

Table 44 – Existing and Future Demand for Traffic Lights

Classification	Road Name	Location of Traffic Lights	Remarks
Existing Traffic Lights			
National Road	McArthur Highway	-Cruz/ Golden Market Crossing	Poor/For repair
Proposed Additional Traffic Lights			
National Road	Cagayan Valley Road	In front of Puregold Sta. Cruz BPI	
		Sta-Rita – Pritil Junction	1 traffic light must be installed at Sta. Rita –Pritil Junction
	McArthur Highway	Tabang-Junction	Additional Traffic light at Tabang to control traffic flow during rush hour.
	Plaridel Bypass Road	Bypass to Tiaong BIR Crossing	1 traffic light must be install for safety of both vehicle and pedestrian crossing Tiaong going to Cutcut vice versa.
Provincial Road	Tabang Road	McArthur HW in front of Robles Roofing	Proposed Additional Traffic light
	Ilang-Ilang-Tabang Road		Light Traffic
	C. Mercado Cruz-Bulakan, Bulacan Road		Light Traffic
	C Mercado Cruz- Tiaong Bypass Road		Light Traffic
	C-5 Road Divimart		Light Traffic Proposed Additional Traffic light
	Balagtas Road Panginay Gto-		Light Traffic

Table below shows the assessment on the existing ancillary road facilities including pedestrian lanes and streetlights. Unfortunately, some of the major road are not yet totally equipped with the needed road ancillary facilities. This results to either frequent to traffic jams or worse, road accidents. Among the mentioned roads in the following table, McArthur Highway specifically portions of Tabang in front of Tesda and the whole stretch of Plaridel Bypass Road are considered accident prone areas due to lack of sufficient lighting.

To lessen and mitigate road related accidents, the Municipal Government aims to install streetlights throughout the entire stretch of McArthur Highway, Cagayan Valley Road and Plaridel Bypass Road.

The traffic monitoring group has identified the areas of Mc Arthur Highway in front of Golden Market, Tabang in front of Robles Roofing, Cagayan Valley Road in front of Puregold, Cagayan Valley Road in front of Sta. Rita Market, Cagayan Valley Road going to Ligas Malolos and Cagayan Valley Road Sta.Rita near Sta. Rita Exit NLEX as parts of national road with heavy traffic during rush hour from 6:30 am to 8:00 am and 4:00 pm to 7:00 pm.

Table 45 – Assessment of Existing Pedestrian Crossings and Streetlights

Road Classification	Road Name	Pedestrian Lane/ Crossing	Street Light	Overpass/ Footbridge	Sidewalk
National Road	Mac Arthur Highway	SUFFICIENT - additional pedestrian lane in front of Divimart	INADEQUATE - need additional streetlight on stretch of Ilang-Ilang to Tabang since road was accident prone area (BY DPWH)	INADEQUATE	INADEQUATE
	Cagayan Valley Road	SUFFICIENT	INADEQUATE - provide streetlight from Puregold Sta. Cruz to Sta.Rita Hangga (By DPWH)	Not needed since most of public and private school was located inside barangay	INADEQUATE
	Plaridel Bypass Road	I-DPWH must provide pedestrian sign on all cross road especially on Tiaong near BIR and Tiaong near Presam Industrial	INADEQUATE - Entire stretch of Bypass road from Cut-cot to Tiaong must be provided with streetlight		INADEQUATE
Provincial Road	Tabang Road	SUFFICIENT	INADEQUATE		
	Ilang-Ilang-Tabang Road	SUFFICIENT	SUFFICIENT - Provided by Barangay of Ilang-Ilang	Not needed since most of public and private school was located inside barangay	
	C. Mercado Cruz-Bulakan, Bulacan Road.	INADEQUATE			
	C Mercado Cruz- Tiaong Bypass Road	INADEQUATE - Additional lane located at RIS 1, RIS 5 , in front of INC Church,	SUFFICIENT - Provided by barangay Tabe and Tiaong		

Road Classification	Road Name	Pedestrian Lane/ Crossing	Street Light	Overpass/ Footbridge	Sidewalk
	C-5 Road Divimart, C. Joaquin	INADEQUATE	SUFFICIENT - Provided by barangay Tuktukan		
	Balagtas Road - Panginay Gto	INADEQUATE			

4.1.4. Transport and Terminals

4.1.3.1. Road Network System

The Municipality of Guiguinto is traversed by four major arterial roads namely, the *Manila North Road (MNR)* or *McArthur Highway*, *North Luzon Expressway (NLEX)*, the *Cagayan Valley Road* or *Daang Maharlika Road*, and the *Plaridel Bypass Road*. These roads conveniently link this small town to other parts of Luzon and Metro Manila through various modes of transportation system.

The MNR, maintained by the *Department of Public Works and Highways (DPWH)*, is a 30-meter national highway where built-up is heavily concentrated. It allows access from any point along the highway making it very open to any type of vehicles and commuters.

Considering the NLEX, maintained and operated by the *Manila North Tollways*, two toll plazas are available at Tabang and Sta. Rita that provides exit and entry from the north and south bound vehicles. However, since NLEX is a toll road facility, it only allows linkage from certain points particularly at the toll plazas. In effect, NLEX divides some areas in Guiguinto creating a level of difficulty in terms of mobility in these places.

Using the Plaridel Bypass Road, the Balagtas Toll Plaza connects the Guiguinto segment of the NLEX to Plaridel going north of Bulacan. In September 2019, the Toll Plaza connecting / linking Balagtas southbound going to Baguio and other parts of the North Luzon was inaugurated. Plaridel Bypass Road's ultimate phase is expected to be 60.00 meters wide consisting of shoulder road for both sides. The said road is very beneficial to commuters/travelers coming from and going to Pulilan, Plaridel, San Rafael, San Ildefonso and other parts of Bulacan.

The modes of transportation available in Guiguinto are buses, FX/Van/UV Express, jeepneys, tricycles, and pedicabs. *Table below* presents the different bus line that uses the three major arterial roads in Guiguinto. Regular trips are available from these bus companies every day.

The only transport terminal in Guiguinto is located at Cloverleaf near the Bureau of Fire Protection Building, Barangay Sta. Cruz. This serves UV express

with Tabang-San Fernando and Tabang-CIT/Cubao routes and vice versa. The said terminal can cater to 15-20 units of Utility Van and approximately 100-150 passengers. The terminal has basic facilities like waiting areas, toilets for male and female and closed circuit television.

Table 46 - Bus Lines and Routes

BUS LINES	FROM	TO
Baliuag Transit, Inc.	Hagonoy	Gracepark
		Divisoria
		Cubao
	Guagua	Gracepark
		Divisoria
		Cubao
	Baliwag	Gracepark
		Cubao
	Cabanatuan	Gracepark
	Cubao	Northern Part of Luzon
Victory Lines	Caloocan	Baguio
		Bataan
		Olongapo
	Pasay/Cubao	Baguio
		Bataan
		Olongapo
	Pasay/Caloocan	Northern Part of Luzon
Philippine Rabbit	Avenida	Tarlac
		Baguio
		Bataan
		San Fernando
	Cubao	Tarlac
		Baguio
		Bataan
		San Fernando
	Avenida/Cubao	Northern Part of Luzon
Beatriz Lines	Macabebe	Divisoria
Five Star Bus	Pasay/Cubao	Bataan
		San Fernando
RL Transit	Cabanatuan	Divisoria
Auto Bus	Pasay/Cubao	Isabela
		Tuguegarao
Royal Eagle	Pasay/Cubao	San Fernando
Alladin Transit	Pasay/Cubao	San Fernando
		Northern Part of Luzon
Golden Bee	Hagonoy	Gracepark
		Divisoria
		Cubao
First North Luzon Transit Inc.	Hagonoy	Cubao
German Espiritu Liner (Passing thru Panginay Guiguinto)	Bulakan, Bulacan	Cubao
		Monumento
		Caloocan

Source: MEO/MPDO, Guiguinto

The table below shows the available route of the different types of transport systems plying in and around Guiguinto. This mode of transportation is very popular in almost all parts of Bulacan. Terminals are usually found at major commercial and industrial establishments and major cross roads along the national and provincial roads.

Table 47 - Tricycle Terminals and Routes

TRICYCLE TERMINALS	AREA OF ROUTES	NO. OF MEMBERS	MAXIMUM TRAVEL (KM.)
Kabilang Bakood (Sta. Rita)	Rocka Phase 2-3	365	1.48
Sta. Rita (near Market)	Sta. Rita and Pritil	230	1.91
Sta. Cruz (in front of Puregold and Oriental Pavillion)	Puregold to Rosaryville Eurobake to Rosaryville/ Malis Puregold to Felville Subdivision	379	2.47
Tabang (near Powerfill Gas Station)	Tabang to Look Malolos Tabang to Bulakan- Bulacan	251	4.82
Ilang-Ilang (in front of Old Tannery)	Ilang-ilang to Look Malolos Ilang-Ilang to Tabang Ilang-ilang to Bulakan-Bulacan	260	4.59
Cruz (Tuktukan Multi-Purpose Hall)	Cruz/ Tuktukan to Panginay,Balagtas Cruz to Bulakan Bulacan	200	3.77
Malis (at the back of Kapitan Tano Market)	Kruz St. to GK /Northville	566	3.15
Daungan (at the back of Kapitan Tano Market)	Kruz St. to GK / Daungan/plaridel Boundary	111	4.48
Tuktukan (in front of Petrol Power near Ceramic Plaza)	Tuktukan to Panginay Balagtas Tuktukan to Camella Balagtas	172	2.69
Tabe (at the back of Kapitan Tano Market)	Kruz St. to BLISS Housing	330	2.89
Cut-Cut (at the back of Kapitan Tano Market)	Kruz St. to Cutcut Brgy. Hall	220	5.78
Tiaong (side of Puregold Bayan)	Kruz St. to Tiaong Labas Kruz St. to Tiaong Loob	100	5.37

4.1.3.2. Railway System

The Municipality of Guiguinto is also traversed by a Rail Road System with a Right-of-Way of 30 meters and the total length of rail road passing the town totals to about 10.5 Km.

The rail road in Guiguinto is divided into 2 alignments. The *EastAlignment* measuring 4.5 Km starts from Barangay Tiaong going to Nueva Ecija and the *North-SouthCommuterRailwayAlignment*, which measures 6 Km, stretches from Calamba-Tutuban to Malolos-Clark.

The *North-South Commuter Railway* alignment is envisioned to support Central Luzon to become a global gateway wherein the region will be opened to the world through comprehensive transportation linkages.

The construction of the planned commuter station in Guiguinto located at the old Slaughter house in Barangay Tabang is ongoing as of end of 2019.

Table 48 – Railway Right of Way

Name of Railway	Barangay	Length (km)	Width (m)	No of Scheduled trips	Physical Condition	Ownership/ Operator
North-South Commuter Railway (East Alignment)	Tabang	1.631	30.00	un-operational	On-going bored filling works	Republic of the Philippines
	Ilang-ilang	0.655	30.00	un-operational	On-going bored filling works	
	Poblacion	0.605	30.00	un-operational	On-going bored filling works	
	Tuktukan	1.87	30.00	un-operational	On-going bored filling works	
PNR Tutuban-Dagupan Railway	Daungan	2.058	30.00	30.00	Un-operational	Republic of the Philippines
	Tiaong	1.87	30.00	30.00	Un-operational	
	Tuktukan	0.841	30.00	30.00	Un-operational	

4.2. Power Utilities

Electricity in Guiguinto is supplied by the *National Power Corporation (NPC)* through *Manila Electric Company (MERALCO)*. All 14 barangays of Guiguinto is electrified with 24-hour service. The following Table shows that the highest power consumer in the Municipality of Guiguinto are the industries which take about almost half of the power consumption in 2013.



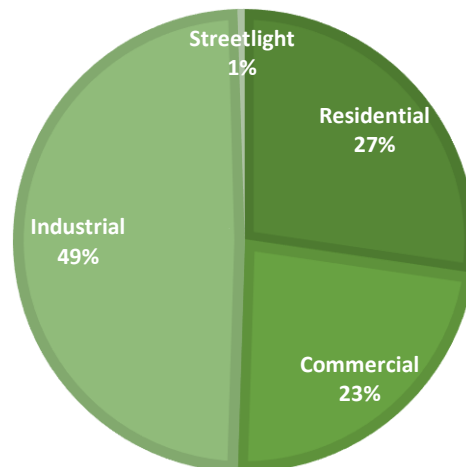
Table 49 - Electricity Consumption by Connections Municipality of Guiguinto

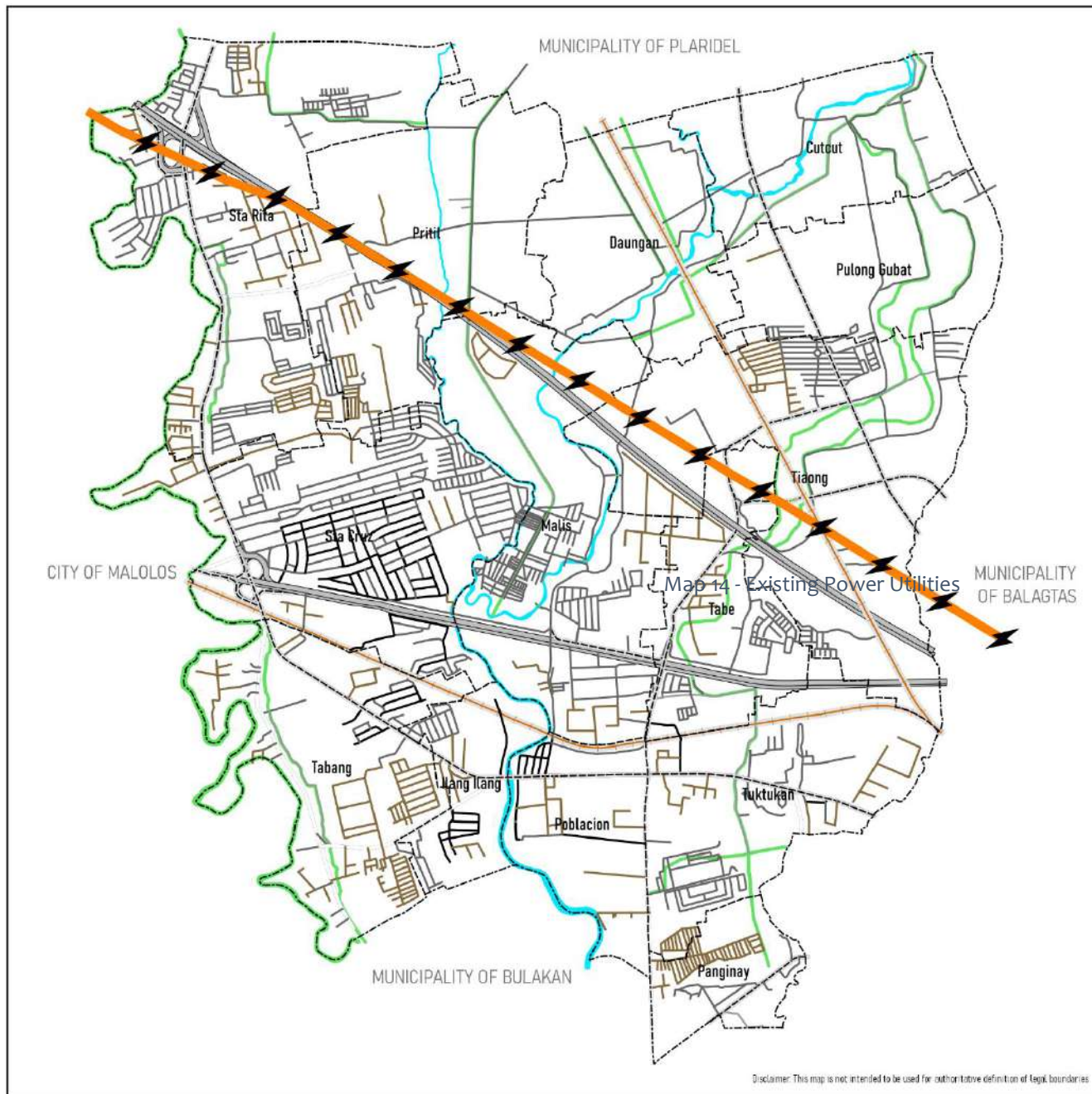
Market Category	Cost per KWh in PhP	Total Generated in 2013 (KWh)
Residential	10.97	33,205,235.00
Commercial	9.48	28,167,960.00
Industrial	7.78	59,635,986.00
Streetlight	11.50	527,281.00
Total	-	121,536,462.00

Source: Meralco

Figure 6 – Total Power Generated, 2013

**TOTAL POWER GENERATED IN 2013 =
121,536,462 KWH**





Disclaimer: This map is not intended to be used for authoritative definition of legal boundaries



SECTORAL STUDIES EXISTING POWER UTILITIES MAP

LEGEND

- Municipal Boundary
- Barangay Boundary
- == North Luzon Expressway
- National Road
- Provincial Road
- Municipal Road
- Barangay Road
- NIA Road
- Private Road
- Railroad Right of Way
- Blue River Network/Creeks
- Green Irrigation Canal
- Orange with black arrow Power Transmission



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Municipal Government of Guiguinto

March 2020

4.3. Water

4.3.1. Domestic

Water supply in Guiguinto is provided by the *Guiguinto Water District* which is operated by the private company *Hiyas Water Resources*. The said water service provider is servicing all barangays of Guiguinto using the ground water as its sole source.

The water system types are of Level 3, hence, providing individual household connection. As of June 2014, about 11,861 (or 59%) of the 20,194 households in Guiguinto has level 3 water connections. Other communities in some barangays of Guiguinto rely on public and private deep and shallow wells. *Table below* shows the significant increase in household connection after *Hiyas Water Resources* assume the operation of providing domestic water to the people of Guiguinto.

Table 50 - Historical Data on Water Service at Household Level

BARANGAY	BEFORE HIYAS	NUMBER OF HOUSEHOLDS		%
		AS OF 2013	AS OF JUNE 2014	
1. Cut- Cut	0	601	214	36
2. Daungan	0	308	116	38
3. Ilang- Ilang	0	987	573	58
4. Malis	0	3,105	1,401	45
5. Panginay	0	258	168	65
6. Poblacion	0	857	773	90
7. Pritil	298	926	762	85
8. Pulong Gubat	0	709	192	27
9. Sta. Cruz	96	2,589	1,772	68
10. Sta. Rita	627	2,928	2,262	77
11. Tabang	0	1,631	1,237	76
12. Tabe	0	1,603	341	21
13. Tiaong	0	1,679	805	48
14. Tuktukan	0	2,013	1,245	62
TOTAL	1,021	20,194	11,861	59

Source: *Hiyas Water Resource*

Guiguinto Water District has 17 pumping stations located strategically within the town as shown in next *Table*. Majority of these pumping station facilities are found in Barangay Sta. Rita, which is attributed by the generous amount of ground water in the area vis-a-vis the strong demand of its population and the immediate vicinity. Other pumping stations are also located where a strong demand for domestic water is present such as Poblacion, Tuktukan, Tabe, Tiaong, and Malis.

Table 51 - List of Pumping Stations

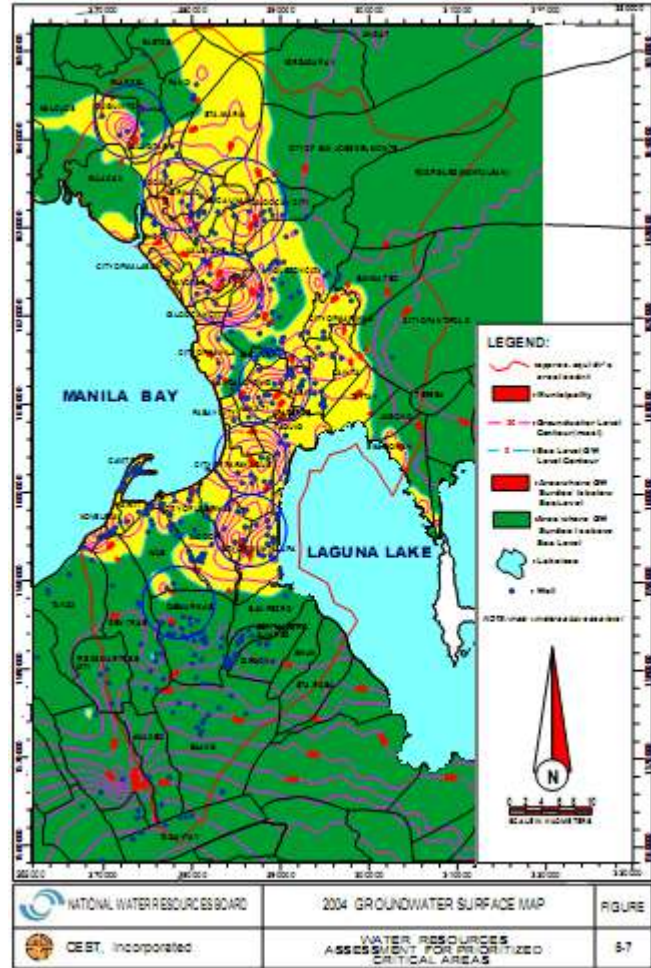
NAME OF STATION	LOCATION
1. Agatha	Sta. Rita
2. Sta. Clara	
3. Sta. Rita	
4. BMWC	
5. Kabilang Bakod	
6. Ali Santiago	
7. Doña Pillar	
8. Crown	Tuktukan
9. Miraverde	
10. Ping Lacson	Poblacion
11. Real Homes	Tabe
12. Tabe	
13. Josie Hernandez	Tabang
14. Vice Gov. Well	
15. Loresco Well	Tiaong
16. Tiaong	
17. North Bel Air	Malis

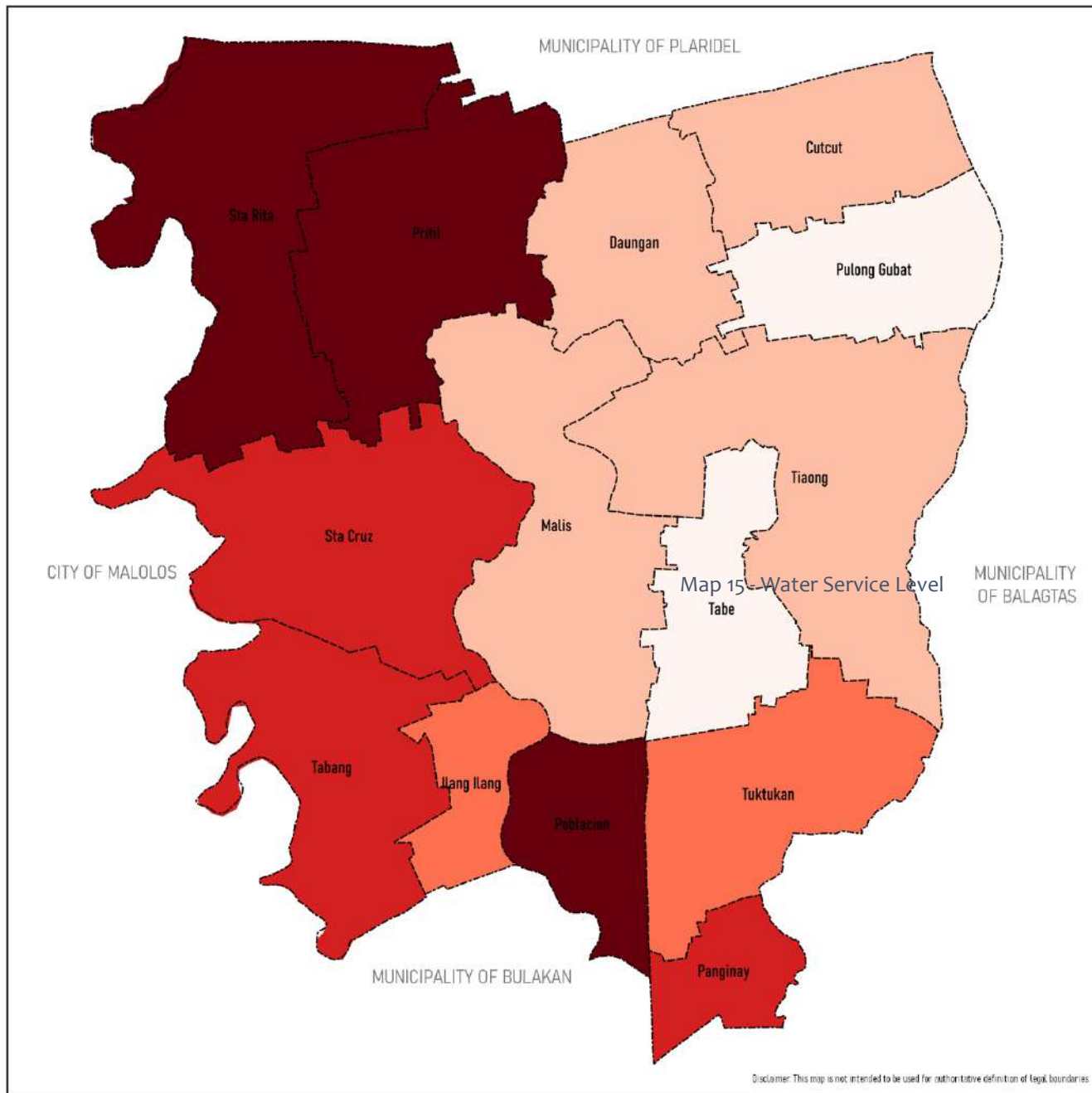
Source: Hiyas Water Resources

However, excessive groundwater withdrawal results to the lowering of water levels that subsequently cause landward movement of seawater towards the aquifer. Some areas are affected by salt bed deposit being exposed due to lowering water levels. Present groundwater level maps in Bulacan indicate degenerating condition based on monitoring from 1994 to 2004. Based on the study of *National Water Resources Board (NWRB)*, the greatest decline in water level of 80 to 100 meters was experienced in the Pasig-Taytay area in Metro Manila.

Eight (8) sites within Metro Manila and immediate vicinities including Bulacan province have been identified by NWRB as in need of urgent attention because of over-abstraction that would further induce saltwater intrusion. These are the cones of depression located in the following areas:

- ❖ Guiguinto
- ❖ Bocaue-Marilao
- ❖ Meycauayan-North Caloocan
- ❖ Navotas-Caloocan-West Quezon City
- ❖ Makati-Mandaluyong-Pasig-Pateros
- ❖ Parañaque-Pasay
- ❖ Las Piñas-Muntinlupa
- ❖ Dasmariñas, Cavite





SECTORAL STUDIES
WATER SERVICE LEVEL MAP

LEGEND

- Barangay Boundary
- Municipal Boundary
- WATER SERVICE LEVEL
- 20-35 Water Service Level
- 36-52 Water Service Level
- 53-67 Water Service Level
- 68-76 Water Service Level
- 77-100 Water Service Level



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Accordingly, this plan is greatly considering the use of surface water to abate the unavoidable circumstances of ground water depletion. Although there are no comprehensive studies assessing the actual condition and level of water at the ground water reservoir beneath the Municipality of Guiguinto, there are accounts in many areas in the province of Bulacan that we are going towards water scarcity if water extraction brought by rapid development is faster than the rate of recharging the natural groundwater aquifers.

In view of the presence of many industries that rely heavily on the use of ground water and the growing economic status of Guiguinto that contributes to the environmental degradation of the fresh water coming from our ground water aquifers, this plan is supporting the use of alternative sources such as surface water. One major project in the Province of Bulacan where almost all of the Water Districts are looking confidently as the most viable strategy to augment their future water needs is the *Bulacan Bulk Water Supply Project*. The project aims to provide a quality and reliable supply of water using the Angat Dam as the source.

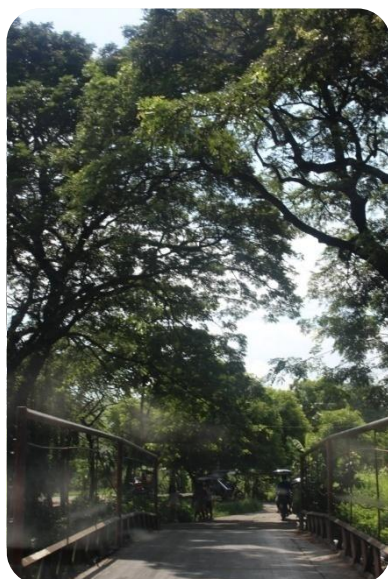
4.3.2. Irrigation

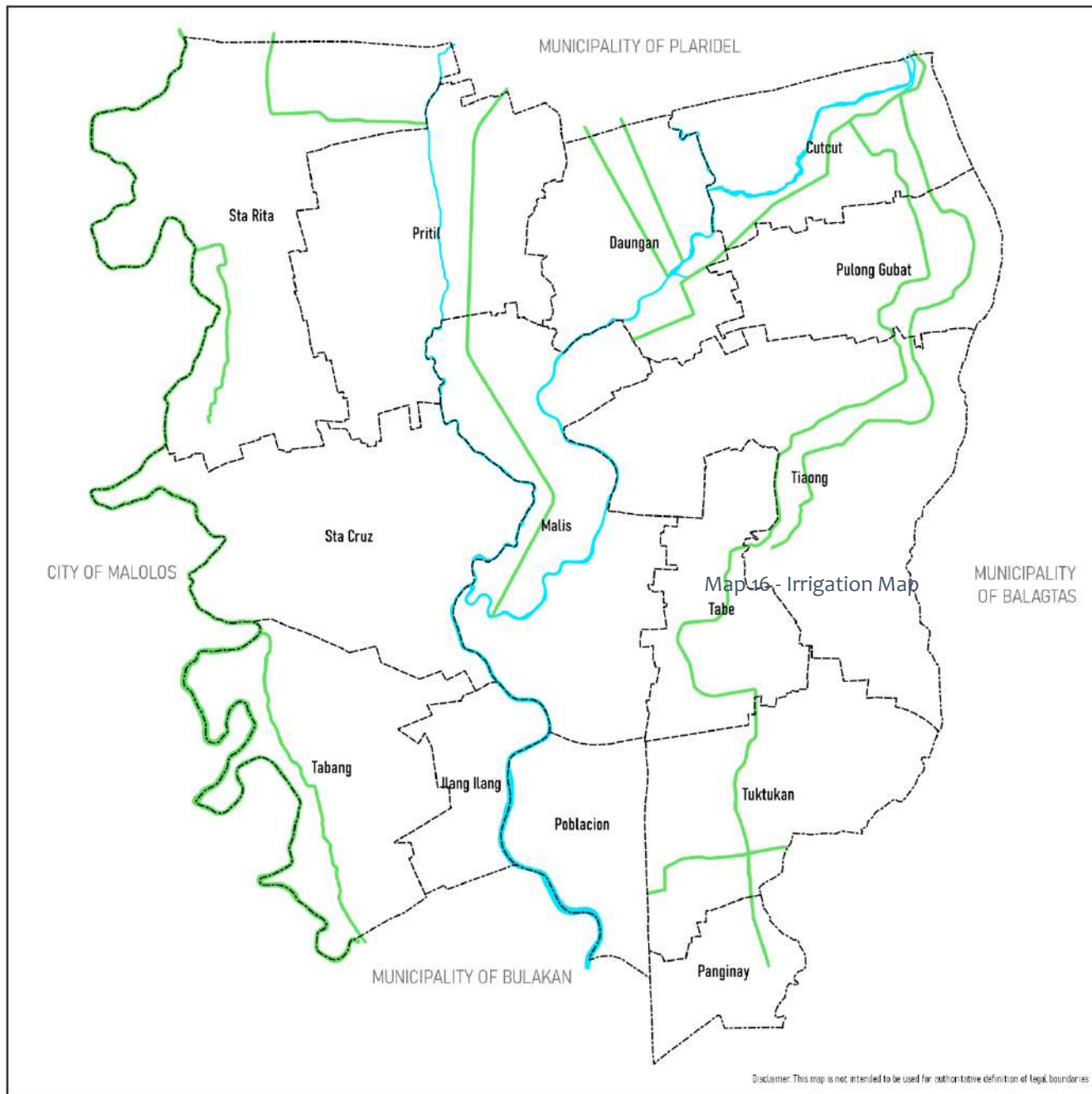
The Municipality of Guiguinto is one of the recipient towns of irrigation water coming from Bustos Dam via the South Main Canal.

Table 52 - Irrigation Services

SERVICE AREA	NATIONAL IRRIGATION SYSTEM	COMMUNAL/PUMP IRRIGATION SYSTEM
Irrigable Area (<i>Has</i>)	3,036	5.5
Irrigated Area (<i>Has</i>)	2,530	4
NO. OF FARMER BENEFICIARIES	3,042	2,534

Source: National Irrigation Administration, as of 2012





SECTORAL STUDIES

EXISTING IRRIGATION FACILITIES MAP

LEGEND

- Municipal Boundary
- Barangay Boundary
- River Network/Creeks
- Irrigation Canal



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4.4. Information and Communication Technology

There is one postal service present in Guiguinto located at the Municipal Hall. The next *Table* shows the organizational manpower and equipment that operates the local municipal postal service. Guiguinto Post Office is equipped with 6 motorcycles, 1 bicycle, and 1 mail truck used to transport posts throughout the municipality. The main telegraph service of Guiguinto, the *Telecom Field Office (TELOF)*, is located at the Municipal Hall, where telegram-social services are being offered. The *Housing and Land Use Regulatory Board (HLURB)* standard for postal service is one post office per 10,000 populations. Given a population of 101,730 (*year 2014 projected*) for Guiguinto, there is an evident insufficiency in the postal service being provided. However, this insufficiency is rectified by the growing number of mobile communication system and internet services.

Table 53 - Postal Services and Facilities

ITEM	DESCRIPTION/ LOCATION	NUMBER
Post Office	Municipality of Guiguinto, Postal Office	
No. of Post Masters		1
No. of Mail Sorters		1
No. of Postal Clerks		7
No. of Postal Carriers		7
Mail Truck/ Van		1
Motorcycle		6
Bicycle		1

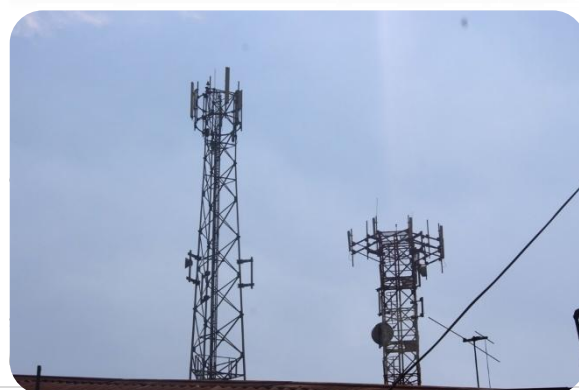
Source: SEP Online 2013-Guiguinto

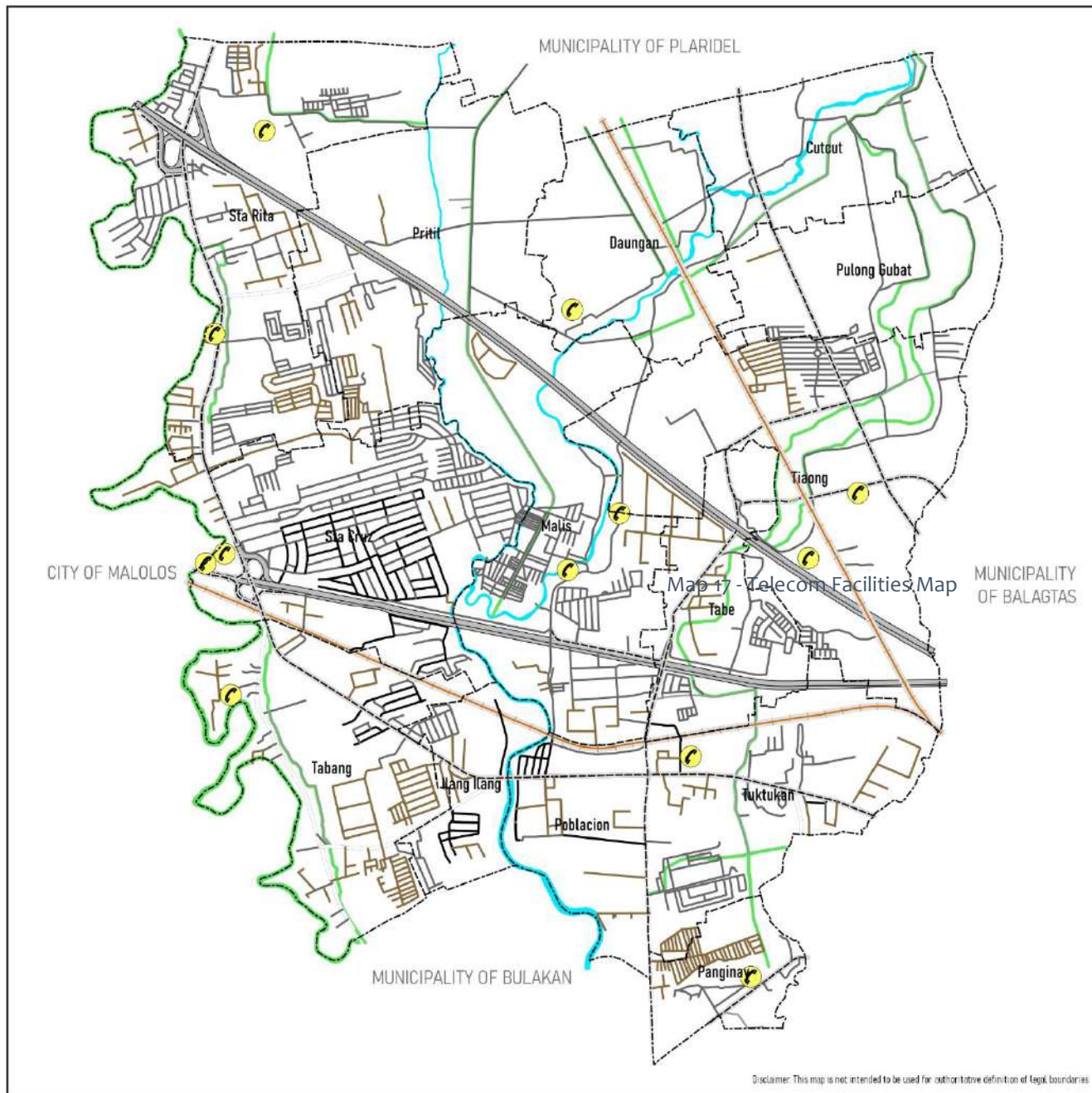
The most popular form of communication system being used nowadays are mobile communication system and internet services. Shown in next table are the fifteen telecommunication service providers in the Municipality of Guiguinto.

