

# Chapter 7. Infrastructure Sector

## Infrastructure and Utilities

Infrastructure refers to the basic physical and organizational structures needed for the operation of a society or enterprise, or the services and facilities necessary for an economy to function. It can be generally defined as the set of interconnected structural elements that provide a framework supporting an entire structure of development. The term typically refers to the technical structures that support a society, such as roads, bridges, water supply, sewers, electrical grids, telecommunications, and so forth, and can be defined as "the physical components of interrelated systems providing commodities and services essential to enable, sustain, or enhance societal living conditions (Wikipedia)".

### Road Transport

The transportation system in the province of Cavite is predominantly land-based, of which the main transport mode is road-based. The roads are classified into national, provincial, city/municipal, and barangay roads. The national roads form part of the trunk line systems and are connected by provincial roads from one city/municipality to another, and the city/municipal roads interlink barangays.

The province is accessible by various land-based vehicles from Manila and other nearby provinces and cities. It may be reached through public utility jeepneys and buses taking the major entrances and exits: the Aguinaldo Boulevard (Manila-Cavite Coastal Road) via Coastal Road Extension and via Talaba, Bacoor, South Luzon Expressway (SLEX) in Carmona, the Aguinaldo Highway (Batangas-Alfonso-Tagaytay Road), the Zapote-Las Piñas Road, the Sta. Rosa-Tagaytay Road, and the Alabang-Molino via Daang Hari Road.

In 2011, the Cavite Expressway (CAVITEX) was opened, which lessened the heavy volume of vehicles on Aguinaldo. Last July 1, 2013, the Kaybiang Tunnel, the country's longest underground highway tunnel at 300 meters was opened along the Ternate-Nasugbu Road piercing through Mt. Pico De Loro's north ridge that shortens the travel time from Manila to the western coves of Cavite and Nasugbu, Batangas (Wikipedia).

### Roads and Bridges

Based on the data consolidated by the Special Projects Division of the Provincial Planning and Development Office, Cavite, the province's road network comprised

about 2,188.5195 kilometers, of which about 19.63% or 429.6080 kilometers were classified as national roads, while 369.6810 kilometers or 16.89% are provincial roads. Furthermore, city/municipal roads comprised 13.19% or 288.5864 kilometers and about 50.29% or 1,100.6441 kilometers are barangay roads. By type of pavement, it is noted that 63.61% or 1,392.1312 kilometers of these roads are paved with concrete while 368.4765 kilometers or 16.84% are paved with asphalt. In addition, unpaved roads comprised 19.55% or 427.9118 kilometers (Table 7A\_).

Bridge connects roads in different cities and municipalities of the province. These are also classified as to national, provincial, city/municipal and barangay. Length totaled to 6,615.92 linear meters.

**Table 7A** Total Length of Roads and Bridges by Classification Province of Cavite: 2015

Road/Bridge Classification	Road				Length	
	Paved		Unpaved		Road (km)	Bridge (lm)
	Concrete	Asphalt	Gravel	Earth fill		
National	171.3601	258.2479			429.6080	3,050.57
Provincial	282.7480	44.7950	42.1380		369.6810	1,078.05
City/Municipal	235.0085	43.5762	0.1000	9.9017	288.58.64	889.70
Barangay	703.0146	21.8574	105.9358	269.8363	1,100.6441	1,597.60
<b>Total</b>	<b>1,392.1312</b>	<b>368.4765</b>	<b>148.1738</b>	<b>279.7380</b>	<b>2,188.5195</b>	<b>6,615.92</b>

Source: Special Projects Division, PPDO, Trece Martires City

### Motor Vehicle Registration

Registered motor vehicles are classified into cars, utility vehicles (UV), sports utility vehicle (SUV), trucks, buses, motorcycles/tricycles and trailers and its registration is under the jurisdiction of the Land Transportation Office (LTO), being the agency of the Philippine government that handles all matters regarding license for drivers, car registration, renewal of these documents and more, which comprise all sorts of land transportation vehicles ([www.ltophilippines.com](http://www.ltophilippines.com)).

Table 7B presents that based on the data gathered from LTO, Region IV-A, (CALABARZON) Lipa City, Batangas, the total number of registered motor vehicles in Cavite reached 251,328 in 2015. This figure is equivalent to a 1.79% increase compared to 2014 data of 246,919 units. It was noted that motorcycles/tricycles contributed the highest vehicle registration with 52.57% of the total or 132,119 units while utility vehicles ranked second with 26.52% or 66,658 units. Trailers have the least registration with only 0.07% or 164 units.

