Village System and Transportation in the Philippines

by

Seiji Nishioka
JICA Expert
National Center for Transportation Studies Project, UP Diliman
Deputy Director, City Planning Division,
Ministry of Construction in Japan

Salome R. Manahan
Senior Transportation Dev. Officer
Transport Training Center, UP Diliman

Samuel Julius B. Garcia
Supervising Transportation Dev. Officer
Transport Training Center, UP Diliman

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Chapter I Introduction

Background/Rationale

The development of the village system in the Philippines has progressed and continues to spread at a very fast pace. The concept of a subdivision or what we term as the "Village system" is a unique residential system not only found in the Philippines but in the USA and in Mexico, as well. Similarities can also be found in the "Soi" system in Thailand and the "Concession" in China before World War II.

Of particular interest is the proximity of the residential development to commercial and business land use. This occurrence leads to various issues concerning the use of the road network adjacent to both areas. Residents of nearby subdivisions would prefer that access roads and village roads be confined only to residential traffic for reasons that include safety of residents, reduction of traffic noise, vehicle emissions and congestions. On the other hand, occupants of the commercial and business area would demand open usage of the road network to allow for a wider extent of their services. This has brought about conflict regarding the use of the road network adjacent to and within subdivisions. This conflict has been addressed by the enclosure of village areas and the closure of village roads to outside traffic.

However, this concept has imparted a negative impact on the overall road network. Restrictions on the use of critical access roads have been the causes of traffic jams in the arterial road network. Thus, causing a strain on the transportation system of the metropolis.

Objectives

The main objectives of this research focus on strengthening the merits and correlation of the demerits of the village system with the development of transportation systems and subsequently, its effect on traffic.

This research envisions to propose a reasonable policy for the village system in the future. It is believed that a good policy for the village system shall provide a giant step in finding solutions to transportation problems in the expanding metropolis and contribute to a good transport environment for the future.

Many concepts have been proposed for the solution of conflict of residence and traffic in urban areas including the village system in the Philippines. This study intends to propose the new concept as the fusion of village system and transportation science. It is also hoped that such a study may be replicated in other urban areas not only in the Philippines but in other countries as well.

Finally, in this approach, it is hoped that future urban development and planning for the village system will be better guided.

Outline of This Paper

This paper consists of six chapters including this introduction. Chapter II contains the present situation of subdivisions using the HLURB data. The data presented, however, does not differentiate villages from subdivision.

Chapter III discusses why such a unique residential system can exist in the Philippines. It considers the legal, historical and political aspects that may have influenced the village system.

Chapter IV deals with transportation considerations for the Village System. It aims to compare the characteristics of the Village System to the Environmental Area which was proposed in the Buchanan Report published in 1963.

Chapter V presents an analysis of traffic conditions outside and inside villages. Villages reflect transportation merits and demerits to the outer area. Moreover, it presents traffic problems that arise within village areas.

Chapter VI contains the conclusion of this report. It presents a summary of the preliminary findings of the research study and problems on the Village System. Finally, it reveals what this research envisions to achieve.

Chapter II Present Situation

Existing and planned subdivisions can be classified according to a variety of factors such as size of individual lots, available facilities, degree of land use, number of available lots per subdivision, general type of housing units, etc. For the purpose of this study, the Village System is defined as a:

* planned,
* residential and
* exclusive subdivision,
* with single-detached housing units,

in general. Essentially though, this study aims to focus on the development of exclusive subdivisions for the upper middle to high income level families. Furthermore, it is presumed that along with being exclusive, these subdivisions are being managed by residents associations.

In our efforts to locate subdivisions in Metro Manila that fall under the above mentioned definition, the research team conducted an inventory survey of the existing villages. The main source of information was the Records Section of the Planning Assistance and Review Office of the Housing and Land Use Regulatory Board (HLURB). The HLURB being the main agency responsible for the issuance of the development permits and license to sell for subdivision developments, was apparently the only agency with the most complete information for the inventory. Since the HLURB was established only in 1975, most of the information available were on subdivisions planned and developed after 1975. But nevertheless, the research team were still able to capture some information on subdivisions which existed prior to the creation of the HLURB.