Table 54 - Telecommunications Service Providers

Location	Provider	Type of Facility
1. Panginay near Brgy. Hall (Azores Residence)	GLOBE/ HUAWEI	Tower
2. Tuktukan (C5 Road- near Divimart)	Globe	Tower
3. Tiaong (Near Dakanay Property- Golden Shower)	SMART/ ERICKSON	Tower
4. Tiaong Near Container yard- going to bypass	Globe	Tower
5. Tabang Near Residential Zone-looban Upgrade	SMART	Tower
6. Malis Sitio 13 near RIS 5	SMART	Tower
7. Malis near Ris 5 and bridge	SMART	Tower
8. Sta. Rita (Kabilang Bakood)	SMART	Tower
9. Sta. Rita near Agatha Gate	SMART	2 Towers
10. Sta Cruz (Near BPI Bank) Upgrade	SMART	2 Towers
11. Ilang- Ilang (Old Digitel Office)	SMART	Tower
12. Daungan	GLOBE/ POWERACT	Tower
13. Tiaong	DITTO TELECOM	Data Center
14. Sta. Cruz Violeta Village	PLDT	Service Provider Office
15. Ilang-Ilang Gd Plaza	Converge	Service Provider Office

Source: MPDO Guiguinto





SECTORAL STUDIES
EXISTING TELECOM FACILITIES MAP

LEGEND

- Municipal Boundary
- Barangay Boundary
- ===== North Luzon Expressway
- National Road
- Provincial Road
- Municipal Road
- Barangay Road
- NIA Road
- Private Road
- Railroad Right of Way
- Blue River Network/Creeks
- Green Irrigation Canal
- Yellow Circle Telecommunication Facilities



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4.5. Development Needs

- ❖ Major arterial roads are dilapidated;
- ❖ Poor condition of some bridges;
- ❖ Insufficient/absence of ancillary road facilities (*e.g. street lights, overpass, sidewalks*);
- ❖ Insufficient loading and unloading area;
- ❖ Excessive ground water extraction that may lead to depletion of the water in the aquifer;
- ❖ Inadequate supply of potable water to some barangays;
- ❖ Inadequate supply of irrigation water;
- ❖ Low water pressure for domestic use in some areas; and
- ❖ Insufficient access to mail or postal services (*delayed delivery in some areas*)

GOAL	OBJECTIVES	STRATEGIES
A well-maintained and adequate infrastructure facilities	TRANSPORTATION	
	<ul style="list-style-type: none"> ➤ To have an efficient and quality road network system ➤ To develop a comprehensive road circulation system necessary to support all development activities including fast transporting of products and commuters ➤ To provide all road network system with appropriate road ancillary facilities for added security and safety of citizens 	<ul style="list-style-type: none"> ➤ Widening and improvement of existing roads and bridges ➤ Improvement of road side drainage system ➤ Development of new road networks such as Farm-to-Market Roads and bypass roads ➤ Development of ancillary road facilities (<i>e.g. street lights, signage</i>)
	TRANSPORT AND TERMINALS	
	<ul style="list-style-type: none"> ➤ To have a sufficient and convenient transport terminals 	<ul style="list-style-type: none"> ➤ Improvement of existing transport terminals for public utility vehicle ➤ Development of new transport terminals in strategic location ➤ Organizing of transport groups/Coops ➤ Re-acquisition of RROW along road networks

Continuation...

GOAL	OBJECTIVES	STRATEGIES
A well-maintained and adequate infrastructure facilities	POWER	
	<ul style="list-style-type: none"> ➤ To promote energy conservation ➤ To improve power delivery services 	<ul style="list-style-type: none"> ➤ IEC ➤ Adoption of renewable/alternative power sources such as solar powers ➤ Upgrading/relocation/installation of power lines and electric posts
	WATER	
	<ul style="list-style-type: none"> ➤ To have a sufficient, quality/safe, and sustainable potable water supply to all water users ➤ To increase irrigation water inputs during dry season 	<ul style="list-style-type: none"> ➤ Educate people on water conservation ➤ Regulation on the use of water sources ➤ Encourage/support waterworks system projects what will improve and provide sufficient and sustainable water supply ➤ Support major development projects that will promote/increase irrigation water inputs ➤ Development and improvement of irrigation facilities
	INFORMATION AND COMMUNICATION TECHNOLOGY	
	<ul style="list-style-type: none"> ➤ To improve postal and other communication services ➤ 100% accessible ICT to all barangays 	<ul style="list-style-type: none"> ➤ Increase access to computers and internet services in every barangay ➤ Improve postal services by expansion of post office staff and provision of adequate postal related service facilities ➤ Regulation of cell site installation

Chapter V - Environment Sector

5.1. Water Environment

The 2012 Socio-Economic Profile of the Municipality of Guiguinto revealed that there is about 9.80 hectares of water bodies in the municipality. The agriculture sector of the municipality's economy depends heavily to this water coming from the river network and through the irrigation system. On the other hand, the manufacturing and tourism industries sector is dependent on the groundwater. Hotels and resorts as well as the manufacturing establishments involve in food processing, chemicals and pharmaceuticals, iron works and concrete products make use of groundwater primarily in their operations. At the same time, these sectors contribute to water degradation and depletion.

As much as the sectors of industries and agriculture are dependent to the groundwater and the water bodies of the municipality, the commercial establishments and the households also do. These households and commercial establishments make use of water as well as contribute to the water contamination in the Guiguinto River as well as in irrigation canal.

Meanwhile, the extent of water pollution in the Guiguinto River as well as in the irrigation system/canals was not determined due to the unavailability of information. The existing Water Quality Sampling Stations of the DENR-EMB Region 3 nearest to Guiguinto are those located in Bocaue, and while there is the National Water Quality Status Report, the information/data therein are aggregated either on a national or sub-national (regional) levels.

5.2. Air Environment

With regards to ambient air quality, based on the National Air Quality Status Report (2003-2007), the following data were collected and collated from the air quality monitoring stations located in Bulacan, thus:

Table 55 - Ambient Air Quality (TSP) - 1 year 24 averaging

STATIONS	CONCENTRATION (ug/Ncm)				
	2003	2004	2005	2006	2007
Saluysoy	141	190	309	186	116
Bocaue			370	195	
Meycauayan City			309		
Intercity Industrial Subdivision					

Source: EMB (National Air Quality Status Report, 2003-2007)

Disaggregated data as well as the updated information from these monitoring stations are not available.

5.3. Land Environment

The terrestrial environs of Guiguinto, as described in the earlier chapter, have only one classification and that is as A&D land with level to gently sloping configurations. Likewise, as discussed earlier, population density of the municipality has increased from population base year 2000 to the latest Census year 2010. This increase in the number of residents per square kilometre can be translated into an increase in land requirement for services and facilities, not to mention the corresponding increase in the wastes that is expected to be generated. Further

discussion of the land environment of the Municipality of Guiguinto will be done separately and in detail later.

5.4. Disaster Risk and Vulnerability Assessment

The international phenomena on climate change have aggravated the disasters already experienced in the country with the onslaught of super typhoon Yolanda in 2013. This is being affirmed by *Philippine Atmospheric, Geophysical, and Astronomical Services Administration (PAGASA)* in its 2011 report on Climate Change in the Philippines stating that the country is facing the very real impacts climate change which threaten to undermine its development prospects.

As part of sectoral studies on environment, this will discuss the assessment on disaster risk of Municipality of Guiguinto and its vulnerability to impacts of climate change. The first part will identify and characterized the potential hazards that may affect the municipality basically categorized into two major groups such as hydro-meteorological and geologic hazards. This will then present the results of the disaster assessment generally referenced from the *Disaster Risk and Climate Change Vulnerability Assessment Report (DR/CCVA)* of the *DRA/CCVA-Enhanced Provincial Development and Physical Framework Plan (PDPFP)* of the Province of Bulacan.

5.4.1. Hazard Profiling

This section will discuss the hazard profiles that combine both hazard characterization and historical data. This is divided into two general hazard categories such as hydro-meteorological and geological hazards.

❖ Hydro-meteorological Hazards

Hydro-meteorological hazards cover those that are related to water and atmosphere caused by climate processes. This process or phenomenon of hydrological, atmospheric, or oceanographic in nature may cause loss of life, injury or other health impacts, property damage, social and economic disruptions or, environmental damages (*United Nations International Strategy for Disaster Reduction 2009*). This includes the discussion flooding, rainfall-induced landslides, storm surges, severe drought, and typhoons with harsh winds.

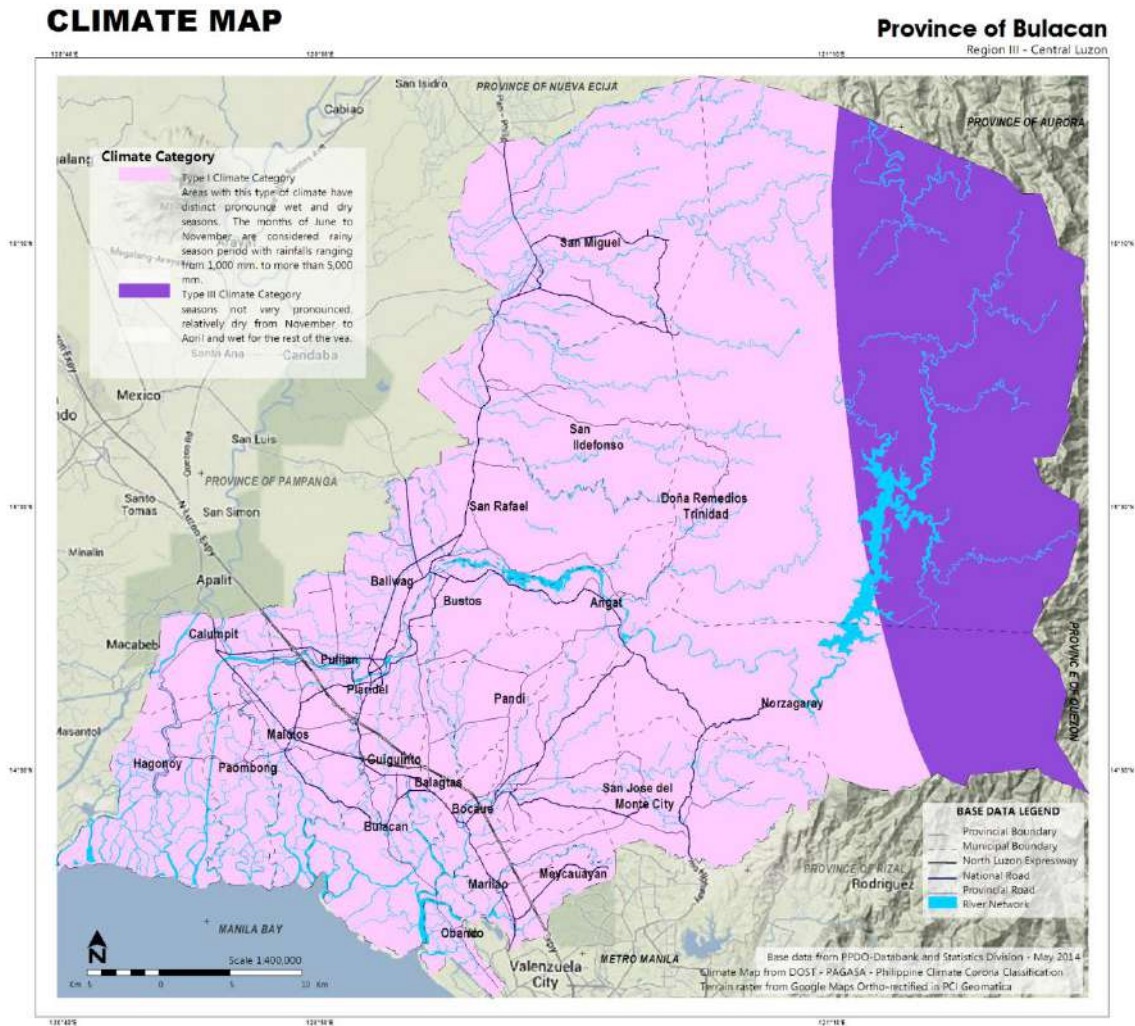
❖ Municipal Climate Profile

The Municipality of Guiguinto as well as the Province of Bulacan generally falls under Type I Category based on the modified *Corona's Philippine Climate Classification (1951-2003)*. Areas with this type of climate have distinct pronounce wet and dry seasons. The months of June to November are considered rainy season period with rainfalls ranging from 1,000 mm. to more than 5,000 mm.

Due to the lack of climate data at the municipal level, characteristics of Guiguinto climate will be adapted from the climate profile of the region and the very least at the provincial level.

The following figure shows the climate map of the Municipality of Guiguinto relative to the province.

Map 18 - Climate Map



Rainy season in the area coincides with the onset of the southwest monsoon, which brings moisture laded cloud formation from the Southwest Asia. However, because of the influence of topography and geomorphology, the eastern portion of the province has a Type III Climate with seasons not very pronounced, relatively dry from November to April and wet for the rest of the year which is geographically far from Guiguinto.

Based from PAGASA report on Climate Change in the Philippines released in 2011, the country experience increased in temperature. The observed mean temperature anomalies from 1951-2010 indicates an increase of 0.648 °C or an average of 0.0108 °C per year-increase based on normal values. However, the province's temperature is relatively constant at 27 degrees Centigrade. In 1995, highest temperature recorded was 37.5 degrees centigrade in April and the lowest was 17.9 degrees centigrade in the months of January and February. The following table shows the observed baseline historical temperature for Central Luzon from 1971-2000.

Table 56 - PAGASA Observed Baseline Historical Temperature for Central Luzon 1971-2000

REGION III	BASELINE OBSERVED (1971-2000)*			
	DJF	MAM	JJA	SON
Aurora	24.5	27.1	27.9	26.7
Bataan	26.4	28.7	27.6	27.3
BULACAN	25.6	27.9	27.1	26.7
Nueva Ecija	25.3	27.7	27.5	26.8
Pampanga	26.0	28.3	27.5	27.1
Tarlac	26.1	28.3	27.8	27.3
Zambales	26.3	28.3	27.4	27.2

The report has divided the observed temperature and rainfall records for the region based on the following seasonal variations:

- **DJF** – December, January, February or northeast monsoon locally known as amihan season;
- **MAM** – March, April, May or summer season;
- **JJA** – June, July, August or southwest monsoon season, or “habagat” season; and
- **SON** – September, October, November or transition from southwest to northeast monsoon

✓ **PAGASA Rainfall Record**

According to PAGASA report, the trends of increases or decreases in extreme daily rainfall are not statistically significant; although, there have been changes in extreme rain events in certain areas in the Philippines. For instance, intensity of extreme daily rainfall is already being experienced in most parts of the country, but not statistically significant. Likewise, the frequency has exhibited an increasing trend, also, not statistically significant.

The following table shows the observed historical rainfall record for Central Luzon from the period of 1971 to 2000.

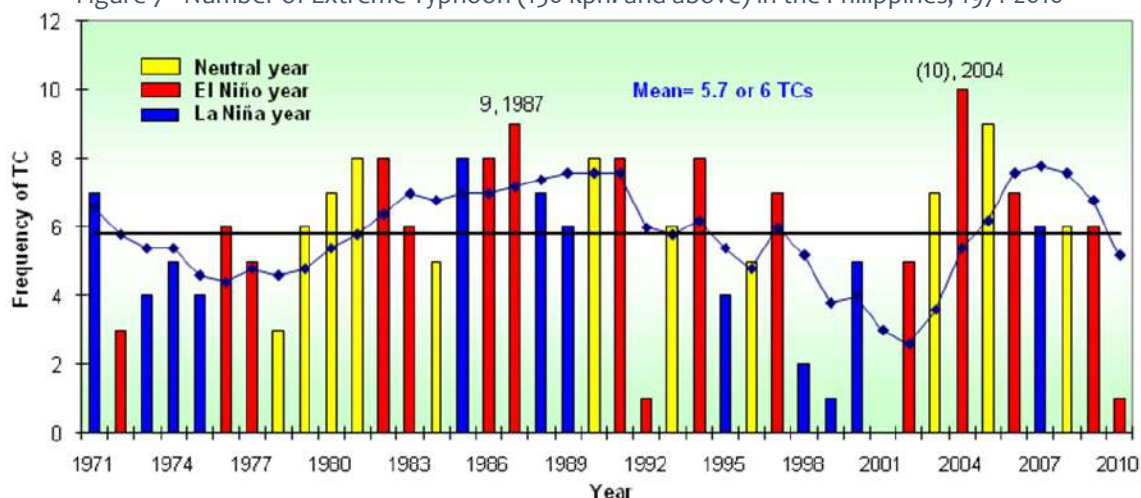
Table 57 - Observed Rainfall Record for Central Luzon (1971-2000)

REGION III	BASELINE OBSERVED (1971-2000) (MM)			
	DJF	MAM	JJA	SON
Aurora	615.7	546.4	768.7	1,151.1
Bataan	71.7	368.7	1,326.2	872.6
BULACAN	212.4	288.9	1,041.4	842.1
Nueva Ecija	155.2	316.5	995.0	745.0
Pampanga	120.8	320.6	1,030.4	785.2
Tarlac	43.4	265.4	1,193.5	644.3
Zambales	40.9	368.0	1,793.9	872.0

✓ Annual Frequency of Typhoons

Based from the PAGASA report, an average of 20 tropical cyclones were formed or passed within the so-called *Philippine Area of Responsibility (PAR)* per year. The trend shows a high variability over the decades but there is no indication of increase in the frequency. However, there is a very slight increase in the number of tropical cyclones with maximum sustained winds of greater than 150kph and above (*typhoon category*) being exhibited during El Niño years.

Figure 7 - Number of Extreme Typhoon (150 kph. and above) in the Philippines, 1971-2010



The following table shows the historical record for numbers of tropical cyclones which crossed the province 50 kilometers from boundaries for Central Luzon from the period of 1948-2009.

Table 58 - Number of Tropical Cyclones crossed Bulacan 50 Kilometers from Boundaries 1948-2009

REGION III	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTAL	TD	TS	TY	STY
Aurora	1	0	0	1	7	16	24	11	17	29	23	4	133	30	42	60	1
Bataan	0	0	0	1	3	6	10	4	11	19	8	2	64	14	20	30	-
BULACAN	0	0	0	0	4	8	9	4	11	23	16	2	77	17	23	37	-
Nueva Ecija	0	0	0	1	6	11	16	8	14	23	19	1	99	23	29	46	1
Pampanga	0	0	0	0	2	7	8	3	11	18	12	2	63	14	17	32	-
Tarlac	0	0	0	0	4	8	14	7	13	17	15	1	79	19	23	36	-
Zambales	0	0	0	1	6	8	13	7	15	24	13	2	89	17	26	45	1

The table also provides a summary of total number of *Tropical Depression (TD)*, *Tropical Storm (TS)*, *Typhoon with sustained winds of 150 k.p.h. (TY)*, and *Super Typhoon (STY)* for the same period.

❖ Climate Change Projection

The PAGASA report on projections on seasonal temperature increase and rainfall change uses the medium range scenario which is also the basis of projection for the province of Bulacan. It is to be noted that all the projected changes are relative to the baseline (1971-2000) climate.

✓ **Year 2020 Temperature Projection**

Climate change projection in the region was determined by PAGASA in its report on Climate Change in the Philippines. The following table shows the projected seasonal mean temperature (*in*°C) in 2020 under medium-range emission scenarios.

Table 59 - Year 2020 Projected Seasonal Mean Temperature under Medium-Range Emission Scenarios

REGION III	BASELINE OBSERVED (1971- 2000)*				PROJECTED TEMPERATURE INCREASE (<i>in</i> °C) UNDER MEDIUM-RANGE EMISSION SCENARIOS				PROJECTED MEAN TEMPERATURE 2020			
	DJF	MAM	JJA	SON	DJF	MAM	JJA	SON	DJF	MAM	JJA	SON
Aurora	24.5	27.1	27.9	26.7	0.9	0.9	1.0	1.0	25.4	28.0	28.9	27.7
Bataan	26.4	28.7	27.6	27.3	1.0	1.1	0.8	1.0	27.4	29.8	28.4	28.3
BULACAN	25.6	27.9	27.1	26.7	0.9	1.1	0.9	1.0	26.5	29.0	28.0	27.7
Nueva Ecija	25.3	27.7	27.5	26.8	0.9	1.1	0.9	1.0	26.2	28.8	28.4	27.8
Pampanga	26.0	28.3	27.5	27.1	1.0	1.1	0.9	1.0	27.0	29.4	28.4	28.1
Tarlac	26.1	28.3	27.8	27.3	1.1	1.1	1.0	1.1	27.2	29.4	28.8	28.4
Zambales	26.3	28.3	27.4	27.2	1.0	1.1	0.9	1.0	27.3	29.4	28.3	28.2

Based on the observed baseline data by PAGASA in 1971-2000, the Province of Bulacan had an increase in the mean temperature from 25.6°C during *December, January, February (DJF)* season to the highest recorded temperature of 27.9°C in *March, April, May (MAM)* season. The mean temperature in the province of Bulacan is projected to increase by 0.9°C to 1.1 °C in 2020.

✓ **Year 2020 Rainfall Change Projection**

The following table shows the projected rainfall (*inmm*) in 2020 under medium-range emission scenarios.

Table 60 - Year 2020 Projected Seasonal Rainfall Volume Change under Medium-Range Emission Scenarios

REGION III	BASELINE OBSERVED (1971-2000) (mm)				PROJECTED RAINFALL CHANGE (/N%) UNDER MEDIUM-RANGE EMISSION SCENARIOS				PROJECTED SEASONAL RAINFALL 2020			
	DJF	MAM	JJA	SON	DJF	MAM	JJA	SON	DJF	MAM	JJA	SON
Aurora	615.7	546.4	768.7	1,151.1	-0.3	-17.1	6.7	5.8	613.9	453.0	820.2	1,217.9
Bataan	71.7	368.7	1,326.2	872.6	2.7	-5.2	9.4	-0.4	73.6	349.5	1,450.9	869.1
BULACAN	212.4	288.9	1,041.4	842.1	4.2	-23.0	12.8	-2.9	221.3	222.5	1,174.7	817.7
Nueva Ecija	155.2	316.5	995.0	745.0	7.5	-13.8	10.1	1.6	166.8	272.8	1,095.5	756.9
Pampanga	120.8	320.6	1,030.4	785.2	16.3	-18.8	4.4	-5.1	140.5	260.3	1,075.7	745.2
Tarlac	43.4	265.4	1,193.5	644.3	26.0	-13.7	-1.6	-9.6	54.7	229.0	1,174.4	582.4
Zambales	40.9	368.0	1,793.9	872.0	34.2	-4.5	13.3	-1.6	54.9	351.4	2,032.5	858.0

The seasonal rainfall in Bulacan is projected to increase by 4.2 percent in 2020 during the northeast monsoon (*DJF*) season. Larger rainfall increase at 12.8 percent is expected during the southwest monsoon season (*JJA*).

✓ **Year 2050 Temperature Projection**

The following table shows projected seasonal mean temperature (*in °C*) in 2050 under medium-range emission scenarios

Table 61 - Year 2050 Projected Seasonal Mean Temperature under Medium-Range Emission Scenarios

REGION III	BASELINE OBSERVED (1971-2000)				PROJECTED TEMPERATURE INCREASE (/N°C) UNDER MEDIUM-RANGE EMISSION SCENARIOS				PROJECTED MEAN TEMPERATURE 2050			
	DJF	MAM	JJA	SON	DJF	MAM	JJA	SON	DJF	MAM	JJA	SON
Aurora	24.5	27.1	27.9	26.7	1.9	1.7	1.7	1.6	26.4	29.1	29.9	28.7
Bataan	26.4	28.7	27.6	27.3	2.0	1.8	1.6	1.9	28.4	30.8	29.3	29.2
BULACAN	25.6	27.9	27.1	26.7	1.9	1.8	1.7	1.7	27.5	30.0	28.8	28.6
Nueva Ecija	25.3	27.7	27.5	26.8	2.0	1.7	1.7	1.8	27.3	29.8	29.3	28.8
Pampanga	26.0	28.3	27.5	27.1	2.1	1.8	1.7	1.8	28.1	30.5	29.3	29.1
Tarlac	26.1	28.3	27.8	27.3	2.2	1.8	1.7	1.9	28.3	30.5	29.7	29.4
Zambales	26.3	28.3	27.4	27.2	2.1	1.8	1.6	1.9	28.4	30.4	29.1	29.1

The projection shows that seasonal temperature will rise in 2050 with 1.7°C to 1.9°C increase.

The following table shows the projected seasonal mean temperature (*in °C*) in 2020 and 2050 under medium-range emission scenarios based on 1971-2000 normal values

Table 62 - Comparative Projected Seasonal Mean Temperature under Medium-Range Emission Scenarios (2020 & 2050)

REGION III	BASELINE OBSERVED (1971-2000)				PROJECTED MEAN TEMPERATURE 2020				PROJECTED MEAN TEMPERATURE 2050			
	DJF	MAM	JJA	SON	DJF	MAM	JJA	SON	DJF	MAM	JJA	SON
Aurora	24.5	1.9	1.9	1.9	25.4	28.0	28.9	27.7	26.4	29.1	29.9	28.7
Bataan	26.4	2.0	2.0	2.0	27.4	29.8	28.4	28.3	28.4	30.8	29.3	29.2
BULACAN	25.6	1.9	1.9	1.9	26.5	29.0	28.0	27.7	27.5	30.0	28.8	28.6
Nueva Ecija	25.3	2.0	2.0	2.0	26.2	28.8	28.4	27.8	27.3	29.8	29.3	28.8
Pampanga	26.0	2.1	2.1	2.1	27.0	29.4	28.4	28.1	28.1	30.5	29.3	29.1
Tarlac	26.1	2.2	2.2	2.2	27.2	29.4	28.8	28.4	28.3	30.5	29.7	29.4
Zambales	26.3	2.1	2.1	2.1	27.3	29.4	28.3	28.2	28.4	30.4	29.1	29.1

The projection shows that there will be around 1°C increase in temperature from 2020 to 2050.

✓ **Year 2050 Rainfall Change Projection**

The following table shows the projected seasonal rainfall (*inmm*) in 2050 under medium-range emission scenarios

Table 63 - Year 2050 Projected Seasonal Rainfall Volume Change under Medium-Range Emission Scenarios

REGION III	BASELINE OBSERVED (1971-2000) (mm)				PROJECTED RAINFALL CHANGE (IN%) UNDER MEDIUM- RANGE EMISSION SCENARIOS				PROJECTED SEASONAL RAINFALL 2050			
	DJF	MAM	JJA	SON	DJF	MAM	JJA	SON	DJF	MAM	JJA	SON
Aurora	615.7	546.4	768.7	1,151.1	8.7	-29.2	7.4	-5.7	669.27	386.85	825.58	1,085.49
Bataan	71.7	368.7	1,326.2	872.6	-8.2	-8.1	29.1	1.5	65.82	338.84	1,712.12	885.69
BULACAN	212.4	288.9	1,041.4	842.1	-13.2	-36.4	23.6	-3.3	184.36	183.74	1,287.17	814.31
Nueva Ecija	155.2	316.5	995.0	745.0	-7.4	-25.7	22.7	-2.4	143.72	235.16	1,220.87	727.12
Pampanga	120.8	320.6	1,030.4	785.2	-15.4	-26.4	13.9	-7.2	102.20	235.96	1,173.63	728.67
Tarlac	43.4	265.4	1,193.5	644.3	-6.7	-18.2	8.8	-5.5	40.49	217.10	1,298.53	608.86
Zambales	40.9	368.0	1,793.9	872.0	-2.2	-21.6	31.4	5.6	40.00	288.51	2,357.18	920.83

In 2050, the province is projected to experience decrease in rainfall except during the southwest monsoon season (*JJA*) when an abrupt 23.6 percent increase of rainfall is expected.

The following table shows the projected seasonal rainfall (*inmm*) in 2020 and 2050 under medium-range emission scenarios based on 1971-2000 normal values

Table 64 - Comparative Projected Seasonal Rainfall Volume Change under medium-range emission scenarios 2020 & 2050

REGION III	BASELINE OBSERVED (1971- 2000) (mm)				PROJECTED SEASONAL RAINFALL 2020				PROJECTED SEASONAL RAINFALL 2050			
	DJF	MAM	JJA	SON	DJF	MAM	JJA	SON	DJF	MAM	JJA	SON
Aurora	615.7	546.4	768.7	1,151.1	613.9	453.0	820.2	1,217.9	669.27	386.85	825.58	1,085.49
Bataan	71.7	368.7	1,326.2	872.6	73.6	349.5	1,450.9	869.1	65.82	338.84	1,712.12	885.69
BULACAN	212.4	288.9	1,041.4	842.1	221.3	222.5	1,174.7	817.7	184.36	183.74	1,287.17	814.31
Nueva Ecija	155.2	316.5	995.0	745.0	166.8	272.8	1,095.5	756.9	143.72	235.16	1,220.87	727.12
Pampanga	120.8	320.6	1,030.4	785.2	140.5	260.3	1,075.7	745.2	102.20	235.96	1,173.63	728.67
Tarlac	43.4	265.4	1,193.5	644.3	54.7	229.0	1,174.4	582.4	40.49	217.10	1,298.53	608.86
Zambales	40.9	368.0	1,793.9	872.0	54.9	351.4	2,032.5	858.0	40.00	288.51	2,357.18	920.83

Summarizing the projected data, it simply suggests that the dry seasons will become drier and there will be increasing rains during rainy seasons.

❖ Flooding

Flooding is defined as temporary covering of land by water outside its normal confines. There are two types of flooding that can be distinguished, the coastal flooding and river flooding. Coastal flooding or sea-borne flood is caused by storm surges or rising tidal waters. River flooding is usually caused by excessive run-off brought on by heavy rains or storms that lead to overflowing of water systems such as rivers and streams.

This is the most common hazard that is intermittently occurring in the Province of Bulacan as well as in the Municipality of Guiguinto, specifically in the low lying areas. It is usually caused by heavy rains from typhoon or monsoon rains wherein the areas near the major rivers and other water ways are flooded for extended period of time.

Table 65 - Municipality of Guiguinto Historical Data on Flooding

DESCRIPTION	POPULATION/AREAS AFFECTED	IMPACTS
TYPHOON PEPENG <i>October 4-6, 2009</i>	<p>Heavy rains on northern Luzon resulting to back-flooding due to release of Pantabangan Dam in province of Nueva Ecija affecting Calumpit, Hagonoy, Pulilan, and western barangays of San Ildefonso and San Miguel near the Province of Pampanga</p>	<ul style="list-style-type: none"> ➤ P 16.6 M damages on 693 hectares of fisheries ➤ P51.6M damages on agriculture in an estimated riceland area of 3,226 hectares ➤ Ipo Dam in Norzagary reached its spilling level.
TYPHOON ONDOY (KETSANA) <i>September 26-27, 2009</i> <i>PAGASA recorded 455mm rainfall, the highest ever recorded in Metro Manila and belongs to the top 20 most rainiest typhoons to strike the Philippines</i>	<ul style="list-style-type: none"> ➤ 25 provinces including Bulacan were placed under state of calamity. ➤ 120,045 families (534,118 people) affected. ➤ 13,015 families (65,799 people) evacuated. ➤ 2,855 houses were damaged on most part of the province. ➤ 566 people stranded in Marilao and Bocaue area as of 22:30H Sep. 26 ➤ The province experienced an unusually high rainfall amount leading to the widespread and massive flooding in the province and overflowing of the Angat dam and opening of the floodgates at about 10:45AM in the morning. 	<ul style="list-style-type: none"> ➤ 37 people reportedly died and 8 more missing. ➤ P 634.8M damages on infrastructures. ➤ P90.5M damages on 4,079 hectares of fisheries. ➤ P594.5M damages of crops and livestock with total land area affected of 26,736 hectares ➤ P121M damages on roads. ➤ Manila-North Road in Marilao area was not passable to all types of vehicles. ➤ North Luzon Expressway affected by flood waters became passable to all vehicles but slow moving as of 05:00H Sep. 27 ➤ Angat dam and IPO dam reached spilling level. ➤ Spilling operation on Angat Dam commenced at 13:00H Sep 26 with opening of 1.0meter every 30 minutes until total outflow reached 500 Cubic Meter per Second (CMS) to maintain the stability of the dam.

Continuation...

DESCRIPTION	POPULATION/AREAS AFFECTED	IMPACTS
TYPHOON MILENYO <i>September 28, 2006</i>	1 city and 2 municipalities 480 families or 2,301 persons evacuated	<ul style="list-style-type: none"> ➤ 1 died ➤ 50 houses were totally destroyed and 376 houses were partially damaged ➤ PhP7,721,000 agricultural damage (<i>OCD Flooding Damage Data</i>)

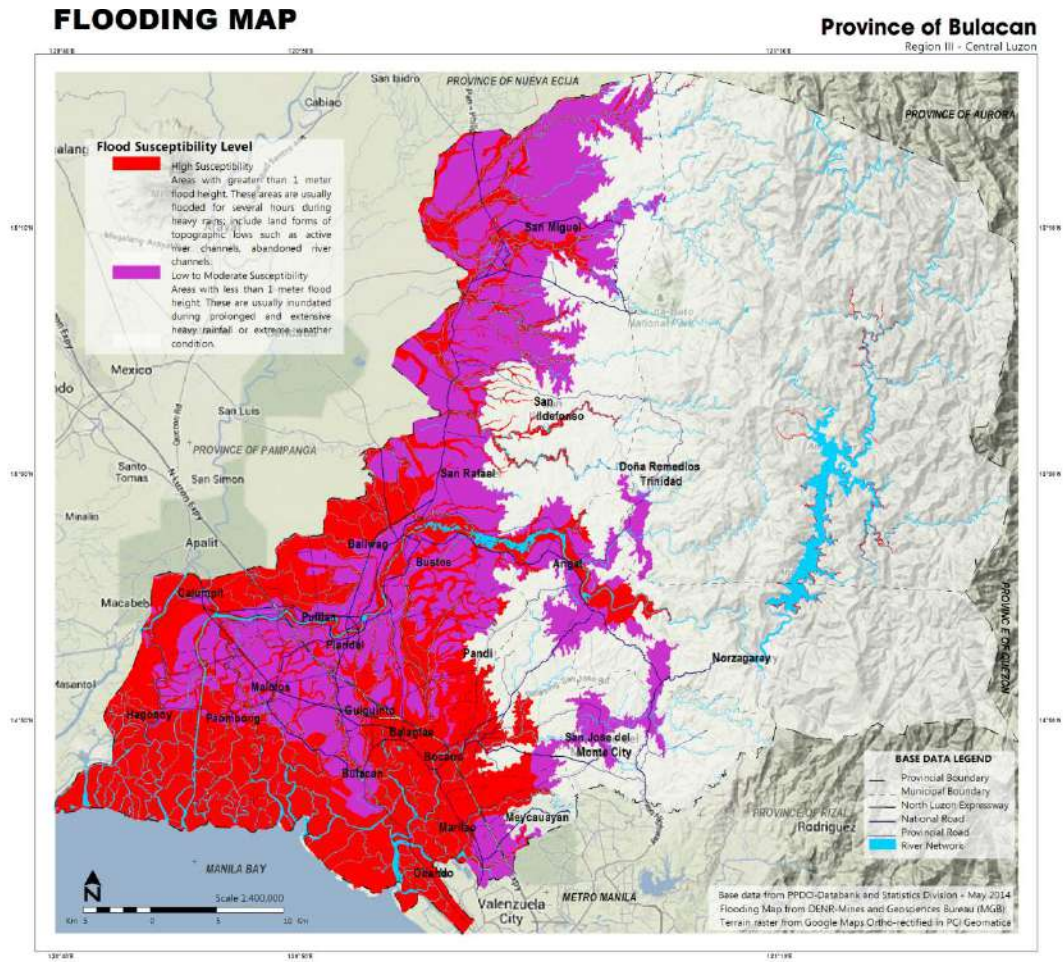
Source: Provincial Disaster Risk Reduction Management Office – Bulacan/ PAGASA/ NDCC

Aside from the established principal cause of flooding in the Municipality of Guiguinto, there are other factors that contribute to this hazard that worsens its effect. The general topography of the affected areas can be described as low-lying with a slope of relatively flat that makes the water current flow slowly towards drainage and streams. There are also silted river systems and clogged water ways that contributes to the rapid flood water rise during heavy rains.

