AN INTERSECTION STUDY AT THE JUNCTION OF N. BACALSO AVE. – DECA ACCESS ROAD, LOWER CALAJOAN, MINGLANILLA

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INTRODUCTION

Traffic congestion exists wherever demand exceeds the capacity of transportation. The challenge in order to solve this problem is getting worse because of the different factors that affect the situation. One possible solution is road widening but this approach is always limited by the availability of funds of the place affected (Banks, 2004). In addition, some suggests that a better land use planning and by using automatic traffic controls where the timing and coordination with the vehicles will improve.

This study is limited only to the analysis of the traffic condition at the junction of N. Bacalso Ave. Deca Access Road, Lower Calajoan, Minglanilla. The data were obtained with the use of the Close-Circuit Television (CCTV) from the establishment around the studied area.

OBJECTIVES

1. Determine the traffic volume passing through the intersection.
2. Determine the level of service (LOS) and delay at the intersection.
3. Prepare an improvement of the geometric design of the intersection to improve the level of service (LOS).
4. Provide recommendations for improvement of the current traffic devices in the area.

MATERIALS AND METHODS

- The three videos were recorded in November 2017 on a Monday, Wednesday and a Friday with a 15-minute interval from 6 am to 8 pm. The month of November was preferred than December to avoid “Christmas rush” which would affect the analysis of traffic data.

- Collection of traffic count was made possible with the use of the functional Close-Circuit Television (CCTV) recordings from an establishment around the studied area and existing road geometric dimensions were manually measured by the researchers using a measuring tape.

- Data treatment was enhanced using the application, Microsoft Excel. Formulas used were acquired from the standard manual, Highway Capacity Manual 2000 (HCM 2000).

- Geometric enhancement of the intersection, plotting existing design and making a new design and comparing both with the aid of CAD software

RESULTS AND DISCUSSION

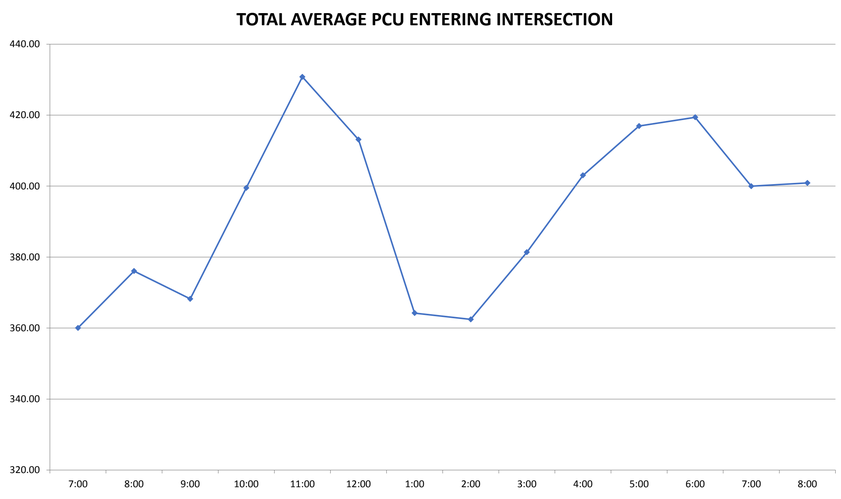

Fig 1. Total average of vehicles (pcu) entering the intersection per hour

The graph shows the total average volume per hour of the signalized intersection. The highest point in the graph is from 10:00 am to 11:00 am considered as the peak hour. In the contrary to what the graph shows, the volume of traffic increases during 6:00pm to 7:00pm but it didn’t reflect on the graph since during the 15-minute interval the flow of the vehicles decelerate due to shorter green time and the accumulated traffic ahead .

The average control delay for the intersection is approximately 132 seconds. This value of control delay belongs to the criteria F. Level of service F represents the worst quality of traffic and in need of an abrupt solution for the problem.

