TRAFFIC FLOW AT THE INTERSECTION OF AQUINO-INFANTE AVENUES AND GENERAL LUNA-M. H. DEL PILAR STREETS, ILOILO CITY

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Abstract: *The purpose of this study was to determine the present traffic flow, and the factors that cause traffic congestion in the intersection of Aquino-Infante Avenues and General Luna-M. H. del Pilar Streets in Iloilo City. The sample survey technique was used to gather primary data on the population, that is, the number of vehicles that were passing on the said intersection. The survey was conducted for one week. The method employed in conducting the survey was through traffic count using direct observation. Hand tally counters were used to count the distribution of traffic by time of day. Frequency counts, means and percentage were used in summarizing the data. Results of the study revealed that the peak hour of traffic in the intersection is in the late mornings and in the late afternoons, with General Luna Street as the busiest among the four road sections adjoining the intersection. Passenger cars, taxis and public utility jeepneys that are plying in the intersection had contributed much to the congestion of the intersection. This is evident by their high tally counts.*

►. INTRODUCTION TO THE STUDY

With the rapid growth of population throughout the world, may people flock to the urban centers to scout for opportunities. This has resulted to a lot of urban problems. One such problem is the problem on traffic. It seems that urban development could not cope with the ·demand of the growing population. Traffic is not only the dilemma of the developed countries but even of third world countries as well. In the Philippines for example, traffic has already been considered as one of the serious and pressing problems.

Background of the Study

The problem on traffic is not only felt in Metro Manila but in other urban centers of the Philippines as well. Take the case of Iloilo City. Iloilo is one of the Philippines' growing cities. Being a bustling metropolis in Western Visayas, there are strong indications that traffic is becoming one of its major problems. Cocjin (2000) described the traffic situation in Iloilo City today as worse as compared in the past years.

Traffic congestion can be attributed to the disparity between road capacity and the increasing traffic volume in and around urban areas. Aside from the rising traffic volume, congestion due to accidents, roadwork for maintenance and repairs, and the aging of existing road facilities are also increasing (Maeda, 1991).

Coupled with problem on congestion, traffic may also pose a problem on safety. For the period of January 1998 to May 1998 alone, the Traffic Management and Engineering Unit (TMEU) of the Iloilo City Police Office has recorded a total of 1,845 vehicular related accidents, 14,682 driver's licenses confiscated due to various traffic violations, and 15 persons arrested for driving without a license.

Conscious of this growing problem, the researcher has attempted to study on the traffic problem of one of Iloilo City's road intersections, the intersection of Aquino-Infante Avenues and General Luna-M. H. del Pilar Streets. The intersection is said to be one of the busiest intersections in the city.

Aquino and Infante Avenues, General Luna and M. H. del Pilar Streets are four-lane streets that are adjoining the intersection. They are classified as national roads and its improvement, maintenance and repair are under the jurisdiction of the Department of Public Works and Highways, Region 6 with the coordination of the City Engineer's Office of Iloilo City. Traffic enforcement and security in the area is under the supervision of the Iloilo City Police Office (ICPO), specifically the Traffic Management and Engineering Unit (TMEU, 1998).

Aquino Avenue extends from the intersection of General Luna and M. H. del Pilar Streets and Infante Avenue and north bound terminating at Barangay Bolilao, Jaro with two tributary roads; one going to the Jaro Plaza and the other going to Ungka, Jaro. Infante Avenue extends from the intersection of General Luna and M. H. del Pilar Streets and Aquino Avenue and south bound terminating at Ledesma Street. General Luna Street extends from Iloilo Provincial Capitol in the city proper, west bound and terminating at the intersection of M. H. del Pilar Street and Aquino and Infante Avenues in Molo. Its opposite street is M. H. del Pilar. M. H. del Pilar Street

extends from the intersection of General Luna Street and Aquino and Infante Avenues and ends at the Molo Plaza.

Presently, the intersection is open to all types of vehicles at twenty-four hours a day.

Objectives of the Study

The objective of this study is to examine the present traffic flow in the intersection of Aquino-Infante Avenues and General Luna-M. H. del Pilar Streets.

More specifically, this study aims to: (a)find out the present traffic flow in the intersection; and (b) present factors that cause traffic congestion in the area.

Scope and Delimitation of the Study

This study is limited to determine the flow of traffic at the intersection of Aquino-Infante Avenues and General Luna-M. H. del Pilar Streets, Iloilo City.

This study does not attempt to present an analysis or absolute solution to problems of all road intersections. The researcher believes that road and traffic conditions vary too widely for every intersection that a "one-size-fits-all" solution is not justifiable.