With the PAGASA forecast on Climate Change in the Philippines, rains will be more frequent and intensified as the weather condition is aggravated by global warming causing more severe and prolonged flooding. Aside from the considerable damages to properties and disruption of socio-economic activities, human lives are also at risks for those who are living within the highly susceptible flood prone areas. Thus, preparedness and mitigation becomes equally valuable component of disaster risk reduction.

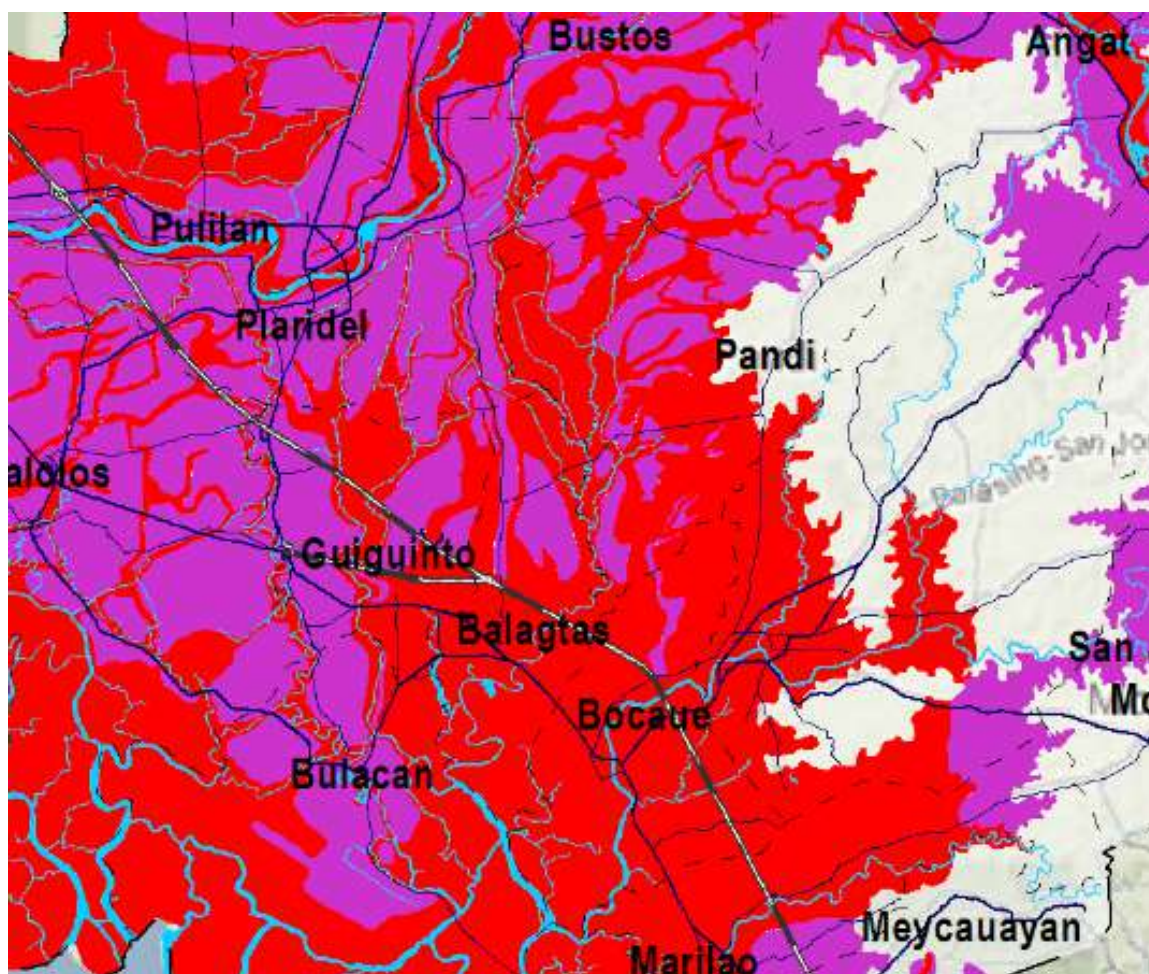
As part of disaster preparedness and risk assessment, hazard mapping is one of the important initial steps to be undertaken. An accurate flood hazard map will be a vital source of information in formulation of various plans such as physical framework plan, disaster preparedness plan and so on. The following figure shows the flooding hazard map identifying the areas susceptible to flooding for the Province of Bulacan.

Map 19 - Flooding Map



This is however an existing flooding map for the province and the only official source as of this writing and as mandated by law. This was created by *Mines and Geosciences Bureau (MGB)* of *Department of Environment and Natural Resources (DENR)* with the latest update on 2011 at a scale of 1:50,000. But based on further validation, it was noted in substantial number of times that the delineation of flood-prone areas are not settled in detail. The cause is initially assumed to be the scale of the map.

It is significantly shown in the map that according to MGB-DENR, the whole municipality of Guiguinto is prone to various levels of susceptibility to flooding. Though only those areas around the river systems are high susceptible, all the other areas are classified as low to moderately susceptible to flooding.



Based from the flooding map, the following table shows the exposure area of flooding per Barangay at varying susceptibility level. The estimates are GIS-derived and may not conform to the total administrative area.

Table 66 - Area Susceptible on Flooding per Barangay

BARANGAY	LAND AREA (HAS.) LMB-DENR	LAND AREA (GISDERIVED IN KM ²)	AREA UNDER HIGH SUSCEPTIBILITY TO FLOODING	AREA UNDER LOW TO MODERATE SUSCEPTIBILITY
Cutcut	226	1.22	0.54	0.59
Daungan	200	1.27	0.94	0.33
Ilang-Ilang	50	0.58	0.33	0.25
Malis	311	2.18	1.39	0.79
Panginay	87	0.52	0.45	0.00
Poblacion	96	0.79	0.67	0.01
Pritil	323	2.09	1.39	0.70

Continuation...

BARANGAY	LAND AREA (HAS.) LMB-DENR	LAND AREA (GISDERIVED IN KM ²)	AREA UNDER HIGH SUSCEPTIBILITY TO FLOODING	AREA UNDER LOW TO MODERATE SUSCEPTIBILITY
Pulong Gubat	151	1.17	0.66	0.51
Sta. Cruz	248	2.22	0.48	1.74
Sta. Rita	272	2.60	0.67	1.93
Tabang	219	1.67	0.10	1.56
Tabe	114	1.06	0.91	0.15
Tiaong	258	2.78	1.34	1.44
Tuktukan	195	1.57	1.56	0.00
TOTAL		21.70	11.43	10.01

The table resulted from GIS overlay analysis of administrative boundaries and flooding susceptibility shows that the barangay Tuktukan, Tabe, Panginay, Poblacion, and Daungan has the highest percentage of exposure to high susceptibility level of flooding.

❖ Rainfall-Induced Landslides

This type of landslides refers to the usually sudden downward movement of loosened materials (*rocks and earth*) due to rain. Based on the DRA/CCVA Report from the PDPFP of the Province of Bulacan, the Municipality of Guiguinto is not prone to this hazard for the topography of the municipality is generally flat.

❖ Storm Surges

Coastal or storm surges are an abnormal rise in sea water level caused by strong winds and low atmospheric pressure during typhoons. Based on the DRA/CCVA Report from the PDPFP of the Province of Bulacan, the Municipality of Guiguinto is not prone to this hazard as the municipality is not along the coastal area.

❖ Geologic Hazards

Geologic hazards are generally categorized as either earthquake related or volcanic related. The source of data in this section generally comes from *Philippine Institute of Volcanology and Seismology (PHIVOLCS)* and will usually be presented from regional or provincial perspective due to lack of data at the municipal level.

❖ Earthquake - Ground Shaking

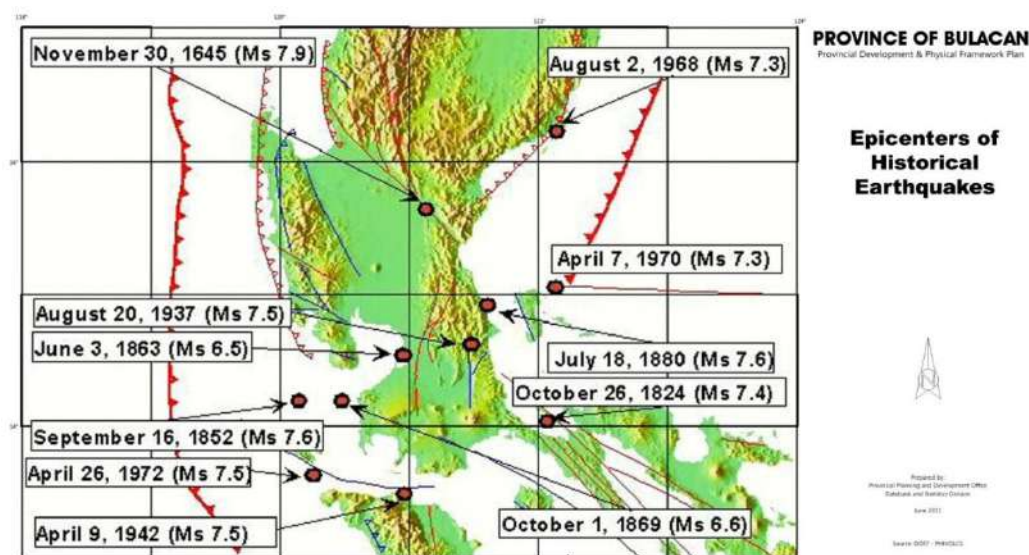
An earthquake is a weak to violent shaking of the ground produced by sudden movement of rock materials below the earth's surface (*L. Bautista, 2008*). Earthquakes are caused either by sudden released of slowly accumulated strain energy along faults and trenches (*tectonic*), or by movement of magma beneath volcanoes (*volcanic*) most commonly at the collision zone between tectonic plates. The Philippines sit between two tectonic plates, the Philippine Sea Plate to the east and the Eurasian Plate to the west. Between these two plates is found the Philippine Fault Zone where the country's most active faults are located including the West Valley Fault System wherein part of it passes the Province of Bulacan.

The table below displays the list of earthquakes for the past 400 years that cause significant damage to the Province of Bulacan.

Table 67 - Historical Earthquake Data

DESCRIPTION	POPULATION/AREAS AFFECTED	IMPACTS
Nov 30, 1645 (<i>Ms</i> 7.9)	Earthquakes for the last 400 years that caused significant damage to Province of Bulacan	
Sep 16, 1852 (<i>Ms</i> 7.6)		
Jun 03, 1863 7:20 pm (<i>Ms</i> 6.5)		Destructive earthquake consisting of vibrations followed by oscillatory movements. Damage to church structures, cracked walls and demolished bell towers at: Bocaue; Polo, Santa Maria, Bulacan, Malolos, San Rafael, Angat, San Isidro, Guiguinto;
Oct 1, 1869 (<i>Ms</i> 6.6)		
Jul 18, 1880 (<i>Ms</i> 7.6)		
Aug 2, 1968 (<i>Ms</i> 7.3) Ruby Tower		
Jul 16, 1990 (<i>Ms</i> 7.8)		Reported 1,283 dead, 3,516 injured and 460 missing. 19 buildings in Baguio were totally destroyed. Severe to moderate damage to 104,614 buildings (<i>damage cost P99B/US\$ 3B</i>). (<i>overall earthquake damage- not specific to Bulacan only</i>)

It is reported that 1990 earthquake was felt at Intensity VII at Bulacan based on *PHILVOCS Earthquake Intensity Scale (PEIS)*. Likewise, the 1645 and the 1990 earthquakes occurred at almost the same epicentre with nearly the same magnitude. The map below shows the location of epicentres of the listed earthquakes.



This map also displays the locations of earthquake generators and active fault lines in the area where Bulacan is located. The historical earthquakes that affect the province were located around these generators such as the Philippine Trench, the Manila Trench and the West Valley Fault System.

Ground shaking is a direct hazard to any structure located around the earthquakes epicentre. Structural failure takes many human lives especially on densely populated areas. The history shows that the Philippines is prone to strong earthquakes which have resulted to damages of great extent and fatalities.

Based on the hazard map from PHIVOLCS, the following table shows the susceptibility matrix based on ground shaking map.

Table 68 - Ground Shaking Susceptibility Matrix

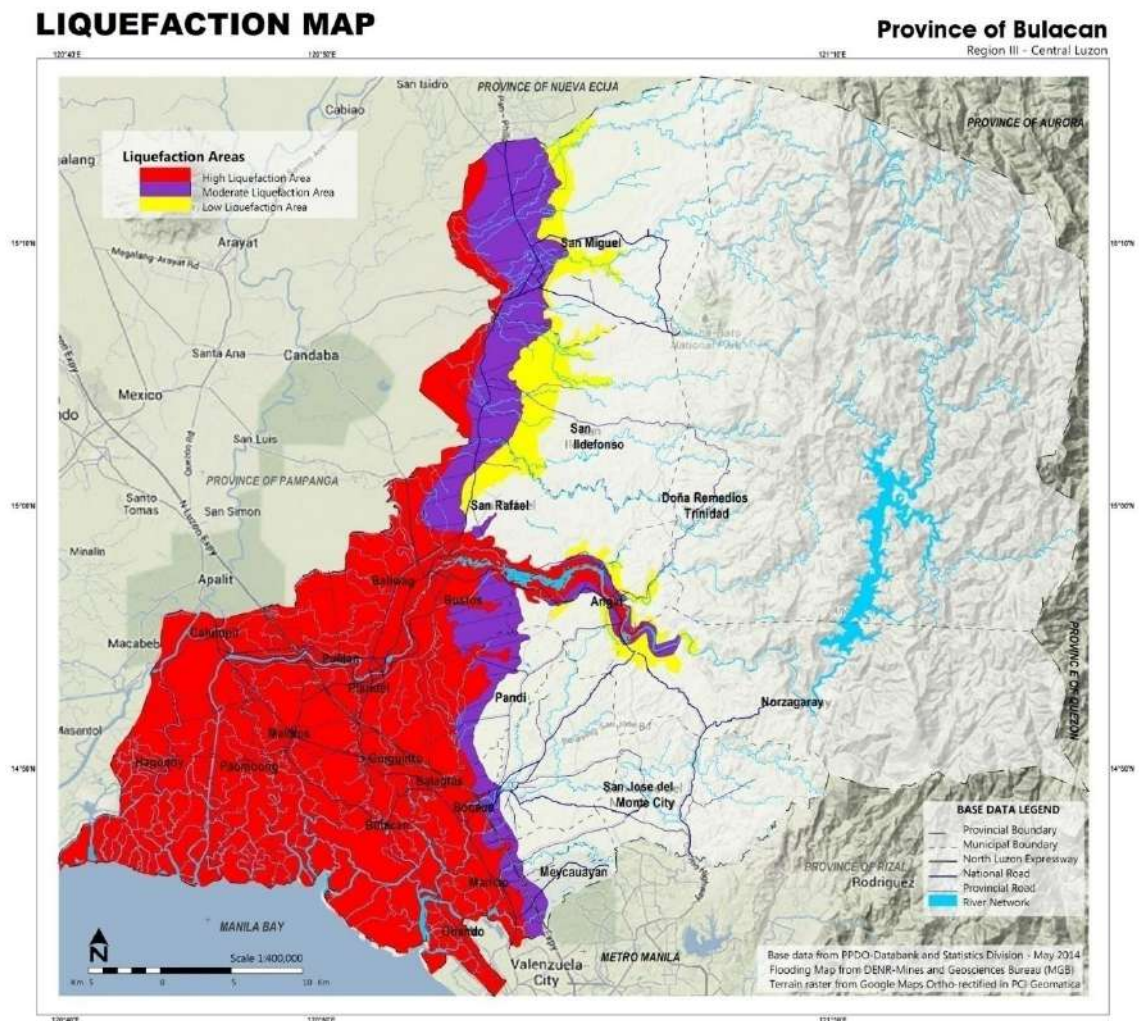
MUNICIPALITY/CITY	SUSCEPTIBILITY TO GROUND SHAKING	TOTAL LAND AREA
Province of Bulacan	<p>The whole province is prone to Intensity VIII Ground shaking level VERY DESTRUCTIVE</p> <ul style="list-style-type: none"> People find it difficult to stand Many well-built buildings are considerably damaged. Concrete dikes and foundations of the bridges are destroyed by ground settling or toppling. Railway tracks are bent or broken. Tombstones maybe displaced, twisted or overturned. Utility post, towers and monuments may tilt or topple. Water and sewer pipes may be bent, twisted or broken. Liquefaction and lateral spreading cause man-made structures to sink, tilt or topple. Numerous landslides and rock 	Whole province.

❖ Ground Rupture

Ground ruptures occurs when seismic waves radiate causing the ground to vibrate which results to differential movements of two sides of a fracture along the fault system. Based from the DRA/CCVA Report from the PDPFP of the Province of Bulacan, the Municipality of Guiguinto is not prone to this hazard for the West Valley Fault system is not within its area of jurisdiction.

❖ Soil Liquefaction

Based from the DRA/CCVA Report from the PDPFP of the Province of Bulacan, liquefaction can be triggered by strong ground shaking in gently sloping areas with unconsolidated material and water saturated deposits of fine sand. Liquefaction can be found in beach zones, sand pits, sand bars, wide coastal plains, deltaic plains, flood plains, abandoned river meanders, former lake beds or existing marshlands, and swamplands.



As per the DRA/CCVA Report and PHIVOLCS hazard map for the province, the Municipality of Guiguinto is generally high susceptible to soil liquefaction due to its geologic properties and topographic characteristics.

❖ Earthquake-Induced Landslides

Earthquake-induced landslides occur because of ground-shaking in areas having relatively steep topography and poor slope stability. Based from the DRA/CCVA Report from the PDPFP of the Province of Bulacan, the Municipality of Guiguinto is not prone to this hazard.

❖ Tsunami

Tsunamis are long-period waves generated in the ocean by sudden displacement of large volume of water. The Province of Bulacan located along the shorelines of Manila Bay, which, according to PHIVOLCS are affected by tsunamis from historical earthquakes. This makes the Province of Bulacan prone to tsunami in case there would be an off-land earthquake that will trigger this hazard.

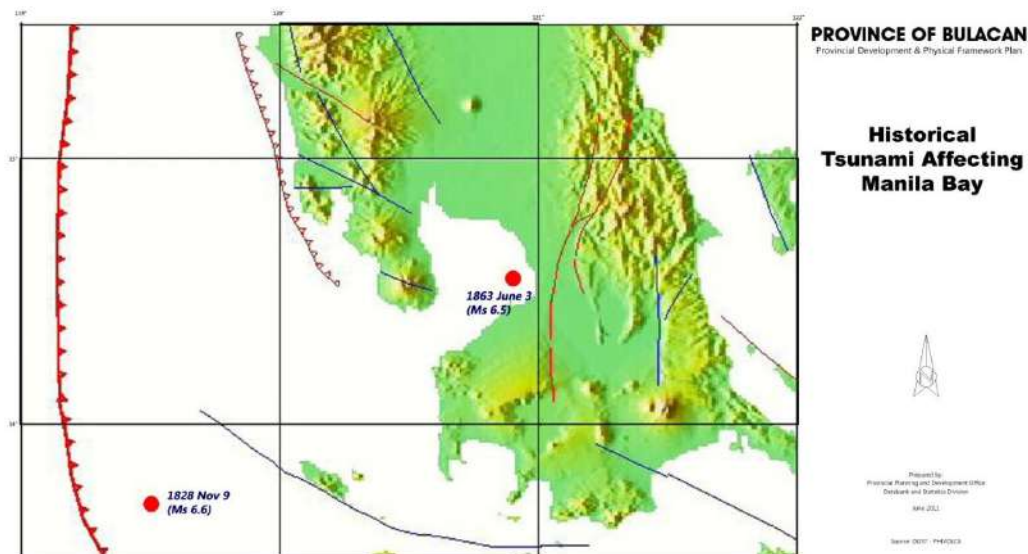
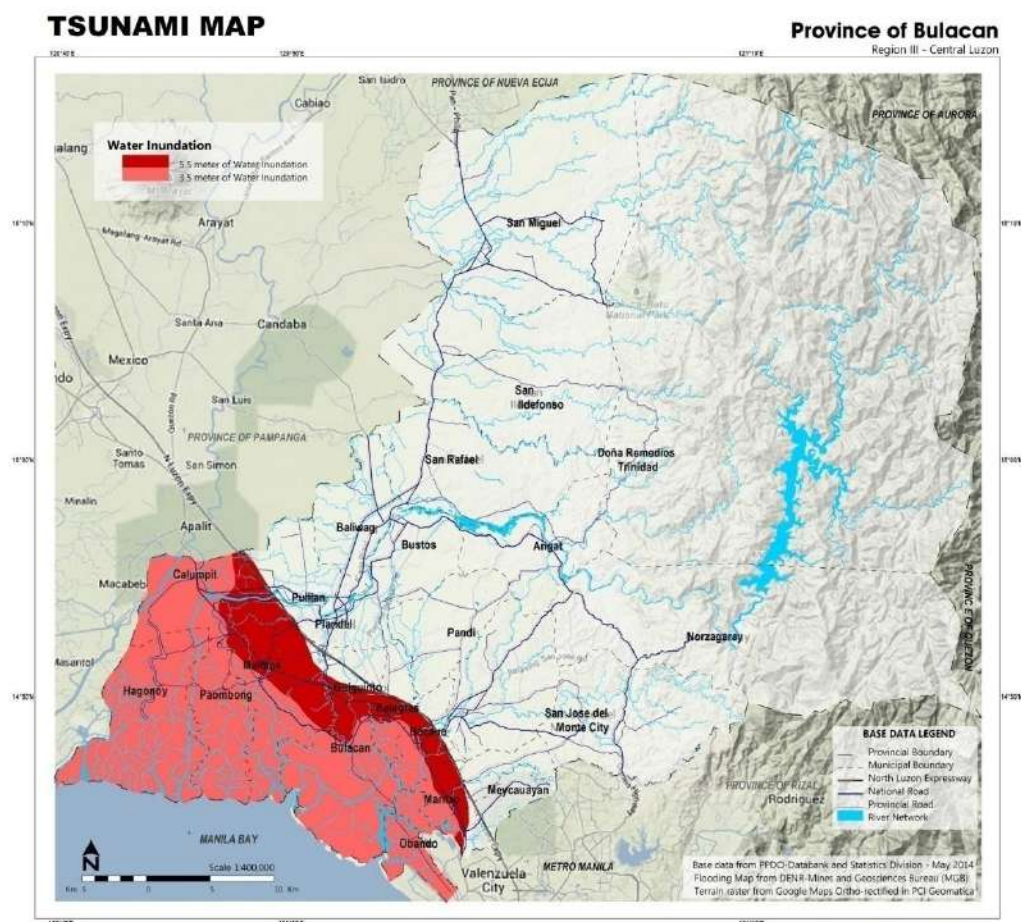


Table 69 - Tsunami Historical Data

DESCRIPTION	POPULATION/AREAS AFFECTED	IMPACTS
November 9, 1828 (<i>Ms</i> 6.6)	Historical earthquakes where it is reported that it generates tsunamis affecting the Manila Bay.	No report on any damages.
Jun 03, 1863 7:20 pm (<i>Ms</i> 6.5)		<ul style="list-style-type: none"> ❖ Destructive earthquake consisting of vibrations followed by oscillatory movements. ❖ Damage to church structures, cracked walls and demolished bell towers at: Bocaue; Polo, Santa Maria, Bulakan, Malolos, San Rafael, Angat, San Isidro, Guiguinto; ❖ No report on damages caused by tsunami.

Source: PHIVOLCS

Based on the hazard map from PHIVOLCS, the Municipality of Guiguinto is prone to tsunami due to its proximity to the shore and topographic characteristics of generally level land.



The tsunami hazard map from PHIVOLCS shows the inundation extents of tsunami waters toward inland municipality of Guiguinto. It is classified into two levels of water inundations such as the 3.5 meters and the 5.5 meters. The following table shows the area in each barangay at a varying inundation level.

Table 70 - Tsunami Prone Table

BARANGAY	LAND AREA (GIS DERIVED IN KM ²)	AREA PRONE TO 5.5 METERS OF TSUNAMI INUNDATION	AREA PRONE TO 3.5 METERS OF TSUNAMI INUNDATION
1. Cutcut	1.22		
2. Daungan	1.27		
3. Ilang-Ilang	0.58	57.60	
4. Malis	2.18	92.40	
5. Panginay	0.52	22.91	28.74
6. Poblacion	0.79	79.11	
7. Pritil	2.09		
8. Pulong Gubat	1.17		
9. Sta. Cruz	2.22	152.63	
10. Sta. Rita	2.60	7.80	
11. Tabang	1.67	166.56	
12. Tabe	1.06	55.38	
13. Tiaong	2.78	18.06	
14. Tuktukan	1.57	156.65	
TOTAL	21.70		

Referring to the tsunami prone area table, only the Barangay of Panginay is prone to 3.5 meters of tsunami inundation. However, according to PHIVOLCS hazard map, should there be 5.5 meters tsunami, the inundation is prone to barangays of Tabang, Tuktukan, Sta. Cruz, Malis, Ilang-ilang, Poblacion, Tabe, Sta. Rita, and Tiaong.

5.4.2. Disaster Risk Exposure Analysis

This section shows the results of the exposure analysis of hazards to initiate the assessment on disaster risks. Considering the hazard profile section, the Municipality of Guiguinto is summarized to be prone to the following hazards at varying susceptibility levels.

- ❖ Flooding
- ❖ Earthquake related
- ❖ Ground Shaking

- ❖ Soil Liquefaction
- ❖ Tsunami

In order to determine the risks that may be brought by these hazards, element exposed to each of these hazards should be identified. The elements that were included in the analysis are basically limited to population, land use properties, critical infrastructures and lifeline services.

After the gathering and preparation of data into operable GIS format, the overlay analysis of hazard and various elements will give us the exposure results.

5.4.3. Climate Change Vulnerability Assessment

This section will discuss the climate change vulnerability of the municipality of Guiguinto being derived generally from DRA/CCVA-enhanced PDPFP of the Province of Bulacan. The threats of climate change is stated to be coming from its variables manifested at the detrimental effects of hydro-meteorologic hazards such as flooding, rain-induced landslides, and storm surge.

These climate change variables enhance the disaster events posing real threats of damages and its effects to species and other life forms. The table below is the summary of the type of disaster events that these variables may exacerbate.

Table 71 - Climate Change Enhanced Disaster Events

CLIMATE CHANGE VARIABLE	DISASTER EVENTS ENHANCED
Temperature increase	Storms and typhoons
	<i>Heat waves</i> – three (3) consecutive days with increase of 1°C or more from the observed seasonal mean temperature.
	<i>Drought</i> – three (3) consecutive months with rainfall record less than the observed seasonal rainfall volume.
Rainfall Changes	Storms/typhoons, floods and landslides
Sea level rise	Floods and storm surge
Sea surface temperature increase	Typhoons, storm surge and massive algal blooms
El Nino	Drought, heat waves, and wildfires
La Nina	Floods, storms and strong waves

Considering these climate-change-enhanced events and the identified hazards in the Municipality of Guiguinto, it can be implied that the first hand threat of climate change will be coming from intense rains, floods, severe drought and heat waves. Thus, confirming the climate projection concluding that hot season will become drier and wet season will be more intensified.

❖ Sectoral Vulnerability to Climate Change

Based on the DRA/CCVA-enhanced PDPFP of the Province of Bulacan, the vulnerability levels are determined through the use of *Vulnerability Assessment tool (VA)* developed under the *Millennium Development Goals Achievement Fund (MDF-F)* program. The VA tool is sector-based and data-intensive for indicators

to be ranked numerically wherein final value is measured as index which are reflected by various indicators that serve as the units of analysis.

The tool indicates the determinants of the *Vulnerability Index (VI)* are *Sensitivity (S)*, *Exposure (Ex)* and *AdaptiveCapacity (AC)* with the working equation presented as $VI = S + Ex + AC$. Each of these determinants was evaluated at the basis of at least two or more indicators based on available databases to measure its weight. The result of which has been presented in form of VA tables and maps per sector. The determinants of VI however were evaluated down to the municipal level only in the said report due to lack of specific and smaller scale information.

The assessment derived from the referred document shows how the Municipality of Guiguinto fared among the other local government units within the province in the subject of climate change vulnerability.

❖ Impact of Flooding to Crops Production in Agriculture Sector

For the agriculture sector, the vulnerability index has been assessed considering fair number of indicators as impact of flooding to crops production such as the following:

- Sensitivity indicators:
 - ✓ Rainfall volume
 - ✓ Slope
 - ✓ Proximity of farmlands to river system
- Exposure indicators:
 - ✓ Extent of flooded production areas
 - ✓ Number of flooding every three years
 - ✓ Duration/retention time of flood waters
- Adaptive capacity indicators:
 - ✓ Updated maps of flood prone areas
 - ✓ Annual historical flooding data
 - ✓ Access to flood forecasting information and early warning systems

Based on the weighted scores of the indicators, the vulnerability levels are derived and resulted in the following matrix.

Table 72 - Crops Production Vulnerability to Flooding

VULNERABILITY LEVEL	CITIES/MUNICIPALITIES
Very High	Calumpit, Hagonoy, Paombong, and City of Malolos
High	Bulakan, Bocaue, Pulilan, Baliwag, Bustos, Balagtas, GUIGUINTO , Plaridel, Marilao, Meycauayan City, Obando, and Santa Maria
Moderate	Pandi, Angat, Norzagaray, San Ildefonso, San Miguel, San Rafael, and City of San Jose Del Monte
Low	Doña Remedios Trinidad
Very Low	--

Based on the assessment results, the Municipality of Guiguinto scored a high vulnerability to the impact of flooding to crops production though not very

high as in the case of coastal municipalities from the first district of the province such as Calumpit, Hagonoy, Paombong, and City of Malolos.

❖ Impact of Flooding to Health Sector resulting to Dengue Cases

- Sensitivity indicators:
 - ✓ Population density
 - ✓ Retention time of flood waters
 - ✓ Access to level 3 water supply
- Exposure indicators:
 - ✓ Percentage of households without access to sanitation facilities
 - ✓ Percentage of households without access to safe water supply
 - ✓ Poverty incidence
- Adaptive capacity indicators:
 - ✓ Water supply and sanitation system
 - ✓ Presence of functional health referral system

Table 73 - Health Sector Vulnerability to Flooding

VULNERABILITY LEVEL	CITIES/MUNICIPALITIES
Very High	---
High	---
Moderate	Doña Remedios Trinidad, Paombong, City of Malolos, Calumpit, and Bocaue
Low	Bulakan, Pulilan, Baliwag, Bustos, Balagtas, GUIGUINTO , Plaridel, Marilao, Meycauayan City, Obando, Santa Maria, Pandi, Angat, Norzagaray, San Ildefonso, San Miguel, San Rafael, and City of San Jose Del Monte
Very Low	---

❖ Impact of Flooding to Water Supply Sector

- Sensitivity indicators:
 - ✓ Rainfall volume
 - ✓ Surface water quality
 - ✓ Storage capacity of multipurpose dams/water impounding facilities
- Exposure indicators:
 - ✓ Proportion of households without access to potable water
 - ✓ Percentage of households without access to safe water supply
 - ✓ Poverty incidence
- Adaptive capacity indicators:
 - ✓ Retrofitting of water supply systems for resiliency
 - ✓ Rainfall/typhoon rain forecasting or rain gauge system

Table 74 - Water Supply Sector Vulnerability to Flooding

VULNERABILITY LEVEL	CITIES/MUNICIPALITIES
Very High	---
High	Doña Remedios Trinidad
Moderate	Bustos, Norzagaray, San Miguel, San Rafael, Marilao, Meycauayan City, Obando
Low	Bulakan, Pulilan, Baliwag, Balagtas, GUIGUINTO , Plaridel, Santa Maria, Pandi, Angat, San Ildefonso, City of San Jose Del Monte, Paombong, City of Malolos, Calumpit, and Bocaue
Very Low	---

Summarizing, the agriculture sector on crops production is the most vulnerable, though in the moderate level, to the impacts of climate change in the Municipality of Guiguinto.

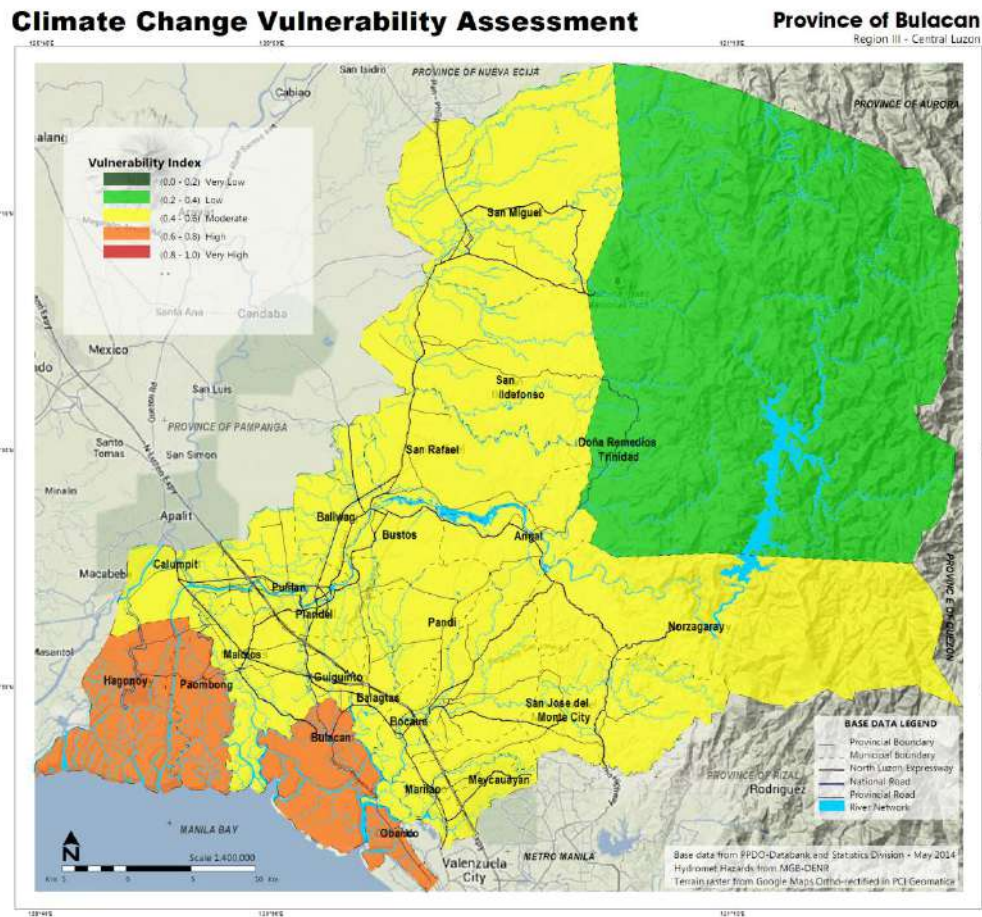
❖ Provincial Climate Change Vulnerability Assessment

The processing in this chapter will utilize the Vulnerability Assessment tool model used in the sectoral assessment such that the index of the identified indicators of *Sensitivity (S)*, *Exposure (E)* and *AdaptiveCapacity (AC)* are determined based on the sub-indicators and its rating.