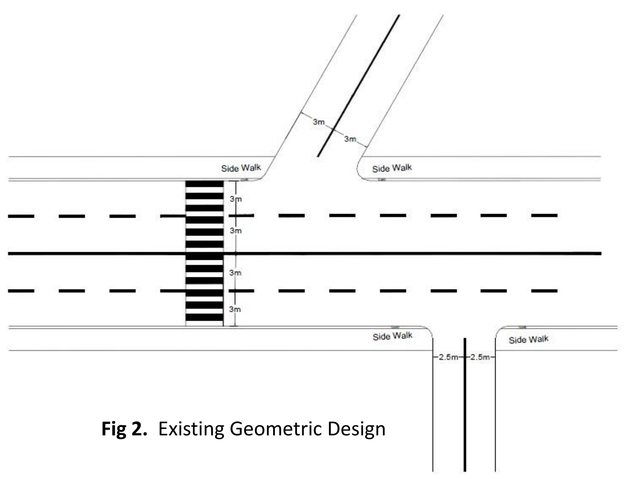

Fig 2. Existing Geometric Design

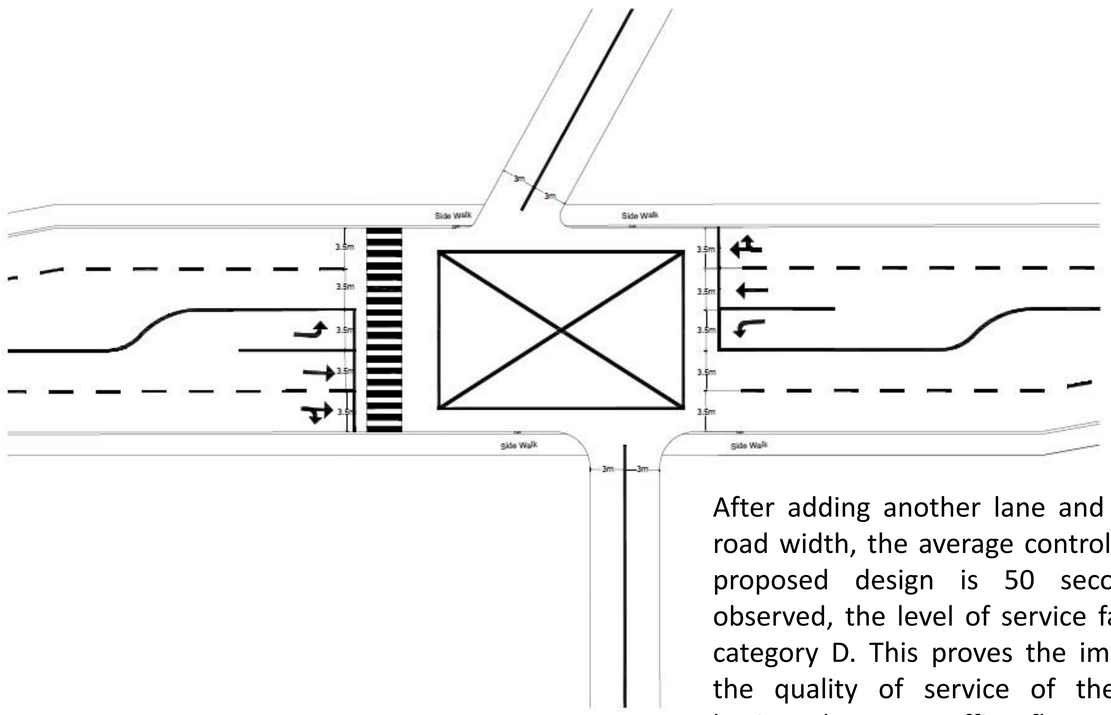

Fig 3. Proposed Geometric Design

After adding another lane and adjusting the road width, the average control delay for the proposed design is 50 seconds and as observed, the level of service falls under the category D. This proves the improvement of the quality of service of the intersection having better traffic flow. Freedom to maneuver within traffic stream has improved with the proposed intersection design. At this level, density deteriorates more quickly with flow.

61% (61 out of 100) of the respondents agreed that the intersection is in need of improvement for pedestrian safety, although, many of them also stated that they still feel moderately safe while crossing the street. The respondents specifically emphasized that it is better to free the sidewalk from any obstructions. These obstructions are mainly the street vendors along the area that utilize the side walk for their business. The pedestrians thought that there is a need to clear these sidewalks for their safety. Because of this, they can no longer utilize the sidewalks and they are forced to walk on the side roads, which are dangerous and also contribute as one of the factors to the delay of traffic.

SURVEY SUMMARY		
AGE	<20	4
	20-30	40
	31-40	18
	41-50	12
	51 and above	26
GENDER :	F	56
	M	44
2)	YES	61
	NO	39
3)	YES	44
	NO	56
4)	1	0
	2	35
	3	50
	4	16
	5	0
5)	NO ANSWERS/ EXPLANATIONS PROVIDED	
6)	YES	100
	NO	0
7)	30 sec	8
	1 min	36
	2 min	34
	3min	21
8)	A lot of the pedestrians said that it is better if the sidewalk would be cleared of obstructions. The vendors on sight that are using the sidewalks are obstructions for them since the space is utilized for their customers already.	

Fig 4. Survey Summary of Pedestrians

CONCLUSIONS and RECOMENDATIONS

- The existing geometric design of the intersection failed to accommodate the increasing number of vehicles that pass through, resulting to a control delay of approximately 132 seconds. This falls to a level of service F. Therefore, the researchers conclude that there is a need for redesigning the geometric design of the intersection.
- Using the proposed geometric design, it was proven that the level of service of the intersection was improved from level of service F to level of service D since the control delay improved to 50 seconds. The additional lanes that were allocated for left turns on both main roads resulted to a great difference on the condition of the flow of traffic of the intersection
- The new geometric design proposes wider lane widths than the existing one thus becoming more effective and prevents the causes of delays that commonly occurs in the area.
- There are 61% (61 out of 100) of the respondents who believed that there is a need for improvement for pedestrian safety on the studied intersection. 57% of them agreed that even so, they don’t find it difficult and majority of them feels moderately safe to cross the street. In the proposed design of intersection, proper sidewalks and well- maintained pedestrian lanes were provided. In this way, the researchers conclude that it would raise the level of safety of the pedestrians.
- MITCOM should strictly implement traffic laws not only on the area of study but also to other neighbouring areas.

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