Significance of the Study

The results of this study will benefit and trigger the realizations of the following: (a) the city traffic engineers, planners and policy makers can use these data as basis for developing proposals for Metro Iloilo so that traffic in the said intersection will not remain a problem but a factor of city's growth and development; (b) the results can also be used by real estate developers, consultants, and agents and homeowners associations for the purpose of appraising real estate properties within the vicinity of the intersection. Accessibility is the prime factor that increases the value of real estate property, however, traffic congestion may also be regarded as a negative factor; and (c) the results of this study may be also helpful to other researchers who are conducting traffic studies similar as this one.

Ultimately, the study may help address national and global issues such as: (a) the Filipino must be highly mobile— able to travel to any part of the country or the world using the road that is safe, convenient, reliable, fast, competitively priced according to the level of service, and environment-friendly; (b)local networks are linked to the national network and travel is facilitated by an all-weather network of roads, bridges, railways, sea and air lanes; and (c) goods and services are provided with a fully integrated, multi-modal transportation system that is safe, convenient, reliable and fast, competitively priced according to the level of service, and environment-friendly.

▶ REVIEW OF RELATED LITERATURE

Effects of Traffic on Mobility of People and Goods

Cocjin (2000) asserted that recently, the traffic situation in Iloilo City has deteriorated from bad to worse. The commuting public has to make a lot of adjustments of coping with clogged choke points while trying to catch up with office or class hours and appointments. He further stressed that gone are the days when one can breeze through from Jaro to Iloilo City and back in ten to fifteen minutes in a public utility jeepney. Furthermore, Cocjin contended that the emission from the exhausts of motor vehicles, whether moving or idling, is one big source of pollution of urban environment.

If one has to look at it deeply, traffic congestion is not just a recent problem. As early as Roman times, it was already a problem in the city life. Poor city planning, then as now, has been a basic cause, usually with roads planned in such a way as to bring traffic from all quarters converging to a main crossing point (Encyclopedia Britannica, 1994).

Maeda (1991) argued that congestion does not only impede the smooth flow of traffic and diminish the functionality of highways but also reduces driving safety and comfort. Inconvenience caused by traffic congestion often leads to frustrations among motorists and commuters or the riding public.

According to Murai (1991), at present, automobile plays the dominant transport role in most countries in the world. Due to this, traffic volumes continue to grow, traffic speeds continue to increase, and hindrances to traffic flows continue to have an effect over an ever-widening area. One of the consequences of this is that traffic congestion has become routine – the rule rather than the exception.

One element that is essential to man and will always be lost due to traffic congestion is time. Man when caught between traffic becomes unproductive. As shown in the recent AMI survey, in Metro Manila alone, over a million work hours are lost everyday due to traffic (Mendoza, 1999).

The National Economic and Development Authority (NEDA) forecasted that road traffic in the Philippines will grow quickly, projecting that from

1995-2004, there will be 50% traffic growth for the interurban areas, and 100% for the surrounding urban areas. In 10 years time, traffic demand is expected to double. If no effective action is taken to counter this problem, not only will traffic impend the movement of people or goods, but likewise, be a serious constraint to future economic performance of the country.

Traffic Management and Control Techniques

To relieve the heavily populated urban areas with vehicular congestion and air pollution, and to improve mobility and safety of motorists and pedestrians, many cities employ effective traffic engineering, usually involving prescribed traffic rules and regulations, and employing traffic devices such as signals, signs and markings. In smaller cities, with lighter traffic, comparable engineering techniques and simpler control devices are used (Beimborn, 1993).

In most localities, traffic control management was established for the safe and efficient flow of automobiles, buses, and trucks over city streets and highways. The ways of promoting this varies from simple improvement on local streets by installing traffic signs and pavement markings to a more sophisticated construction of a comprehensive freeway control systems. These comprehensive systems include the use of ramp meters to monitor and control freeway access; closed-circuit television surveillance cameras are installed at strategic locations along roads or highways to detect quickly any deteriorating traffic flow; and stand-by emergency services are available to provide aid in case of accident and injury (Beimborn, 1993).

The use of one-way streets, enforcement of traffic flow regulations, building traffic islands and turning bays, and the use of traffic signals are some other traffic-control techniques being considered and implemented in many areas (Beimborn, 1993).