- Sensitivity indicators:
 - ✓ Flooding hazard
 - ✓ Rain Induced landslides/soil erosion
 - ✓ Coastal/storm surges
 - ✓ Prolonged drought/heat wave
 - ✓ Sea level rise
- Exposure indicators:
 - ✓ Population density
 - ✓ Production/agricultural land area
 - ✓ Road density
- Adaptive capacity indicators:
 - ✓ Poverty Incidence
 - ✓ *HumanDevelopmentIndex (HDI)*
 - ✓ LGU Income classification

** Index model and indicators based on Vulnerability Assessment Tool as prescribed by NEDA-UNDP under the Mainstreaming DRR/CCA Guidelines. Sub-indicators and ratings used are based on the agreed standard of Central Luzon – Regional Geographic Information Network.*

Overall, most part of the province is moderately vulnerable to climate change. There are no municipalities that were ranked at a very high vulnerability though the coastal municipalities of Hagonoy, Paombong, Obando, and Bulakan are highly vulnerable to the impacts of climate change. The following map shows the overall vulnerability assessment of the Province of Bulacan to Climate Change.



The Municipality of Guiguinto are among those municipalities generally assessed to be moderately vulnerable to climate change impacts.

❖ *Climate Change Threats and Potential Impacts to Vulnerable Sectors*

Aside from degree vulnerability, impacts of climate change on these sectors will likewise soon to happen. The following table is sourced from PAGASA report on Climate Change in the Philippines showing the impacts of climate changes presented per vulnerable sector.

Table 75 - Potential Impacts of Climate Change to Vulnerable Sectors

SECTOR	IMPACTS OF CLIMATE CHANGE
Water	<ul style="list-style-type: none"> Water quality problems (e.g. presence of metallic substance, algal blooms, contaminations) Reduction in rainfall during the summer season will result in water shortage. Irrigation water for farms will be less affecting food production. Water level in dams will be low affecting energy production. Heavy rains in many areas will create flooding affecting economic activities, damages to physical assets and even fatalities, injuries and illnesses. Decrease fresh water availability due to salt water intrusion
Forestry	<ul style="list-style-type: none"> Increase in temperature and variability in rainfall will affect the growth and development of plants and animals in the forest. Some forest plants and wildlife animal species may not survive. Invasive species may override the natural habitats of fruit-bearing plants. Forest fires may become frequent in forest and grassland areas during El Nino episodes.
Agriculture	<ul style="list-style-type: none"> Land degradation resulting to crop failures Changes in temperature and rainfall intensity, frequency and distribution will affect the growth and yield of climate sensitive crops and fruit trees. Floods and strong winds brought by typhoons will damage crops and affect their production. Prolonged drought may dry up inland fish ponds resulting to decrease in yields. Drought will seriously affect crop production while heat stress will increase mortality of poultry and livestock. Changes in temperature and rainfall will trigger the spread of pests and diseases of both plants and animals. Sea surface temperature will affect fishery. Fish will move out to cooler and deeper waters making it difficult to reach and catch them by artisanal fishermen. Aquaculture and marine culture are damaged by typhoons and coastal flooding aside from storm surges. Insects/ pest outbreaks
Coastal resources	<ul style="list-style-type: none"> Storm surge and sea level rise will inundate coastal settlements and tourism industry. Small islands will significantly be affected by sea level rise inundating large portions of the lands and contaminating the ground water with saline. Damages to coral reefs/ see grass
Health	<ul style="list-style-type: none"> Flooding will cause the outbreak and spread of water-based and vector-borne diseases leading to higher morbidity and mortality. The incidence of malaria, dengue, leptospirosis, schistosomiasis, cholera and dysentery will increase in flooded and unsanitary areas. Heat waves will increase heat stroke among the elderly. The demand for energy will increase and may exceed the available supply. Typhoons and monsoon rains can flood hospitals and health centers disrupting services and access by the residents. Declining air quality in cities and reduction in quality of life for people in warm areas Risk of food and water shortage and malnutrition

Source: PAGASA Report on Climate Change in Philippines 2011/ Sabates-Wheeler et al., 2008

The listed impacts are based on initial qualitative assessment and are not just limited on the list. Analysis of its effect may vary depending on the focus of the subject on various sectors. Further assessment may lead these impacts to certain levels damages or destruction of as shown from the figure below.

Figure 8 - Waves of Climate Change Impact Affecting Forest, Biodiversity, Coastal and Marine Ecosystems



With this impact, *Climate Change Adaptation (CCA)* is being pursued by the developing countries including the Philippines in which ways of coping with adverse impacts of climate change is undertaken. Activities that leads to avoiding, preventing of adjusting down the known adverse impacts is a form of adaptation. While climate change mitigation is mandated for developed countries, the Philippines is coursed to adapt to continue controlled emissions for further economic development.

5.5. Development Needs

The Prevention strategies and measures that need to be integrated in local development plans and implemented in development projects include the following:

1. **Proper sitting of human settlements.** New urban towns and new settlement areas should be located away from disaster prone areas.
2. **Proper zoning of disaster prone areas.** Areas frequently devastated by floods, volcano eruption, landslides, mudslides, rockslides should be zoned as danger zones and their land uses should be strictly regulated; residents occupying highly vulnerable areas should be relocated and resettled.
3. **Strict monitoring and prohibiting the occupation by informal settlers of hazard zones.** Danger zones should be closely guarded to prevent informal settlers from intruding and occupying these areas.
4. **Preserving or conserving natural defense.** Critical environment and natural resources should be protected and conserved because they are natural buffer zones against natural disasters. Degraded environments further trigger or aggravate disasters.

5. **Reducing trigger factors and sources contributing to climate change, landslides and flooding** (e.g., climate change - emission of GHGs; landslides - improper uses and denudation of unstable slopes; flooding - heavy siltation or obstruction of river channels and built-up of river flood plains; drought effects on wetlands and biotic components).
6. **Improving socio-economic status of vulnerable communities.** Poverty reduction programs should be established and greater opportunities for employment should be provided. Resilient, low cost, and affordable housing projects for resettled or relocated communities should be made available.

The necessary Mitigation strategies and measures include, but not limited to, the following:

1. **Providing access to insurance or various forms of risk transfer mechanism.** Awareness and access of disaster-prone communities to insurance systems should be provided.
2. **Establishing safety regulations.** Regulations (e.g., SOPs) to safeguard populations from hazards brought about by physical events should be established and enforced.
3. **Properly enforcing building codes and fire codes.** Existing building regulations and requirements should be properly enforced.
4. **Strictly enforcing environmental laws and regulations to minimize the adverse impacts of climate change.** Monitor compliance to environmental laws and regulations by developers and residents.
5. **Issuing local ordinances on safety of communities.** Local ordinances establishing measures for communities to stay away from disaster risk areas and adopt prescribed safety measures should be issued and strictly enforced.
6. **Providing appropriate engineering interventions or structural measures.** Physical structures/infrastructures like dams, levees, flood control and drainage, river bank and road bank stabilization structures (e.g., rip raps) should be constructed and properly maintained.
7. **Developing and building climate change resilient architecture designs** such as green buildings and water-proofed housing, and using climate change resistant construction materials in vulnerable areas.

5.5.1. Problems /Issues /Concerns

- ❖ Water quality of rivers, streams and other water bodies in the municipality is fast deteriorating with the increasing number of industries and the current practice of non-separation of sewage and storm drainage plus the absence of a sewerage treatment plant;
- ❖ Water intake of water-related/water-dependent industries contribute to dependency to groundwater extraction resulting to the presence of cones of depression;
- ❖ Quality of water from local water district and Tabe RWSA;
- ❖ Pre-disposed to contribute negatively to air quality of Guiguinto and nearby towns are the manufacturing establishments, poultry and livestock farms, as well as the ongoing development and construction activities, not to mention the vehicles transiting in the municipality;
- ❖ The non-operational MRFs in Tiaong and Malis and the use of the Ilang-ilang MRF as “open dump”;
- ❖ Hospitals and funeral parlours wastes need to be disposed of properly and so not to get mixed in general/household wastes;

GOAL	OBJECTIVES	STRATEGIES
Clean and safe environment DRR-able and climate change-ready communities	Compliance to environment and related laws and regulations	Crafting of IRR for the Municipal Environment Code
	Ecologically-sound disposal system	IEC and implementation of RA 9003 Reactivation Local SWM Board Promotion of Waste Minimization Program Review of waste characterization study Preparation of 10-year SWM Plan Construction of additional MRF in 10 barangays Transformation of non-bio wastes into construction materials and usable products Quarterly assessment and evaluation of Barangay Waste Management Plan
	Availability of potable drinking water	Monitoring of water-intensive industries
	Water bodies are classified as safe	Implementation of law (RA) requiring barangay to develop surface water as source of potable water Monitoring of wastewater (effluents) and influents of industries & establishments
	Zero complaints on emissions of industry and commercial establishments	Monitoring of emissions of industries, commercial establishments, development / construction activities Promotion of Greening and Beautification Program Regulate emissions from pollutant sources Formulate and enforce vehicle anti-idling ordinance
	Noise reduction	Implementation of national laws and regulations & municipal and barangay ordinances
	Strengthening institutional capacity by improving risk reduction management	Preparation of DRRM Plan Improvement of disaster preparedness measures Preparation of Local Climate Change Action Plan Improvement of climate change adaptation measures Develop and implement post disaster epidemic outbreak management and disease surveillance

Chapter VI – Institutional Machinery

Municipality of Guiguinto has placed various institutional mechanisms including the Quality Management System and various information systems to address the identified needs, institutionalize the identified strategies, and efficiently manage the municipal resources.

6.1. Quality Management System

The Municipal Government of Guiguinto has established the Quality Management System covering all the departments and their respective areas of responsibilities and mandates as required by the Philippine laws and in accordance with the ISO 9001:2015 requirements.

6.1.1. Documented Information

The Quality Management System follows a three-level documentation structure shown in the next figure. The topmost level presents the Quality Manual describing the general policies of the organization while meeting and addressing the applicable requirements of ISO 9001:2015.

Level II on the other hand represents the Quality Management System Procedures and Work Instructions describing the processes that are carried out and maintained under specified conditions including the details of the documented information/procedure that are part of the Quality Management System and dependent on the complexity of the process, methods, training and competency of the personnel involved in the implementation of the procedures & other documented information. This level of documentation includes the procedures of all departments that describe the processes that are being carried out to ensure proper controls of the Quality Management System including the required trainings and competency of the personnel involved in the implementation of the procedures and other documented information. Both Levels I and II documentations are approved by the Municipal Mayor.

Level III documentation involves all objective evidences proving the conduct and existence of activities or processes that have already been done or complied with.

Figure 9 – QMS Documentation Structure



cases of problems in the execution of the services this shall be handled in accordance with Corrective Action Procedure.

Meanwhile, the Quality Manual has also included various processes particularly of engineering in nature to ensure compliance to existing rules and regulations. Engineering may or may not participate on the specifics of the design inputs. If the project is LGU controlled project, Engineering and or the concerned department shall clarify the project description and Engineering will establish the Program of Works to clarify the scope, materials needed including the responsibilities of the LGU. Engineering will determine if the project will be done by admin or by subcontractors. All inputs & controls of design will partially be provided by Engineering in accordance with the Building Code of the Philippines and standard design of the Implementing agency. Design review and validation shall be the responsibility of the implementing agency. Engineering will just monitor the defined duration of the project. In cases of the LGU controlled project Engineering will determine whether the project will be managed by admin for simple repair and the controls will be in accordance with the existing infrastructure specifications, Otherwise, the project will be outsourced. Engineering will just define the terms of reference and monitor the progress of the project. For the projects under subcontractor the terms of reference shall be defined by the LGU or the standard TOR of the implementing agency.

6.1.3. Quality Policy

The Municipality of Guiguinto is committed to good governance in order to make our locality a livable place and contribute to sustainable and inclusive national development by becoming the ***“Garden Capital of the Philippines”***. We shall provide our constituents and stakeholders with services characterized by transparency, accountability, and efficiency through effective implementation of our Quality Management System compliant with the requirements of the standard, as well as with relevant statutory and regulatory requirements.

This Quality Policy shall be communicated and understood by the employees, and it shall be pursued by adopting the following principles:

1. Maintain an effective and efficient organization staffed with experienced and qualified department heads and personnel;
2. Provide all the resources needed and ensure IT-enabled and systematic services to ensure that the needs and expectations of our constituents and stakeholders are complied with;
3. Promote people’s participation in the governance and administration of our Municipality;
4. Conduct audits to measure the actual service performance against standards, enabling the identification and rectification of the weakness of the QMS; and

5. Implement a framework for the establishment and review of quality objectives, thus ensuring stability and continual improvement of the Municipality's Governance & Administration.

6.1.4. Risk Analysis

Every procedure, service, and product available in the Municipality of Guiguinto undergo risk analysis at least twice a year. After identification of internal and external issues in various focus areas, the concerned departments and implementing units are required to measure or at least estimate the actual risk or effects of these issues if not addressed. Effects of weaknesses and threats are evaluated in terms of likelihood and severity. Significant risks identified will have to require the necessary risk treatments or action plans.

6.1.5. Monitoring and Evaluation

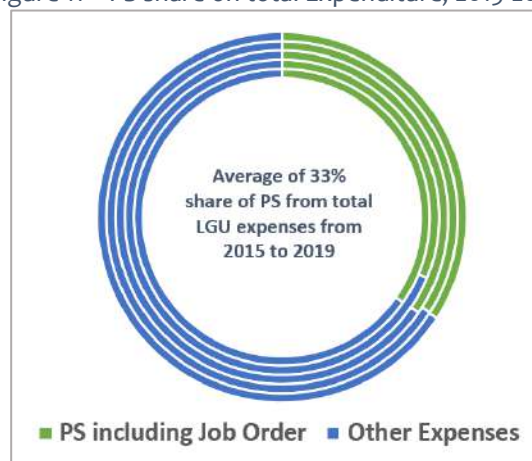
All institutional machineries, the required outputs, impacts of strategies, and feedbacks are monitored and evaluated using the QMS Monitoring, Measurement, Analysis and Evaluation Corrective Action Procedure. The Municipal Government of Guiguinto employs a monitoring system that measures and verifies that the quality service requirements of Good Governance are met and are carried out under controlled condition during all stages of service realization process. All departments ensure that the services offered are monitored in accordance with specified procedures.

As results of monitoring and evaluation, all nonconforming services or procedures are addressed in three ways; (1) by taking action to eliminate the detected nonconformity, (2) by taking action to preclude its original intended execution process of the service, and (3) by taking action appropriate to the effects, or potential effects, of the nonconformity after the service has been delivered.

6.2. Financial Management

Two of the basic indicators in the assessment of financial sustainability of an LGU include the IRA Dependency and the share of the personal services in the total expenditure. Performance of the Municipality of Guiguinto in these two indicator show that in the past several years, a big majority (two-thirds) of the total expenditure of the Municipal Government are capital outlays and maintenance and other operating expenses. These figures may be directly translated in to actual services provided to the people and investments on major projects initiated and implemented for the benefit of the people. Figure below shows that only 33 percent of the total annual expenditures of are spent on the salaries and wages of all employees regardless of employment status.

Figure 11 – PS share on total Expenditure, 2015-2019



IRA Dependency rates in the past few year also show the efficiency of local tax collection strategies and efforts of the Local Government to improve its local sources.

Table 76 – IRA Dependency, 2015-2019

YEAR	ACTUAL COLLECTION LOCAL SOURCES	COLLECTION EXTERNAL SOURCES	IRA	TOTAL INCOME	IRA DEPENDENCY
2015	155,843,105.80	11,223,209.51	133,978,500.00	301,044,815.31	45%
2016	176,767,748.21	10,368,918.79	147,846,384.00	334,983,051.00	44%
2017	205,896,639.12	2,217,103.51	169,764,396.00	377,878,138.63	45%
2018	234,226,594.34	2,754,527.48	182,210,274.00	419,191,395.82	43%
2019	293,739,875.53	799,182.45	200,753,464.00	495,292,521.98	41%

With the introduction of the Public Financial Management Assessment Tool or PFMAT devised and implemented by the Department of Budget and Management, the Municipality of Guiguinto has been able to evaluate its performance vis-à-vis all identified aspects of financial management. The PFMAT measures seven critical dimensions using 20 indicators. These indicators include policy-based budgeting; comprehensiveness and transparency; credibility of the budget; predictability and control in budget execution; accounting, recording, and reporting; internal and external audit; and citizen's participation.

Latest available evaluation results show that Guiguinto performs quite well at an average of 3.36 where 4.0 is the perfect score. The Municipality of Guiguinto just needs to maintain its efficiency in both comprehensiveness and transparency and citizens' participations. On the other hand, a lot may still be done to improve policy-based budgeting and internal and external audit procedures. Meanwhile, a little more improvement may be applied to current financial management practices to get perfect scores in the areas of accounting, recording and reporting; credibility, predictability and control in the budget. Table below shows the summary of the evaluation results derived from 2019 PFMAT.

Table 77 – Public Financial Management Assessment Tool
Critical Dimension and Guiguinto Rating in 2019

Critical Dimensions	No. of Indicators	2019 Rating
Policy-based budgeting	4	2.58
Comprehensiveness and Transparency	2	4.00
Credibility of the Budget	2	3.67
Predictability and Control in Budget Execution	6	3.64
Accounting, Recording and Reporting	2	3.75
Internal and External Audit	2	2.00
Citizens' Participation	2	4.00
Total Indicators/Average Rating	20	3.38

6.2.1. Policy-based Budgeting

The assessment on Policy-based budgeting looks into the multi-year perspective in fiscal planning and budgeting, financial management improvement policies, orderliness of activities on budget preparation, and financial self-reliance of local economic enterprises. The assessment results show that the Municipality of Guiguinto has been able to link the Provincial Development and Physical Framework Plan with both the Comprehensive Development Plan and the Local Development Investment Program. Its annual slice, the Annual Investment Program, has also proven to be in line with the priority development programs identified in the long term plans of both the Municipality and the Province. It has also been the practice of the Municipal Government to ensure that only those included in the investment programs will be given appropriations in the Annual Budget. The set budget calendars have been effective as the approval of Annual Budget in the previous years were within the prescribed period identified by the Department of Budget and Management.

6.2.2. Comprehensiveness, Transparency, and Credibility of the Budget

Both transparency and credibility of the budget and the process during its preparation have been established in the Municipality of Guiguinto. Assessment from 2016 to 2018 budget preparation shows that all budget information contained in the Appropriation Ordinance covering the Annual Budget includes all the required supporting documents such as budget expenditure and sources of financing, annual investment program, and personnel schedule among others. Posting of various reports in compliance with the Full Disclosure Policy required by the DILG through Memorandum Circular No. 2010-83 has been consistently implemented in the Municipality of Guiguinto.

Estimates on budget prepared have also been credible given that the total actual revenue collections were 90% to 100% of the total estimated local revenues. Similarly, the actual expenditures have been 90% to 100% of the total appropriations. These indicators show the ability of the Municipality of Guiguinto to realize its budget estimates and ensure that the programs, project, and activities given appropriations were implemented.

6.2.3. Budget Execution, Accounting, and Reporting

In the past three years (2016 to 2018), there have been no adverse Commission on Audit findings on both the quality and timeliness of the regular financial reports and annual financial statements of the Municipality of Guiguinto. The same public financial management assessment tool also show that 100 percent of bank reconciliation for general funds take place every month within five working days from receipt of bank statements. However, the Municipality of Guiguinto may improve further by ensuring that 100 percent of cash advances are reconciled and liquidated within the prescribed deadline for liquidation.

Real property collection has been assessed to be performing just as well. There have been 90% to 100% Real Property Accomplishment Rate from 2016 to 2018.

6.3. Management Information Systems

The Municipality of Guiguinto currently has 17 Information Systems available to provide ease in the delivery of basic services. A big majority (12 out of 17) of these information systems are developed by the in-house MIS Office while the rest are provided by other partner government agencies or third party developer. A big majority of these systems are also implemented while the rest are still in the trial stage. The table below shows the details of the said systems.

Table 78 – IT Systems Available and Used in the Municipal Government, as of 2019

IT Systems	Status of Implementation	Developer
Business Permit and Licensing System (BPLS)	Implemented	PCM Business Solutions, Co.
Electronic Business Permit and Licensing System (e-BPLS)	Developed but Not-Implemented	Provided by DICT
Electronic New Government Accounting System (e-NGAS)	Implemented	Provided by COA
Engineering Information System	Implemented	In-house
Guiguinto Market Place (https://ecommerce.guiguinto.gov.ph/)	Implemented	In-house
Guiguinto Municipal Website (https://www.guiguinto.gov.ph/)	Implemented	In-house
Human Resource Information System (HRIS) v1.2	Developed but Not-Implemented	In-house
Integrated Hospital Operations and Management Information System (iHOMIS)	Implemented	Provided by DOH
MCR Rental for Municipal Cemetery System	Implemented	In-house
MIS Machine Inventory System	Developed but Not-Implemented	In-house
MIS Ticketing System	Developed but Not-Implemented	In-house
MSWD Information System	Implemented	In-house
Municipal Civil Registrar Death Records	Implemented	In-house
Queuing System of Municipal Treasurer's Office	Implemented	In-house
Real Property Tax Information System (RPTIS)	Implemented	Provided by Provincial
RHU Sanitary Permit and Health Card System	Implemented	In-house
Zoning Information System	Developed but Not-Implemented	In-house

6.4. Human Resources

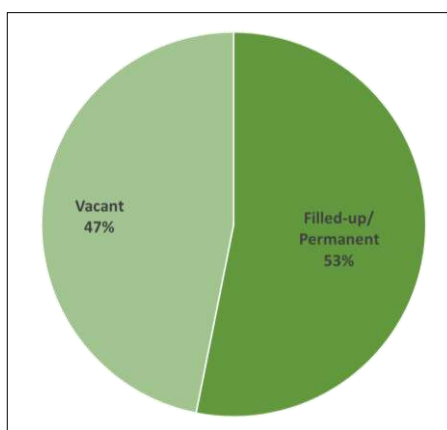
By the end of 2019, there were 430 employees in the Municipal Government of Guiguinto. This pool of manpower is composed of elected, professional, managerial, technical, administrative, support, and security personnel. Of the total 430, only 27.4 percent are permanent employees while the remaining are casual, job order, coterminous, and contract of service workers.

Table 79 – Human Resource Employment Status, 2019

LGU Personnel	Coterminous	Permanent	Casual	Job Order	COS	Total
Elected	12	0	0	0	0	12
Professional	1	44	26	10	3	84
Managerial	2	13	0	0	4	19
Technical	1	8	9	2	0	20
Administrative	0	38	67	37	0	142
Support	0	15	24	92	0	131
Security	5	0	6	11	0	22
TOTAL	21	118	132	152	7	430

As mentioned earlier, the Municipal Government has been able to work with the number of employees with PS expenditures falling within the limits set by the Local Government Code and DBM guidelines. This is basically due to not filling-up all the approved plantilla positions. Of the total 239 plantilla positions, only 53% were filled up including the coterminous items.

Figure 12 – Plantilla Positions, 2019
Total = 239



The Municipal Government ensures that employees undergo necessary trainings to maximize their delivery of services. In the past three years (2017 to 2019), at least 164 training programs were attended by a total of 575 employees (some of employees were required to attend more than one training program). These trainings include those required for frontliners, technical and administrative personnel, management team, health and other service- or field-specific personnel. The Municipal Government ensures that employee capabilities are updated at least once every two years. While frequent trainings provided by various national agencies for their local counterparts were attended consistently.

6.5. Local Legislations

Local legislators in the Municipality of Guiguinto are focused on prioritizing legislations in the following areas:

- ❖ Promotion of good local governance
- ❖ Building Resilient LGUs
- ❖ Building Safe and Secure Communities
- ❖ Drug-Free LGUs
- ❖ Local Economic Development
- ❖ Health
- ❖ Governance
- ❖ eGovernance

6.6. Development Needs

The Municipal Government of Guiguinto may improve its institutional mechanism in the following aspects:

- ❖ Legislative Development
- ❖ Strengthening of Local Economic Enterprises
- ❖ Establishment of Internal Audit
- ❖ Review of Organizational Structure and Staffing Pattern
- ❖ Digitization of Permanent Records
- ❖ Availability of IT Systems and Web-based applications and services

The risks posed by the spread of infectious diseases has opened both limitations and opportunities to public services. The ease of access, convenience, and reduction of exposure to health risks all require the availability of various products and services, including those provided by government agencies, through online and other electronic platforms. The Municipal Government of Guiguinto may further improve its services by allowing its usual tax collections, transactions, and other services thru the web or mobile applications.

Goals:

Active and Functional Councils and Committees
Computerized Systems and Processes
Competent and Efficient Personnel
Improved and Well-Maintained Facilities
Financial Sustainability

Objectives	Strategies
To ensure convention of councils and committees quarterly/twice a year	<ul style="list-style-type: none"> ✓ Calendar of activities reflecting necessary committee and council meetings ✓ Issuance of EO reactivating the pertinent councils and committees ✓ Conduct of review/orientation on the functions, duties, and responsibilities of the council/committee and its members
To automate all possible systems/procedures by the end of planning period	<ul style="list-style-type: none"> ✓ Selection of third party program developer for IT system development ✓ Adoption of Resolution allowing the LCE to enter MOA

Goals: Active and Functional Councils and Committees Computerized Systems and Processes Competent and Efficient Personnel Improved and Well-Maintained Facilities Financial Sustainability	
Objectives	Strategies
<ul style="list-style-type: none"> ✓ Human Resource Information System ✓ e-Budget ✓ Inventory Management System ✓ Legislative Tracking System ✓ Others 	<ul style="list-style-type: none"> ✓ MOA with third party program developers ✓ Trainings on proper use/management of IT systems
To ensure that all employees are trained every two years	<ul style="list-style-type: none"> ✓ Annual Review and Evaluation of Training Requirements ✓ Coordination with NGAs, NGOs, and other institutions providing assistance/trainings ✓ Conduct of trainings/seminars identified in the Consolidated Individual Development Plan
To decrease IRA dependency	<ul style="list-style-type: none"> ✓ Conduct of tax mapping for businesses and real properties ✓ Issuance of notice to delinquent taxpayers ✓ Inventory and Inspection of lots owned by the Municipal Government ✓ Purchase of service vehicle required in field s ✓ Updating of Revenue Code ✓ Resolution authorizing the LCE to enter MOA with Lessee
To ensure structural soundness of government facilities	<ul style="list-style-type: none"> ✓ Conduct of Infrastructure Audit Tool at least once a year, or every after occurrence of disaster ✓ Conduct of preventive maintenance of government facilities
To ensure compliance of government facilities to Accessibility Law	<ul style="list-style-type: none"> ✓ Construction/improvement of ramps, toilets, and other government facilities
To standardize all identified procedures and processes	<ul style="list-style-type: none"> ✓ Conduct of biannual internal audit ✓ Issuance of CAR ✓ Undergo annual external audit ✓ Conduct ISO relevant trainings



Part II

COMPREHENSIVE LAND USE PLAN

Comprehensive Land Use Plan 2019-2027

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Chapter VII - Land Use Planning of Guiguinto

7.1. Rationale

Republic Act 7160, otherwise known as the Local Government Code of 1991, provides that *Local Government Units (LGUs)* shall continue to prepare their respective comprehensive land use plans enacted through zoning ordinances which shall be the primary and dominant bases for the future use of land resources. Accordingly, the code provides the share with national government the responsibility in the management and maintenance of ecological balance in its territorial jurisdiction (*Section 2a, 15 and 3i*). Further, as directed by the Constitution ...” to regulate the acquisition, ownership, use, and disposition of property...” (*Art XIII, Sec 1*), the Municipality of Guiguinto has updated its comprehensive land use plan.

The comprehensive land use plan of Guiguinto shall guide the town in realizing the physical development it aspires for the next nine years. It shall give directions in the rational and judicious approach of allocating available land resources to different land use activities including agriculture, residential, industrial and other functions consistent with the overall development vision/goal of the town.

The Comprehensive Land Use Plan (2019-2027) of the Municipality of Guiguinto is a product of various planning approaches such as analysis of the planning environment relative to the demographic condition of the town, critical issues of different sectors, and the analysis of the existing condition and the future demand of the physical environment. Furthermore, it includes review of the local and national policies and conduct of a wide range of consultations/deliberation and workshops with multi-stakeholders. One of the most significant initiative and demonstration of public participation led by Hon. Ambrosio C. Cruz, Jr. is the conduct of consultative workshops with all the stakeholders encompassing all the sectors in the society. Based on the findings, and learning from the planning approaches, techniques employed and consultations, the most preferred development option of the Municipality of Guiguinto for the planning period is commercial and industrial development considering a multi-nodal structure plan focusing on transport-oriented development strategy.

From the preferred spatial strategy, the plan introduces growth nodes and sub-centers for future socio-economic development. The spatial strategy will boost the commercial and industrial potential of the town being its major economic activity with interventions to support the development of its agricultural sector. The strategy would also lead the development of new areas for commercial and tourism economy geared at making Guiguinto as the “Garden Capital” of the country. For future land use, policy recommendations are made for each of the land use policy areas of settlement, production, open space areas, and infrastructure areas in consideration of the disaster risk reduction and climate change adaptation strategies. And this will serve as a framework or long-term guide for the physical development of Guiguinto for the next nine years. Consequently, the CLUP will be enacted into a zoning ordinance (*RA 7160, Sec. 20c*) to become a statutory plan whose provisions are not merely indicative but are legally enforceable. However, the zoning ordinance will be more detailed on the delineation of each policy area.

7.2. Vision Statement

The Comprehensive Land Use Plan of the Municipality of Guiguinto is anchored on its Vision defined and detailed through a highly participative process involving various sectors and stakeholders. This defined and focused development direction has become Guiguinto's roadmap to greater responsiveness and efficacy of its programs and projects.

VISION STATEMENT:

“The Garden Capital of the Philippines serving as the business gateway to the North, providing a diversified economy, well-planned and safe environment to its empowered citizenry managed by responsive and transparent government with the guidance of the Almighty”

7.3. Vision-Reality Gap Analysis

To evaluate the gap between the new vision of the Municipality of Guiguinto and its current state, the Current Reality Rating Scale (CRRS) was utilized. The CRRS is a quantitative tool used for a precise vision-reality gap analysis using the various vision descriptors, indicators, data and information available in the Municipality.

Using the scale from 1 to 10, where 10 means the vision element has been completely attained, the Municipality of Guiguinto scores indicate that “the goal is half accomplished” at the average score of 5.4.

On a sectoral approach, institutional or local governance sector got the highest average score of 6.0 while the environmental sector got the lowest score of 3.6. Other limitations observed in this analysis include the lack of updated data and information particularly in the economic and infrastructure sectors.

7.3.1. Guiguinto as the Garden Capital of the Philippines

To realize the vision on being the Garden Capital of the Philippines, the garden industry in the country must be established first. Because the lack of benchmark might prevent the municipality to make it become recognized in this industry. This sector got an average score of 3.5 because of the lack of data establishing that the said goal has already been accomplished.

7.3.2. Social Services Personnel and Facilities

The social sector got an average score of 5.7 despite having high scores in various indicators because of the insufficient of social services facilities and lack of adequate social services personnel who keep the Municipality peaceful and orderly and who make sure social services are appropriately given to the people.

7.3.3. The Need for Economic Programs

Programs in economic development and support to employment must be developed and prioritized to make sure that the people of the Municipality of Guiguinto are not left behind by the advancement of the people in the neighboring city and municipalities. The economic sector got a low average score of 5.57 because of the lack of adequate and concrete support to the culture based and creative industry of the Municipality. Lack of relevant labor data also

contributes to lowering the score of this section, which therefore must be given attention by the Public Employment Service Office (PESO).

7.3.4. Solid Waste Practices and Management

The increase in solid waste generation is tied with the increasing population and minimizing the first one is very challenging. This appears to be the main reason that the environment sector got the lowest score in this vision-reality-gap analysis. The challenges in promoting ecologically-sound waste disposal and management is matched with the lack of Materials Recovery Facilities in each barangay.

7.3.5. Inaccessibility of Public Documents and Information and Lack of Information Systems

The lack of official website of the Municipality of Guiguinto hinders its people to fully access relevant information in one click. On the other hand, the Municipal Government has also been limiting itself in offering its services to the public using advance information systems. While utilization of various information systems is proven to make processes faster and more efficient, the Municipal Government of Guiguinto is not yet fully investing in this venture. This one aspect of governance.

7.3.6. Road and Traffic Management

Due to its location where three national roads namely Cagayan Valley Road, Manila North Road (McArthur Highway), and North Luzon Expressway, adjoin, the Municipality of Guiguinto frequently experiences road repairs and rehabilitation. This condition has been continuously interrupting various socio-economic activities and has become one of the relevant concerns of the citizens. While national road improvements are inevitable, the local government has started to prioritize innovations on how to manage roads and traffic more efficiently. However, the initiatives still have long way to go having an average score of 4.2 during the Vision-Reality Gap Analysis.

7.3.7. Ecologically-Balanced Development

The Municipality is also facing the challenge of an ecologically-balanced development. The use of open spaces for productive uses has to be promoted and the industrialization must be limited to the extent allowed by the existing laws, guidelines, and procedures. The investments keep on coming towards this strategically-located Municipality, the local government still has to ensure that food sufficiency through sustainable agriculture production is maintained.