Initially, subdivisions are classified by the HLURB as those under Presidential Decree 957 (P.D. 957) and Batas Pambansa 220 (B.P. 220), both decrees regulating the design, development, and selling of subdivision lots and condominium units. The distinction of one from the other is that the latter provides for different levels of standards and technical requirements for economic and socialized housing projects in the urban and rural areas from those provided in the former category. These decrees support the legality of the existence of the village system here in the Philippines.

For the entire metropolis, subdivisions conceived under the village system totals 1,428. Quezon City has the largest number of subdivisions followed by Parañaque, Caloocan City, Las Piñas and Pasig. The distribution of subdivisions in Metro Manila is further shown in Table 1 below.

Table 1
Number of Subdivisions by Municipality

MUNICIPALITY	NO. OF SUBDIVISIONS	AVERAGE LOT SIZE
Caloocan City	161	311.04
Las Piñas	153	330.01
Makati	4	3,277.40
Malabon	20	388.47
Mandaluyong	10	127.85
Manila	28	129.77
Marikina	90	368.44
Muntinlupa	78	406.67
Navotas	2	91.00
Parañaque	181	362.60
Pasay City	6	150.77
Pasig	121	400.00
Pateros	3	47.40
Quezon City	474	436.29
San Juan	4	208.59
Taguig	22	173.77
Valenzuela	71	262.34
TOTAL	1,428	

Note: The average lot size given in this table was derived by simple averaging computation of total land areas in subdivisions and total number of lots.

However, based on Table 1, the limitations of the inventory survey are apparent in the number of subdivisions registered in Makati. It is common knowledge that a number of exclusive subdivisions do exist in Makati which definitely total to more than only four. Thus, for the purpose of further assessment, the research team has tapped other sources of information specifically historical records that indicate the earliest existence of villages.

For the Municipality of Makati, the following figures were derived from reports and other sources on the development of subdivisions in Makati. Table 2 below indicates the average lot areas of the residential lots in each of the thirteen villages located in Makati.

Forbes Park North, apparently, has the largest average lot area among the subdivisions in Makati. Incidentally, Forbes Park happens to be one of the most exclusive subdivisions wherein entry of non-residents is strictly monitored.

Table 2
Average Lot Area in Makati Subdivisions
(In Square Meters)

SUBDIVISION	AVERAGE LOT AREA
Forbes Park	1,740.42
Forbes Park North	2,724.01
San Lorenzo Village	850.97
Urdaneta Village	1,559.89
Bel-Air Subdivision	882.27
Legazpi Village	1,425.37
Magallanes Village	891.57
Dasmariñas Village	1,192.67
Salcedo Village	585.71
San Carlos Village	580.00
Santiago Subdivision	353.33
Rizal Subdivision	396.00
Palm "C"	757.20

For purposes of comparison, Table 3 presents the number of subdivisions in each municipality/city with the available lot sizes in the subdivisions.

As evident in the table above, Quezon City has the most number of subdivisions with large lot areas but in terms of distribution, Makati maintains a high share of subdivisions with large lot areas.

Table 3
Lot Sizes of Subdivisions
(in Square Meters)

MUNICIPALITY	< 300	301-500	501-1000	>1001	TOTAL
Caloocan City	110	38	4	9	161
Las Piñas	73	62	13	5	153
Makati	0	1	1	2	4
Malabon	11	1	6	2	20
Mandaluyong	9	1	0	0	10
Manila	22	5	1	0	28
Marikina	48	33	7	2	90
Muntinlupa	45	12	13	8	78
Navotas	2	0	0	0	2
Parañaque	101	60	16	4	181
Pasay City	5	1	0	0	6
Pasig	51	44	10	6	121
Pateros	2	1	0	0	3
Quezon City	219	128	93	34	474
San Juan	3	0	0	1	4
Taguig	15	6	1	0	22
Valenzuela	39	27	3	2	71
TOTAL	765	420	168	75	1428

Chapter III Existence of the Village System in the Philippines

The existence of the Village System in the Philippines is made possible not only through legal backing but has practically been imposed through history and government policy.