In Iloilo City as in many cities of the world, at busy city street junctions, traffic light signals were installed to permit safe movement of vehicles and pedestrians. According to Beimborn (1993), in this system, the most widely used of traffic signalization was the fixed-time system. The length of the green light is the same for the whole time and is set to favor traffic on the main roadway. Main roadway traffic is halted intermittently to allow the side-street traffic to cross the intersection for a short fixed time before the signal again allows traffic on the main roadway. The time element in the cycle of signal changes is determined by systematic studies of traffic flow and pedestrian needs. Such cycle lengths can be fixed to vary during the day to serve changing traffic patterns.

As of now, one way of decongesting traffic in the city streets of Iloilo is to build and construct new roads, or to widen the existing ones. But according to Cocjin (2000), despite of the additional roads constructed, it appears that the volume of vehicles on the roads of the city still manages to congest choke points especially in the main arteries.

▶ RESEARCH DESIGN AND METHODOLOGY

Research Design

In this study, the sample survey technique design was used to gather primary data on the population, that is, the number of vehicles that are passing on the said intersection per day. The method employed in conducting the survey was through traffic count using direct observation. The observation approach was non-participant (NPO).

The data gathering were done using the hand tally counters or mechanical counters that record the distribution of traffic by time of day, in one week. The data were summarized to show the Average Daily Traffic (ADT) and average weekday characteristics by traffic station.

Development of the Survey Instruments

The observation guide or survey instruments includes the following aspects: (a) frequency of vehicles passing in the observed direction at a specified time; and (b) types of vehicles passing in the observed direction at a specified time.

Data Gathering and Fieldwork

The fieldwork for this project was conducted for one week, from six o'clock in the morning up to eight o'clock in the evening, and a random traffic count survey between eight o'clock in the evening and five o'clock in the morning. At a designated point at each road section, the vehicles were counted as they inbound the road section. The types of vehicles and the road section where they came from were also recorded. An interval of thirty (30) minutes was allotted for the counting of vehicles passing at the road section coming from the opposite side, from the right side and from the left side.

▶ FINDINGS

The following are the results of the study:

1. The average daily traffic (ADT) volume passing at the road sections of the intersection is 97,906. When the entire traffic count was ranked according to road sections, General

Luna Street ranked number one with 31,677 (32.35%), followed by Aquino Avenue with 26,138 (26.70%), then by M. H. del Pilar Street with 23,860 (24.37%), and lastly by Infante Avenue with 16,231 (16.58%). Table 1 shows the summary of the results of the finding.

In this finding, it should be noted that a vehicle can be counted twice since it will be counted first in the inbound lane of one road section as it enters the intersection, and then in the outbound lane of another road section as it leaves the intersection.

Table 1. Average Daily Traffic Volume When Ranked According to the Road Sections Whose Traffic is Flowing in Both Directions, Inbound And Outbound

Road Section	M	Rank	%
A. Average Daily Traffic	97,906		100.00
B. General Luna Street	31,677	1	32.35
C. Aquino Avenue	26,138	2	26.70
D. M. H del Pilar Street	23,860	3	24.37
E. Infante Avenue	16,231	4	16.58

There is no restriction as to the direction of flow of traffic at the intersection. Figure 1 shows that at green light, the vehicles at the inbound lanes of the four road sections can cross at the intersection going to any of the three outbound lanes as shown by the arrows.
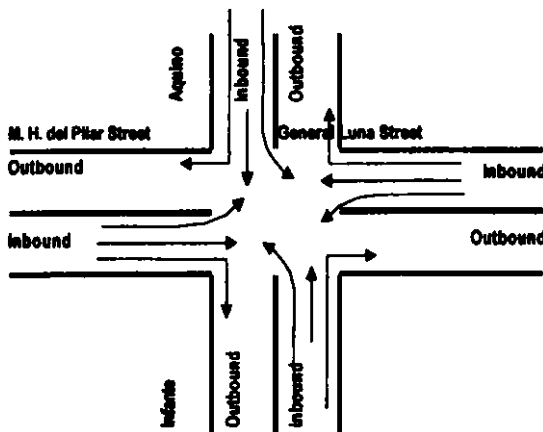

Figure 1. Traffic Flow Direction at the Intersection.

When the inbound and outbound flow of traffic at the various road sections of the intersection were calculated and determined, and the average daily volume of the traffic in both directions were recorded separately, so that the predominate direction and the opposite direction of traffic flow per road section are identified, the result showed that for General Luna Street, the outbound lanes are predominate with 16,034

(50.62%), and the inbound lanes as opposite with 15,643 (49.38%). For Aquino Avenue, the inbound lanes are the predominate with 13,868 (53.05%), and the outbound lanes as opposite with 12,271 (46.95%). For M. H. del Pilar Street, the outbound lanes are predominate with 12,749 (53.43%), and the inbound lanes as the opposite with 11,111 (46.57%). Lastly, for Infante Avenue, the inbound lanes are predominate with 8,333 (51.34%), and the outbound lanes as the opposite with 7,899 (48.66%).