Table 1 - Current Reality Rating Scale

Rating	Interpretation
0	Absolutely nothing has been done about the goal
1	
2	Something is already being done to achieve the goal but the level of attainment is still on the low side
3	
4	
5	The goal is half accomplished
6	
7	
8	Goal is more than half-fulfilled but still short of full attainment
9	

10	The goal is completely attained
N	No data Available

Table 2 - Vision-Reality Gap Rating

Vision Element/ Descriptor	Success Indicators	Available Data	Rating	Average
Social Sector Overall Goal: Improve access to quality basic social services				5.72
Safe	Adequate police officers	41 police officers, short of 66 policemen to fulfill 1:1,000 standard ratio	4	4.4
	Well-appointed courts	Municipal Trial Court present	8	
	Well-maintained jails and detention cells	Over populated, Small PNP-maintained detention cells	4	
	Facilities to prevent drug abuse available	On-going construction of BahayPagbabago	2	
	Rehabilitation centers for vagrants, beggars, juvenile delinquents, and victims of drug abuse in place	Proposal re: construction of GuintongPag-asa& budget available	2	
	Legal assistance to CICL / VAWC	Municipal Legal office/unit provides consultation services 2016-6 2017-11 2018-16	5	
	Sports promotion and development consistently pursued	23 government-owned Sports complex/playing courts	6	
	Decreasing crime rate	The municipality is generally peaceful according to the Provincial Socio-Economic Profile, Crime rate is decreasing	8	
	All ISF, families living in danger zones are provided with socialized housing	Less than 10% of housing units are available for relocation	1	
	Upgrading to Level I Hospital Services	Level I hospital services available but still requires upgrading	4	
	Reduction in poverty incidence		N	
Empowered Citizenry (healthy, educated, skilled)Re	Child mortality rate	2017=1.47 2018=1.62 2019	6	6.60
	Maternal mortality rate	No instances since 2015	8	
	No incidence of malnutrition	2016=1.16 2017=0.69 2018=0.55 (to include data from schools)	8	

Vision Element/ Descriptor	Success Indicators	Available Data	Rating	Average
	Health center in every barangay	13 BHS 2 RHU	8	
	Widest possible coverage of level III water supply	2017= LEVEL 3 2018=LEVEL 3	8	
	100% of HH with access to sanitary facilities	2015 CBMS (97%)	9	
	Technical / vocational schools established	ATEC, Global alliance technological institute Corp. , TESDA	8	
	Facilities to rehabilitate the mentally ill and drug users available	No existing facility	0	
	Physical fitness exercises well attended	Regular Zumba in every barangay	8	
	Presence of primary schools in all barangays	All barangays except Panginay has primary schools	7	
	All OSY and dropouts are enrolled in ALS	Dropouts 2016=3.22% 2017=3.42 2018=2.07	N	
	100% Enrollment Rate (primary and secondary)		N	
	100% Completion Rate (primary and secondary)		N	
	Fertility rate	2016= 0.23 2017=0.22 2018= 0.20	6	
	Health insurance coverage for all	4P's 1,384 SC 8,200 NHTS=2279	6	
	No users/pushers of dangerous drugs	4 barangays are declared/identified as drug free	3	
	Low incidence of mental illness		6	
	Public awareness of safe sex at a high level	WAD=Dec School Awareness =8 Candle lighting= May Community assembly= 10	8	

Vision Element/ Descriptor	Success Indicators	Available Data	Rating	Average
Environmental Sector Overall Goals: 1. Clean and safe environment 2. DRR-ready and climate-change resilient communities				3.64
Safe	Exclusive use of organic fertilizers and pesticides	2 MRF Produced Organic Fertilizer	3	3.92
	Minimized waste generation	(Diversion) 88.9% - 60%	7	
	Use of ecologically-sound waste disposal practices	SWM Scheme/4 MRF Hazardous	4	
	Disaster responsive	Available Rescue Equipment -Water Search & Rescue – 70% -High Angle Rescue – 50% -Extrication – 50%	7	
	Regulated use of biotechnology		2	
	Technology research and dissemination program for the use of indigenous resources and the reuse of recovered waste materials consistently pursued	GuintongLikha	7	
	Clean air monitoring and enforcement effective	No machine for monitoring	0	
		Clean air enforcement	4	
	Acceptable waste management systems (liquid and solid) in place	Not existing	0	
		Solid waste management Scheme was established	6	
	Tree parks and green belts in abundance	Not existing	0	
	Built up surfaces not completely impervious		7	
	Acceptable ratio of built form to open space	*No target goal	N	
Infrastructure Overall Goal: A well-maintained and adequate infrastructure facilities				5.62
Safe	Urban expansion directed towards areas with least environmental constraints		6	4.22
	Decreasing Road Accidents	MDRRMO	5	

Vision Element/ Descriptor	Success Indicators	Available Data	Rating	Average
	Proportion of roads in good condition	Xx% of local roads (69 km roads) paved/concreted/asphalted	7	
	Construction of New Roads	3.6 km funded	2	
	Rehabilitation/Improvement of Existing Roads		4	
	Presence of street signage/ Pedestrian sidewalks/crossings or traffic signals provided in busy streets	Street signages require updating/improvement/maintenance	4	
	Well-lighted streets	550m of 8km road are well-lit	3	
	Fire station and fire-fighting equipment in every municipality	3 Fire Trucks (1 serviceable)	3	
	Flood control and drainage structures functional	Existing drainage requires maintenance Ongoing revetment Phase I of III Centralized Drainage Plan is accomplished Dredging projects ongoing	4	
	Eliminate traffic in the identified five traffic zones		N	
Business Gateway to the North	Presence of linkages to various parts of North Luzon	All major roads are passable but some require repair and improvement	7	6.67
	Availability of Public Transport Services to North and South	7 routes to NCR/South	7	
		11 routes to North Luzon	7	
	Adequate infrastructure support for production activities	90% irrigated	8	
	- Irrigation systems		8	
	- Farm to market roads		6	
	- Commercial/industrial zones		8	
	- Agricultural supply stores			
	Adequate infrastructure support for distribution/consumption	No public market	2	
	- Grain drying		7	
	- Agricultural product processing plants		5	
	- Public markets			

Vision Element/ Descriptor	Success Indicators	Available Data	Rating	Average
	Modern communication systems in place	Operations of Command Center	7	
	Banks and other financial institutions available	10 Banks	8	
Economic Sector and Outward Looking Component Overall Goals: <ol style="list-style-type: none"> 1. Sustainable agricultural production to the remaining productive area of Guiguinto 2. Sustain economic growth of local industries 3. Increase income and employment 4. Be Recognized as the Garden Capital of the Philippines 				5.57
Diversified Economy	Availability of non-farm jobs	<ul style="list-style-type: none"> • Mfg-5384 • Trading- 3507 • Services-5626 	7	7.00
	Proportion and income from native/ agricultural product manufacturing and trading	Farmer 17,250/ planting season Gardener 12,000/monthly	7	
	Total no. of registered business	Target 2019: 2750 registeres business establishments As of May 2019 - 2046	7	
	Increase in number of MSMEs and their gross receipts		N	
	Increase number of active cooperatives, membership, and capitalization		N	
	Increasing Productivity of Palay Production (5MT per hectare)	4.79 MT per hectare	N	
Garden Capital of the Philippines	Proportion of garden industry of Guiguinto with the rest of the Philippines.	none	0	3.50
	Proportion of local industry devoted to gardening/landscaping	30 hectres	4	
	Employment generated by garden industry	1,661 families	6	
	Increase in the number of registered gardeners		N	
	Increased in the number of gross receipt		N	
	Increase in the number of production		N	

Vision Element/ Descriptor	Success Indicators	Available Data	Rating	Average
	area			
	Tourist arrival	12,724 as of 1 st quarter of 2019	4	
Empowered Citizenry (employed, economically independent)	Support facilities for informal businesses and small enterprises provided	<ul style="list-style-type: none"> • Training and seminars total – 563 • Creation of Negosyo Center • Barangay Micro Business Enterprises membership for 10 employees below • Information dissemination from different business group 	4	6.14
	Opportunities for self-employment assured	PNB 374 Target 600 / 5group a month	6	
	Investment information and job placement services available	14,517 employed 2046 company	7	
	Proportion of skilled labor force	11,010 from MFG and trading	7	
	Labor force participation rate	66,046 LF / 108,980 total population x 100 = 55.51%	7	
	Availability of research and development programs for new products and processes	<ul style="list-style-type: none"> • ATEC • Global Alliance • TESDA 	5	
	Linkages between academe and industry established	<ul style="list-style-type: none"> • 6 academe • 2046 company 	7	
Institutional/ Local Government Overall Goal:				6.00
Responsive	Competent and professional local officials and personnel	57% of employees (professional, admin, technical, security, etc.) are trained	5	7.09
	Performance in delivery of service	Governance Assessment Report indicates two measures requiring improvement	8	
	Presence of response mechanisms/grievance committee addressing complaints (with proper proceedings)	Grievance committee existing but requires reactivation and documentation	2	
	Presence of Committee on Decorum and Investigation (CODI) on sexual harassment	Not existing	0	
	Availability of response mechanism	Response mechanism available	8	

Vision Element/ Descriptor	Success Indicators	Available Data	Rating	Average
	No report of government personnel brutality or abuse against constituents	No cases on police brutality reported/recorded in PLEB	8	
	Institutional ability to respond to disasters	Operation/command center and ICS established	7	
	IRA Dependency	Decreasing in the past 3 years	7	
Responsive	Increase in Assessed value of real properties	2018 = 9B	N	
	Standardized procedures	QMS in place	8	
	Institutional Facilities are existing and well maintained	Existing but requires improvement	7	
	Computerization of processes	IT systems area available in various services	5	
Transparent	Availability and accessibility of public documents/ reports	Documents are available upon request at the Municipal Government offices, Official website is not updated/does not contain all information open to public	7	6.50
	Bulletin/billboards in public places	Bulletin/billboards are present in institutional facilities only	6	
Total Indicators Average Rating	With data = 85 indicators Without data/not available ATM = 13 Total No. of Success Indicators = 98	Average of indicators with data	5.4	

7.4. Existing Land Use and Land Use trends

7.4.1. General Land Uses

The Municipality of Guiguinto is predominantly agricultural. The biggest part of its lands are still classified as agriculture. Over the years, however, local development has continued to introduce rapid changes in the land use. The introduction of new economic ventures, social and political influences, availability of opportunities and infrastructure developments has triggered the conversion of some of the agriculture lands into residential, business or commercial sites, and most especially industrial sites. Likewise, population growth has its share in the continuous modification of the municipal land use.

Vast agricultural areas of Guiguinto are still found on the northern side of the North Luzon Expressway. However, commercialization and industrialization is beginning to flourish around north eastern part of the municipality due to the recently established Plaridel Bypass Road. On the other hand, the Malolos-Meycauayan Growth Corridor, or the area traversed by the Manila North Road, is where urbanization in Guiguinto is rapidly taking place. This also covers the area on both sides of the Cagayan Valley Road. Commercial and industrial businesses are concentrated on these parts of Guiguinto. Reinforced by several residential subdivisions, the urban core of Guiguinto is represented by barangays Poblacion, Tuktukan, Malis, Ilang-Ilang, Tabang, Sta Cruz, and Sta. Rita. Other barangays outside the urban core occupy the rest of the area, which is mostly agricultural. It must be noted, however, that within these barangays, there are clusters of residential areas; hence, they form part of built-up areas. The Guiguinto River and its tributaries also occupy a considerable area.

7.4.2. Built-Environment

This consists of approximately 1,455.20 hectares or 65.51% of the municipality's total land area. It includes the densely populated urban barangays and the clusters of residential subdivisions and road networks within the town. The identification of built-up areas is based on the existence of socio-economic activities and presence of infrastructure support facilities in a territory.

Historically, the existing built-up and urban form of the Municipality of Guiguinto can be attributed by the way our Spanish conquistadores plan and constructed the first structures and roads in the town. It is a common practice during the Spanish era to build the government seat near the church. This will serve as the town's center wherein settlements are later developed outward. Such type of urban planning is evident in the Municipality of Guiguinto and many towns in the country.

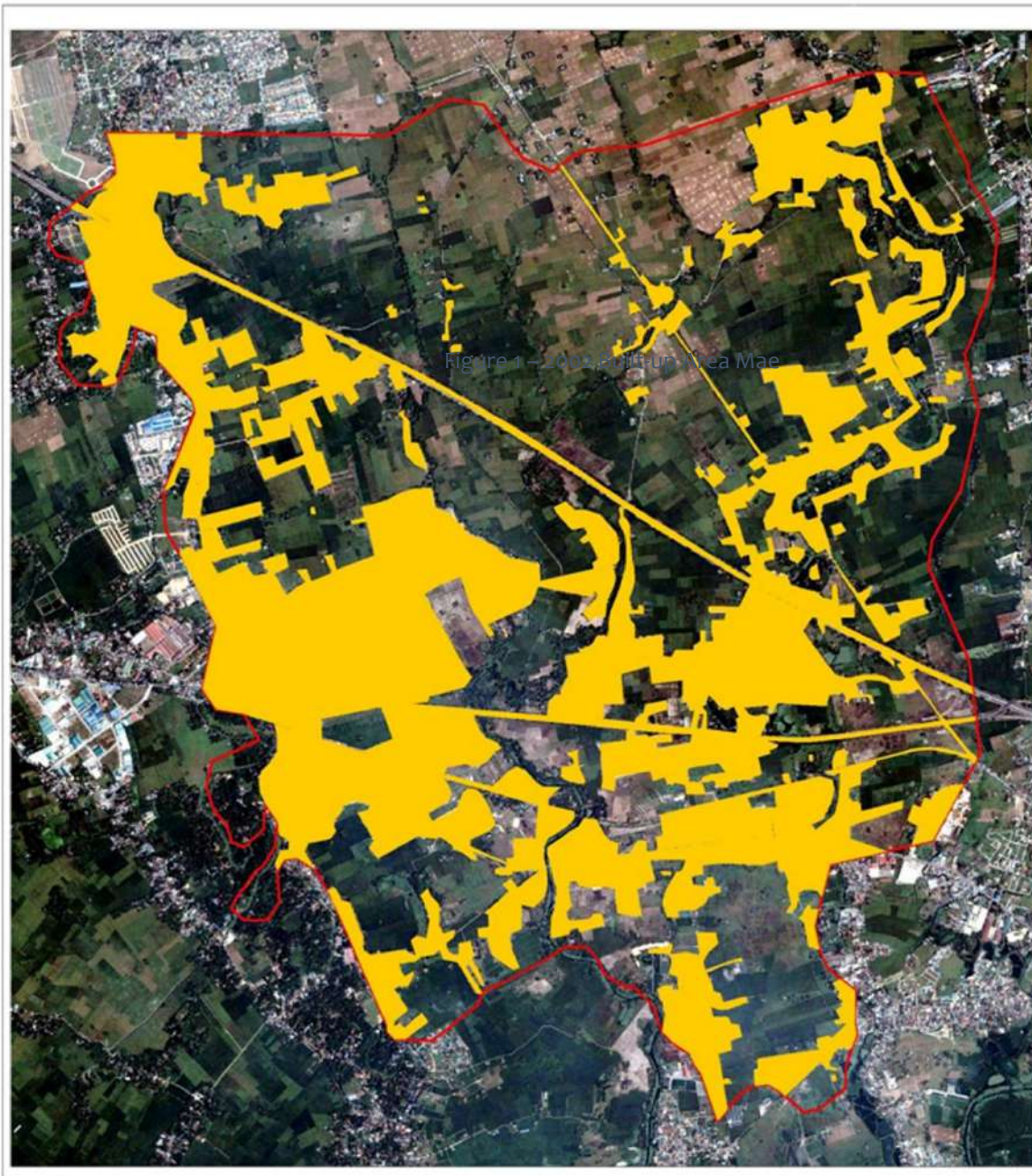
Along this, residential subdivisions in various categories have found their place in Guiguinto. From socialized housing communities to high-end type of residential subdivisions, Guiguinto continue to attract real estate developments because of the ideal environment the municipality has to offer. Considering the town's small area, there are residential subdivisions with more than 20 hectares of land each and housing developments are continuously occupying the grounds of Guiguinto. These include Sta. Clara Estates in barangay Sta. Rita and Pritil, La Aldea Residences in barangay Ilang-Ilang, and Rockavilla Subdivision.

Commercial and industrial businesses also form a major part of the built-environment of Guiguinto. In fact, this industry is the primary source of income in the municipality. It occupies about 26.89% the built-up area in Guiguinto. For the past decade, Guiguinto continues to experience commercialization and industrialization as a result of the municipality's drive towards economic growth and prosperity. Commercial areas are commonly thriving along the major road networks such as Puregold and Walter Mart. Industrial areas, on the other hand, are dispersed in various barangays. The largest industrial business venture in Guiguinto, the RIS industrial subdivision, is found in barangay Malis with an area covering more than 40 hectares. Also, large industries can be found in barangay Sta. Rita-Pritil and Tiaong, the Bulacan Metro Warehouse and Evergreen with an area of 12 hectares and 10 hectares respectively. These commercial and industrial businesses, which are continuously expanding, are regarded to be included among the major contributors for the continuous expansion of the built-environment in Guiguinto.

For the past 15 years, the Municipality of Guiguinto has markedly experienced urbanization pressure that brought positive and sometimes undesirable changes in its landscape. Figure below shows a view of the satellite image of Guiguinto in year 2002 taken from Google Earth. It can be observed that the built-area is distributed throughout the municipality, however, concentration of development is evident along the road networks particularly along the Manila North Road or Mac Arthur Highway and the Old Cagayan Valley Road. This particular type of development is not distinct in Guiguinto but can also be observed throughout the stretch of these primary roads in other areas in the province. Being part of the Malolos-Meycauayan urban growth corridor, development flourished along this area brought about by economic forces under the policy advocacy of the Provincial Physical Framework Plan of Bulacan province. Consequently, urbanization in Guiguinto from the last 15 years is concentrated at Poblacion where the seat of the government is located. Built-up in Poblacion area also covers the adjacent barangays along the path of the primary roads. From here, urbanization starts to spread outward slowly occupying the immediate agricultural areas.

Generally, since road infrastructures usually act as catalyst to urbanization in most of rural communities, the central and northern part of Guiguinto including barangays Malis, Daungan, Cutcut, Pritil, and Pulong Gubat still remains to have agricultural lands. Irrigation system is still present in these areas via the south main canal of NIA. Thus, policies to preserve some areas in these barangays will have to be instituted to protect the interest of many farmers relying heavily in the agricultural sector.

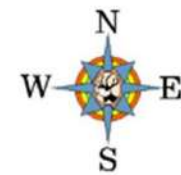
For the past decades, concentration of settlement growth and industries continues to be observed within the Poblacion area and some barangays. With this, communities in other barangays have recorded to increase significantly. The socio-economic activities are observed to grow rapidly. Hence, considering this trend, sub-centers are expected to develop in the future. Following maps show the built-areas as of 2018 and the projected built-up areas at the end of the planning period.



2002 BUILT-UP AREA

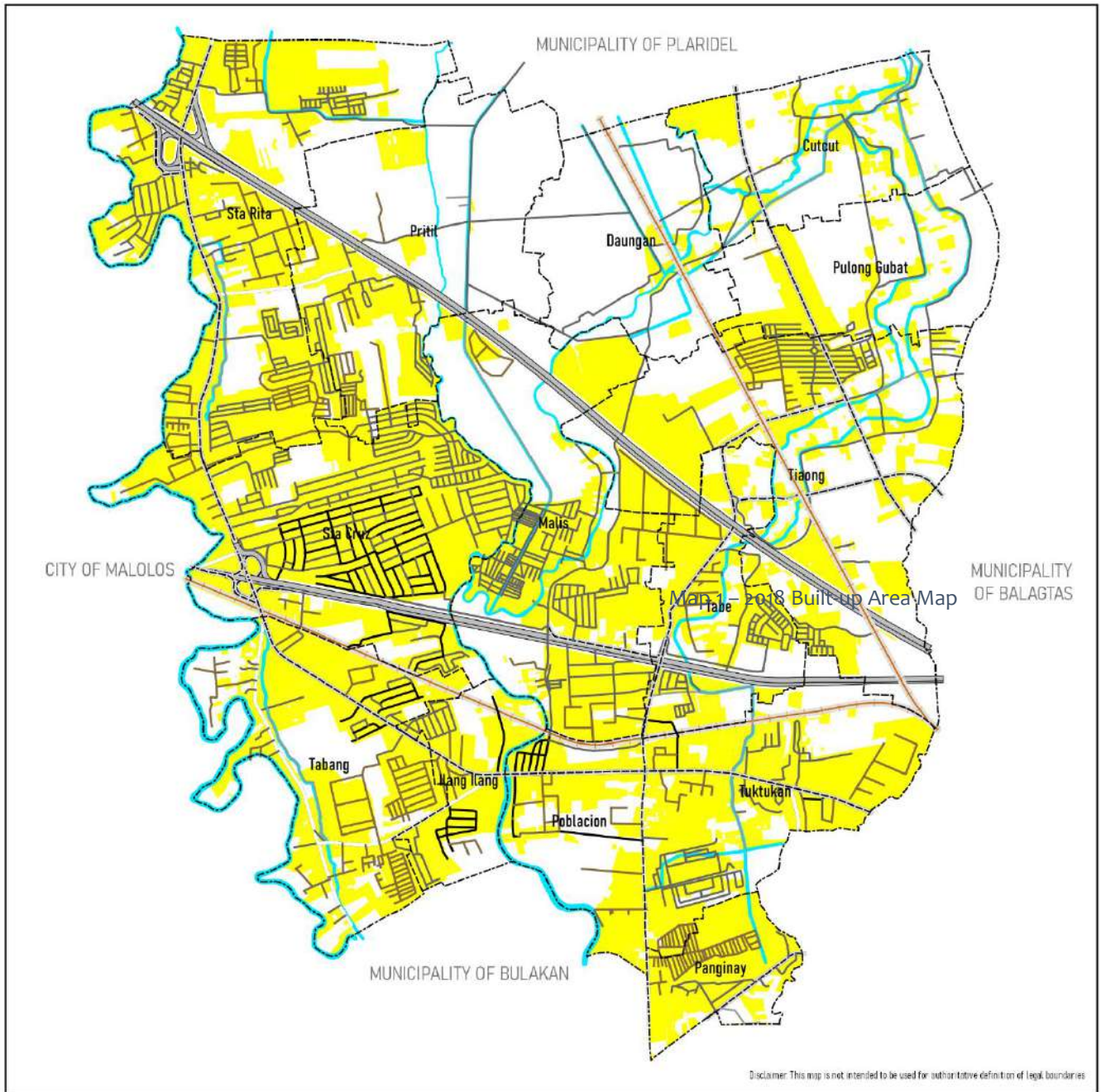
LEGEND

- | | |
|---|-------------------------|
|  | Administrative Boundary |
|  | Built-up Area |



Source:
Google Map

Prepared by:
Municipal Planning and Development Office - Guiguinta
March 2015



Disclaimer: This map is not intended to be used for authoritative definition of legal boundaries



COMPREHENSIVE LAND USE PLAN 2019-2027
2018 BUILT-UP AREA MAP

LEGEND

- Municipal Boundary
- Barangay Boundary
- ===== North Luzon Expressway
- National Road
- Provincial Road
- Municipal Road
- Barangay Road
- NIA Road
- Private Road
- Railroad Right of Way
- Blue River Network/Creeks/Canals
- Yellow Built-up Area



SCALE 1:35,000

Prepared by:

Municipal Planning and Development Office
 Municipal Government of Guiginto

March 2020



COMPREHENSIVE LAND USE PLAN 2019-2027

2027 BUILT-UP AREA MAP

LEGEND

- Municipal Boundary
- Barangay Boundary
- ===== North Luzon Expressway
- National Road
- Provincial Road
- Municipal Road
- Barangay Road
- NIA Road
- Private Road
- Railroad Right of Way
- Blue River Network/Creeks/Canals
- Yellow Built-up Area



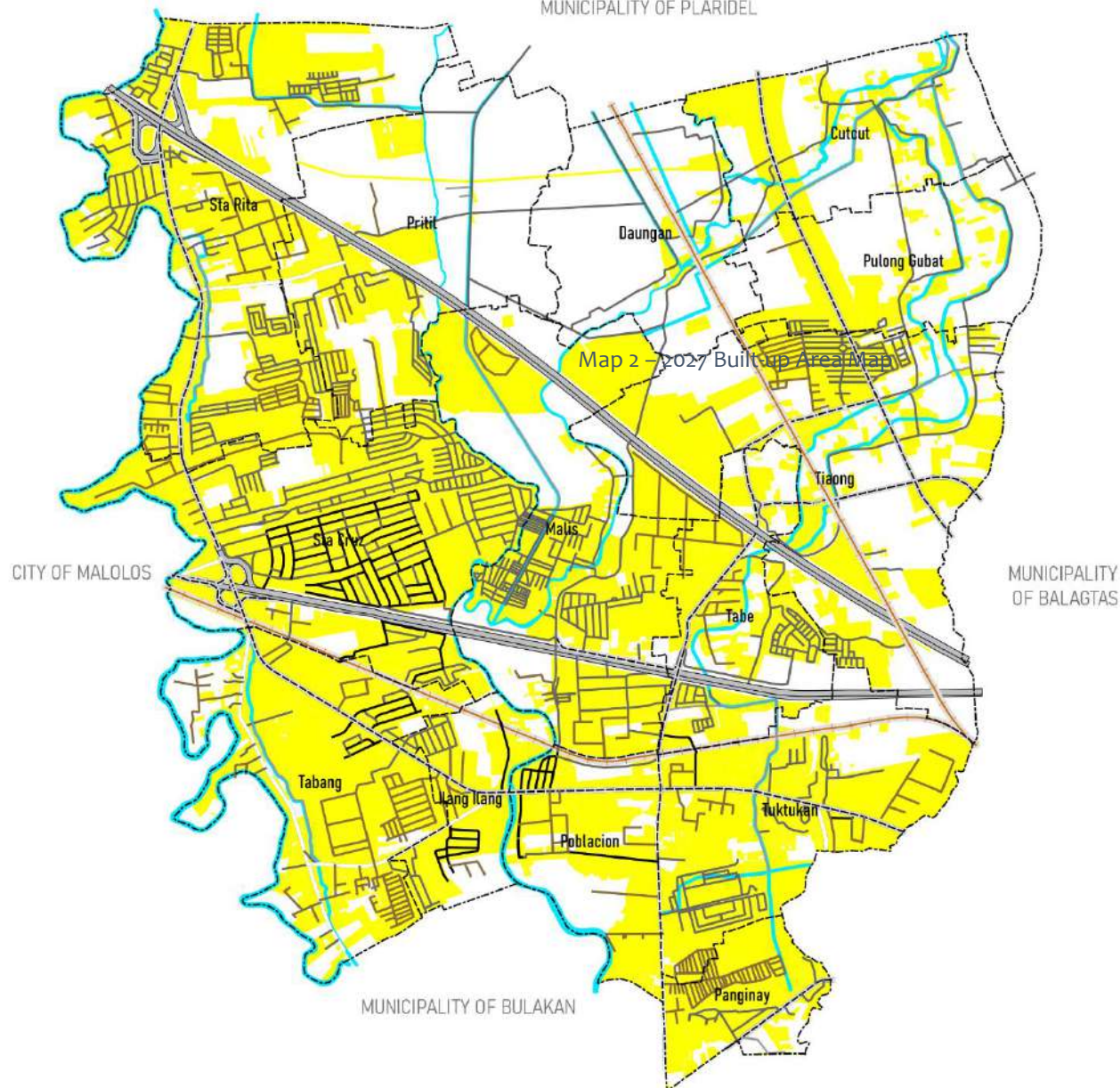
SCALE 1:30,000

Prepared by:

Municipal Planning and Development Office
Municipal Government of Guiguinto

March 2020

MUNICIPALITY OF PLARIDEL



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7.4.3. Agricultural Areas and Irrigation System

Although the primary source of income of the Municipality of Guiguinto does not rely on its agricultural lands, which is about 879 hectares or 39.5% of the town's total land area, agricultural related activities are still thriving in most part of the town particularly in the northern part. Palay and high-value crops including varieties of vegetable production are still present contributing to 1.46% of Bulacan's agricultural production. This was possible because of the presence of the *National Irrigation Administration's (NIA)* irrigation laterals traversing various parts of Guiguinto. At present, more than 26% of the agricultural lands belongs to prime lands or key production areas that require protection. As one of the primary thrusts of the local government, this plan shall delineate certain areas in the municipality as protected area for agriculture. This will guarantee the protection and conservation of the remaining strategically located agricultural lands in the town. It will likewise ensure the town's contribution to the national government's aim towards food security. Most of these lands are irrigated and irrigable that can be found at the northern part of the town mainly on the northbound side of the NLEX covering the barangays of Pritil, Daungan and Cutcut.

Over the years, commercialization and industrialization in Guiguinto has rapidly altered its agricultural landscape, making services and trading the primary contributor of the economic growth of the town. The tracts of land classified under non-productive agricultural areas and open spaces within the built-up area of Guiguinto belongs to idle lands, open grasslands, and the like are ideal places for such use and more importantly for urban expansion. Considerable lands are also currently being utilized for the production of ornamental plants in the built-up area. These industries, considered as agricultural-based activities, have been growing significantly over the past years. Also known as horticulture, it is now fast flourishing in Guiguinto and nearby towns in the province. The demand for this industry is not only widely known locally to Guiguinto and nearby provinces but it is now learned its way to international market. Hence, horticulture in Guiguinto has shaped the town's character as Garden Capital in Bulacan. Fostered by the Municipal Government of Guiguinto's support, the town now declares the month of January of every year as Halamanan Festival as a way of promoting and expanding this industry.

7.4.4. Rivers and Creeks

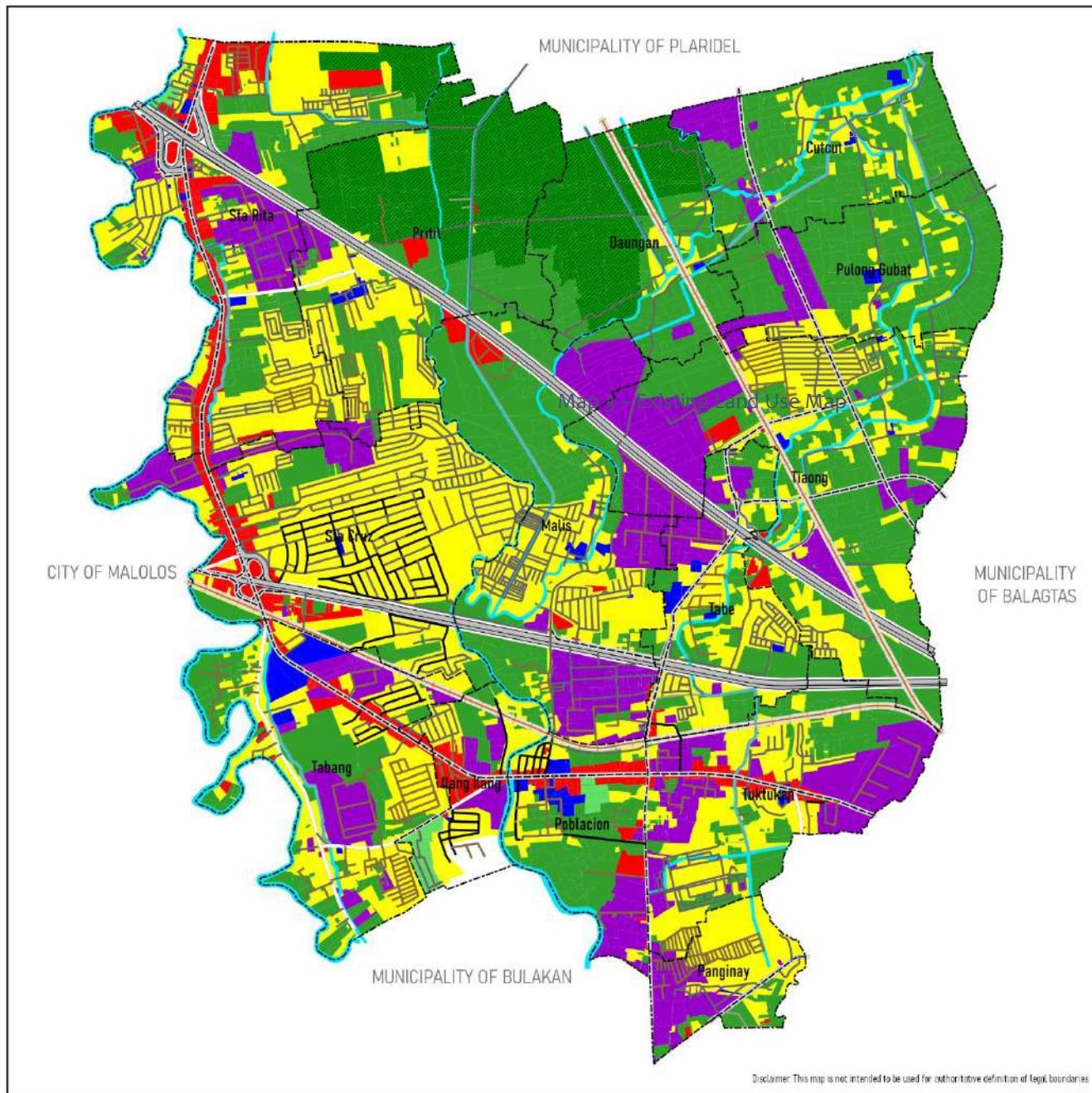
Guiguinto is also blessed with a river system that plays an important role in shaping the town's landscape and socio-economic structure. Contributing to about 1.54% of the total area of the town, Guiguinto River divides the municipality vertically from the north where the river passed through barangays Daungan, Malis, Cutcut, and Pritil down to the south traversing barangays Ilang-ilang and Poblacion.

Historically, Guiguinto River was used by the early inhabitants to ferry goods and transport people. It is during those days that this river is very wide and the water is teeming with various species of fishes. Thus, it was a major source of livelihood to some residents through fishing and by growing "kangkong" used as vegetable.

According to the law, rivers are within the jurisdiction of the national government. However, the devolution of power to the local government units gave them the obligation to take care of these precious resources through co-management.

However, the pressure of urbanization in Poblacion and other barangays have resulted to illegal settlements along the river banks. Illegal structures were built and informal family settlers continue to grow over the past decade.

This plan shall ensure the conservation and protection of the Guiguinto River and its tributaries due to its importance not only to the local residents but also in managing the risks inherent to these natural resource.



Disclaimer: This map is not intended to be used for authoritative definition of legal boundaries



COMPREHENSIVE LAND USE PLAN 2019-2027

EXISTING LAND USE MAP

LEGEND

- Municipal Boundary
- Barangay Boundary
- ===== North Luzon Expressway
- National Road
- Provincial Road
- Municipal Road
- Barangay Road
- NIA Road
- Private Road
- Railroad Right of Way
- ===== River Network/Creeks/Canals
- ===== Protected Agricultural Area
- ===== Production Agricultural Area
- ===== Residential Area
- ===== Commercial Area
- ===== Institutional Area
- ===== Industrial Area
- ===== Cemetery/Memorial Park



SCALE 1:35,000

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Municipal Planning and Development Office
Municipal Government of Guiguinto

March 2020

7.5. Priority Issues and Concerns

Following are the summary of the issues and concerns recognized resulting from the data gathered and likewise observations resulting from going around and/or transiting the municipality.

- ❖ Conversion of agricultural lands into ventures which were deemed more economical than land tilling;
- ❖ Most developments are market-driven and are oriented towards existing or proposed transit/transport links;
- ❖ Continuing attraction to and increasing number of activities in and around the Poblacion area;
- ❖ Illegal settlements and encroachments of river banks are increasing in number;

These priority issues and concerns though may seem few are link with each other and result to other related issues and concerns. These problems ought to be understood well and provided with solutions necessary to enhance the capacity of the municipality for a more ecologically-friendly development.

7.5.1. DRR-CCA Priority Issues and Concerns

This section discusses the priority issues and concerns from the perspective of DRR-CCA. It focuses on two main segments of concerns such as the risk evaluation and the institutional challenges on DRR-CCA implementation. The risk evaluation will determine if the estimated risks are generally acceptable and will turn as one of the basis of land use and development planning. Then the succeeding segment will enumerate the challenges on governance sector in implementing plans and various programs as a response towards risk reduction.

7.5.1.1. Risk Evaluation

The risk assessment methodology and procedures employed in this document were based on the Guidelines on Mainstreaming DRR-CCA into Local Development Planning and Decision Making Processes as well as the Disaster Risk Assessment and Climate Change Vulnerability Assessment Report of the Province of Bulacan. The risk estimates for the Municipality of Guiguinto were done by analyzing the relationships of the factors hazard, exposure, and vulnerability as illustrated in the Risk Triangle. Based on this definition, risk level is contributed by any one of the three factors.

Figure 2 - The Risk Triangle



Source: Adapted from D. Crichton, 1999; Kron 2002

As previously discussed from the Planning Environment Chapter, the Municipality of Guiguinto is exposed to certain types of hydro-meteorological and geologic hazards at various susceptibility levels. This will constitute as composite hazard factor that will determine what are the exposed elements and its existing conditions.

While the hazard and exposure are the most common factors given at every scenario, vulnerability is a concept that links the relationship of the exposed population or properties to the totality of its condition and social situation (*Bankoff, et. al. 2004*). In other words, it should assess how much harm or damage a hazard could inflict on people considering the overall status. One way of doing this is lessening the vulnerability which can be done through better land use planning.

7.5.1.2. Hazard Factor

The following table shows the identified hazards in the municipality with its corresponding defined weight and ratings as suggested from the DRA-CCVA Report of the Province of Bulacan. The composite hazard index carried a weight of 50 percent in assessment of overall risk.

Table 3 - Composite Hazard Index

HAZARD FACTOR (INDEXWT = 0.5)	SCALE CLASSIFICATION	SCALE RATING	WEIGHT
Flooding Hazard	Extent of flooding at various susceptibility levels		
	High Susceptibility	1.0	0.2
	Low - Moderate Susceptibility	0.6	
	Not Susceptible	0.0	
Rain-induced Landslides (RIL)	Extent of RIL hazard - Not Susceptible	0.0	0.1
Storm/Coastal Surge	Not prone to Storm surge	0.0	0.05
Ground Shaking (Earthquake)	Prone to strong ground shaking	1.0	0.2
Ground Rupture	Not Prone	0.0	0.1
Soil Liquefaction	High susceptibility to soil liquefaction	1.0	0.1
Earthquake Induced Landslides	Not susceptible to EIL	0.0	0.1
Tsunami	Prone to Tsunami Inundation	1.0	0.05
	Not Prone	0.0	
Infectious Diseases	Prone to Infectious Diseases	1.0	0.1

The flooding hazard was given a weight of 20 percent weight because as per DRA-CCVA report, it is the most common and frequently recurring hazard in the province. While the ground shaking from geologic hazards were given likewise a 20 percent weight because as though it occurred rarely, it carries a larger factor of fatality and property damages. The rest of hazards are given five to 20 percent share based on the frequency of occurrence.

The following figure is the composite hazard map based on the scale factors and ratings used for risk estimates. The hazard levels were computed as hazard

index from scale rating and corresponding weight and were represented in five categories based on the defined range such as 0.0-0.2 Very Low Hazard Index; 0.2-0.4 – Low; 0.4-0.6 – Moderate; 0.6-0.8 – High; 0.8-1.0 – Very High Hazard Index.