**Table 7B** Number of Registered Motor Vehicles by Type, Province of Cavite: 2015

Type of Vehicle	Number of Vehicle Registration				Total
	City of Imus District Office	Kawit District Office	Tagaytay City Extension Office	City of Dasmariñas Extension Office	
Cars	12,837	10,728	9,188	5,446	38,199
Utility Vehicles	22,556	17,870	17,957	8,275	66,658
Sports Utility Vehicles	3,957	3,014	2,506	1,511	10,988
Trucks	782	1,055	893	219	2,949
Buses	14	125	100	12	251
Motorcycles/Tricycles	34,849	49,222	19,412	28,636	132,119
Trailers	78	67	16	3	164
<b>Total</b>	<b>75,073</b>	<b>82,081</b>	<b>50,072</b>	<b>44,102</b>	<b>251,328</b>

Among the four (4) Land Transportation District and Extension Offices in the province, the highest registration was recorded at Kawit District Office with 32.66% or 82,081 units followed by City of Imus District Office having 75,073 units or 29.87%. In addition, Tagaytay City Extension Office recorded a total of 50,072 units or 19.92% while the City of Dasmariñas Extension Office has a total registration of 44,102 units or 17.55% share.

As presented also on the table, Kawit Licensing Center contributed the highest percentage share with 29.64% of the total issuances or 64,957 while Tagaytay City Extension Office followed next registered at 28.56% or 62,595 issuances. Furthermore, City of Imus District Office has 55,375 issuances or 25.27% while the least number of issuances with 16.53% or 36,232 was registered at City of Dasmariñas Extension Office.

Of the three types of driver's license, non-professional license contributed the highest share of 33.75% (73,760) while student permit and professional driver's license was registered at 33.64% (73,519) and 32.61% (71,280), respectively.

The data on license and permit issued are also classified according to the type of application, namely new and renewal. Out of 219,159 issuances, 49.10% or 107,610 are new applications while 50.90% or 111,549 applied for renewal.

## Licenses

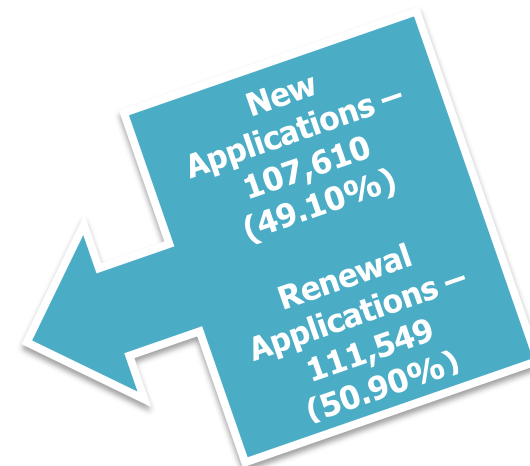
A driver's license is an official document authorizing an individual to drive a motorized vehicle in the Philippines. The Land Transportation Office issues three types of driver's licenses: student permit, non-professional and professional driver's license. Conductors permit was also being issued by LTO. A student permit is an official document authorizing a person to operate a motorized vehicle in the presence of a duly licensed driver. A non-professional driver's license is an official document authorizing a person to operate private vehicles in a private capacity, not for the purpose of earning compensation. A professional driver's license is an official document authorizing a person to operate a private or public utility vehicle for the purpose of earning compensation. A conductor's permit is an official document authorizing a person to assist the driver of a public utility vehicle in order to ensure the safety of its passengers and/or cargo ([www.gov.ph/services/driverslicense/Official Gazette of the Republic of the Philippines](http://www.gov.ph/services/driverslicense/Official%20Gazette%20of%20the%20Republic%20of%20the%20Philippines)).

Data on driver's licenses and permits issued obtained from the said agency posted a total of 219,159 issuances by which 218,559 are driver's license while 600 are conductors permit (Table 7C).

**Table 7C** Number of Driver's Licenses and Permits Issued by District and Extension Office, Province of Cavite: 2015

Agency	Driver's License									Conductors Permit			Total Driver's Licenses and Permits Issued
	Professional			Non-Professional			Student Permit	Total					
	New	Renewal	Sub-Total	New	Renewal	Sub-Total	New						
Tagaytay City Extension Office	5,190	18,025	23,215	12,477	10,097	22,574	16,471	62,260	156	179	335	62,595	
City of Imus District Office		17,319	17,319		13,494	13,494	24,510	55,323		52	52	55,375	
Dasmariñas Extension Office		11,039	11,039	21	9,611	9,632	15,543	36,214		18	18	36,232	
Kawit Licensing Center	1,289	18,418	19,707	14,858	13,202	28,060	16,995	64,762	100	95	195	64,957	
<b>Total</b>	<b>6,479</b>	<b>64,801</b>	<b>71,280</b>	<b>27,356</b>	<b>46,404</b>	<b>73,760</b>	<b>73,519</b>	<b>218,559</b>	<b>256</b>	<b>344</b>	<b>600</b>	<b>219,159</b>	

Source: Land Transportation Office, Regional Office No. IV-A (CALABARZON), Lipa City



## Communication

People communicate with each other by writing letters, sending telegrams, radio, television, computer technology, newspapers, magazines and pamphlets; messages can be sent by telegram, facsimile machine (FAX) and E-mail (Electronic mail) for business trade and other services.