In Table 2, the summary of the data is shown when traffic count is classified according to the direction of flow relative to the intersection.

Table 2 *Average Frequency of Daily Traffic Volume at the Road Sections of the Intersection when Traffic Count Is Classified According to the Direction of Flow*

Road Section	Ave. f	%	Description
A. Average Daily Traffic	97,906		
B. General Luna Street			
Inbound	15,643	49.38	Opposite
Outbound	16,034	50.62	Predominate
C. Aquino Avenue			
Inbound	13,868	53.05	Predominate
Outbound	12,271	47.95	Opposite
D. M. H del Pilar Street			
Inbound	11,111	46.57	Opposite
Outbound	12,749	53.43	Predominate
E. Infante Avenue			
Inbound	8,333	51.34	Predominate
Outbound	7,899	48.66	Opposite

Figure 2. Shows the direction of the predominate flow of traffic at the various road sections of the intersection. The figure indicates that the inbound lanes of both Aquino Avenue and Infante Avenue which are opposite road sections of the intersection are the predominate, while M. H. del Pilar Street and General Luna Street which are also road sections opposite each other, the predominate flow is at the outbound side.
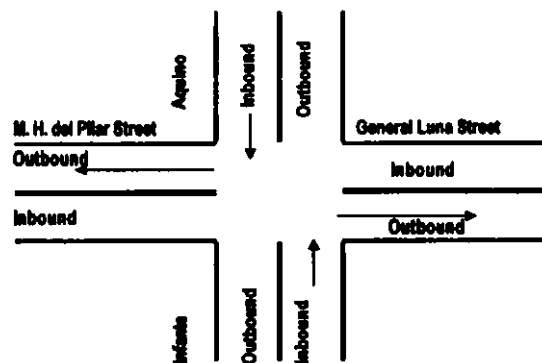

Figure 2 Predominate Traffic Flow at the Road Sections of the Intersection.

When the average daily traffic count based on the incoming vehicles towards the intersection or in the inbound side of the road sections were compared, the result showed that those vehicles coming from General Luna Street is the heaviest with an average volume of 15,643 (31.95%) per day, followed by Aquino Avenue with 13,868 (28.33%), then by M. H. del Pilar Street with 11,111 (22.70%), and lastly by Infante Avenue with 8,333 (17.02%). Table 3 summarizes the data.

Table 3 Average Daily Traffic Count Based on the Inbound Lanes of the Road Sections or Average Number of Vehicles Entering the Intersection

Road Section	M	Rank	%
A. Total Average Daily Traffic at the Inbound Side	48,953		100.00
B. General Luna Street	15,643	1	31.95
C. Aquino Avenue	13,868	2	28.33
D. M. H del Pilar Street	11,111	3	22.70
E. Infante Avenue	8,333	4	17.02

When the average daily traffic count based on the outgoing vehicles, or those leaving from the intersection were compared, the result showed that those vehicles entering General Luna Street is the heaviest with an average volume of 16,034 (32.75%) per day, followed by M. H. del Pilar Street with 12,749 (26.04%), then by Aquino Avenue with 12,271 (25.07%), and lastly by Infante Avenue with 7,899 (16.14%). See Table 4.

Table 4 Average Daily Traffic Count Based on the Outbound Lanes of the Road Sections or Average Number of Vehicles Leaving the Road Intersection

Road Section	M	Rank	%
A. Total Average Daily Traffic at the Outbound Side	48,953	100.00	
B. General Luna Street	16,034	1	32.75
C. M. H del Pilar Street	12,749	2	26.04
D. Aquino Avenue	12,271	3	25.07
E. Infante Avenue	7,899	4	16.14

2   The traffic count showed that when the peak hour is determined to find the maximum average traffic volume at the road sections, General Luna Street is heaviest at 4:30-5:30 PM with 2,570

vehicles/hr, followed by Aquino Avenue which is heavy traffic at 10:30-11:30 AM with 2,183 vehicles/hr, then by M. H. del Pilar Street which is heavy traffic at 5:00-6:00 PM with 1,940 vehicles/hr, and finally by Infante Avenue which is heavy traffic at 10:30-11:30 AM with 1,398 vehicles/hr. Table 5 summarizes the result of the finding. Aquino and Infante Avenues are heavy traffic in the late morning while General Luna and M. H. del Pilar Street is heavy in the late afternoon.