Legal Aspects

According to P.D. 957 and B.P. 220, the very nature of the village system is considered legal and can exist as long as development of the subdivision conforms to the provisions in the above mentioned decrees. But there remains one issue which is still considered to be controversial. That is, if village systems can keep the internal roads private property and demand exclusive use.

One source of controversy arising from the provisions of P.D. 957 as amended by P.D. 1216 is the provision in Section 2 of the latter stating that "upon their completion ... the roads, alleys, sidewalks and playgrounds shall be donated by the owner or developer to the city or municipality and it shall be mandatory for the local governments to accept ..."

One interpretation of the law here presented is that roads and similar passageways in a subdivision are deemed to have been donated to government within the prescribed completion period of one year from the issuance of a license to the developer/owner. As such the roads are government property, not subject to control by private personalities and thus their closure by homeowners' associations are illegal. Of course the implication would be that government would have to take care of maintenance, and real estate taxes may

no longer collected on the same land.

The other is that the word "donate" connotes willingness on the part of the donor. Thus the owner may not be obligated against his will to make the donation of roads, alleys, etc.. What is made mandatory by the decree is the acceptance by the local government. With this interpretation the owner/developer may retain title to the roads and exercise control over them and maintain exclusiveness of the subdivision. Needless to say, he still has to pay taxes on the land.

In either interpretation, both government and homeowners and developers seem to agree to use the latter interpretation. Except for the matter of taxes it seems advantageous to all three to accept this interpretation. It may be disadvantageous to potential users of the roads who are not homeowners in the subdivision.

This topic may continue controversial from now on. We believe that we should consider about this topic only on the translation of existing decrees but on the discussion of future desirable future figure of metropolis. If necessary we should change the provisions of them to fit to the reasonable situation.

Historical Influence

Urbanization patterns in the Philippines is a result of colonial experience under Spain (from 1571 to 1898), then the United States of America (from 1898 to 1946). The patterns that resulted from the impact of western culture reflect the attempt of Filipino culture to adapt to impositions of the culture and political authority of the colonizer. Although settlement patterns of today as seen in the village system may not conform totally to what was in the past, traces of past settlement patterns are still quite evident. However, it is sad to note that cartographic evidences on the evolution of settlement patterns are not readily available. The absence of such records are stumbling blocks in our attempt to find explanations on particular features now found in the present village system. Nevertheless, an initial understanding of the past shall undeniably ease our understanding of the present.

It was in the period 1571 to 1645 (Legaspi's Manila) when Intramuros was established. Intramuros had the four main characteristics of an exclusive subdivision in Makati in the 1990's. This was the result of military or defense requirements that necessitated fortifications, and racial segregation.

Intramuros was established as the distinctive and exclusive Spanish section of Manila. For the Spanish, it symbolized the superiority stature of their Regime. Fortifications were built initially for the purpose of defence but eventually was a means to segregate the Spanish from the natives. It was in every sense an exclusive district within Manila.

The end of World War I marked the beginning of land development in the south. The first subdivisions were not particularly well-planned. They merely reflected the accepted standards for real estate development of the early 20th century - streets were narrow, there was very little allowance for expansion; residential blocks were not well defined, the drainage system was inadequate and there was no running water and electricity. However, the first subdivisions: Olimpia (1924), Consuelo (1925), and the others in 1946: San Andres, San Andres Extension, and Singalong were quickly sold.