Communication is a two-way process of reaching mutual understanding, in which participants not only exchange information, news, ideas and feelings but also create and share meaning. In general, communication is a means of connecting people or places. In business, it is a key function of management—an organization cannot operate without communication between levels, departments and employees. Nowadays, electronic communication is an efficient way to deliver mass messages to various people. Companies typically use it to communicate with customers and the general public, by creating different channels that fit their target markets. Electronic communication is also a fast way to contact people from other parts of the globe. Examples of electronic communication include online chat, emails, text messages, social networks and web conferences ([www.businessdictionary.com](http://www.businessdictionary.com)).

In addition to telephone services and cellular mobile telephone system providers available in Cavite, radio has also proven to be an effective development communication channel. Over the past decades, radio is also acknowledged as the primary source of news and the most pervasive, persuasive, and credible medium ([www.ncca.gov.ph](http://www.ncca.gov.ph)).

Based on record from National Telecommunications Commission (NTC), Region IV-A, Batangas City, there are two (2) radio stations operating in the province, the Delta Broadcasting System and De La Salle University while there are registered radio groups that help the community especially at times of disasters, one of which is the Public Assistance for Rescue, Disaster & Support Services (PARDSS) Foundation International, Inc. (Tables 7D & 7E).

Other means of communication is through letter writing and the Philippine Postal Corporation, abbreviated as PHLPPost, is the government-owned and controlled corporation responsible for providing postal services in the Philippines (*Wikipedia*). Data gathered from PHLPPost, Office of the Postmaster General, Manila revealed that despite the existence of modern means of communications, like cellular phones and the social network, there are still domestic and international mails being handled by post offices located in every city/municipality of the province. Volume of these mails is shown in Table 7F.

It is noted that the municipality of Gen. E. Aguinaldo received their letters thru the municipality of Alfonso while the letters for the municipalities of Magallanes, Maragondon and Ternate are delivered at the municipality of Naic (*Post Office, Alfonso*).

As defined, posted mails are mails received from windows, counters, lobby drop boxes and street boxes while delivered mails are mails distributed in the locality through letter carriers through the use of post office (P.O.) boxes ([www.nscb.gov.ph](http://www.nscb.gov.ph)).

**Table 7D** Operating Radio Stations, Province of Cavite: 2015

Operating Agency	Transmitter & Studio	Call-Sign
<b>I. AM BROADCASTING</b> Delta Broadcasting System	Manila-Cavite Road, San Rafael III, Noveleta	DWXI - AM
<b>II. FM BROADCASTING</b> De La Salle University	JFH Building, DLSU Campus, City of Dasmariñas, Cavite	DWSU - FM

Source: National Telecommunications Commission (NTC), Region IV-A, Batangas City

**Table 7E** Registered Radio Groups and Location, Province of Cavite: 2015

Name of Group/Club	Location of Base Station
<b>I. Amateur Radio Group</b> Cavite Amateur Communication Enthusiast, Inc. (DXI-ACE)	Alvaran Compound, St. Charbel, South Executive VII, City of Dasmariñas, Cavite
Communications World of Amateur Phils., Inc.	A & V Soriano M.D. Bldg., 178 , Zapote , City of Bacoor, Cavite
<b>II. Civic Radio Group</b> 79 CBR Civic Radio Group, Inc.	Blk 3 Lot 20 St. Martin de Porres Villa, Bayan Luma, City of Imus, Cavite
Kabalikat Civicom, Inc. (Cavite Provincial Council)	Daang Bukid, City of Bacoor, Cavite
	285 Capt. Villareal St., Caridad, Cavite City
Kabalikat Civicom, Inc. (Cavite Chapter)	Blk 4 Lot 36, Poblacion I, Gen. Mariano Alvarez, Cavite
United Muslim & Christian Riverside Community Association , Inc. (UMCRC) Sagip Ilog Volunteer Association, Inc.	Blk 41, Lot 15 Datu Esmael, City of Dasmariñas, Cavite
Public Assistance For Rescue , Disaster and Support Services (PARDSS) Foundation International, Inc. (Maragondon & Ternate Chapter)	Maragondon & Ternate
Concerned Brotherhood Comm. Group, Inc.	179 Ligas II, City of Bacoor; Blk 4 Lot 10 GreenTown Villas 2, Bayanan, City of Bacoor