COMPREHENSIVE LAND USE PLAN 2019-2027
COMPOSITE HAZARD MAP

LEGEND

- Municipal Boundary
- Barangay Boundary
- ===== North Luzon Expressway
- National Road
- Provincial Road
- Municipal Road
- Barangay Road
- NIA Road
- Railroad Right of Way
- Blue line River Network/Creeks/Canals
- Very Low
- Low
- Moderate
- High
- Very High



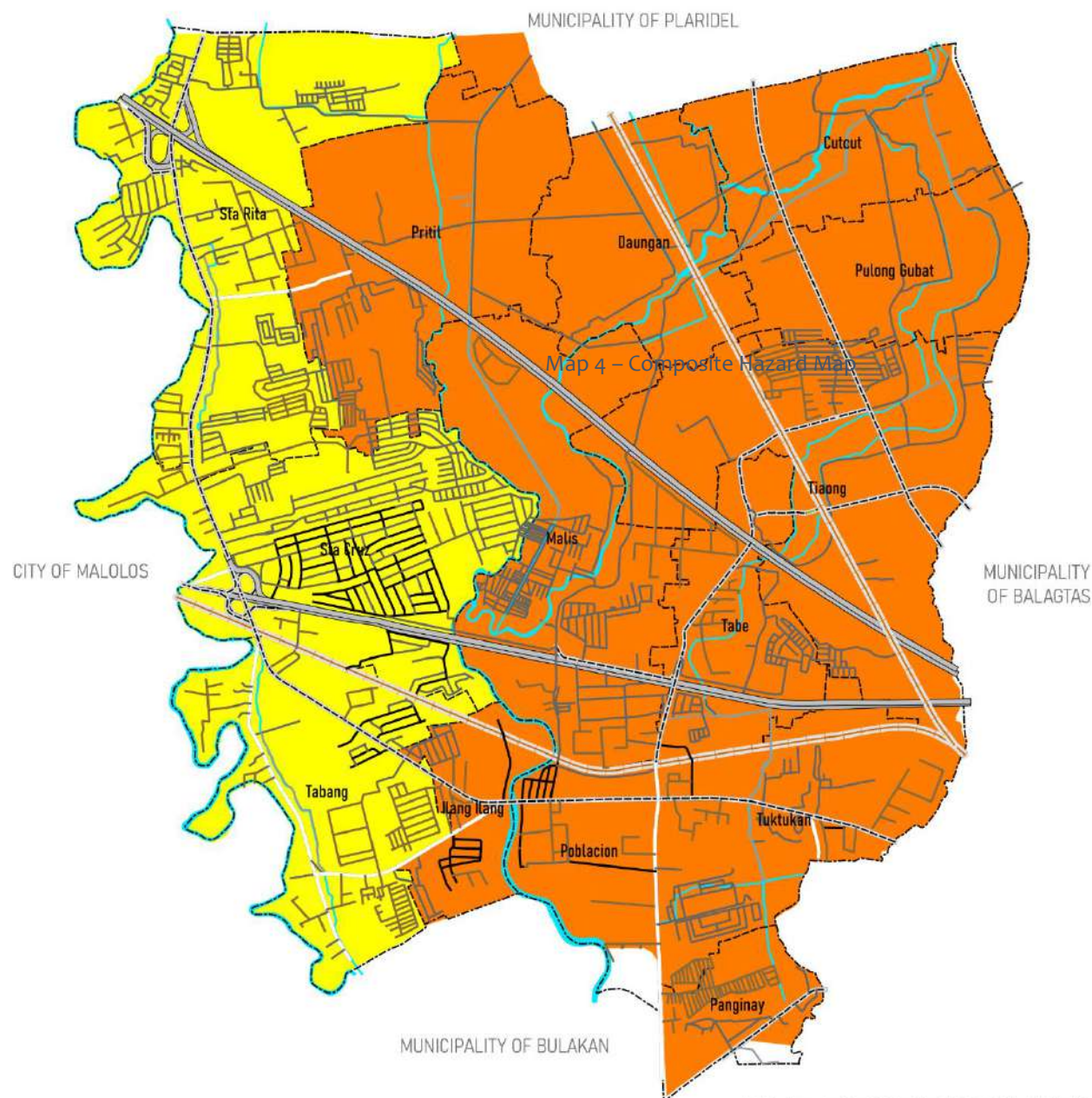
500 0 500 1000 m

SCALE 1:35,000

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Municipal Government of Guiginto

March 2020



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Based on the result of overlaying all the hazard maps with its corresponding weight, the composite hazard index for the Municipality of Guiguinto was generated. While most parts of the locality determined to be between low to moderate hazard level index, there are portions where the hazard index are high such. The following table illustrates the generated area of hazard index per barangay.

Table 4 - Hazard Index per Barangay

BARANGAY	LAND AREA COVERED (IN SQ.KM.) PER HAZARD INDEX LEVEL				
	VERY LOW (0.0 - 0.2)	LOW (0.2 - 0.4)	MODERATE (0.4 - 0.6)	HIGH (0.6 - 0.8)	VERY HIGH (0.8 - 1.0)
Cutcut	0.00	0.52	0.71	0.00	0.00
Daungan	0.00	0.21	1.10	0.00	0.00
Ilang-Ilang	0.00	0.00	0.42	0.18	0.00
Malis	0.00	0.19	1.50	0.58	0.00
Panginay	0.00	0.00	0.00	0.53	0.00
Poblacion	0.00	0.00	0.03	0.82	0.00
Pritil	0.00	0.93	0.00	0.00	0.00
Pulong Gubat	0.00	0.65	0.52	0.00	0.00
Sta. Cruz	0.00	0.60	1.30	0.25	0.00
Sta. Rita	0.00	1.90	0.77	0.02	0.00
Tabang	0.00	0.00	1.50	0.25	0.00
Tabe	0.00	0.31	0.26	0.51	0.00
Tiaong	0.00	1.50	1.10	0.20	0.00
Tuktukan	0.00	0.00	0.00	1.60	0.00

* Please note that all are geometry are GIS-derived.

The table shows that there is a high hazard index for the most parts of the barangays of Tuktukan, Poblacion, Malis, Panginay, and Tabe while there are no areas determined to be in extremes of very low or very high hazard level index.

7.5.1.3. Exposure Level

The exposure index utilized the three common indicators such as population, land use properties and road network. The population will be presented as density per barangay on built-area with a given weight of 60 percent while the agricultural areas and roads with 20 percent each.

The following table shows the identified indicators for exposure factors with corresponding scale rating and weight. The composite hazard index carried a weight of 25 percent in assessment of overall risk.

Table 5 - Composite Hazard Index

EXPOSURE INDICATOR (INDEXWEIGHT = 0.25)	SCALE CLASSIFICATION	EXPOSURE RATING	WEIGHT
Population on built-up area based on existing land use	2015 Population density based on 2015 Census and barangay built-up area		
	>6,000 Person/Sq. Km.	1.0 (Very High)	0.6
	4,000-6,000 Person/Sq. Km.	0.8 (High)	
	2,000-4,000 Person/Sq. Km.	0.6 (Moderate)	
	500-2,000 Person/Sq. Km.	0.4 (Low)	
	<500 Person/Sq. Km.	0.2 (Very Low)	
Agricultural Area/Open Spaces based on existing land use	Percentage of agricultural area per alienable and disposable barangay land area		
	>80%	1.0 (Very High)	0.2
	>60%-80%	0.8 (High)	
	>40%-60%	0.6 (Moderate)	
	>20%-40%	0.4 (Low)	
	<20%	0.2 (Very Low)	
Lifelines – Road Network	Percentage of road area per alienable and disposable barangay land area		
	>16%	1.0 (Very High)	0.2
	>12%-16%	0.8 (High)	
	>8%-12%	0.6 (Moderate)	
	>4%-8%	0.4 (Low)	
	<0-4%	0.2 (Very Low)	

Most of the weight percentage were assigned to population because of its significance and priority over other exposed elements. The open areas and roads, though not of equal importance compared to population, likewise influences the risk factor when it is exposed to a certain hazard. There are other elements that can be added here as exposure indicators but these three indicator is sufficient to determine the exposure index.

The following figure is the exposure index map based on the scale factors and ratings used for risk estimates.



COMPREHENSIVE LAND USE PLAN 2019-2027

EXPOSURE INDEX MAP

LEGEND

- Municipal Boundary
- Barangay Boundary
- ===== North Luzon Expressway
- National Road
- Provincial Road
- Municipal Road
- Barangay Road
- NIA Road
- Railroad Right of Way
- Blue Line River Network/Creeks/Canals
- Very Low
- Low
- Moderate
- High
- Very High



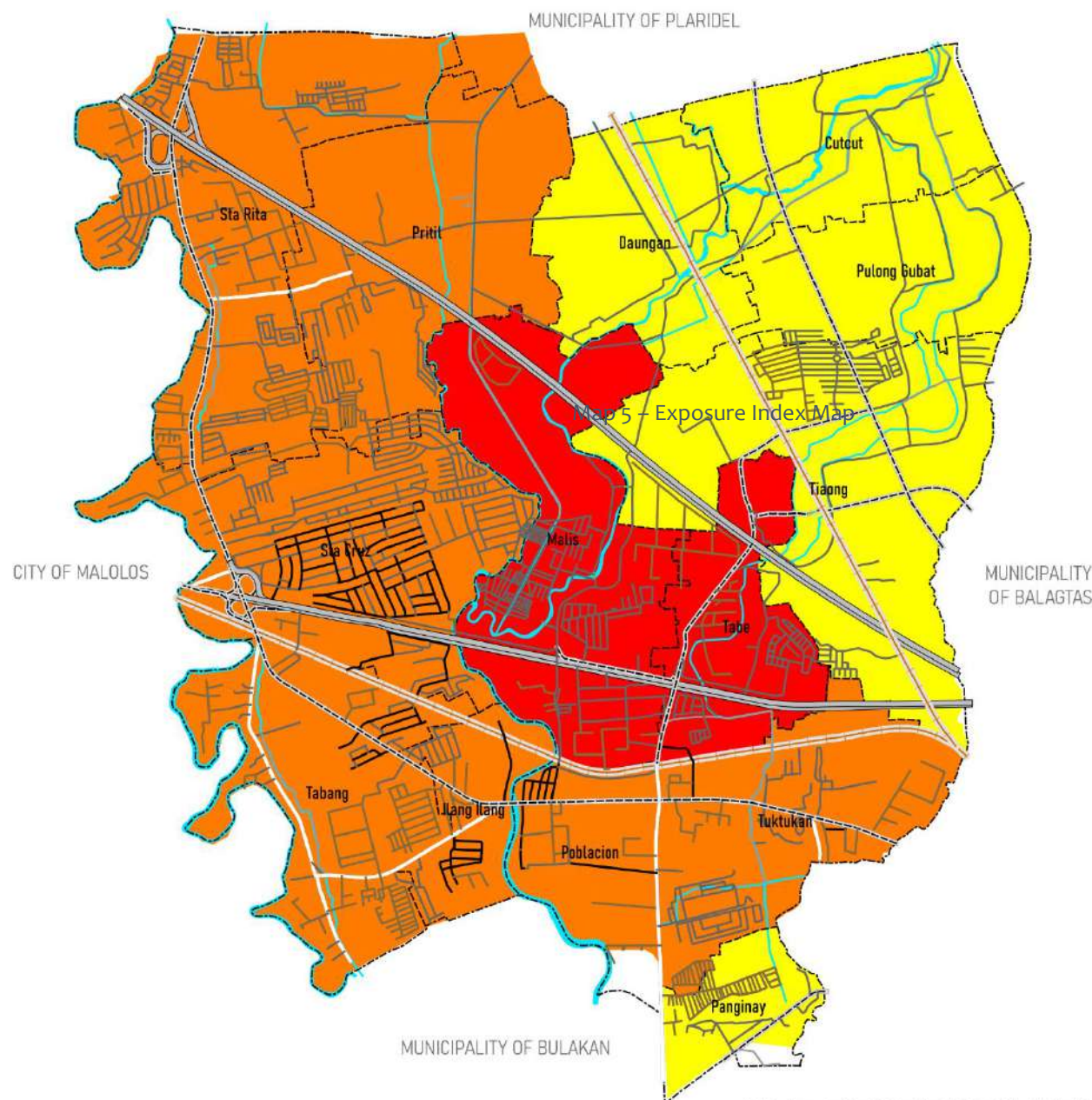
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Prepared by:

Municipal Planning and Development Office
Municipal Government of Guiguinto

March 2020



Disclaimer: This map is not intended to be used for authoritative definition of legal boundaries

From the overlaying of defined indicators, the exposure index map illustrates the level of exposure for the Municipality of Guiguinto. This map is presented based on the exposure rating and does not factor-in the weight percentage of each expose elements.

7.5.1.4. Vulnerability Level

The following table shows the identified indicators for vulnerability factors with corresponding scale rating and weight. The vulnerability index carried a weight of 25 percent in assessment of overall risk. Indicators used in this assessment includes the poverty threshold, makeshift housing, unemployment, and barangay urbanity classification.

Table 6 - Vulnerability Index

VULNERABILITY INDICATORS (INDEXWEIGHT = 0.25)	SCALE CLASSIFICATION	VULNERABILITY RATING	WEIGHT
Proportion of Population below Poverty Threshold	Population below Poverty Threshold based on CBMS 2015 results		
	>40%	1.0 (<i>Very High</i>)	0.5
	>30%-40%	0.8 (<i>High</i>)	
	>20%-30%	0.6 (<i>Moderate</i>)	
	>10%-20%	0.4 (<i>Low</i>)	
	<10%	0.2 (<i>Very Low</i>)	
Proportion of Households Living in makeshift Housing	Based on CBMS 2015 results		
	>10%	1.0 (<i>Very High</i>)	0.2
	>6%-10%	0.8 (<i>High</i>)	
	>3%-6%	0.6 (<i>Moderate</i>)	
	>1%-3%	0.4 (<i>Low</i>)	
	<1%	0.2 (<i>Very Low</i>)	
Proportion of Unemployed Member of Labor Force	Based on CBMS 2015 results		
	>10%	1.0 (<i>Very High</i>)	0.2
	>6%-10%	0.8 (<i>High</i>)	
	>3%-6%	0.6 (<i>Moderate</i>)	
	>1%-3%	0.4 (<i>Low</i>)	
	<1%	0.2 (<i>Very Low</i>)	
Barangay Urbanity Classification	Urban or Rural Barangay Classification		
	Rural Barangay	0.8 High	0.1
	Urban Barangay	0.4 Low	

The Municipal and City Level Small Area Poverty Estimates in 2015 data show that the Municipality of Guiguinto has poverty incidence of 5.7 percent. This

report on the other hand utilized the poverty incidence generated using the *Community Based Management System (CBMS)* 2015 where data are disaggregated by barangay. Other results from CBMS 2015 such as proportion of household with makeshift housing and unemployment rates were also used as indicators of vulnerability level.

The Province of Bulacan being among the top 10 provinces with highest Human Development Index is also a good indicator of that Guiguinto is a resilient locality when referring to vulnerability level. The following figure is the vulnerability index map based on the scale factors and ratings used for risk estimates. The following table is the summary of computed estimates for vulnerability index.

Table 7 - Summary of Computed Estimates for Vulnerability Index

BARANGAY	NO. OF HH 2015 CBMS	POPULATION 2015 CENSUS	LABOR FORCE 2015 CBMS	PROPORTION OF HH WITH MAKESHIFT HOUSING	POVERTY INCIDENCE	UNEMPLOYMENT RATE	POVERTY RATING	MAKESHIFT RATING	UN-EMPLOYMENT RATING	URBANITY RATING	VULNERABILITY INDEX
Cutcut	618	2,940	838	0.49	3.07	3.22	0.20	0.20	0.40	0.40	0.26
Daungan	489	1,800	698	-	6.95	5.87	0.20	0.20	0.60	0.40	0.30
Ilang-Ilang	1,105	5,628	1,385	3.26	4.80	7.58	0.20	0.40	0.80	0.40	0.38
Malis	2,639	16,223	3,523	0.30	12.13	3.55	0.40	0.20	0.60	0.40	0.40
Panginay	295	1,528	463	1.36	6.78	8.42	0.20	0.40	0.80	0.40	0.38
Poblacion	719	4,099	970	4.59	3.76	7.22	0.20	0.80	0.80	0.40	0.46
Pritil	1,211	5,172	1,634	2.72	1.49	4.53	0.20	0.40	0.60	0.40	0.34
Pulong Gubat	281	1,879	366	0.36	1.42	5.19	0.20	0.20	0.60	0.40	0.30
Sta. Cruz	2,297	12,216	3,085	1.44	0.52	3.24	0.20	0.40	0.40	0.40	0.30
Sta. Rita	3,101	13,687	3,947	1.29	1.06	4.99	0.20	0.40	0.60	0.40	0.34
Tabang	1,633	8,832	2,144	1.29	0.37	6.58	0.20	0.40	0.80	0.40	0.38
Tabe	1,722	8,310	2,266	1.05	3.14	2.91	0.20	0.40	0.40	0.40	0.30
Tiaong	2,109	7,640	2,680	1.23	5.88	6.60	0.20	0.40	0.80	0.40	0.38
Tuktukan	2,089	9,776	2,467	1.15	2.15	2.47	0.20	0.40	0.40	0.40	0.30



COMPREHENSIVE LAND USE PLAN 2019-2027

VULNERABILITY MAP

LEGEND

- Municipal Boundary
- Barangay Boundary
- ===== North Luzon Expressway
- National Road
- Provincial Road
- Municipal Road
- Barangay Road
- NIA Road
- Railroad Right of Way
- Blue Line River Network/Creeks/Canals
- Very Low
- Low
- Moderate
- High
- Very High



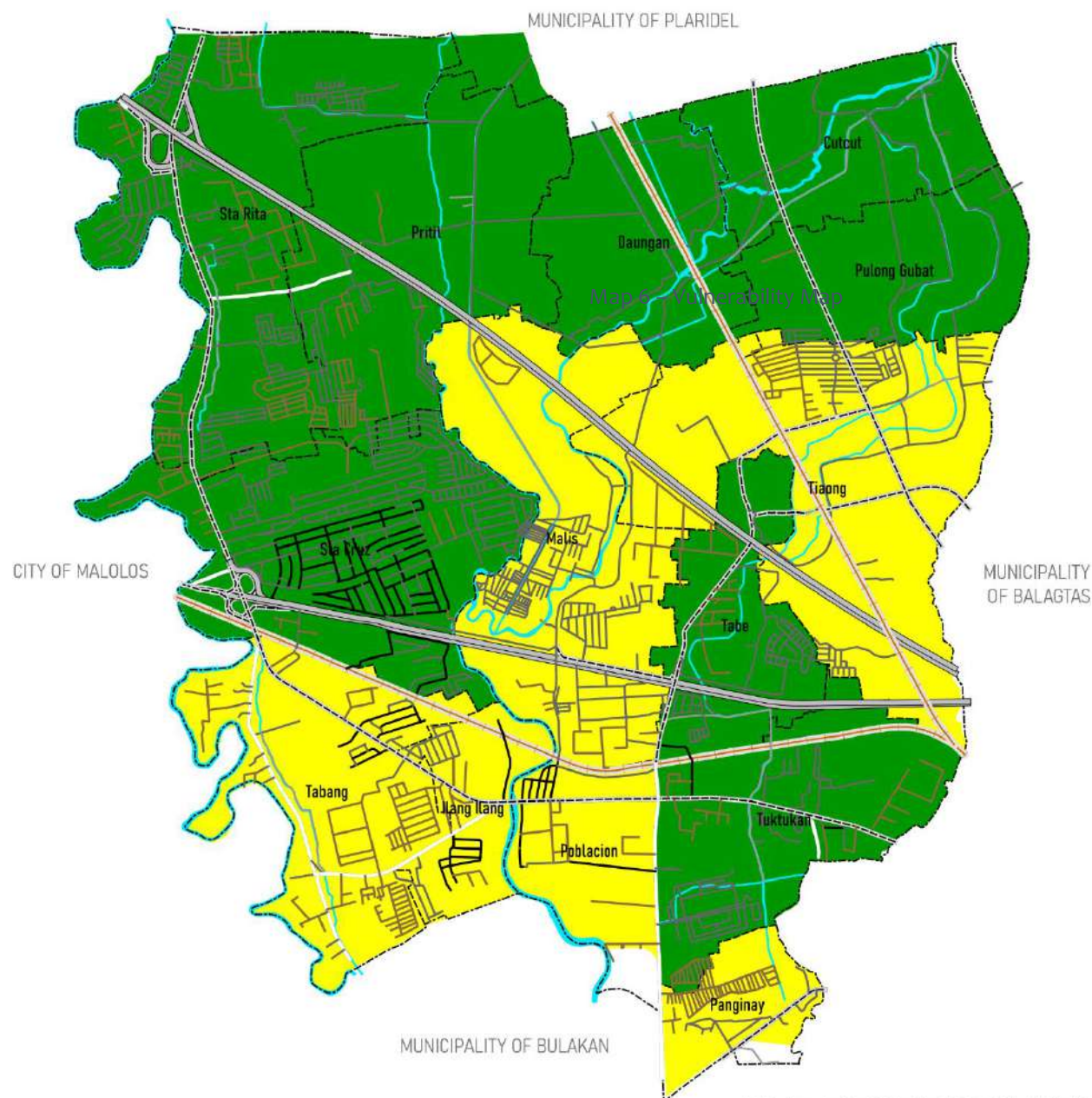
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Municipal Planning and Development Office
Municipal Government of Guiginto

March 2020



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The table shows that most of the barangays in the Municipality are categorized to have low to moderate vulnerability. Barangays classified to have moderate vulnerability are mostly affected by unemployment and proportion of households living in makeshift housing.

7.5.1.5. Risk Estimates

Based on the overlay analysis of composite hazard map, exposure index map, and vulnerability index maps, the following Map shows the resultant risk map for the Municipality of Guiguinto.

Table 8 - Summary of Computed Risk Estimates

BARANGAY	Vulnerability Index		Composite Hazard Index		Exposure Index		Overall Risk	
Cutcut	0.26	Low	0.65	High	0.56	Moderate	0.53	Moderate
Daungan	0.30	Low	0.65	High	0.48	Moderate	0.52	Moderate
Ilang-Ilang	0.38	Moderate	0.65	High	0.80	High	0.62	High
Malis	0.40	Moderate	0.65	High	0.84	Very High	0.64	High
Panginay	0.38	Moderate	0.65	High	0.52	Moderate	0.55	Moderate
Poblacion	0.46	Moderate	0.65	High	0.68	High	0.61	High
Pritil	0.34	Low	0.65	High	0.64	High	0.57	Moderate
Pulong Gubat	0.30	Low	0.65	High	0.48	Moderate	0.52	Moderate
Sta. Cruz	0.30	Low	0.57	Moderate	0.72	High	0.54	Moderate
Sta. Rita	0.34	Low	0.57	Moderate	0.68	High	0.54	Moderate
Tabang	0.38	Moderate	0.57	Moderate	0.64	High	0.54	Moderate
Tabe	0.30	Low	0.65	High	0.88	Very High	0.62	High
Tiaong	0.38	Moderate	0.65	High	0.56	Moderate	0.56	Moderate
Tuktukan	0.30	Low	0.65	High	0.76	High	0.59	Moderate



COMPREHENSIVE LAND USE PLAN 2019-2027

RISK MAP

LEGEND

- Municipal Boundary
- Barangay Boundary
- ===== North Luzon Expressway
- National Road
- Provincial Road
- Municipal Road
- Barangay Road
- NIA Road
- Railroad Right of Way
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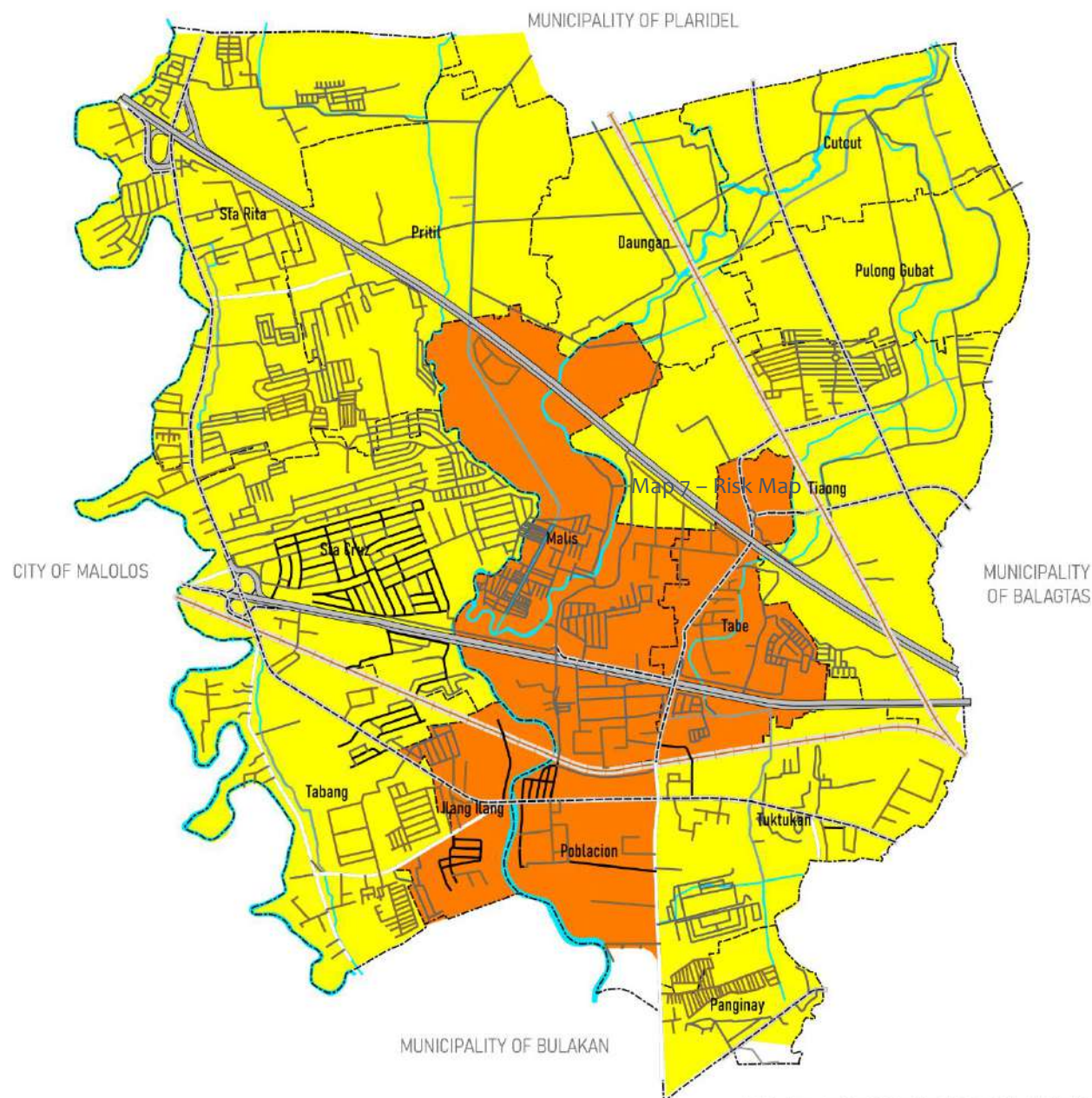
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SCALE 1:35,000

Prepared by:

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The map generally presents that a big majority of the area in the municipality is assessed to be at moderate risk while the rest are assessed to be at high risk. With reference to the results DRA-CCVA report and in the Planning Environment, this risk assessment results are appropriate and parallel, thus it is considered to be accepted. From the risk prioritization results, the Municipality of Guiguinto is not included in the urgent priority when it comes to provincial hazard classification confirming the risk map with only few high risk areas. Likewise, from the overall climate change vulnerability of the Province of Bulacan, Guiguinto is among the municipalities assessed to be moderately vulnerable to climate change impacts which was also proven by this resulting risk map.

Based from the result of assessment, the risk is classified with the scale rating of moderate to high level for the Municipality of Guiguinto. Risk reduction measures and strategies should be undertaken by the government. This may include the reduction or management of exposed elements and lessening its vulnerabilities, though implementing each activities poses a varying level of challenges on institutional aspect.

7.5.2. Institutional Challenges on DRRM/CCA Implementation

Being sensitive of the assessed risks, the institutional capacity plays a vital role in addressing the concerns in *Disaster Risk Reduction Management and Climate Change Adaptation (DRRM/CCA)*. This includes the actions taken and planned efforts on policy formulation, plans, and programs undertaken of being undertaken by the Municipal Government to adapt and prepare for climate change and disaster events. Thus, strengthening the institutional capacity is the best way for risk reduction.

7.5.2.1. Compliance to Legal Mandates

The basic challenge is the compliance to laws and other prevailing legal mandates. The Municipal Government recognizes that the changes in the frequency and intensity of the hazards will result into an increase in severity of disasters. Thus to establish its commitment to DRRM and CCA the Municipality of Guiguinto should take actions in order to comply with the mandates the following laws and regulations:

❖ *International Policies - Hyogo Framework for Action Priorities – United Nations International Strategy for Disaster Reduction (2005-2015)*

The World Conference on Disaster Reduction held in Hyogo, Japan with a theme of “Building the resilience of nations and communities” agreed on five specific priorities for actions.

- Making disaster risk reduction a priority;
- Improving risk information and early warning;
- Building a culture of safety and resilience;
- Reducing the risks in key sectors;
- Strengthening preparedness for response.

❖ *Philippine Disaster Risk Reduction and Management Act of 2010 (RA 10121)*

RA 10121, also known as the Philippine Disaster Risk Reduction and Management Act, was made into a law in 2010, repealing Presidential Decree 1566 of 1978. It provided a paradigm shift from a reactive focus on relief and response to a more proactive approach, giving attention to preparedness, prevention, and mitigation.

The DRRM Act mandates the institutionalization of the DRRM system at the local level through the establishment of a local *DRRM Office (DRRMO)*. It provides for the reorganization of the Disaster Coordinating Councils, now known as the *DRRM Council (DRRMC)*, and further strengthens their functions.

Disaster risk reduction is a national and local priority with strong institutional basis for actions such as the following:

- Identify, assess and monitor disaster risks and enhance early warning
- Knowledge, innovation, education for culture of safety and resilience
- Reduce the underlying risk factors
- Strengthen disaster preparedness for effective response

❖ *Philippine Climate Change Act of 2009 (RA 9729)*

The Climate Change Act of 2009 outlines the policy of the Philippine Government to protect climate systems, build national and local resiliency and implement programs to promote climate change adaptation and mitigation in support of sustainable development.

RA 9729 also mandates local government units to formulate Climate Change Action Plans and build local awareness, knowledge and build capacity for Climate Change Adaption and mitigation.

❖ *Presidential Decree 1566 dated 11 June 1978 "Strengthening the Philippine Disaster Control Capability and Establishing a Community Disaster Preparedness Program Nationwide*

Sec. 1 (d) - responsibility for leadership rests on the Provincial Governor.

Sec. 1 (b) - each political and administrative subdivision of the country shall utilize all available resources in the area before asking for assistance from neighboring entities or higher authority;

❖ *Local Government Code of 1991*

Section 444 par. B (vii) and Sec. 324 (d) amended by RA 8185..." Local Government Units shall adopt measures to protect its inhabitants from harmful effects of man-made or natural calamities and to provide relief services and assistance to victims".

7.5.3. DRRM Challenges

The results of the assessment had identify gaps, weaknesses, and constraints in DRRM and CCA implementation. The method employed the assessment based on the legal mandates under existing DRRM and CCA laws. Based on the institutional assessment of the municipal government on DRRM/CCA implementation, the following challenges has been identified with regards to DRRM.

Table 9 - DRRM Phase & Challenges

DRRM PHASE	CHALLENGES
Prevention	Uncontrolled and informal settlements along high danger zones to hazards. Proper implementation of Zoning Ordinances.
	River buffer zones sometimes being neglected.
	Conversion/reclassification of agricultural lands resulting into drainage problems leading to floods.
	Siltation of rivers proves to be a contributing factor to flooding.
Mitigation	De-silting waterways and slope protection activities. Extent of enforcements of building codes needs to be assessed.
	All projects should go through Environmental Impact Assessment especially the locally funded projects.
	Resilient architecture designs should become standard and part of provisions on building code.
	Formulation of community-based or street level early warning system should be promoted.
Preparedness	Institutionalization of Municipal DRRM office with full time DRRM officer(s)
	DRRM plans though included in the CLUPs and CDP should be properly mainstreamed giving it an emphasis as another development sector.
Response	Incident Command System in place and implemented.
	Mobilization of organizations and volunteers in relief operation.
	<i>Rapid Damage and Needs Analysis (RDANA)</i> should be carried out immediately after disaster event.
	Relief and rehabilitation plan clearly formulated.

7.5.4. CCA Challenges

The following table shows the gaps and challenges of the Local Government Units in the implementation of PPAs with regards to Climate Change Adaptation.

Table 10 - Gaps & Challenges

CCA PROGRAMS & PROJECTS		CHALLENGES
MITIGATION		
Energy Efficiency and Conservation		Intensification of campaign on energy conservation
Renewable Energy Adoption		Limited or no existing renewable energy programs.
Environmentally Sustainable Transport		No known environmentally sustainable transport being implemented.
Watershed Management and Reforestation		Implementation of Watershed Management and Reforestation Programs
Mangrove Conservation and Reforestation		Efforts on mangrove reforestation are somewhat minimal or needs to be materialized.
Solid Waste Management		Implementation of sustainable Solid Waste Management program.
ADAPTATION		
Enhanced vulnerability and adaptation assessment		Continuing study for assessment of vulnerability being undertaken.
Integrated Ecosystem Management		No known integrated ecosystem management.
Climate Responsive Agriculture		Resilient crops variety should be considered.
Water Governance and Management		No known Water Governance.
Climate Responsive Health Sector		The Municipal Health Office to continually upgrading its capacity and resource to be responsive to changing needs.
Resilient Cities		Program for promoting of resilient communities should be formalized.
Climate Responsive Industries		No known program for promotion climate responsive industries.
Climate Proofed Buildings and Infrastructure		Building code to be updated to have a provision on climate proofed buildings and infrastructure.
CROSS CUTTING		
Knowledge Management		Cross cutting measures should cover wide range of recipients from all possible sectors. There should be focal department of committee in charge of CCA.
LGU CCA Capacity Building		
Gender and Development		
Technology Transfer		
Research and Development		
Information, Education, and Communication		

The Municipal DRRM Office with full time DRRM officers is currently being fully institutionalized. The Municipal DRRM Office the focal department to be in-charge of CCA activities. These people also spearheads the formulation of the Municipal DRRM Plan and the Local Climate Change Action Plan not just only for compliance to legal mandates but being as responsive as possible to these challenges.

7.5.5. Resilient Communities by Reducing Vulnerability

One of the best way to respond to the risk reduction is the promotion of resilient communities by lessening their vulnerability and strengthening its adaptive capacity. It would be nearly impossible to reduce the hazard and its arguable questionable to reduce exposure, thus vulnerability is the last factor that the government must be able

to reduced. The following table shows the challenges in vulnerability reduction measures.

Table 11 - Vulnerability Reduction Measures

VULNERABLE SECTORS	CHALLENGES
Population and Settlements	Stable employment and livelihood programs
	Organization and raising of public awareness
	Increase the access to health and educational facilities
	Promotion of resilient settlements areas
	Strengthening of residences to withstand floods and earthquakes.
Production Areas	Stimulating climate responsive agriculture
	Enforcing risk responsive and climate sensitive industries
Hard infrastructures	Climate proofing structures

7.6. Functional Role of the Municipality

The *Local Government Code of 1991 (RA7160, Section440)* defines the role of the municipality as, the municipality, consisting of a group of Barangays, serves primarily as a general purpose government for the coordination and delivery of basic, regular and direct services and, effective governance of the inhabitants within its territorial jurisdiction. The code further states the dual nature of an LGU as political and corporate body in the planning mandates. As a political body, the LGU is a subdivision of the national government endowed with powers to manage its territorial jurisdiction in conformity with the law for and on behalf of the national government. As a corporate body, the LGU is likewise endowed with powers to promote the general welfare of its inhabitants (*Section2a, Section15*).

Relative to the above-cited provisions of the Code, the Municipality of Guiguinto is required to prepare two plans, the *Comprehensive Land Use Plan (CLUP)* and the *Comprehensive Development Plan (CDP)*. The CLUP will serve as a long-term guide enacted through zoning ordinances for the physical development of the municipality. The multi-sectoral CDP on the other hand, will set the direction of economic and social development, and coordinating development efforts within its territorial jurisdiction (*Section20, Section106*). The CDP will also serve as a basis in crafting the *Executive-Legislative Agenda (ELA)* of the municipal government.