It was after World War II that Makati of today literally rose from the destruction and ashes

of the war. The Ayala Corporation under the management of Colonel Joseph McMicking created a vision of a model city which was to rise out of the dismal swamps and unfertile hacienda. Early attempts to engage in real estate development began in 1948 when the groundwork for the most stylish residential settlement in Makati - Forbes Park Village (named after the 5th American Governor of the Philippines, W. Cameron Forbes) was made. The primary purpose was to attract affluent families, foreign capitalists, business tycoons and industrial titans. Forbes Park started out with a select group of 400 houses. Sooner than what was expected Forbes park became easily populated by prominent people. Forbes Park stands as the oldest planned, exclusive, residential with single detached housing units subdivision in Metro Manila - our first "Village System". It, thereafter, started the trend. Other subdivisions were opened to accommodate droves of fashionable rich who wanted to reside in Makati. San Lorenzo Village was opened in 1952, Bel Air in 1954, Urdaneta in 1957, San Miguel in 1960, Magallanes and Dasmariñas in 1962, and Legaspi and Salcedo sometime in 1976.

Forbes Park initially was an open residential area basically influenced by American design. The enclosure of the village could have been brought about by several reasons.

For one, historically, Philippine culture and religion dictate that the Filipino should live closely together. By setting themselves proximate to each other, they can extend help more readily to family members and close relatives. Moreover, it is perceived that building a wall around their houses could protect themselves better. This further explains the preference of Filipino families to enclose their individual houses and this concept extends further to subdivisions since the residents are linked together by the existence of a residents' association which somehow serves as the binding force.

Government Policy

The success of a private sector development as seen in Forbes Park lead government to recognize and accept the capability of the private sector. Although government efforts should also be commended for the cooperation and support extended to such large scale private development. Moreover, the inability of Government to finance such projects is a deterrent for government to insist on the responsibility of such developments. The class structure of the Philippine society is pyramidal and reliance on tax payments for sources of funds is thus out of the question.

Today, the maintenance of village roads and infrastructure is a shared responsibility of the residents' association and subdivision developer. By such, government need not account for such expenditures. The developer, on the other hand, considers this an investment since such costs can be transferred to the selling price of the lots in the subdivision. Finally, the land owner extends the willingness to shoulder such costs in exchange for the assurance of security and privacy. In addition, the quality of work and level of services can be to their desired standards.

An excellent model of such cooperation and coordination is seen in Makati. Residents' associations are non-stock, non-profit organizations. The funding of the association comes from the dues collected from the members on the basis of the areas of lot owned. This is a supra-tax ("user charges") over and above the tax that residents of Makati pay to the Municipality. On the other hand, the tax that residents pay is used to improve the poorer sections of the municipality.

Chapter IV Characteristics from the Transportation Viewpoint

Characteristics as an Environmental Area

As we mentioned above, the origin of the Village System in the Philippines is Forbes Park in 1948. At that time, the solution to increased vehicle traffic in residential areas was one of the most controversial topics in transportation study in the world. Some new concepts were proposed from the 1920's to the present. The Village System reflects these new concepts and presents the most Modern system in the world.

Table 4
Historical Review of Improvement of the Residential Road Network

Worldwide Topics	Topics in the Philippines
1928 Radbahn System (U.S.A.)	
1929 Neighborhood Theory (U.K.)	
	1938 Quezon City Plan
	1948 Forbes Park
	1952 San Lorenzo Village
	1957 Urdaneta Village
	1962 Magallanes, Dasmariñas Village
1963 Buchanan Report (U.K.)	
Mall Concept (Germany)	
1970 Traffic Zone System (Sweden)	
Boonerf (Holland)	

Most famous of the concepts for the traffic control system in a residential area is the Environmental Area proposed by the Buchanan Report in 1963. Actually, the Village System which existed in the Makati development in 1948 already embodied the main features contained in the Environmental Area concept.

Environmental Area concept has three typical objectives: 1) road hierarchy, 2) prevention of passing-through traffic and 3) decrease of vehicle speed. Based on the same objectives, the characteristics of Village System shall be discussed.