Source: National Telecommunications Commission (NTC), Region IV-A, Batangas City

**Table 7F** Volume of Mails Posted and Delivered by Post Office, Province of Cavite: 2015

Post Office	Posted		Total	Delivered		Total
	Domestic	International		Domestic	International	
<b>1<sup>st</sup> District</b>	<b>61,854</b>	<b>12,881</b>	<b>74,735</b>	<b>553,199</b>	<b>11,569</b>	<b>564,768</b>
Cavite City Post Office	31,367	5,669	37,036	100,416	5,669	106,085
Kawit Post Office	7,096	1,494	8,590	96,320	582	96,902
Noveleta Post Office	4,908	1,408	6,316	29,250	1,341	30,591
Rosario Post Office	18,483	4,310	22,793	327,213	3,977	331,190
<b>2<sup>nd</sup> District</b>	<b>134,243</b>	<b>10,549</b>	<b>144,792</b>	<b>1,348,441</b>	<b>6,001</b>	<b>1,354,442</b>
City of Bacoor Post Office	113,572	3,698	117,270	834,098	3,422	837,520
Molino Post Office	20,671	6,851	27,522	514,343	2,579	516,922
<b>3<sup>rd</sup> District</b>	<b>289,391</b>	<b>16,283</b>	<b>305,674</b>	<b>1,102,147</b>	<b>16,048</b>	<b>1,118,195</b>
City of Imus Post Office	273,215	13,945	287,160	1,100,087	13,927	1,114,014
Bahayang Pag-asa Post Office	16,176	2,338	18,514	2,060	2,121	4,181
<b>4<sup>th</sup> District</b>	<b>46,592</b>	<b>9,772</b>	<b>56,364</b>	<b>582,904</b>	<b>9,340</b>	<b>592,244</b>
City of Dasmariñas Post Office	9,931	2,827	12,758	16,564	2,481	19,045
City of Dasmariñas Central Market Post Office	35,182	5,837	41,019	564,828	5,843	570,671
FCIE Post Office	430	140	570	1,276	48	1,324
Robinson Post Office	1,049	968	2,017	236	968	1,204
<b>5<sup>th</sup> District</b>	<b>88,261</b>	<b>10,501</b>	<b>98,762</b>	<b>825,106</b>	<b>6,808</b>	<b>831,914</b>
Carmona Post Office	23,215	2,047	25,262	78,209	1,721	79,930
Gen. Mariano Alvarez Post Office	11,407	1,774	13,181	174,062	1,607	175,669
Silang Post Office	53,639	6,680	60,319	572,835	3,480	576,315
<b>6<sup>th</sup> District</b>	<b>86,109</b>	<b>47,491</b>	<b>133,600</b>	<b>1,030,635</b>	<b>6,894</b>	<b>1,037,529</b>
Amadeo Post Office	5,658	138	5,796	79,275	129	79,404
City of Gen. Trias Post Office	31,457	2,645	34,102	142,878	2,591	145,469
Manggahan Post Office	12,382	3,753	16,135	134,533	851	135,384
Tanza Post Office	12,341	39,553	51,894	416,897	1,873	418,770
Trece Martires City Post Office	24,271	1,402	25,673	257,052	1,450	258,502
<b>7<sup>th</sup> District</b>	<b>148,202</b>	<b>18,561</b>	<b>166,763</b>	<b>768,201</b>	<b>16,266</b>	<b>784,467</b>
Alfonso Post Office	7,256	692	7,948	30,612	692	31,304
Indang Post Office	16,947	1,210	18,157	75,603	1,221	76,824
Naic Post Office	26,790	2,412	29,202	274,006	1,801	275,807
Mendez Post Office	2,083	766	2,849	33,895	626	34,521
Tagaytay City Post Office	95,126	13,481	108,607	354,085	11,926	366,011
<b>Total</b>	<b>854,652</b>	<b>126,038</b>	<b>980,690</b>	<b>6,210,633</b>	<b>72,926</b>	<b>6,283,559</b>

Source: Philippine Postal Corporation, Office of the Postmaster General, Manila

## Power

Manila Electric Company or Meralco is the Philippines' largest electric power distribution company which provides power to 5.5 6 million consumers in 35 cities and 76 municipalities, including Metro Manila, the provinces of Rizal, **Cavite** and Bulacan, and parts of the provinces of Pampanga, Batangas, Laguna and Quezon ([www.jgsummit.com.ph/meralco](http://www.jgsummit.com.ph/meralco)).

All towns down to all barangays of Cavite have access to electric power supplied by Meralco thus giving the province's energization rate of 100%.

Data gathered from this agency indicates that the consolidated number of customer expanded to a total of 811,435 customers, 5.21% higher than in 2014 data of 771,262 customers. Residential customers accounted for 93.59% totaling to 759,382 while commercial customers was registered at 6.24% or 50,601. Furthermore, industrial and streetlight customers totaled to 683 and 769, respectively. These accounted for less than 1% of total customer count (Table 7G).