Table 5 Peak Hour of the Volume of Traffic at the Road Sections of the Intersection

ROAD SECTION	PEAK HOUR	TRAFFIC VOLUME	RANK
GEN. LUNA	4:30-5:30 P.M.	2,570	1
AQUINO	10:30-11:30 A.M.	2,183	2
MH DEL PILAR	5:00-6:00 P.M.	1,940	3
INFANTE	10:30-11:30 A.M.	1,398	4

Further, when each road section is divided into lanes of predominate and opposite directions, the volume of vehicles at the predominate direction at peak hour for the morning and afternoon traffic for Aquino Avenue is 1,204 (10:30-11:30 AM; inbound)and 1,126 (4:30-5:30 PM; outbound), for Infante Avenue is 702 (10:30-11:30 AM, outbound) and 682 (4:30-5:30 PM; inbound), for General Luna Street is 1,350 (10:00-11:00 AM; outbound) and 1,386 (4:30-5:30 PM; inbound), and for M. H. del Pilar Street is 950 (10:30-11:30 AM; outbound)and 1,147 (5:00-6:00 PM; outbound).

Based from the data in Table 6, it should be noted that the mode of the peak hours at the road sections of the intersection is 10:30-11:30 in the morning and 4:30-5:30 in the afternoon.

Table 6 Volume of Traffic at Peak Hour at the Road Sections When Classified According to Predominate or Opposite Direction

ROAD SECTION	PEAK HOUR	TRAFFIC VOLUME	PREDOMINATE DIRECTION		OPPOSITE DIRECTION	
			Inbound	Out bound	Inbound	Out bound
AQUINO						
AM	10:30-11:30	2,183	1,204			979
PM	4:30-5:30	2,171		1,126	1,045	
INFANTE						
AM	10:30-11:30	1,398		702	696	
PM	4:30-:30	1,216	682			534
GEN. LUNA						
AM	10:00-11:00	2,473		1,350	1,124	
PM	4:30-5:30	2,570	1,386			1,184
MH DEL PILAR						
AM	10:30-11:30	1,853		950	903	
PM	5:00-6:00	1,940		1,147	793	

5

Table 7 shows the volume of the flow of traffic at peak hour from the source road section going to the destined road section as they pass the intersection. There are three destined directions. The direction of the traffic flow was classified as through or going to the opposite side, turning to the right or turning to the left. The volume of traffic at the peak hours for the morning and the afternoon were recorded in the table. The finding showed that for Aquino Avenue, most vehicles are coming from Infante Avenue (441) in the morning followed by General Luna Street (413), and in the afternoon from General Luna Street (600) followed by Infante Avenue (421). Less number of vehicles is coming from M. H. del Pilar Street (159, AM; 151, PM). For Infante Avenue, most vehicles entering the road section are coming Aquino Avenue (556, AM; 467, PM), followed by those coming from General Luna (83, AM; 83, PM) and lastly from M. H. del Pilar Street (70,AM; 66, PM). For General Luna Street, most vehicles entering the road sections are coming from M. H. del Pilar Street (741, AM; 644, PM), followed by those from Aquino Avenue (471, AM; 417 PM) and lastly from Infante Avenue (187, AM;182, PM). For M. H. del Pilar Street, most vehicles are coming from General Luna Street (707, AM; 797, PM), followed by those coming from Aquino Avenue (186, AM; 218, PM), and lastly from Infante Avenue (128, AM; 135, PM). The pattern of the flow of traffic for both morning and afternoon is similar to all road sections except for Aquino Avenue.

Table 7 Peak Hour Volume per Lane, the Flow of Traffic Being Towards the Road Section Leaving the Intersection

DIRECTION	PEAK HOUR		TRAFFIC		VOLUME			
			THROUGH		LEFT TURN		RIGHT TURN	
FROM TO	AM	PM	AM	PM	AM	PM	AM	PM
AQUINO								
	11:00-12:00	5:00-6:00	441	421				
	11:00-12:00	4:00-5:00					413	600
	11:00-12:00	5:00-6:00			159	151		
INFANTE								
	10:30-11:30	3:30-4:30	556	467				
	9:00-10:00	3:30-4:30					70	66
	11:00-12:00	2:30-3:30			83	83		
GEN. LUNA								
	7:30-8:30	3:30-4:30	741	644				
	10:00-11:00	3:00-4:00					187	182
	10:30-11:30	2:30-3:30			471	417		
MH DEL PILAR								
	7:30-8:30	5:00-6:00	707	797				
	7:30-8:30	4:30-5:30					186	218
	11:00-12:00	5:00-6:00			128	135		