1) Road Hierarchy

On the Environmental Area concept, the road network should be classified according to its function to transportation: primary distributor, district distributor and local distributor. Each environment area is surrounded by district distributors or primary distributors. Makati area, for instance, exhibits such a design. However, there are still some problems associated to this concept, as follows:

* Hierarchial gap between EDSA and other arterial roads
  Many of the villages were developed along EDSA. This implies that residents of said villages are compelled to use EDSA. Thus, the transportation convenience of these villages highly depend on this main thoroughfare. By such, heavy traffic conditions occurring along EDSA, which may be caused by accidents, flooding, or

by the sheer volume of traffic, may actually paralyze networks which are secondary to EDSA.

* Access Control from within the Villages to Outer Arterial Roads
There are few access points from villages to arterial roads. It prevents disturbing traffic flow and thus increases traffic function of arterial roads.

* Proximity of Access Points of Villages to Intersections of Arterial Roads
To control the access points from villages to arterial roads, there are service roads or sometimes circuit roads behind arterial roads. Their access points are often located close to the intersections of arterial roads. This hinders smooth traffic flow along arterial roads.

* No Pedestrian-vehicle Segregation.
The protection of pedestrians from vehicles is very important. Exclusive pedestrian walkways are virtually absent in the villages. A possible explanation could be that the residents of villages have their own private vehicles and the need for walking is minimal. Moreover, the reluctance to walk could be attributed to the severe heat typical of tropical areas.

To keep the environment of Environmental Area free from pollution and to promote communication and interaction between village residents, passing through traffic is prevented from flowing into village roads while traffic speed of vehicles using them are regulated. Such measures can also be seen in the village system.

2) Prevention of Passing Through Traffic from Entering

Original idea for prevention of traffic flow is based on the design of a road network as follows:

* Gates
Gates are installed at the entrance of villages to secure the village and ensure privacy. This measure also completely prevents passing through traffic.

* Curved Road
The existence of curved roads in villages confuse drivers of passing through vehicles with respect to recognizing the location of a certain area. This is more often found in open villages since this discourages drivers to use the village road network. Likewise, residents and their guests also get confused. This perhaps explains why enclosed villages no longer have too many curved roads.

3) Decrease Vehicle Speed

* T-intersections
There are many T-intersections in the village compared with other residential areas. Such intersections provide guidance to the driver on the priority of roads at the intersection and prevent increased speed of vehicles. It has been proven that this measure is effective in reducing traffic accidents.

* Regulations
  Some village associations set the upper limit speed and install the corresponding signs along the streets. It, however, does not appear effective since the associations do not have the proper enforcing power.

* Humps
  Humps are used to decrease vehicle speed in villages. Although there are other physical measures to reduce vehicle speed, like image hump, bottle neck, slalom and ramble strip, the use of humps is still common. It is presumed that it may be due to cost and security. Humps are the cheapest of the measure and they do not block a person's view on the road.

Changes of Inner Village Road Network Design Concept

It has been mentioned that the main characteristics of the road network inside the village are T-intersections and curved roads. Figure 1 shows the different degrees of presence of these two characteristics between several villages and older residential areas. From this figure, several interesting points about the changes in road network design concept inside villages can be derived.

Ancient residential areas in Manila and the 1940's developed residential areas in Quezon City share a somewhat similar road network design. These road networks consist mainly of straight roads and cross-intersections.

The design of road network in Forbes Park South and Urdaneta is very much different from that of earlier residential areas in Manila and Quezon City. They started using curved roads and T-intersections in the design of road network in Forbes Park South and Urdaneta.

In the late 1950's and early 1960's, the road network design within Makati area included some changes. This time a reduction in the use of curved roads and an increase in the use of T-intersections is evident. It may be surmised that because of the emergence of gates at the entrances, it was no longer necessary to use curved roads to prevent passing through traffic. The use of T-intersections was apparently increased up to 80 percent.