On the other hand, as to the role of the municipality in the development of local economy of the province particularly in the sectoral distribution of employment, Guiguinto shares in the service sector as the chief driver of the economy. Further, the municipality also contributes in the industry sector and agriculture sector. In 2014, more than 6 hectares of land was devoted to high value crops production despite Guiguinto has least share in the total land area of the province.

Chapter VIII - Land Supply - Land Demand Balancing

8.1. Land Area Computation

This plan shall use the total area generated by the *Geographic Information System (GIS)* for the Municipality of Guiguinto throughout the discussion and will also use the boundaries and areas per barangay based on the GIS maps. Hence, the total land area of Guiguinto would be 2,221.43 hectares. The area per barangay as shown in Chapter 1 shall be treated according to the maps generated using GIS so that it shall be planned according to their territorial boundaries. This land use plan, however, shall not declare or state the said land areas discussed as official and legal since the authoritative agency that determines official land areas of local government units still rest on the *Land Management Bureau (LMB)* of the *Department of Environment and Natural Resources (DENR)*. Accordingly, the delineation of boundaries and computed areas are based on the records of the Assessor's Office and therefore can be used as basis in the future when establishing the official boundaries and area of Guiguinto.

8.2. Supply of Land

Table below shows that the open land available for future urban expansion is approximately 695 hectares. The said area was estimated based on the premise that the built-up area which is composed of residential, commercial, and institutional areas would not be part of the expansion area as necessitate by the population growth. Prime production areas should also be preserved, protected and free from major land developments that would alter the nature of its existing functional use including the river network and irrigation systems.

Table 12 - Land Supply Tabulation, 2018

LAND USE	AREA (HAS.)	% Share
Residential	631.84	28.44
Commercial	95.51	4.30
Institutional	26.84	1.21
Memorial Park	8.20	0.37
Industrial	295.79	13.32
Agricultural	878.30	39.54
Key Production Areas ²	183.02	8.24
Other Production/Agricultural Lands ³	695.28	31.30
Roads and Bridges***	224.45	10.10
Railroad	26.33	1.19
Rivers/Creeks/Irrigation System	34.17	1.54
TOTAL	2,221.43	100.00

Likewise, roads, bridges, areas with utilities and other infrastructure facilities are not considered part of the expansion area. Lands under special use should also be given equal priority. This includes areas designated for waste disposals and the large area of river system, which is currently a major natural floodway in the Municipality. Accordingly, the land supply accounting shown in the Table clearly describes how Municipality of Guiguinto is blessed with land resources despite its small area. About 10% of its total land area belongs to the major thoroughfare that is very important to the local circulation in the area. More importantly, with its vision to become a Garden City, there are still available lands that can be utilized for this purpose.

The key production areas are also sensitive because of its critical function in balancing the ecosystem and in its contribution to food security not only within the Municipality of Guiguinto but to the adjacent towns as well. This plan shall ensure that the environmentally sensitive areas within the territorial jurisdiction of Guiguinto shall be given the necessary protection it needs to attain sustainability and balance between environmental protection and development. According to the records of MPDO, there are no agricultural areas that are covered by Comprehensive Agrarian Reform Program or any other similar issuances declaring protection on certain agricultural lands. However, this plan identified more than 100 hectares of prime agricultural lands that the Municipal Government of Guiguinto opt to declare as protection area for production. These lands are generally located at Barangay Daungan, Pritil and Cutcut.

Areas highly exposed to geo-hazards are also major considerations of the physical constraints for development in Guiguinto. Natural hazards in Guiguinto include flooding and geologic related hazards such as ground shaking and tsunami. These areas are also considered in terms of restrictions for built-up development which is discussed comprehensively in the previous sections.

It is at this point when decision makers and stakeholders should plan and decide how to match the demand with the supply and identify the lands that will form part of developments in the next nine years given the computed land proportions. Evidently, the Municipality of Guiguinto needs to carefully manage the remaining potential expansion area that can be explored for its future population growth.

8.3. Demand for Land

Using the standards set by the Food and Agricultural Organization (FAO) in assessing demand for future land requirements, the following discussions will show the future land area estimates of the Municipality of Guiguinto for the next nine (9) years in various land categories. The standards used by FAO are mainly determined by two (2) factors which are directly proportional, the land area and population. Thus, it is essential to assess how the population grows in the Municipality of Guiguinto given its land resources to determine the inhabitants' density. This shall provide direction for the planning period on the most probable factors or values specified by FAO that would give the soundest estimates for land requirements in the future.

Consequently, the Municipality of Guiguinto belongs to the high density and fast-growing settlements in the province. Other towns and cities with the same pace are Marilao, City of San Jose Del Monte, City of Malolos, and Santa Maria. These towns exhibited a population density and annual population growth rate greater than the province. It is very significant to note that the said municipalities and cities with high density and fast-growing population have large land mass compared to Guiguinto. This means that Guiguinto is experiencing influx of settlements for the past years and seen to persist in the future given its social and economic progress.

Accordingly, shown in the next table, average to high value estimates will be adopted in some cases to project the land area requirements of Guiguinto in 2027. Because the Municipality of Guiguinto is regarded to be fast growing in terms of population growth rate, it is also among those towns with high density population and currently experiencing fast growing economy.

The proximity of Guiguinto to City of Malolos and to Metro Manila and Pampanga were also taken into consideration since these were characterized as fast growing and developing areas.

Table 13 - FAO Prescribed Urban Land Distribution

CATEGORY	FAO VALUES (HAS./1,000 POPULATION)
Residential Area	4.0-6.0
Institutional	0.2-0.5
Education	0.3-0.6
Health	0.1-0.2
Commercial	0.2-0.5
Industrial	0.4-1.5

Source: FAO

In 2027, the Municipality of Guiguinto is projected to have a population of 124,496. This means that the additional population of almost 20,000, from the 2018 projected population of 105,416, will require additional space for land and other resources. With this, shown in the table below is the estimated demand for land of Guiguinto considering the said additional population using the FAO standard as presented earlier. This estimates can be used a basis of land use distribution for Guiguinto to address the future need for land.

Table 14 - Demand for Land of Guiguinto by Year 2027, in hectares

CATEGORY	Additional land requirement using FAO guidelines		Additional requirement using HLURB guidelines	Existing Land Use	Proposed Land Use	Difference
	Minimum	Maximum				
Residential Area	76.32	114.48	119.94	631.84	652.50	20.66
Institutional	3.82	9.54	6.47	26.84	33.97	7.13
Commercial	3.82	9.54	1.19 to 2.38	95.51	99.25	3.74
Industrial	7.63	28.62	50.00	295.79	332.36	36.57

However, future estimates of land requirement using FAO standard are derived considering scenarios from urban areas. Such settings may be similar with the town's situation and not to some extent. Hence, in order to substantiate the estimates provided by FAO standards, this plan also look in employing the standards used by the *Housing and Land Use Regulatory Board (HLURB)*, which can be more fitting in the Municipality of Guiguinto.

8.3.1. Residential Area

Using the HLURB guidelines on the projection of future residential land demand, the Municipality of Guiguinto requires a total of 746.19 hectares for the projected 28,885 households in 2027. Using the previously presented data on residential land area of 631.84 hectares, 2027 population projection of 124,496, and 4.31 average household size as of 2015 Census, the total of 746.19 hectares of residential land is based on the following computations:

$$\text{Residential Density} = \frac{105,416 \text{ (2018 population)}}{632.19 \text{ ha.residential area}} = 166 \text{ persons per ha.of residential land}$$

$$\text{Household Density} = \frac{166 \text{ persons per ha.of residential land}}{4.31 \text{ average household size}} = 38.69 \text{ household per ha.of residential area}$$

$$\text{Average lot size per household} = \frac{10,000}{38.69 \text{ household per ha.of residential area}} = 258.47 \text{ sq.m.lot per household}$$

The resulting future residential land requirement from the computations guided by the HLURB guidelines is even more than the figures using the FAO guidelines. On the other hand, the Municipality of Guiguinto proposes for additional of only 20.66 hectares of additional land. While the Municipality of Guiguinto ranks as the smallest town in the Province of Bulacan, its strategic direction for the provision of additional housing units is towards mixed-use and midrise residential facilities. The Municipal Government recommends that future residential developments provide medium to high density residential area classified as Residential-3 (R-3) Zone. This type of residential developments is characterized by mainly low-rise or medium-rise residential buildings with multi-family dwellings with mixed housing types.

According to HLURB standard for high density residential housing, it is estimated that 250 persons or greater should be represented in every 1 hectare of land. Considering the density of the urban area of Guiguinto using the 2015 Census data, there are at most 94 persons per hectare in the Municipality. This is less than the density range of what HLURB has set for high density settlement area. Taking into account that Guiguinto belongs to the fast growing municipalities in terms of population, it is suggested to use the HLURB standard density of residential area for year 2015 in projecting future settlement needs.

Meanwhile, the Municipal Government of Guiguinto, through its Housing and Resettlement Office, have been initializing the establishment of mid-rise, medium to high density economic and socialized housing the address the housing unit backlogs. These projects are in line with the CLUP's recommendation towards maximizing of remaining lots assigned for residential uses.

Although it is a common practice that the residential pattern is spontaneously formed by private households and private developers, still the public interest is better served if the government exerts stronger influence with regards to locating settlement areas. With this plan, the municipal government of Guiguinto can reorganize the town's physical structure via properly conceived residential pattern. This is because spontaneous residential pattern sometimes give rise to undesirable consequences due to the difficulty of regulating their actions. On the other hand, though subdivisions may

have qualitative advantage, they have selective clientele which tend to exacerbate social segregation.

The bottom line is still promoting the general welfare of the residents of Guiguinto. The projected future demand for residential area of Guiguinto should be located in areas free from natural and man-made hazards because this plan's primary concern is the health and safety of the people. This will be reflected in the proposed land use and zoning map of the plan.

8.3.2. Commercial Area

Based on the standard value prescribed by HLURB in projecting future space requirements for commercial area, it can be noted that it should make-up an estimated of about 1.5% to 3% of the total built-up area of a municipality. Similarly, according to the standards derived by FAO, commercial areas should range from 0.2 to 0.5 hectares per 1000 population in a given area. These standards may guide the Municipality of Guiguinto in estimating future land requirements of commercial area given the development directions it decides.

In 2018, considering the HLURB guidelines, the Municipality of Guiguinto has a total built-up area of 1,455.20 hectares. Accordingly, Guiguinto is projected to record about 1,534.61 hectares of built-up area in year 2027 considering a steady increase in population. This will result to more than 79 hectares increase in built-up area in the span of ten years using 2018 as base year. On the other hand, shown in the table for Demand for Land of Guiguinto by Year 2027, additional of at least 1.19 hectares and maximum of 9.54 hectares.

Guiguinto has been heading towards commercialization and industrialization in the past five years. Most of the areas adjacent to major roads and thoroughfares have been either commercialized or industrialized. The Municipality of Guiguinto therefore finds the minimum additional areas required by FAO for commercial zone sufficient.

8.3.3. Industrial Area

Manufacturing in the Municipality of Guiguinto gets the biggest share in terms of industry by capitalization. It can be noted also that in terms of land allocation, industrial estates offer the most in number among the major economic activities playing in Guiguinto. Considering these major industrial activities, it can be generalized that the town is a manufacturing, trade and commerce industry municipality. Following this scenario and the thrust of the present administration, this plan will adopt a low to medium level or average intensity industrial standard set by the HLURB.

According to HLURB standard on allowable allocation for medium intensity industries, a municipality should have a density of 0.0025 hectares of industrial area per person. In view of the additional population of Guiguinto of almost 20,000 from 2018 to 2027 and the HLURB standard for medium intensity industries, the town is expected to allocate an additional 50 hectares of land for industrial use. This projected future demand, however, may not be sufficient to accommodate the influx of investments due to the strong and steady commitment of the present administration to boost industrialization

in the Municipality. With these thrusts, big investors that are engaged in developing industries that require large tract of lands is expected to pour in Guiguinto in the next five to ten years. Hence, making the future land area requirement for industrial activity to potentially double its size.

The location of industrial areas in Guiguinto must not only follow the current pattern the town is experiencing but should also be properly located to afford convenience and economy to local residents. The location should also promote employment to substantial portion of the labor force within a barangay where it could be located.

Since the chosen type of industries that will be allowed in the Municipality of Guiguinto are low to medium intensity industries only, the location must still be carefully selected because it could also be a major source of traffic. However, low and medium intensity industries including trading and commercial activities may be located in conjunction with the residential areas. The Plaridel Bypass Road which was inaugurated in 2013, has also caught the attention of investors, even institutional agencies towards it reclassification from previous agricultural use to other uses. Adjacent lots throughout the Guiguinto segment of the Plaridel Bypass Road shall be included in the proposed industrial hubs in the municipality. The manufacturing industries on the other hand will have to be placed in the path of the expansion areas.

8.3.4. Institutional Area

Current urban density approach suggested by HLURB will be employed in projecting future land requirement for institutional use. This approach assumes that future land allocation for institutional use shall be based on existing urban density regardless of the growth in urban population. By examining the density for institutional land use in 2018, there are about 3,927 persons per hectare of institutional land in Guiguinto. Considering such density and the projected population of the town by 2027, this demand needs Guiguinto to allocate an additional of at least 5.09 hectares or a total of 31.93 hectares of land for institutional use.

Institutional land uses in the town of Guiguinto consist of government-owned lands where public buildings are established. One of the largest areas where institutional land can be found in the Municipality of Guiguinto is located in Barangay Poblacion where the municipal government compound is found. Other institutional area includes land occupied by education facilities, barangay halls and health facilities which are scattered all over the town.

8.4. Matching Demand with Supply

It is a practice to use the agricultural lands as option for future expansion area to cater the demand for land. However, this land use plan shall highly consider those unproductive agricultural areas to absorb the additional demand for land of Guiguinto. It is the policy of this plan to protect the lands devoted and protected for agricultural production. The identification of agricultural lands that may be explored for other uses should be based on the existing laws which allow the conversion of these lands on certain conditions based on existing usage and productivity. This includes idle agricultural areas that can be found within the fringes of the existing built-up areas including pockets of agricultural lands that are already idle. Similarly, areas highly exposed to geo-hazards should also be covered by strict policies to provide

preparedness and mitigating measures in these places as future expansion areas which is explored in the previous section. Other supply management strategies are also being considered in this plan in order to make use of the town's land in the most efficient manner. In-filling of vacant urban lands especially for settlement use is regarded as one of the major strategies to preserve the agricultural lands and to address the unoccupied areas in the urban areas particularly at the identified growth centers.

Chapter IX - Proposed Land Uses

9.1. The Planning Period

A comprehensive land use plan provides framework for the physical development of a local territory in a long-term basis. It should offer continuing management over the physical territory of a town where public and private investments should be properly allocated. And this should be within the direction of the attainment of the Municipality's vision which cannot be achieved in a short period of time. Further, the time frame should be long-term for it to be aligned with higher level plans.

According to the recent Board Resolution No. 906 of the *Housing and Land Use Regulatory Board (HLURB)*, the planning period or time of a CLUP should cover a planning period of nine (9) years at the maximum. Further, the review, updating and amendment should be after three (3) years from its date of approval. This activity may coincide with the term of the Mayor and other locally elected officials, for their awareness and for continuity of plan implementation. The time frame and review period will also provide opportunity to harmonize the new administration's development agenda with the approved CLUP.

The Municipality of Guiguinto's projected population doubling time can also be a basis for the planning period for this CLUP at 34 years (year 2052). This will enable the plan to physically prepare for the town's future where the population of Guiguinto will double its size given a fixed land area. This plan may also synch its time frame with the planning period of the *Provincial Development and Physical Framework Plan (PDPFP)* of the Province of Bulacan at 2010-2030. However, this plan opted to follow the prescribed time frame set by the HLURB, hence, covering a planning period of 2019-2027.

9.2. The Concept/Structure Plan

9.2.1. Guiguinto Development Thrusts/Option

This part of the plan discusses the preferred future development options of the Municipality of Guiguinto focusing on the land use elements vis-à-vis inputs from the social, economic and infrastructure sectors. The possible development options that Guiguinto may pursue were identified through a consultative workshop with the stakeholders composing of multi-sector groups and local government officials. The workshop was guided by presenting and describing the different development options applicable to Guiguinto in relation to the municipality's vision, goals, objectives, and its present socio-economic and land use status.

As a result of the consultative workshop, the Municipality of Guiguinto opts to adopt commercial-industrial-agricultural development in general. Given the functional role of Guiguinto in the province and the aspiration of its people, Guiguinto decided to focus on these three development options that they believe will ensure the attainment of their long term vision.

Commercial development involves intensification of the commercial activities within the identified growth centers of the municipality including Tabang, Sta. Rita, portions of Malis, Poblacion, Tiaong, Sta. Rita, and Cutcut. It will highlight the role of the barangays within these growth centers where the presence of support facilities, utilities and incentive mechanisms will be improved to encourage investors to further diversify and

increase investments. Considering the industrial development option, the Municipality of Guiguinto shall focus on promoting the expansion of most of the existing manufacturing industries. This will entail encouraging these industries to intensify their mitigating measures to control pollution and to address the impacts of their operation. Other forms of industrial activities will also be considered in some identified growth nodes where support services, facilities and utilities such as power, water, roads, telecommunications and solid waste disposal systems must be ensured to be at all times available. Primarily, the industrial developments are focused on barangays Malis (*Southern Part*), Tabang, Sta. Rita and Poblacion.

Along this commercialization and industrialization, the people of Guiguinto still opt to take advantage of their remaining prime agricultural areas and pursue agricultural development. The Municipality of Guiguinto still recognizes the significant contribution of their agricultural sector not only in their locality but to the province as well. The planning environment in the preceding sections revealed that there are large tracts of agricultural lands in Guiguinto that are still enjoying two to three cropping seasons because of the presence of the Guiguinto River and the NIA irrigation canal. This physical characteristic provides opportunities for Guiguinto to pursue further development of their agriculture sector. Given this thrust, the Municipality shall identify and delineate prime agricultural areas for protection and conservation. In these areas is where the local government shall ensure the provision of the required support physical infrastructure and services such as irrigation facilities, farm to market roads, credit/lending facilities, technology and increasing access to markets/product end users. Agricultural development in Guiguinto will cover barangays Daungan, Tiaong and portions of Malis.

9.2.2. The Preferred Spatial Strategy

According to land use planning documents, multi-nodal strategy is just the logical extension of the past and current trends if no major intervention by the government is introduced to the area other than those already on-going, programmed or committed. More so, multi-nodal urban form matches the galaxy form of urban development conceptualized by Kevin Lynch, which characterized by clusters of development with each cluster having its own specialization. This strategy is where the structure plan of the previous CLUP of Guiguinto, with planning period 2003-2013, was based. Such urban form aims to re-direct development away from the center toward identified urban growth areas.

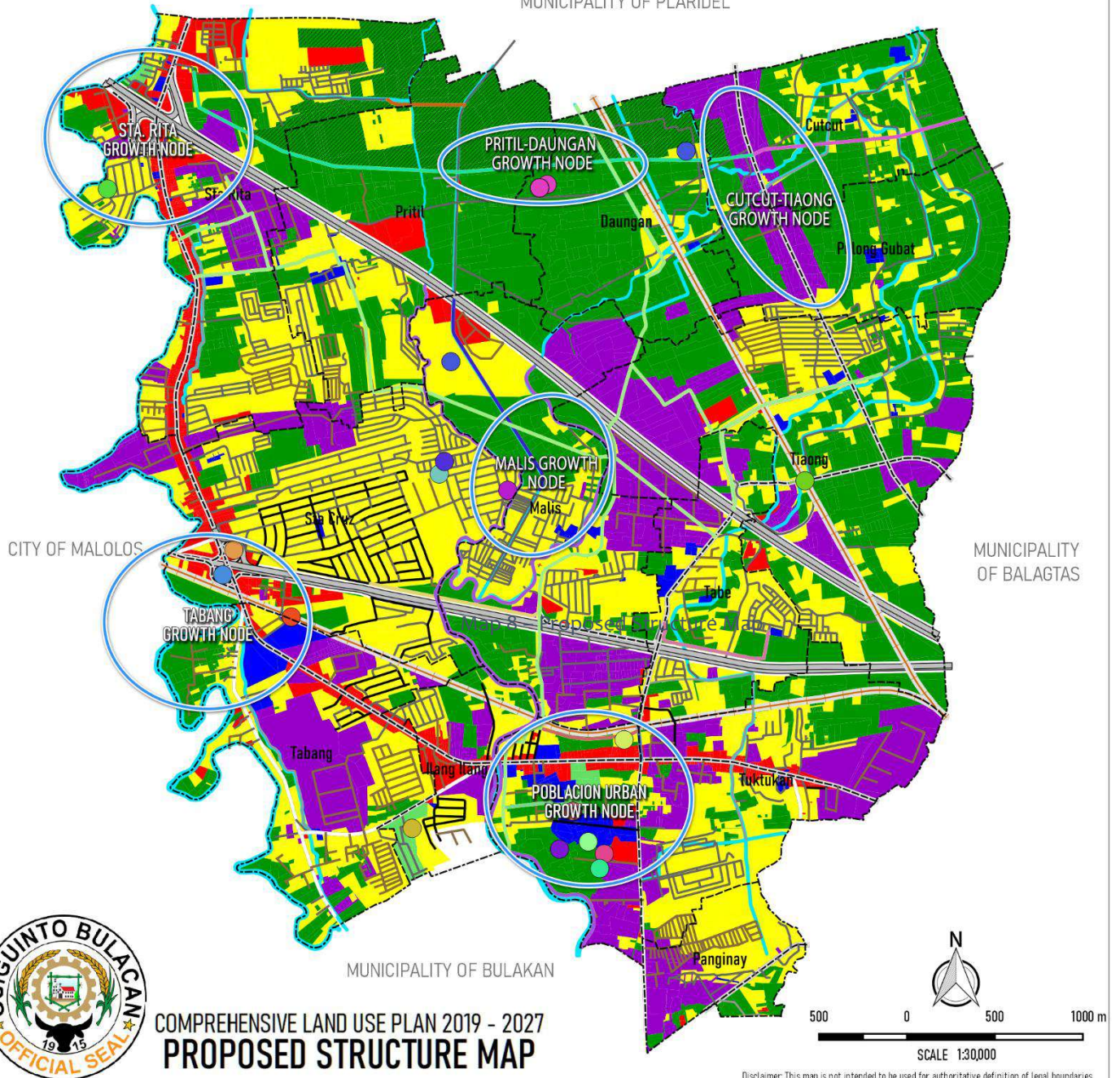
Accordingly, this plan shall continue to adopt the multi-nodal development strategy as agreed and approved during the consultation and validation workshop participated by the officials and department heads of the municipal government of Guiguinto, barangays and different sector representatives from the national government, non-government organizations and business sectors. The said consultation-validation workshop, which aimed to establish the development thrusts/options and spatial strategies that the Guiguinto would pursue in the next planning period, identified multi-nodal urban form to be the most suitable approach to attain the desired development options of the town. Below are the general characteristics of the multi-nodal strategy:

- ❖ Urban Center is still on the top of the development hierarchy, however, decongestion will happen by introducing small centers (*growth nodes*) to other parts of the town.
- ❖ This will improve visual image of local communities/barangays

- ❖ Access to social and economic services will be much closer to each barangay
- ❖ Travel patterns is significantly improved because of the introduction of infrastructures that will link each growth nodes
- ❖ The town center will be decongested allowing efficient circulation of trade and services
- ❖ Rational use of land for development will be sustained
- ❖ Preservation of protected ecosystem will be promoted because developments will be concentrated in the nodes
- ❖ Requires large investments in infrastructures development that are focused in addressing environment friendly infrastructure in order to promote development intentions in the sensitive areas.
- ❖ High density increases in the nodes posing possible discomfort due to noise, congestion and pollution
- ❖ Efficient public transport, supplementary access connecting the secondary centers improves circulation in general. However, costly circumferential road networks.
- ❖ Job opportunities will increase as a result of new investments sprouting within the nodes

The multi-nodal development as the spatial strategy would guide Guiguinto in the allocation and location of its various future land use activities and facilities. It is expected that the selected strategy will best provide the conditions necessary to attain the long-term development goals of Guiguinto. Further, the strategy is translated into structure plan presented in Map 8.

MUNICIPALITY OF PLARIDEL



9.3. The Land Use Plan

In the structure plan, each growth nodes or centers are envisage to play a specialized function based on their existing and emerging contribution in the realization of the long-term vision of Guiguinto. This ensures complementation and sustainability among the different nodes or centers while giving each nodes unique identity. Each growth nodes or center is also envisioned to be a mixed-use development while allowing activities that would give the node's character or identity based on the development direction it will pursue. Hence, the distinct role each node has to play will be integrated with other support or complementing land categories such as residential, commercial, industrial and institutional land uses.

9.3.1. Poblacion Urban Growth Node (Institutional-Commercial-Industrial Development)

The Poblacion Urban Growth Node still promotes the existing urban center or the Poblacion as the primary urban core or major center of Guiguinto. Consisting of the immediate surrounding Barangays of Ilang-ilang and Tuktukan, mix use of land shall be promoted in this area to attain the development thrusts intended. However, it shall maintain its pride as the heart of socio-economic development in the town. Accordingly, this area will be the core of the municipality's character and serve as the central nerve of its development as the seat of the local government is situated in Poblacion. Being the center of the local government, expansion and improvement of institutional facilities and other support infrastructure in this area shall be fostered. The municipal building and its surrounding vicinity shall be improved and enhanced to make the government facility more pleasing, more comfort, and more compliant to accessibility law for the clients, hence making government transactions easier and efficient. Along with the physical improvement of the local government's offices, enhancement of facilities includes renovations, restorations and relocation of the existing parking area from its present location along MNR to the back of the municipal building. The vacated parking space will be filled with elegant and exceptional landscape built by its locals, hence, creating a "garden city" character distinctly for Guiguinto. The gymnasium situated at the rear side of the municipal building will also be improved to advance sports development and at the same time serving as a multi-purpose building for other activities.

In consideration of pursuing commercial development in the urban center, investments will be encouraged to pour in Poblacion urban core alongside with the promotion of low to medium density settlements. Commercial area is expected to expand and intensify along the *Manila North Road* or *Mac Arthur Highway (MNR)* stretching from barangay Ilang-ilang to Tuktukan where trade and industry is concentrated. These activities including banking and cooperatives shall be promoted particularly at the junction of MNR and Matungao-Guiguinto Road, prominently known as Cruz. It is within this area where the public market is situated along with several large retail supermarkets and shopping areas. Cruz, having the locational advantage, will play a crucial role in boosting the economic growth and shaping the physical development of the primary urban core. This advantage shall have to be promoted and carefully zone to maximize the areas' huge potential for further development and expansion. Accordingly, strip development consisting of commercial businesses and residential housing will be the primary use of land along this section of the MNR. Commercial corridors are also expected to grow along secondary roads which are likely to absorb additional need for commercial area particularly towards Matungao-Guiguinto Road due to the spill of

commercial activities in Cruz. On the other hand, another expansion area is seen towards Guiguinto Old Road, section of barangay Ilang-ilang. This shall complement the continuous growth of residential subdivision within and in the surrounding area of Barangay Ilang-ilang.

To promote industrial development in the urban core, some areas in Barangay Ilang-ilang and Tuktukan shall be classified for industrial purposes. Existing industrial activities shall be supported to protect the local workforce it served. However, identification of additional areas for industrial uses should first consider the natural expansion areas of the existing industries.

In-filling land management strategy for settlement shall be one of the principal strategies in the prime urban core since some areas have low settlement density particularly in the existing residential subdivisions. However, development of a few lots deep shall be allowed along the major road strips. Expansion of residential areas including commercial and industrial uses shall be regulated towards the river side. Structures near the banks of the Guiguinto River, creeks and its tributaries shall be allowed only upon consideration of the geotechnical hazards that have been identified by proper and authorized government agency.

Given this development thrust in the Poblacion urban core, the Municipality of Guiguinto shall ensure the presence or availability of support facilities, utilities and incentives to encourage investors to diversify and increase investments. Guiguinto shall also invest on programs and projects needed to address the impacts of intensified commercial activities including increased generation of solid and liquid wastes, demand for more parking spaces, traffic congestion, housing, services, health facilities, etc. One major improvement in the urban core is the improvement of local roads and drainage systems circulating the Poblacion area. Some programs or projects include upgrading of drainage cross drains especially in areas where localized flooding is recurrent such as in Cruz. The flooding experienced in these areas may be caused by constriction of the waterways or drainage channels.

9.3.2. Malis Growth Node

Barangay Malis is geographically located at the heart of Guiguinto. Although it is not the largest in terms of land area among the barangays, it recorded to have the highest population in the municipality. It also offers three vigorous land use activities composing of agriculture, commercial and industries. This spatial character has played a very important role and contribution in shaping the present socio-economic status of Guiguinto.

Because of the persisting growth of Barangay Malis as a result of the continuous flowing of developments brought by the agricultural, commercial and industrial activities, it was decided during the municipality's multi-sectoral consultation to divide Barangay Malis into two (2) thematic development areas; the North and South Malis. Each thematic area is envisioned to perform a specialized and distinct function that would significantly contribute to the attainment of the vision of Guiguinto.

9.3.2.1. Malis North: *(Residential-Institutional Development)*

The northern part of Barangay Malis generally constitute large tract of open space with agricultural-based activities as the dominant land use. Parcels of these open spaces shall be utilized for socialized housing which will cater to in-house relocations. Since the in-town relocation areas are already located in Malis, its expansion is envisioned until the end of the planning period. This shall entail the expansion on government services in the area through maintaining satellite offices and other institutional facilities that will provide services to the relocatees.

The persisting growth of Barangay Malis as a result of the continuous flowing of developments brought by the agricultural, commercial and industrial activities shall provide economic activities and employment to the residents of the socialized housing areas.

9.3.2.2. Malis South (Industrial-Commercial Development)

Characterized by the presence of more than 20 hectares of industrial lands, this part of Barangay Malis has become the major source of employment and driver of commercial growth in the area. This advantage has also resulted into concentration of residential area within the periphery of the industrial lands. Accordingly, this plan opts to adopt intensification of industrial and commercial activities within the Malis South. To further take advantage of the growing strength of industrialization and commercialization in this part of Malis growth node, expansion shall be promoted to augment or increase the outputs of the surrounding barangays. The identification of Malis South for industrial-commercial development was also highlighted during the consultation-workshop with key stakeholders. However, the expansion will be limited only to low and medium industrial activities to avoid the entry of pollutive and hazardous industries.

Malis growth node will also require strong support from the government in terms of preparing the thematic areas ideal for the individual functions they have to perform. Adequate infrastructure support will be infused including widening of roads, drainage improvement and waste disposal facilities. Particularly, the conversion of Malis Foot Bridge into 4-lane vehicular bridge is crucial to the realization of the Mali growth node. The Municipal Government of Guiguinto has to protect also the interest of the community and the environment from the impacts of industrial and commercial operations. This can be done by placing mitigating measures to control pollution that can directly affect the river tributaries traversing Malis North and from the unwanted impacts of industrial operations in Malis South.

9.3.3. Tabang Growth Node (Commercial-Industrial Development)

This node has the same locational advantage as the urban core in terms of having a national highway traversing its area of influence. Such circulation system is seen to play a major contributing factor in shaping the physical structure of this node as a commercial-industrial area. More importantly is the natural value of the area due to the presence of support facilities including school, hospitals, utilities and government institutions including the proposed transfer of the fire station.

Being a major gateway to Malolos City and other first class municipalities in Bulacan, Guiguinto should therefore take this advantage to capture huge market for commercial and industrial activities. Barangay Tabang, as the first barangay who has the privilege of welcoming those who enters Guiguinto from the *North Luzon Expressway (NLEX)*, has certainly the benefit of making business more dynamic in the area. It is in this node where four (4) major road/linkages meet; the NLEX, Manila North Road or Mac Arthur Highway, Cagayan Valley Road and the North-South Commuter Railway Alignment. Considering this locational advantage, commercial and industrial activities predominantly composed of trading, services and manufacturing has increased the share of Barangays Tabang and Sta. Cruz in the economy of Guiguinto. For the past 5 years, commercial centers have flourished in the area including Puregold, Jollibee Food Corporation and numerous commercial establishments.

One major development project in this node is the establishment of the Tabang Commuter Train Station for the North-South Commuter Railway Project specifically located at the back of the old slaughterhouse owned by the Provincial Government of Bulacan. The designation of Tabang to host one of the train stations along its alignment will bring tremendous opportunities to Guiguinto and surrounding towns. It is also in this premise that Barangay Tabang was identified as one of the growth nodes in the Municipality, which is supportive to the provincial policy of adopting a transit oriented development to boost economic progress and inclusive growth. In anticipation of this major development in the area, commercial and industrial activities will be further intensified to strengthen its role within Guiguinto and Malolos City.

The envisioned commercial and industrial development in Tabang growth node shall be complemented by structural or physical improvements of the roads, utilities and other support infrastructures. Programs and projects in this node shall correspond to its needs which shall address the impacts of intensified commercial and industrial activities such as increased volume of solid and liquid wastes, need for more parking space, management of traffic, housing, health facilities, warehousing, etc. It is very crucial in this node and other growth centers as well to ensure that all roads leading to the primary roads should conform to the standard width per road category described in the Zoning Ordinance of this plan. Also, adequate and properly designed drainage system shall be a primary improvement that has to be prioritized.

9.3.4. Sta. Rita Growth Node (Industrial-Commercial Development)

Another major point of entry to Guiguinto from NLEX is through Barangay Sta. Rita toll plaza. This toll facility does not only serve as a gateway to the Municipality of Guiguinto but it also connects NLEX to Cagayan Valley Road and Mac Arthur Highway which leads to Northern provinces. This means Barangay Sta. Rita plays a crucial role in shaping the social and economic opportunities of the adjacent towns of Plaridel, Baliwag, Pulilan, San Rafael and other municipalities and cities traversed northward by the Cagayan Valley Road. Because of this comparative advantage, Barangay Sta. Rita has experienced significant growth in commercial and industrial activities over the past years. Low to medium density commercial activities flourished in the area contributing significantly to Guiguinto's economy. Together with industrial activities in the area, Barangay Sta. Rita was identified as emerging secondary town center.

Similar to other growth centers focusing on commercial and industrial development, this node shall adopt commercialization or intensification of trading activities as its thrust. Strengthening commercial activities shall give emphasis on low to medium density

commercial development along the peripheries of the Cagayan Valley Road and attached secondary roads. Hence, it will also cover Barangay Sta. Cruz as the immediate influence area to absorb the projected increase in space requirement for trading, services and manufacturing. Since strip development along the Cagayan Valley Road is expected, residential subdivisions are also expected to intensify.

The existing industrial area located at the junction of north bound direction of the Cagayan Valley Road and south bound side of NLEX, will serve as the major determinant of industrial development and growth in this node. Presently utilized as warehouse, low to medium type of industrial activities will be introduced within and its vicinity. Implementation schemes such as public-private-partnership shall be the primary structure in realizing this intention. Such scheme will require strong support from the local government and higher level institutions.

9.3.5. Pritil - Daungan Growth Node (Agro-Commercial Development)

The identification of these barangays as agricultural node emanates from the competitive strength of the area for being a host to the remaining prime agricultural lands in the Municipality of Guiguinto. Majority of the area in these barangays are fertile and suitable for rice production. Although these lands are not covered by CARP as per Department of Agriculture, as a matter of policy, this plan designates these areas as protection and production land use. The presence of irrigation support and high-level of suitability of soil makes it ideal to agricultural production, hence, should be protected and enriched.

This delineation does not only designate the area as agricultural hub but it shall insinuate putting up infrastructure support and investment from the government. This strategy shall improve the agricultural productivity not only of barangays Sta. Rita, Pritil, and Daungan, but also of the remaining agricultural areas of barangays Pulunggubat and Tiaong. One of the primary objective is to increase the income of farmers. By designating the area as agro-commercial hub, support policies are likewise imperative to promote preservation and conservation of these productive lands.

Infrastructure support facilities also includes construction of post-harvest processing centers that could give added value to the crops, storage facilities, improvement and construction of new farm-to-market roads and bridge to facilitate the transportation of farm products to central node.

Low to medium level of agro-commercial activities will be promoted as part of the development thrust in this node. Strip development along major and secondary roads will be encouraged within few lots deep. However, this anticipated development has to be limited in terms of horizontal expansion considering that the areas surrounding the node are designated protection areas for agricultural production. The introduction of the Cutcut-Sta. Rita Bypass road shall be regarded as an opportunity that will provide the needed support and services to facilitate agricultural intensification in this node.