3. When the average daily traffic passing at the intersection were classified according to type of vehicles, the passenger cars and taxis lead the rest of the vehicles with 19,709 (40.26%). This was followed by the Public Utility Jeepneys (PUJ) with 19,534 (39.90%), then by other types of vehicles which were grouped into one with 4,820 (9.85%), then by the light cargo vehicles (LCV) with 3,001 (6.13%), then by heavy cargo vehicles (HCV) with 1,114 (2.28%), and lastly by the public utility buses (PUB) with 776 (1.59%). See Table 8 for the summary of data.

Table 8 Average Daily Traffic Volume Classified According to Types of Vehicles Passing at the Inbound Lanes of the Road Sections

Vehicle Type	M	Rank	%
A. Average Daily Traffic at the Inbound Lanes of the Road Sections	48,953		100.00
B. Car/Taxi (C/T)	19,709	1	40.26
C. Public Utility Jeepney (PUJ)	19,534	2	39.90
D. Others (Pedicab, Motorcycle, etc.)	4,820	3	9.85
E. Light Cargo Vehicle (LCV)	3,001	4	6.13
F. Heavy Cargo Vehicle (HCV)	1,114	5	2.28
G. Public Utility Bus (PUB)	776	6	1.59

► **CONCLUSIONS AND RECOMMENDATIONS**

Conclusions

In view of the above findings, the following conclusions were drawn upon:

1. The heavy volume of traffic that passes General Luna Street maybe attributed to the fact that the road section is more convenient for travel between the city proper at one end of the road and the district of Molo on the other. The concentration of city activities, both business and commerce lies within the city proper area which is being served by the said road section. This includes commercial establishments, business offices, government offices, and educational institutions. The Molo end of the road on the other hand is the point of convergence of people coming from all parts of the southern and central parts of the city and province of Iloilo. The road section is maybe a

convenient thoroughfare for these commuters in going to the city proper for their intended business transactions and upon returning home. The other road sections of the intersection are also becoming congested especially the Aquino Avenue because of perhaps similar reasons.

The intersection has also become a busy one considering perhaps of the rapid growth and development in the surrounding area for the past years.

2. The peak hour of traffic in the intersection is usually in the late morning and in the late afternoon. The late morning congestion maybe attributed to the reason that the activities within the city proper area are starting in the late morning considering that most commercial and business establishments open their business at 9:00 o'clock in the morning. The afternoon rush in the intersection maybe attributed to the end of ones work or classes for most people and are now moving out the city proper area for home or for leisure.

3. Passenger cars and taxis followed closely by the public utility jeepneys are dominating the types of vehicles that are passing in the said intersection. Maybe, this is due to the fact that the road sections adjoining the intersection are the most convenient routes for commuters, both the well to do and the ordinary people, in going to their place of work or business and in going back to their respective homes.

Recommendations

To further improve the traffic flow at the road intersection, the following recommendations or schemes are suggested:

Scheme 1— In this scheme, no suitable junction improvement or major infrastructure project is recommended, just an efficient traffic management. Aquino Avenue and Infante Avenue are constructed of four-lane carriageways and cross General Luna Street and M. H. del Pilar Street at right angle. The area's right of way is too small for the construction of a fly-over at this junction to provide more safety for the four-way intersection. Extending the right of way maybe costly considering the value of property that surrounds the vicinity of the intersection. Instead, more efficient traffic light signalization is proposed, giving more green lights to the main roadway or to the heavy traffic road section, that is, General Luna Street.

Road signs, hazard markings and give way signs must be properly maintained along the approaches of the intersection. In addition, drainage system in the junction must be properly maintained and if necessary improved, especially in the Infante Avenue area where elevation is lower as compared to other areas of the intersection. The flooding in the area due to the accumulation of water even in short rainfall tends to retard the velocity of vehicles passing in that part of the intersection.