From the 1960's up to the present, the percentage of T-intersections remains almost the same but with an increase in the use of curved roads to about the same level as in Forbes Park. There are perhaps three reasons that can somehow explain the increased usage of curved roads;

1) Since Metro Manila is constantly expanding, the newly developed areas are basically located on hilly parts of Metro Manila. Some of the most recent developing areas are Fairview in Quezon City, Alabang and Paranaque.
2) Straight roads usually form ordinary villages and curved roads form unique villages. The rich resident who lives in the village would usually opt for uniqueness.
3) Village system has become so popular that the designers would follow the design concept without considering the implications of the design concept.

Table 5. Internal Network Pattern of Villages

SUBDIVISIONS	OPEN YEAR	INTERSECTION				STREETS				
		+	T	TOTAL	T%	Curve	Straight	Cul de sac	TOTAL	Curve %
INTRAMUROS	1584	27	28	55	51	2	22	1	25	8
MALATE	1948	26	22	48	46	2	18	0	20	10
(MANILA TOTAL)	--	53	50	103	49	4	40	1	45	9
MURPHY	1949	35	20	55	36	4	26	0	30	13
STA. MESA HEIGHTS	1950	104	46	150	31	1	53	0	54	2
(Q. C. TOTAL)	--	139	66	205	32	5	79	0	84	6
FORBES SOUTH	1948	9	19	28	68	9	4	3	16	56
SAN LORENZO	1952	9	37	46	80	2	22	1	25	8
BEL-AIR I, III & IV	1957	6	21	27	78	3	17	0	20	15
URDANETA	1957	6	22	28	79	7	6	0	13	54
DASMARINAS	1962	16	62	78	79	6	27	1	34	18
MAGALLANES	1962	10	46	56	82	8	15	1	24	33
FORBES NORTH	1963	4	19	23	83	6	7	1	14	43
LEGASPI	1974	10	42	52	81	8	17	0	25	32
SALCEDO	1974	5	29	34	85	6	11	0	17	35
(MAKATI TOTAL)	--	75	297	372	80	55	126	7	188	29
GREENHILLS	1965	4	23	27	85	2	14	0	16	13
CORINTHIAN GARDEN	1978	12	43	55	78	9	15	0	24	38
(GREENHILLS TOTAL)	--	16	66	82	80	11	29	0	40	28
BF HOMES ALMANZA	1973	12	58	70	83	9	22	3	34	26
BF HOMES PHASE II	1975	8	38	46	83	9	19	2	30	30
ALABANG HILLS PH. III	1984	3	15	18	83	5	5	0	10	50
(OTHERS TOTAL)	--	23	111	134	83	23	46	5	74	31

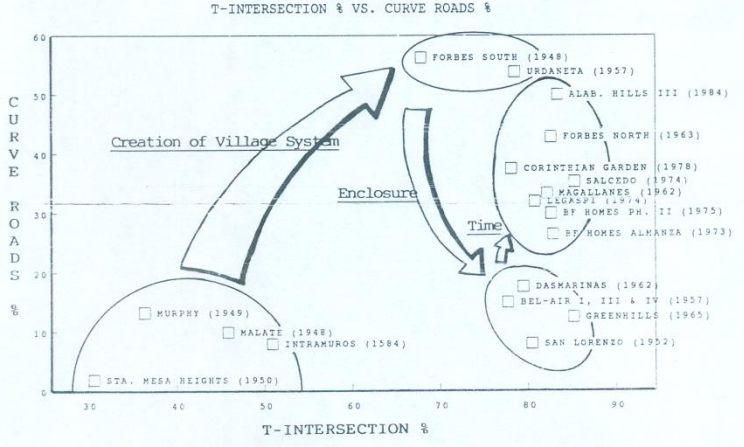

Figure 1. T-Intersection VS. Curved Road in Villages

Chapter V Traffic Reflection Inside and Outside Villages

Village System reflects both inside and outside traffic of the villages. There are several merits and as well as some demerits. To investigate and verify, an actual shall be necessary. Nevertheless, initial observations can be derived through careful though, as follows:

Reflection to External Traffic

1) Merits

* Increase the Traffic Function of Arterial Roads
  Because of the access control to arterial roads from inside villages, the road traffic flow is not disturbed much from access traffic of them.