Table 7H shows the existing substation in the province and its location. A substation is a part of an electrical generation, transmission, and distribution system. Substations transform voltage from high to low, or the reverse, or perform any of several other important functions. Between the generating station and consumer, electric power may flow through several substations at different voltage levels (*Wikipedia*).

Meralco's electric capital projects (ECPs) were designed to meet growth in power demand and enhance customer experience, as well as improve the distribution system ensuring reliability, power quality, and resiliency in the face of natural calamities and other contingencies ([www.manilatimes.net](http://www.manilatimes.net)).

The details of 2015 electric capital projects for the province of Cavite are shown in Table 7I.



**Table 7G** Number of Customers by City/Municipality, Province of Cavite: 2015

City/Municipality	Number of Customers				
	Residential	Commercial	Industrial	Streetlight	Total
<b>1<sup>st</sup> District</b>	<b>64,283</b>	<b>6,106</b>	<b>16</b>	<b>34</b>	<b>70,439</b>
Cavite City	18,408	1,842	2	2	20,254
Kawit	17,944	1,778	8	23	19,753
Noveleta	9,892	936	1	5	10,834
Rosario	18,039	1,550	5	4	19,598
<b>2<sup>nd</sup> District</b>	<b>112,527</b>	<b>7,816</b>	<b>41</b>	<b>146</b>	<b>120,530</b>
City of Bacoor	112,527	7,816	41	146	120,530
<b>3<sup>rd</sup> District</b>	<b>105,826</b>	<b>6,702</b>	<b>44</b>	<b>95</b>	<b>112,667</b>
City of Imus	105,826	6,702	44	95	112,667
<b>4<sup>th</sup> District</b>	<b>136,568</b>	<b>8,787</b>	<b>140</b>	<b>124</b>	<b>145,619</b>
City of Dasmariñas	136,568	8,787	140	124	145,619
<b>5<sup>th</sup> District</b>	<b>92,828</b>	<b>6,180</b>	<b>313</b>	<b>93</b>	<b>99,414</b>
Carmona	21,089	1,597	202	40	22,928
Gen. Mariano Alvarez	24,746	1,267	9	11	26,033
Silang	46,993	3,316	102	42	50,453
<b>6<sup>th</sup> District</b>	<b>162,135</b>	<b>8,168</b>	<b>116</b>	<b>153</b>	<b>170,572</b>
Amadeo	6,872	390	1		7,263
City of Gen. Trias	78,856	3,286	63	87	82,292
Tanza	44,765	2,956	20	47	47,788
Trece Martires City	31,642	1,536	32	19	33,229
<b>7<sup>th</sup> District</b>	<b>85,215</b>	<b>6,842</b>	<b>13</b>	<b>124</b>	<b>92,194</b>
Alfonso	10,861	967	2	15	11,845
Gen. Aguinaldo	3,394	205	1		3,600
Indang	12,703	888	2	5	13,598
Magallanes	3,411	204		7	3,622
Maragondon	5,717	511			6,228
Mendez	6,117	419		3	6,539
Naic	20,427	1,539	4	29	21,999
Tagaytay City	19,431	1,937	2	63	21,433
Ternate	3,154	172	2	2	3,330
<b>Total</b>	<b>759,382</b>	<b>50,601</b>	<b>683</b>	<b>769</b>	<b>811,435</b>

Source: Meralco, Ortigas Avenue, Pasig City

**Table 7H** Existing Power Substations, Province of Cavite: 2015

Substation	Location
Abubot Substation	Aguinaldo Hi-way, Abubot, City of Dasmariñas
Amadeo Substation	Provincial Road, Banaybanay, Amadeo
Bacoor Substation	Aguinaldo Highway, Habay, City of Bacoor
FCIE Substation	Langkaan, City of Dasmariñas
Gateway Substation	Gateway Business Park, Javalera, City of Gen. Trias
GMA Substation	Lakeview Industrial Corp., Kabilang Baybay, Gen. Mariano Alvarez

Substation	Location
Imus Substation	Aguinaldo Highway, Anabu, City of Imus
Puerto Azul Substation	Puerto Azul, Ternate
Silang Substation	Aguinaldo Highway, San Vicente, Silang
Tagaytay Substation	Aguinaldo Highway, Buho, Silang
Tagaytay West Substation	National Road, Maharlika West, Tagaytay City
Tanza Substation	National Road, Amaya, Tanza
TMC II Substation	National Road, Tanauan (Quintana), Tanza
Dasmariñas Substation*	Aguinaldo Highway, San Agustin I, City of Dasmariñas
Rosario Substation*	Along Gen. Trias Drive, Rosario
Ternate Substation*	Along Governor's Drive, Ternate