Traffic policemen must also be permanently assigned to the area round the clock, to keep the flow of traffic in order especially during brown-outs wherein signal lights are not functional and during rush hours wherein many motorists would like to beat the red light. Figure 3 shows the present flow of traffic in the intersection.
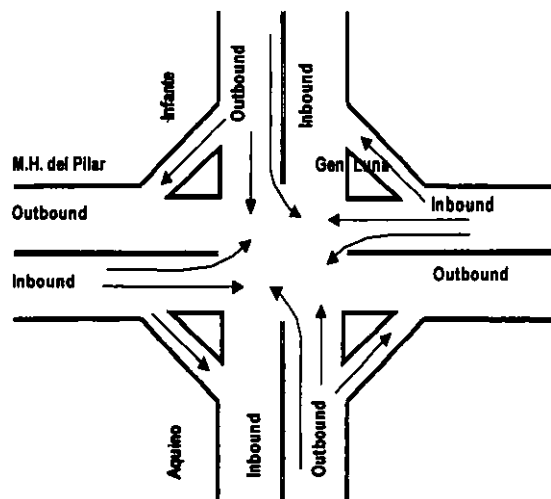
Figure 3. Traffic Flow at the Intersection Using the Present Traffic System.

Scheme 2 — A more modest roundabout or rotunda can be constructed in the intersection in replacement to traffic lights signalization. Again, due to the limitation of the right of way of the intersection, the diameter of the rotunda may be limited to 6 meters only, just enough for the motorists or drivers to make a good maneuver in crossing the intersection.

Unlike in the traffic lights signalization, wherein the flow of traffic in one direction is temporarily interrupted at timed intervals to give way to the vehicles of the adjacent road sections to cross, the vehicles can manage to maneuver and pass at the intersection going to their desired destination anytime without much interruption. The proposed roundabout or rotunda is found in Figure 4.

Figure 4. Traffic Flow at the Intersection When Rotunda or Roundabout is Implemented.

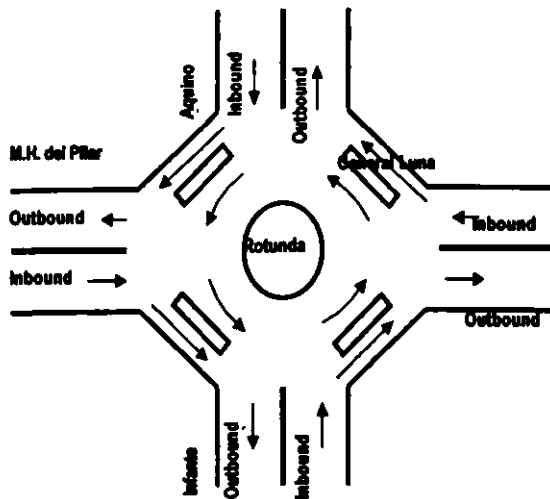Scheme 3 — To keep the road intersection efficient, it is proposed that some public utility transportation passing in the said intersection be re-routed say the public utilities plying the provincial routes. It should be noted that 41.49% of the vehicles passing in the intersection are public utility jeepneys and buses.

However, further study should be conducted whether or not re-routing of some public utility vehicles in the area is possible in order to decongest the road section, since this scheme if implemented may cause an effect to the economy and the mobility of people and goods of the surrounding area.

Lastly, whichever scheme is to be adopted and implemented in improving the traffic management in the intersection, now depends on the decision of the proper government agencies.

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AVERAGE VOLUME OF TRAFFIC COUNTED AS PER LANE, IN BOTH INBOUND AND OUTBOUND DIRECTION
INTERSECTION GEN. LUNA-M. H. DEL PILAR AND AQUINO-INFANTE STREETS