9.3.6. Cutcut-Tiaong Growth Node (Industrial Development)

Since Plaridel Bypass road is an open road system, most agricultural areas are now being transformed into built-up zones. The entire stretch of the Plaridel Bypass road now

serves as the new Industrial growth center allowing low to medium industries to operate to adjacent properties. The Municipal Government of Guiguinto finds this an opportunity to expand the investments and invite developers to capitalize throughout the stretch of the Plaridel Bypass road. This plan shall include the continuous expansion of up to medium density industries that are either pollutive/non-hazardous or pollutive/hazardous, which shall be further discussed in the Zoning Ordinance.

Each primary growth node is envisioned to serve its own area of influence. Shown in the table below are the chosen development thrusts to be pursued within the municipality's land use planning horizon and influence areas of each growth nodes or centers:

Table 15 - Growth Nodes/Centers and Their Influence Barangays

CORE BARANGAYS	DEVELOPMENT THRUSTS/OPTIONS	INFLUENCE AREA (BARANGAY)
Poblacion Urban Growth Node	Institutional-Commercial-Industrial	Poblacion, Ilang-ilang, Tuktukan, Panginay
Malis Growth Node	Commercial-Industrial-Agriculture-Institutional	Malis, Sta. Cruz, Tabe
Tabang Growth Node	Commercial-Industrial	Tabang, Sta. Cruz, Ilang-Ilang
Sta. Rita Growth Node	Commercial-Industrial	Sta. Rita, Pritil
Pritil-Daungan Growth Node	Agriculture-Commercial	Sta. Rita, Pritil, Daungan, Cutcut, Pulong Gubat
Cutcut-Tiaong Growth Node	Industrial	Areas in Cutcut, Pulong Gubat, and Tiaong adjacent to Plaridel Bypass Road

9.3.6.1. Infrastructure Support Systems

The strategy encompassing the infrastructure support systems must be consistent with the multi-nodal development form adopted in this plan. Therefore, each node will be provided with the adequate and appropriate infrastructure to support its functions. Proposed interventions through programs/projects and policies/legislations are identified in the last part of this plan. The next map highlights the major infrastructure projects carefully identified to ensure the attainment of the long-term development thrusts of Guiguinto.

9.3.7. Land Use Distribution Matrix

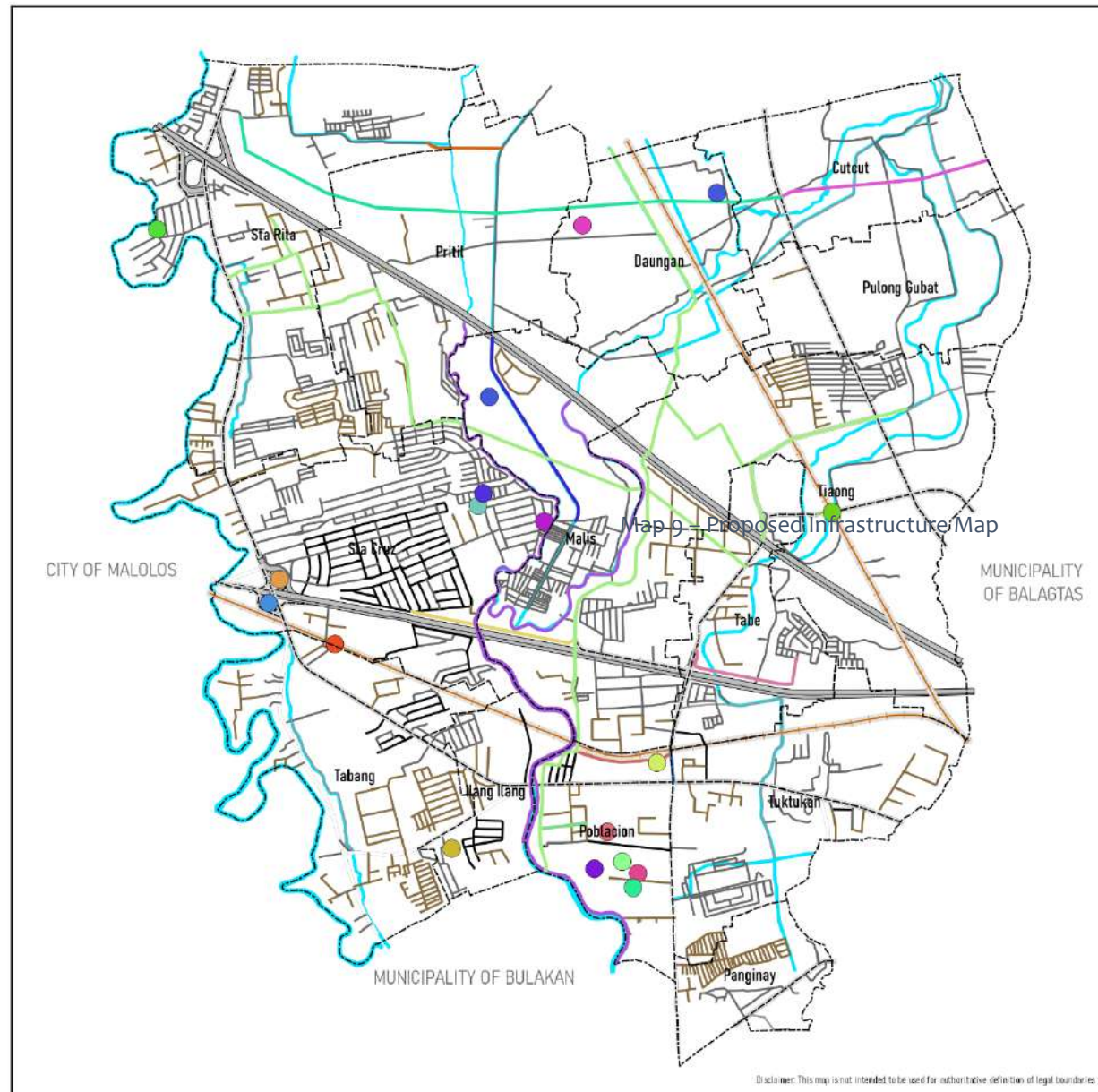
Based on the future land estimates discussed in the previous chapters, Table below presents the summary of land area demand per land use category for the Municipality of Guiguinto in the next 9 years. It can be noted that the future land area requirement exceeds the 10% allowable limit prescribed under section 20 of the Local Government Code of the Philippines otherwise known as RA 7160 for reclassification of agricultural lands to other uses for first class municipalities. Considering the acceptable planning standards and guidelines in determining future land requirements, the excessive land area demand is inevitable. It is in these circumstances that the law provides measures to reconcile the inevitability of progress over a limited space. According to the same section of RA 7160, the President may, upon the recommendation of the National Economic Development Authority, authorize a city or municipality to reclassify lands in excess of the limits set by the law. Nevertheless, this plan already enumerated several land supply-demand management strategies in the previous discussions to optimize the use of agricultural lands for development. This includes in-filling strategies and densification to absorb most of the future requirement for settlement area instead of entirely relying on horizontal expansion. In essence, some of the projected land area requirement of the more than hundred hectares of residential area needed to cater the future growth of population in Guiguinto in the next nine years (2019-2027) can be absorbed by the existing settlement areas or other complementary land use category.

Table 16 - Land Use Distribution Matrix

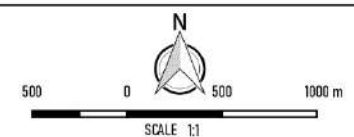
LAND USE	EXISTING LAND AREA IN HAS. (YEAR 2018) ¹	% SHARE	PROPOSED INCREASE/ REDUCTION IN HAS.	PROPOSED LAND AREA IN HAS. (YEAR 2027)	% SHARE
Residential	631.84	28.44	22.90	654.74	29.37
Commercial	95.51	4.30	3.74	99.25	4.47
Institutional	26.84	1.21	7.13	33.97	1.53
<i>Memorial Park</i>	8.20	0.37	1.66	9.87	
Industrial	295.79	13.32	36.57	332.36	14.96
Agricultural	878.30	39.54	(81.97)	796.33	35.85
<i>Key Production Areas²</i>	183.02	8.24	(74.07)	108.95	4.90
<i>Other Production/ Agricultural Lands³</i>	695.28	31.30	(7.90)	687.38	30.94
Roads and Bridges***	224.45	10.10	9.97	234.42	10.55
Railroad	26.33	1.19	(0.00)	26.33	1.19
Rivers/Creeks/Irrigation System	34.17	1.54		34.17	1.54
TOTAL	2,221.43	100.00		2,221.43	100.00

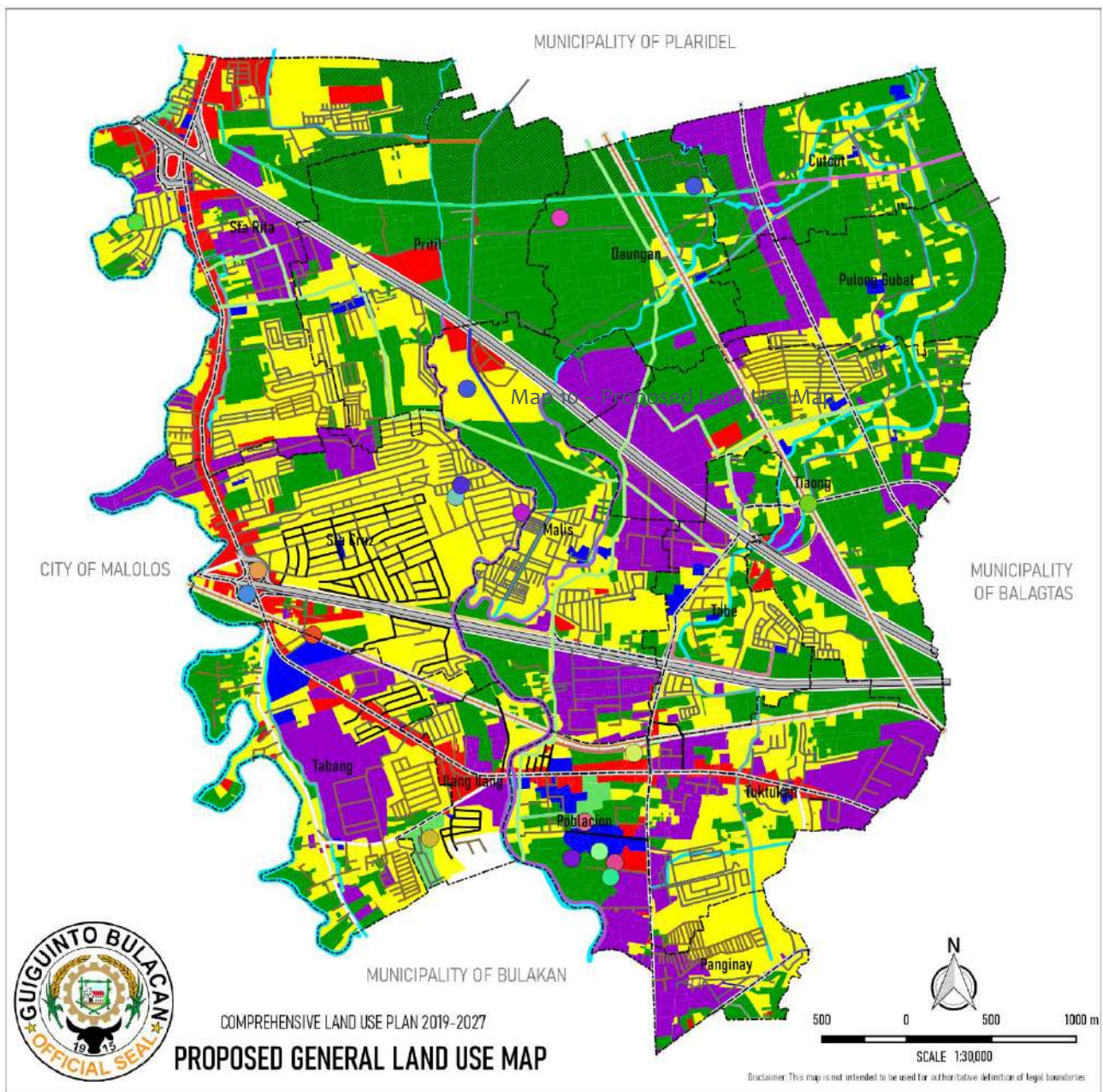


COMPREHENSIVE LAND USE PLAN 2019-2027
PROPOSED INFRASTRUCTURE MAP



Disclaimer: This map is not intended to be used for authoritative definition of legal boundaries.





Chapter X - Proposed Land Use Policy Framework

10.1. Settlement Areas

10.1.1. Residential Areas

Residential areas in the Municipality of Guiguinto covers all private subdivisions, self-built houses, public houses, and socialized housing facilities. At present, settlements are sprawling all over the fourteen (14) barangays of Guiguinto. However, the fast growing population of the town will require additional land for settlements. Hence, proper planning on residential pattern is necessary to promote the general welfare of the residents in the municipality. The effective implementation of locational clearance system and subdivision regulation shall be observed to restructure residential patterns. Access to social and economic services, however shall also be considered. Subsequently, the municipal government will provide the livable environment and will further ensure that the residential areas are free from natural and man-made hazards. Another policy recommendation is to promote medium rise residential development as part of infilling development strategy for settlements. For the new residential development, the policy action is to limit the growth of settlements in the town center and optimize the use of the identified settlement sites to meet the demand within the planning period. Adequate parking spaces prescribed in the Zoning Ordinance must be strictly followed particularly those located along road networks.

At present, private subdivisions are scattered in ten (10) barangays of the town. Most of the subdivisions are sited in barangay Sta. Cruz, while a number are situated in Sta. Rita, Tabang, Malis, Ilang-ilang, and Tuktukan. The demand for residential facilities may possibly stimulate development of private subdivisions. Thus, the policy action is to strictly observe the minimum requirements in accordance with the applicable laws particularly the stipulations on setbacks, open space, structure heights and bulks, easement, and buffer. Likewise, the enforcement of the provision of *Presidential Decree 957 (Regulating the sale of Subdivision Lots and Condominiums, Providing Penalties for Violations thereof)* and *Presidential Decree 953 (Requiring the planting of trees in subdivisions and open spaces)* among others should be observed.

In practice, self-built houses in the Municipality of Guiguinto are results of the premeditated approach of individual households. The spontaneous sprawling of self-built houses may result to undesirable consequences in the future. Thus, the action should focus on the regulation related to the mandatory setbacks, open space, or direct road access to every house and lot. Further, strict enforcement of all applicable provisions of the *National Building Code (PD1096)* should be observed and monitored.

Policies related to the required setbacks, height and bulk of the structure, open space, etc. should be included in the zoning ordinance. Monitoring system should be in place from the issuance of building permit to the issuance of occupancy permit to ensure compliance with the pertinent laws and local ordinances.

Public housing site of the municipal government as identified to be used as relocation site for approximately 216 families is in barangay Malis. However, the increasing demand for housing facilities prompted the municipal government to expand the site. Subsequently, strict adherence to the guidelines of the HLURB particularly the provision for common facilities like parks, commercial store, and community hall and to the

National Building Code for the provisions on setbacks, ventilation, open space, etc. should be observed.

Socialized housing facilities to cater to formal and informal sector with low income shall be the focus of the municipal government. Likewise, the provision of socialized housing facilities for municipal employees is the priority interventions of the municipal government on housing needs. To realize such intention, collaboration with other financing institutions-private and other national agencies shall be the strategy. Further, the development of socialized housing facilities should be guided by pertinent laws such as *Batas Pambansa Blg. 220*.

10.2. Infrastructure Areas

10.2.1. Institutional Areas

10.2.1.1. Municipal Government

The site of the seat of the Municipal Government of Guiguinto is approximately 3.94 hectares and suitably located along the Manila North Road or the MacArthur Highway. It shall maintain its current location and will make it a policy to further improve the physical appearance and facilities of the municipal building to efficiently provide the highest form of public service to Guiguinteros. The area covered by the existing municipal building shall be expanded towards the rear side of the land. The parking space shall be transferred in this area to increase the volume of vehicles the local government can accommodate. It will also improve the frontage of the municipal hall by placing landscapes using local ornamental plants. The Municipal Government is now in the process of acquiring additional lots approximately six hectares giving a total of more than 10 hectares of institutional center at Barangay Poblacion.

In order to maximize and efficiently use the institutional area within the Poblacion node, this plan shall warrant the preparation of a master plan for the whole institutional area covered by the municipal government. This will ensure proper allocation of spaces for every facility within its vicinity in anticipation of future growth of facility users and clients. Likewise, such planning will create a conducive working environment not only for the government employees and clients of the local government but to the students of Guiguinto National High School, which is situated just beside the municipal hall. The local drainage should likewise be considered in the master plan. Government buildings, which are considered critical infrastructures, will have to undergo structural assessment to examine if these facilities are capable of withstanding the probable maximum ground shaking defined in the geo-hazard map of Guiguinto. Other government institutions including health facilities and schools are included in the structural assessment for seismic forces.

10.2.1.2. Schools

Schools are considered critical infrastructure, hence, the location, design and structural integrity of these facilities shall be one of the primary considerations in developing new schools. The policy recommendation in this sector is to develop new school site as well as improving existing educational facilities in consideration of the risks posed by local hazards. Avoiding high risks areas is the main approach, however, adoption and proper mitigating measures to reduce disaster risks is acceptable. Along this policies, establishing our schools should be in accordance with the provisions of the *National Building Code (PD1096)*, *Republic Act 7192 (Women in Development and Nation –Building Act)*, *Republic Act 7277 / Republic Act 9442 (Magna Carta for Disabled Persons)* and other pertinent laws but with

10.2.1.3. Hospitals

Hospital facilities are also considered critical infrastructure in the realm of disaster management and response. In this view that it should be one of the primary policy recommendations of this plan to ensure that development of new hospitals should be risks sensitive. The disaster risks assessment provided in this plan should be integrated in all hospital development to decrease exposure and vulnerability. Accordingly, hospital structures should be designed in accordance to the new structural code standards with proper and strict implementation. Likewise, hospitals must be developed in accordance with the provisions of the *National Building Code (PD1096)*, *Republic Act 7192 (Women in Development and Nation Building Act)*, *Republic Act 7277 / Republic Act 9442 (Magna Carta for Disabled Persons)* and other pertinent laws. Old health facility buildings will have to be assessed for structural integrity to determine proper intervention to make our hospitals more resilient.

Physical improvement of the Ospital ng Guiguinto including expansion and enhancement are essential to make the spaces and movement of patients more efficient. Improving access of this LGU run hospital also plays a critical component in improving its delivery of health care services.

10.2.1.4. Public Market

Guiguinto public market is located in the Poblacion growth node along the national highway. Similar to other public markets located beside road networks, it has become a major traffic generator especially during “*palengke*” days. The retail activity in this area has created the congestion both from the suppliers and buyers. Congestion and sanitation in the public markets of Guiguinto can be improved by placing policies that would promote efficient use of the existing market. Primarily, it should be the policy to prohibit the use of the road carriageway and easements as selling area or extension of the public market. By assigning idle spaces within the public market and assigning these idle areas for ambulant vendors, spill-over of vendors onto the road pavement can be avoided. This will not only ensure continuous flow of traffic but it will prevent accidents involving pedestrians.

Identification of spaces within the fringes of the public market that can be used for off-street parking will mitigate obstruction of traffic flow. The local government of Guiguinto shall also opt to invest in transforming the public market particularly in the Poblacion growth center into multi-level selling area create more spaces allowing the flow of goods and vehicles more spacious.

10.2.1.5. Solid Waste Management

The Municipality of Guiguinto showed established *Material Recovery Facility (MRF)* in every Barangay with the implementation of RA 9003 or the Ecological Solid Waste Management Act. Although it is very difficult for Guiguinto to a sanitary land fill due to the absence of suitable land in terms of area and locations, the establishment of other types of solid waste facility to serve as the final disposal site for residual and/or wastes that can no longer be processed in Barangay MRFs should be carefully studied. Such facility should be strictly regulated and monitored to prevent scavenging and squatting in the disposal site.

Meanwhile, wastes coming from commercial establishments may opt to use the barangay MRFs or the municipal solid waste facility to take care of their wastes.

RA 9003 should be strictly observed for sanitation, hygiene, and for issues related to flooding. The municipal government of Guiguinto should invest in green technology, particularly in the disposal of wastes coming from hospitals, medical clinics, funeral parlors, slaughterhouse, and the public market.

10.2.1.6. Cemetery

There are a total of six (6) cemeteries in the Municipality of Guiguinto; four of which are private while two are public. These cemeteries do not only host local population but it also caters to the burial needs of other nearby barangays outside Guiguinto. The public cemetery in Poblacion is the largest in terms of area. Since it is located along the Mac Arthur Highway, it becomes a traffic generator during the annual commemoration of All Souls' Day. Similarly, other cemeteries also experience the same congestion every year. The need for expansion of public cemeteries is inevitable which is evidently illustrated by congestion.

10.2.1.7. Slaughterhouse

Locations of slaughterhouse should be carefully sited where it will not become a nuisance to settlements and commercial activities. The proposed location should have a high level of accessibility where transportation and support facilities are highly reliable. Given the locational characteristic it should possess, the slaughterhouse should meet standards prescribed by the government agencies like, but not limited to, DENR, DOH and the *National Meat Inspection Service (NMIS)*.

The proposed infrastructure map shows that the Municipal Government is proposing for a slaughter house adjacent to the newly constructed local access road parallel to Manila North Road, behind the Municipal Government Compound. This proposed slaughter house is subject to feasibility study to identify the most suitable investment approach, considering the Public Private Partnership options.

10.2.2. Other Special Use

10.2.2.1. Roads

Setback regulations and standard road width set forth in the Zoning Ordinance of this plan shall be the accepted measurements of all road networks in Guiginto. Proper road inventory and survey of all roads to determine conformity to prescribed standards shall be conducted.

It shall be the policy of this plan to make the growth nodes pedestrian-friendly (*walkable*). This entails proper paving of roads and sidewalks for comfortable walking and moving around the growth nodes. Sidewalks shall be required in all streets especially within the commercial areas where pedestrian activities are heavy. Street trees and landscapes will be scattered along roads to create the garden character Guiginto is envisioning.

Obstructions and encroachments on road right-of-way shall not be permitted. The Municipal Engineer's Office shall be vigilant on implementing this policy before the encroachment gets worst especially where critical infrastructures like hospitals, fire stations are located and accessed. Traffic management plays a critical role in maintaining the road networks always open. This includes ensuring that the road carriageways are not being used as parking spaces. More importantly, road networks in Guiginto must meet the minimum requirements for ancillary road facilities especially within the growth nodes along the national highways. Such facilities include traffic lights, pedestrian crossings, sidewalk, waiting sheds, street lights, roads signage, overpass, and bicycle lanes.

10.2.2.2. River

Similar to normal road infrastructure, it is the policy of this plan that the river/road dikes ROW shall be open and free from permanent structures.

This plan shall also adopt policies from higher level plans including River bank stabilization, control of settlement encroachment and pollution from industry, households and commercial establishments. A minimum of three (3) meters buffer strip should be retained adjacent to the river bank to protect water bodies from encroachments. Only natural vegetation, roads and street furniture shall be allowed within the river buffer strips.

10.2.2.3. Railway

As discussed in the previous chapters, the Municipality of Guiguinto is traversed by two railway alignments. The East alignment that cuts across Barangay Tiaong going to Nueva Ecija and the North-South Commuter Railway (NSCR) alignment that stretches from Barangay Tuktukan all the way to the City of Malolos. As of end of 2019, the NSCR right-of-way (ROW) has been reclaimed and even expanded. The construction of the railway and the proposed station at Tabang is ongoing. Since the new design of the railway system will adopt a viaduct structure, the Municipal Government of Guiguinto shall establish a partnership with the Department of Transportation and Communication in-charge of the railroad ROW in using the open spaces under the viaduct as greenbelt. This will contribute to the goals of this plan towards a greener Guiguinto.

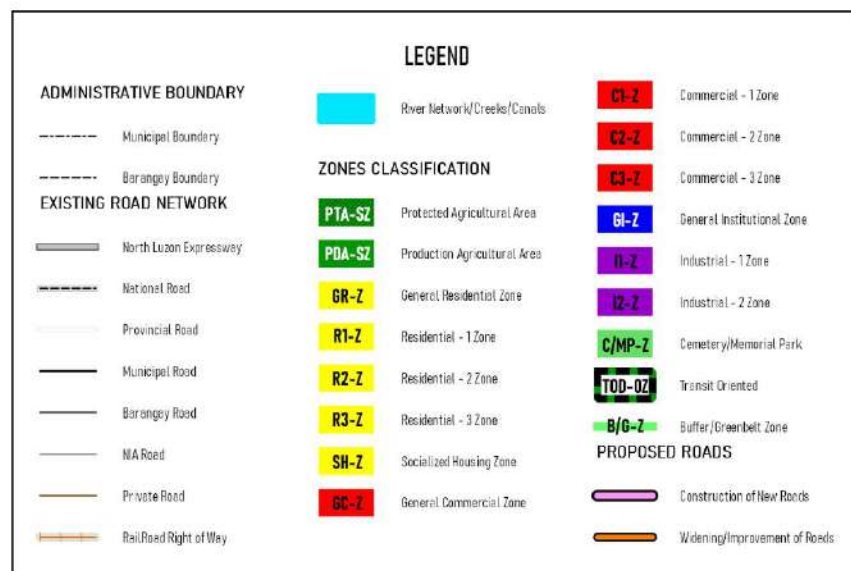
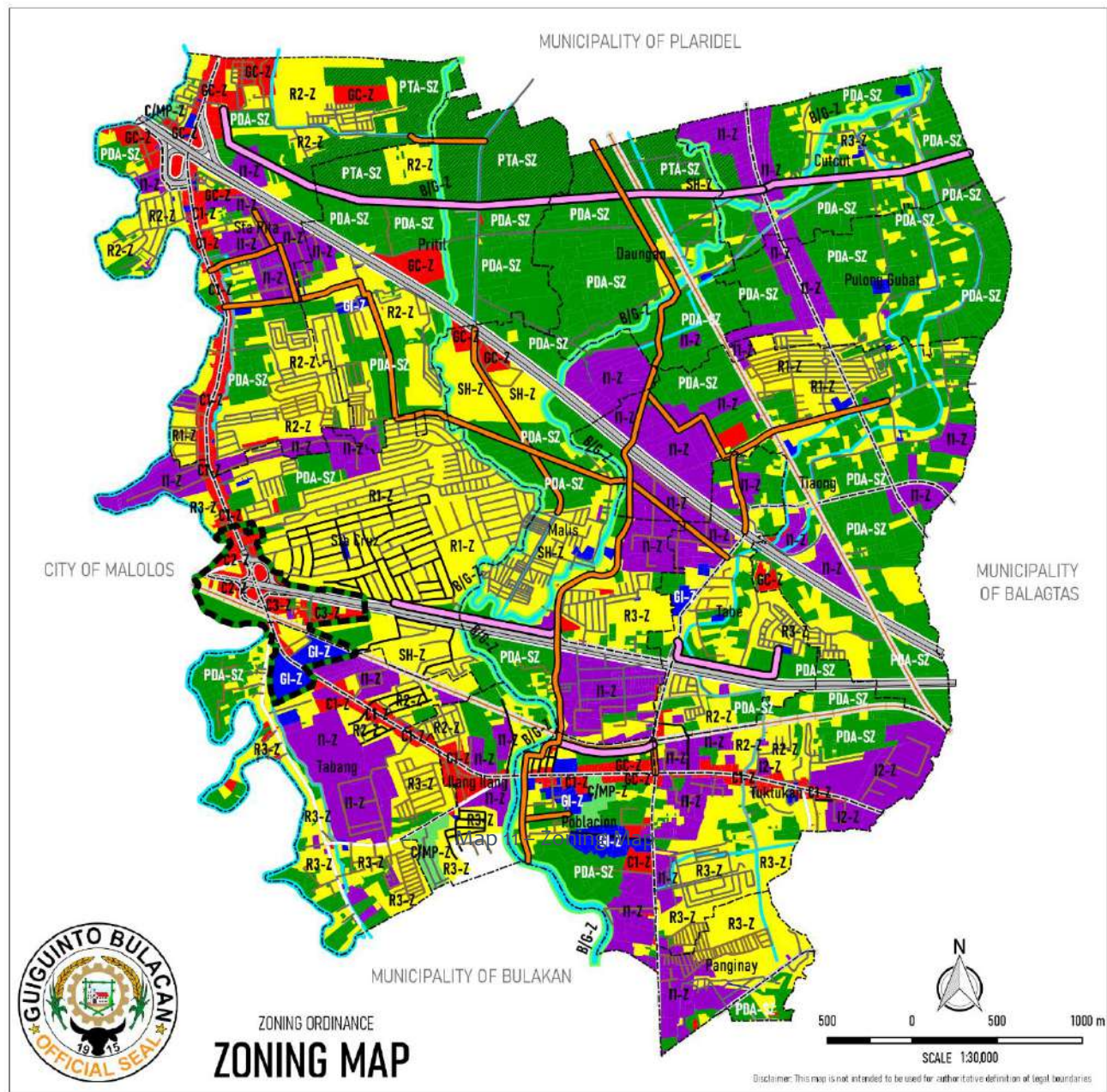
On the other hand, the plan to reestablish the East alignment that cuts across Barangay Tiaong going to Nueva Ecija has been started. However, since its right-of-way (ROW) was occupied by various kinds of uses from residential to commercial types. This condition persisted for many years until the railroad right-of-way was reclaimed by the national government. At present, if the National Government decides to finally revive the East alignment, it shall be the policy of this plan to adhere to the prescribed right-of-way of the said railway system.

10.2.2.4. Water Supply

Consistent with the national and provincial policies, this plan supports the use of surface water as alternative to groundwater extraction for domestic use. It has been clarified in the previous chapters that Guiguinto belongs to the area with cone of depression which is characterized by intensive extraction of groundwater. This resulted to potable water scarcity in the Guiguinto. Adoption of green technology including rain water harvesting shall be promoted to augment water supply while continuous and large scale groundwater extraction shall be discouraged.

10.2.2.5. Septage Treatment Facility

In compliance with the existing rules and regulation on the establishment of Septage Treatment Facility, the Municipal Government of Guiguinto shall identify and provide an appropriate location for the Septage Treatment Facility, in coordination with the water service providers, DPWH, and other relevant agencies. In case of non-availability of appropriate location, a Memorandum of Agreement with a third-party septage treatment provider must be entered to ensure that liquid wastes are collected, treated, and properly disposed.



Chapter XI - Priority Programs and Projects

11.1. Settlement Areas

- ❖ Expansion of public housing and socialized housing facilities
- ❖ Housing project for municipal employees

11.2. Infrastructure

- ❖ Construction of Foot Bridge at Poblacion, Tuktukan and Tabang
- ❖ Road Widening at C. Mercado St.
- ❖ Widening and Improvement of Sta. Rita Access Road
- ❖ Widening of Roads leading to Malis North
- ❖ Widening of other roads and inclusion of bicycle lanes
- ❖ Construction of Farm-to-Market Roads (*Daungan and Tiaong*)
- ❖ Construction/Widening of Garden City Access Road
- ❖ Conversion of Malis Foot Bridge into four (4) Lane Vehicular Bridge
- ❖ Drainage Improvement at Poblacion
- ❖ Dredging/deepening of Natural Waterways
- ❖ Rip-rapping of Bagbag Creek
- ❖ GMACC Completion cum Evacuation Center
- ❖ Establishment of Tabang Commuter Train Station
- ❖ Establishment of Common Transport Terminal
- ❖ River Ferry System Project
- ❖ Establishment of Guiguinto Garden City
- ❖ Establishment of Guiguinto Techno Park
- ❖ Establishment of Septage Treatment Facility
- ❖ Guiguinto Green Belt Project
- ❖ Improvement of Sta. Cruz Mini park
- ❖ Expansion and Improvement of Municipal Building
- ❖ Expansion of Guiguinto National High School
- ❖ Relocation of Informal Settler Families
- ❖ Bulacan Bulk Water Supply Project
- ❖ Materials Recovery Facility Project
- ❖ Establishment of Agricultural Support Facilities (*Daungan-Tiaong*)

11.3. Governance

- ❖ Preparation of Drainage Master Plan
- ❖ Preparation of Garden City Master Plan

11.4. Disaster Risk and Reduction Management

DRRM PPA - The following are the proposed PPA for Municipality of Guiguinto with regards to Disaster Risk Reduction Management categorized per DRRM phase based on National DRRM Framework:

- ❖ **Preparedness:**
 1. Institutionalization of Municipal DRRM office with full time DRRM officer(s)
 - To be supported by administrative personnel, rescue teams or other volunteer groups with established Operations Center

- To organize Municipal DRRM Council and serve as its secretariat
 - To train and directly supervise municipal emergency response teams
 - To program and coordinate DRRM activities consistent with the National/Provincial standards and guidelines
 - To formulate and implement a Comprehensive Municipal DRRM Plan
 - To prepare and submit to SB annual Municipal DRRM budget/fund. Comply with the guidelines on the utilization of the 5% budget dedicated for DRRM and CCA Activities
2. Programs to support and facilitate risks assessment and contingency planning activities at local level
 - Raise public awareness and compliance with DRRM Act and establish linkages with other LGUs regarding DRRM
 - Conduct of community-based *Education and Information Campaign (EIC)* for hazard occurrences, risk estimates and implementation local warning systems.
 - Designation of evacuation sites per community/household cluster and identification of evacuate routes per hazard occurrence.
 - Evacuation/protective shelter management program such as provisions for food supplies and medical needs.
 3. Conduct of strengthening programs for partnership with private sectors and other volunteer groups

❖ **Mitigation:**

1. Waterways clearing and de-silting.
2. River slope protection thru dikes and formation of riverside public parks.
3. Development of waste management facilities (*i.e., MRF, waste treatment*)
4. Monitoring and reporting programs in prohibiting occupation of informal settlements along hazard zones.
5. Establishing safety regulations such as structures built on concept of disaster resilient architecture designs - waterproof-green buildings

❖ **Response:**

1. Establishing *Incident Command System (ICS)*
2. Rescue and relief operations projects as should be indicated from Municipal DRRM Plan
3. Situation stabilization program such as power and communications management during emergencies
4. Health programs for detection and containment of epidemics or disease outbreaks

❖ **Rehabilitation:**

1. Conduct of post-disaster assessment and reporting
2. Psychological programs to provide support to vulnerable groups to stress related factors
3. Rehabilitation and recovery programs as should be indicated from the Municipal DRRM Plan such as reconstruction and repairs of public structures and facilities and other income generating activities.
4. Program for provision of assistance to other LGUs needing help after disaster.

Climate Change Adaptation and Mitigation PPA

1. Formulation of Municipal Climate Change Action Plan

2. Conduct public awareness campaigns on the effects of climate change and energy-saving solutions to mitigate these effects, and initiatives, through educational and training programs especially for children and women in rural areas.
3. Climate change mitigation PPA
 - ❖ Energy efficiency and conservation
 - ❖ Renewable energy adoption
 - ❖ Environmentally sustainable transport
 - ❖ Watershed/river management and reforestation
 - ❖ Promotion of reusable/biodegradable container or grocery bags
 - ❖ Scheduled waste collection based on types of wastes (*i.e., Fridays - biodegradables; Mondays - industrial wastes, toxic, used oil; Tuesdays - plastics; etc.*)
4. Climate change adaptation PPA
 - ❖ Conduct of community based adaptation assessment
 - ❖ Integrated ecosystem management
 - ❖ Climate responsive agriculture
 - ❖ Water governance and management
 - ❖ Climate responsive health sector
 - ❖ Promotion of resilient settlements
 - ❖ Climate responsive industries thru climate proof buildings and infrastructures
5. Gathering and profiling of climate change related databases

Proposed PPAs Specifically for the Areas Classified under Moderate Risk Level

1. Regulated building structures to withstand events of flooding and strong ground shaking.
2. Promotion of insurance coverage for crops production.
3. Implementation of roads and river easement to be identified as no-built zone.
4. Regularly conduct education campaign for hazard profiling, disaster drills and evacuation plans.
5. Equipment upgrading and training of the Barangay DRRM councils.

Proposed PPAs Specifically for the Areas Classified under Low Risk Level

1. Observe building structures compliance to local regulations.
2. Monitor industrial and agricultural activities to aid mitigation of climate change impacts.
3. Prepare the Barangay DRRM councils to provide assistance to other barangay as the need arises.