\*NGCP-owned substation

Source: Meralco, Ortigas Avenue, Pasig City

**Table 7I** Electric Capital Projects, Province of Cavite: 2015

Project Name	Objective
<b>Subtransmission Projects</b>	
Construction of Dasmariñas - Imus 115 kV Line	To provide switching flexibility to both Bacoor and Imus substations through the second 115 kV source from Dasmariñas substation and to increase the reliability of the existing 115 kV system by providing a link between Dasmariñas and Zapote 230 kV -115 kV substations.
Rebuilding portion of Dasmariñas - Imus 115 kV Line	To provide additional capacity to meet the increasing power demand in City of Dasmariñas, Trece Martires City, City of Gen. Trias, Rosario and adjacent towns in Cavite
<b>Substation Projects</b>	
Installation of 34.5kV Metalclad Switchgear at Dasmariñas 83 MVA transformer owned by Meralco	To improve switching flexibility and better reliability in the area of City of Dasmariñas and will partially unload Imus substation.
<b>Distribution Projects</b>	
Partial conversion of Tanza 38ZW to 20kV/34.5 kV Phase 2 (Amaya 1)	To convert a portion of Tanza 38ZW feeder from 13.8 kV to the standard 34.5 kV distribution to address its limited tying capability that causes unserved demand during contingency.

Project Name	Objective
Partial conversion of Tanza 38ZW to 20kV/34.5 kV Phase 3 (Julugan)	To convert a portion of Tanza 38ZW feeder from 13.8 kV to the standard 34.5 kV distribution to address its limited tying capability that causes unserved demand during contingency.
Flexibility improvement of Imus 423WK	To reduced unserved demand of Imus power transformer bank no. 2. This project will benefit customers in some portions of City of Imus.
Partial conversion of Imus 34WK to 20kV/34.5 kV Phases 2 & 3	To reduce the impact of power interruption that affects the residential and commercial customers served by circuit Imus 34WK due to its ageing oil circuit breaker.
Construction of Bacoor 424 WX - Imus 424 WK tie line	To improve the switching flexibility of Bacoor and Imus circuits during emergency and scheduled interruptions.
Flexibility improvement of Dasmariñas 43DA and 41DA	To improve the switching flexibility of Dasmariñas circuits during emergency and scheduled interruptions.

Source: Meralco, Ortigas Avenue, Pasig City

## Water Supply

Access to safe drinking water is not only essential for the promotion and protection of public health but is a basic human right. Provision of safe water supply prevents the transmission of waterborne pathogens and reduces the exposure of individuals to chemical and physical hazards that could be ingested through contaminated drinking water ([www.doh.gov.ph](http://www.doh.gov.ph)). Generally, the entire province of Cavite has access to

clean and safe water. It is being provided by Maynilad Water Services, Inc. also known as Maynilad, a water and waste water services provider of cities and municipalities of the National Capital Region that forms the West Zone and some parts of Cavite which include City of Imus, City of Bacoor, Cavite City and the municipalities of Noveleta, Kawit and Rosario. (*Wikipedia*).

Moreover, the municipalities of Mendez, Indang, Silang, Gen. Mariano Alvarez, Maragondon, Tanza, Carmona, Amadeo, Gen. E. Aguinaldo, City of Dasmariñas, Tagaytay City and Trece Martires City are being supplied by water districts. Likewise, there are private corporations operating as water service providers in the province like General Trias Water Corporation in City of Gen. Trias, Naic Water System Corporation in Naic and Western Cavite Water Supply and Service Corporation in Ternate while the municipal governments of Alfonso and Magallanes manage their respective water supply systems. Table 7J shows the number of customers served and the residential water rate schedule of each water service providers. For the water districts, the minimum charge (first 10 cubic meters) ranges from P163.00 in Gen. E. Aguinaldo Water District to P280.00 in Gen. Mariano Alvarez Water District. For LGUs and private corporations, the minimum charge ranges from P50.00 (1<sup>st</sup> 8 cu.m.) in Alfonso to P144.37 in Western Cavite Water Supply & Services, Ternate while Maynilad Water Services, Inc. charges P144.37 for the first 10 cubic meters.