* Proximity of Resident to Commercial and Business Land Use
  Through the Makati development, it may be surmised that the original village concept encourages proximity of resident to commercial and business area. It makes commuter traffic length shorter and lightens the traffic congestion during commuting hours.

2) Demerits

* Restrictions on the Use of Critical Access
  The bigger the size of villages, the heavier traffic loads along the arterial road network fronting it since the traffic demand is influenced by the size and activity of the area. Some of the villages appear too large than the moderate size when including the adjacent arterial road network .

* Disorderly Development
  Basic urban planning concepts dictate that any development of subdivision should be connected with infrastructure plan. Presently, there has been no relation between them and it would invariably be the cause of traffic problems in the near future.

* Application for Land Use Changes
  Land use of urban areas can be changed from lower levels to higher ones. Then any residential area can be transformed to commercial or business area in the future. Villages are generally so well planned but the possibility of change still exists. However, the village system may not adoptable to such kind of a situation due to careless planning.

Reflections to Internal Traffic

1) Merits

* Few Passing Through Traffic
  Because of establishing a gate system, there is basically no passing through traffic in villages. It reduces pollution, traffic accidents and communication gaps usually caused by passing through traffic.

* Traffic Safety
  Many humps and T-intersections prevent vehicles from travelling at high speeds. It is certainly difficult to drive at a speed higher than 30 kilometer per hour.

* Good Environment
  These previous two merits bring good environmental condition for residence in the villages.

2) Demerits

* Difficult Recognition of Location
  A simple road network pattern such as a grid network allows drivers to recognize where he is in the village. As mentioned above, the road network pattern in villages are not of the grid pattern but instead the combination of T-intersections and curved roads. It confuses the drivers in recognizing his location.

* Schools Disturb Internal Traffic
  Some villages have schools located in them originally for the purpose of attracting residents. It hinders smooth internal traffic when students arrive and leave school.

Chapter VI Conclusions

Through this study, historical facts are presented and an assessment of the present situation of the village system in Metro Manila was made possible. The Village System contain most modern transportation planning concepts in 1950's and 1960's that is almost the same as the Environmental Area concept which was proposed in the Buchanan Report in 1963. It is understood that this system is basically legal under the Philippine law, and is suitable for the culture and present social condition in this nation. But, the closing of village roads to the public still remains a controversial topic. Nevertheless, the Village System has already spread so wide in this nation and is expected to continue to do so in the future.

Solution for Existing Traffic Problems of Village System

Village system looks comparably well managed than other nation's application of the Environmental Area. But it still has some problems for further study from transportation viewpoint. This research aims to find the proper solutions to solve existing problems of village system.

* Solution for Changing of Land Use from Residence to Commercial or Business Use
* Solution for the Demand for Opening Private Road to Public
* Solution for Traffic Problems brought about by the location of the School

Desirable Development of Residential Areas in Expanding Metro Manila

Metro Manila is still expanding by subdivisions. The proposal for desirable development of subdivisions can be the proposal for desirable development of Metro Manila. The remaining modules of this research study shall clearly examine the following concerns:

* Proper Size and Shape of Villages
* Proper Arterial Road Network Pattern Around Villages
* Proper Inner Road Network Pattern
* Arrangement of Entrances of Villages
* Division and Distribution of Lots
* Arrangement of Entrance of Edge Lots in Villages

Development of the New Design Concept of Residential Area

Finally, this research study aims to conceive a new design concept worth introducing not only locally but also all over the world.

* Complex of Business and Residential Districts
* Combination Plan of Adjoining Villages
* New Construction Concept of Arterial Road Network Using Subdivisions (Villages)

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