ROAD SECTION: **GENERAL LUNA STREET**
DATE: **02 FEBRUARY - 08 FEBRUARY 2000**

DIRECTION OF TRAFFIC	FROM	AVERAGE VOLUME OF TRAFFIC PER DAY								TR VOL/ SECTION
		INFANTE	DEL PILAR	AQUINO	TR VOL/	GENERAL LUNA STREET			TR VOL/	
	TO	GENERAL LUNA STREET			DIR	INFANTE	DEL PILAR	AQUINO	DIR	
	TIME:									
AM										
12:00-5:00	5 HR	19	88	54	160	11	115	72	198	358
5:00-6:00	30 MIN	5	17	10	32	3	12	14	28	60
	30 MIN	10	54	33	96	6	80	44	130	226
6:00-7:00	30 MIN	19	168	112	299	11	177	117	305	604
	30 MIN	50	271	159	479	12	208	152	372	851
7:00-8:00	30 MIN	67	338	196	601	13	321	169	504	1104
	30 MIN	69	374	221	664	21	349	164	534	1198
8:00-9:00	30 MIN	69	367	223	659	26	358	167	551	1210
	30 MIN	76	349	214	639	25	348	167	540	1179
9:00-10:00	30 MIN	78	336	211	626	23	313	184	519	1145
	30 MIN	90	340	223	654	28	309	194	531	1185
10:00-11:00	30 MIN	93	346	231	670	28	321	202	551	1221
	30 MIN	94	351	234	679	39	333	200	573	1252
11:00-12:00	30 MIN	68	327	236	632	41	318	208	567	1199
	30 MIN	70	286	198	555	42	311	205	558	1113
PM										
12:00-1:00	30 MIN	79	232	153	465	27	302	183	512	977
	30 MIN	74	264	172	510	33	304	169	506	1016
1:00-2:00	30 MIN	79	297	194	570	35	306	199	539	1110
	30 MIN	81	302	190	573	32	309	219	560	1133
2:00-3:00	30 MIN	87	317	191	594	32	311	214	557	1151
	30 MIN	90	309	209	607	38	313	210	561	1168
3:00-4:00	30 MIN	91	306	208	605	45	308	261	613	1218
	30 MIN	91	322	207	620	35	305	273	612	1233
4:00-5:00	30 MIN	76	321	201	599	32	326	296	654	1253
	30 MIN	81	312	200	592	30	349	304	684	1275
5:00-6:00	30 MIN	80	307	205	592	26	396	282	703	1295
	30 MIN	71	279	174	524	25	401	249	676	1200
6:00-7:00	30 MIN	62	243	140	445	27	356	198	582	1027
	30 MIN	60	238	138	436	21	312	168	501	937
7:00-8:00	30 MIN	44	176	74	294	15	200	104	319	613
	30 MIN	27	70	37	134	6	78	58	143	277
8:00-12:00	4 HR	71	246	111	428	21	278	162	462	890
TOTAL		2121	8553	5360	16034	809	9029	5805	15643	31677

CONDUCTED BY:

SUPERVISED BY:

AVERAGE VOLUME OF VEHICLES CLASIFIED PER TYPE PASSING AT THE ROAD SECTION OF THE INTERSECTION
INTERSECTION GEN. LUNA-M. H. DEL PILAR AND AQUINO-INFANTE STREETS

ROAD SECTION: GENERAL LUNA STREET
DATE: 02 FEBRUARY - 08 FEBRUARY 2000

		TYPE OF VEHICLE						TR VOL/ SECTION
		C/T	PUJ	PUB	LCV	HCV	OTH	
	TIME:							
AM								
12:00-5:00	5 HR	142	153	0	19	3	39	358
5:00-6:00	30 MIN	25	25	0	3	1	7	60
	30 MIN	89	98	0	12	2	25	226
6:00-7:00	30 MIN	237	262	1	34	6	65	604
	30 MIN	330	376	1	47	8	89	851
7:00-8:00	30 MIN	422	497	1	59	11	115	1104
	30 MIN	456	541	1	64	11	125	1198
8:00-9:00	30 MIN	463	543	1	65	12	127	1210
	30 MIN	453	528	1	63	11	124	1179
9:00-10:00	30 MIN	444	507	1	62	11	120	1145
	30 MIN	463	519	1	65	12	125	1185
10:00-11:00	30 MIN	478	535	1	67	12	129	1221
	30 MIN	492	545	1	68	12	133	1252
11:00-12:00	30 MIN	475	514	1	67	12	129	1199
	30 MIN	445	473	1	62	11	121	1113
PM								
12:00-1:00	30 MIN	387	420	1	52	9	106	977
	30 MIN	400	441	1	55	10	109	1016
1:00-2:00	30 MIN	439	478	1	61	11	119	1110
	30 MIN	450	487	1	62	11	122	1133
2:00-3:00	30 MIN	455	498	1	62	11	123	1151
	30 MIN	464	501	1	64	12	125	1168
3:00-4:00	30 MIN	494	509	1	68	12	133	1218
	30 MIN	497	519	1	69	12	134	1233
4:00-5:00	30 MIN	506	525	1	70	12	137	1253
	30 MIN	516	535	1	71	13	140	1275
5:00-6:00	30 MIN	516	552	1	71	13	141	1295
	30 MIN	475	515	1	65	12	131	1200
6:00-7:00	30 MIN	405	444	1	54	10	113	1027
	30 MIN	366	411	1	49	9	101	937
7:00-8:00	30 MIN	237	273	1	31	5	66	613
	30 MIN	110	119	0	15	3	30	277
8:00-12:00	4 HR	347	392	1	46	8	96	890
TOTAL		12477	13736	35	1723	308	3398	31677

CONDUCTED BY: **SUPERVISED BY:**