**Table 7J** Number of Customers Served and Residential Water Rates by Water Service Providers, Province of Cavite: 2015

Water Agency	Number of Customers Served								Residential Water Rates		
	Residential	Commercial	Semi-Commercial	Industrial	Institutional	Government	Block Faucet/Others	Total	Minimum Charge (1st 10 cu.m.)	Price per cubic meter	
										11-20	21-30
Alfonso Waterworks Office	1,291	76					9	1,376	50.00*	10.00	10.00
Magallanes Waterworks Office	3,245	80				46		3,371	150.00	15.50	16.50
Maynilad Water Services, Inc.	90,172	1,885	2,079	55	51	53		94,295	144.37	17.83	33.52
Naic Water Supply Corp.	5,993							5,993	120.00	10.00	10.00
Western Cavite Water Supply	1,243					5		1,248	144.00	15.50	16.50
Amadeo Water District	6,530	76	25			44		6,675	211.00	26.00	28.00
Carmona Water District	11,008	262				60		11,330	238.60	26.20	29.00
Dasmariñas Water District	99,239	987	16,019			265	552	117,062	173.00	20.80	24.95
Gen. Aguinaldo Water District	2,511	94	134			9		2,748	163.00	17.30	19.70
Gen. Trias Water Corporation											
GMA Water District	14,603	179	494			45		15,321	280.00	29.65	32.35
Indang Water District	6,534	190	201			55		6,980	188.00	22.25	24.90
Maragondon Water District	3,062	32	270			22		3,386	168.00	18.00	19.50
Mendez Water District	4,220	155				1		4,376	195.00	21.50	24.00
Silang Water District	32,685	887	474			117		34,163	229.00	25.00	28.00
Tagaytay City Water District	13,043	978			72	108	72	14,273	254.00	28.00	31.00
Tanza Water District	10,562	346				40		10,948	180.00	18.30	19.45
Trece Martires City Water District	20,313	386				149		20,848	170.00	18.25	19.55
<b>Total</b>	<b>326,254</b>	<b>6,613</b>	<b>19,696</b>	<b>55</b>	<b>123</b>	<b>1,019</b>	<b>633</b>	<b>354,393</b>			

\*1<sup>st</sup> 8 cu.m. Source: Special Projects Division, Provincial Planning & Development Office, Trece Martires City

## Irrigation

Based on data from National Irrigation Administration ([www.nia.gov.ph](http://www.nia.gov.ph)), there are three categories of irrigation systems: national, communal, and private. National irrigation systems (NIS) are large and medium schemes. These are basically operated and maintained by NIA where beneficiaries are charged irrigation service fee for the services rendered in the delivery of water. In the 1980s, joint management of portions of national systems with irrigators associations (IA) was effected.

Communal irrigation systems (CIS) are small-scale schemes and constructed with the participation of farmer-beneficiaries thru their IAs. The operation and maintenance (O&M) of CIS is turned over to IAs upon project completion subject to a cost recovery arrangement. Farmers amortize the chargeable cost for a period not exceeding 50 years at 0% interest. The repayment scheme is pre-arranged and acceptable to both NIA and the IA. Another scheme is the payment of 30% equity equivalent to 30% of the total direct cost which is to be paid within one year.

Private irrigation systems are those constructed, operated and maintained by private individuals or groups with or without technical assistance by NIA or other government agencies.

### NIA Cavite Report

Cavite Friar Lands Irrigation Systems (CFLIS) with its office located in Naic, Cavite is one of the oldest national irrigation systems in the Philippines. Sometimes in 17<sup>th</sup> century during the Spanish period, "encomiendas" or Spanish Royal land grants were implemented in Cavite. The priests were granted by the Spanish King, portions of agricultural lands which were subdivided into four estates namely: Naic Estate, Sta. Cruz de Malabon Estate, San Francisco de Malabon Estate and Imus Estate, all of which are now popularly called as Cavite Friar Lands.

In 2015, Cavite Friar Lands Irrigation Systems' firmed - up service area (FUSA) totaled to 8,542.00 hectares by which 5,100.00 hectares are operational or planted with crops and 3,442.00 hectares are non-operational. FUSA covers the municipalities of Maragondon, Ternate, Naic, Tanza, Cities of Gen. Trias, Imus, Bacoor, and Dasmariñas. As presented on Table 7K, 2,661.00 hectares are located at Naic Estate; 1,748.00 hectares came from Sta. Cruz de Malabon Estate while San Francisco de Malabon Estate comprised 2,447.00 hectares and Imus Estate was recorded at 1,686.00 hectares.

Communal Irrigation System (CIS) has a total firmed-up service area of 983.00 hectares serving the municipalities of Kawit, Gen. E. Aguinaldo, Ternate, Maragondon, Carmona, Silang, Gen. Mariano Alvarez, Naic, Magallanes and the City of Bacoor. Out of the total, 449 hectares are operational while 534 hectares are non-operational. Farmer beneficiaries were registered at 379 (Table 7L).

**Table 7K** National Irrigation System, Province of Cavite: 2015

System	City/ Municipality	Firmed – Up Service Area (FUSA) (Hectares)			Farmer Beneficiaries
		Total	Operational	Non- Operational	
<b>Naic Estate</b>		<b>2,661.00</b>	<b>2,151.00</b>	<b>513.00</b>	<b>1,851</b>
Mabacao Pump	Maragondon	35.00		35.00	35
Kay-Akle River					
Irrigation System (RIS)	Maragondon	385.00	299.00	86.00	257
Kay-Akle RIS	Ternate	18.00	18.00	0.00	14
Balayungan RIS	Ternate	22.00	22.00	0.00	13
Balayungan RIS	Maragondon	207.00	207.00	0.00	128
Balayungan RIS	Naic	1,317.00	1,128.00	189.00	831
Culong-Culong RIS	Naic	475.00	347.00	128.00	397
Sahing RIS	Naic	202.00	130.00	72.00	176
<b>Sta. Cruz de Malabon Estate</b>		<b>1,748.00</b>	<b>1,188.00</b>	<b>560.00</b>	<b>655</b>
Tres Cruces RIS	Tanza	573.00	512.00	61.00	172
Matanda RIS	Tanza	1,175.00	676.00	499.00	483
<b>San Francisco de Malabon Estate</b>		<b>2,447.00</b>	<b>1,043.00</b>	<b>1,404.00</b>	<b>1,316</b>
Vargas (Bankud) RIS	City of Gen. Trias	544.00	210.00	334.00	340
Plucena-Bayan RIS	City of Gen. Trias	290.00	157.00	133.00	162
Butas-Lawang Bato RIS	City of Gen. Trias	529.00	307.00	222.00	278
Butas RIS	City of Gen. Trias	269.00	145.00	124.00	182
Butas-Marcelo RIS	City of Gen. Trias	335.00	77.00	258.00	165
Butas-Palanas RIS	City of Gen. Trias	480.00	147.00	333.00	189
<b>Imus Estate</b>		<b>1,686.00</b>	<b>718.00</b>	<b>968.00</b>	<b>1,087</b>
San Agustin RIS	City of Imus	414.00	174.00	240.00	278
Pasong Kastila RIS	City of Imus	511.00	227.00	284.00	288
Julian RIS	City of Imus	208.00	64.00	144.00	106
Makuling RIS	City of Dasmariñas	149.00	25.00	124.00	86
Lukshin RIS	City of Dasmariñas	109.00	52.00	57.00	77
Embarcadero RIS	City of Dasmariñas	61.00	40.00	21.00	47
Baluctot RIS	City of Dasmariñas	150.00	96.00	54.00	130
Molino RIS	City of Bacoor	84.00	40.00	44.00	75
<b>Total</b>		<b>8,542.00</b>	<b>5,100.00</b>	<b>3,442.00</b>	<b>4,909</b>

Source: National Irrigation Administration, Naic, Cavite

**Table 7L** Communal Irrigation System, Province of Cavite: 2015

System	City/ Municipality	Firmed – Up Service Area (FUSA) (Hectares)			Farmer Beneficiaries
		Total	Operational	Non- Operational	
Kawit Pump Communal Irrigation System (PCIS)	Kawit	60.00		60.00	20
San Nicolas II PIS	City of Bacoor	52.00	43.00	9.00	4
Lantic I CIS	Carmona	99.00	99.00		27
Lantic II CIS	Carmona	55.00	55.00		16
Maduya PCIS	Carmona	34.00	34.00		7
F. De Castro PCIS	Gen. Mariano Alvarez	32.00		32.00	85
Pasong Saguing PCIS	Gen. Mariano Alvarez	34.00		34.00	99
Lumil & Tartaria PCIS	Silang	40.00		40.00	
Gen. Aguinaldo CIS	Gen. E. Aguinaldo	30.00		30.00	
Narvaez CIS	Gen. E. Aguinaldo	100.00	100.00		
Pacheco PCIS	Magallanes	42.00	12.00	30.00	10
Magay CIS	Maragondon	300.00	36.00	264.00	73
Palangue PCIS	Naic	35.00		35.00	
Golova CIS	Ternate	60.00	60.00		28
Bacoor II Pump Irrigation Project	Molino III, City of Bacoor	10.00	10.00		10
<b>Total</b>		<b>983.00</b>	<b>449.00</b>	<b>534.00</b>	<b>379</b>

Source: National Irrigation Administration, Naic, Cavite

To sum up, the reported firmed-up service area (FUSA) or the service area to be covered by irrigation facilities totaled to 9,525.00 hectares by which 8,542.00 hectares comprised national irrigation system while 983 hectares are communal irrigation system. Out of the total, 5,549.00 hectares are operational while non-operational totaled to 3,976.00 hectares. Farmer beneficiaries were recorded at 5,288 (Table 7M).

**Table 7M** Firmed-up Service Area by Irrigation System, Province of Cavite: 2015

Irrigation System	Firmed-up Service Area (FUSA)			Farmer Beneficiaries
	Total	Operational	Non-Operational	
National Irrigation System	8,542.00	5,100.00	3,442.00	4,909
Communal Irrigation System	983.00	449.00	534.00	379
<b>Total</b>	<b>9,525.00</b>	<b>5,549.00</b>	<b>3,976.00</b>	<b>5,288</b>

Source: National Irrigation Administration, Naic, Cavite