

Blue Asphalt Lane Designation as a Policy Design to Influence Motorist Behavior Along Commonwealth Avenue

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Abstract: This paper explores the potential of colored asphalt lane designations as a policy for improving the highway level of service along Commonwealth Avenue. Through combining road design and behavior modification measures, the study proposes disciplining motorists by limiting them to use color-coded lane for motorcycles. This will be implemented to supplement the existing road provisions in Commonwealth Avenue, such as the 60 kph speed limit, the yellow bus and PUV lanes, and the blue motorcycle lanes. Colored asphalt used as decorative materials for pavements have been successful in deterring motorists from crossing colored roads. Motorists perceived that these are for pedestrian use only. To that effect, the study uses color-coded lanes as strictly for specific vehicle types only. Moreover, colored asphalt is considered to be a fast, easy, and environmentally sustainable option for maintaining roadways.

Keywords: asphalt, motorcycle lanes, road design, behavior modification

1. INTRODUCTION

Recognizing the need to address the increasing number of motorcycle related accidents along major thoroughfares in Metro Manila, Chairman Francis Tolentino of the Metropolitan Manila Development Authority (MMDA) introduced the blue lane motorcycle policy to improve the safety of motorists along major thoroughfares. The MMDA Motorcycle Lanes, also called Blue Lanes, were first implemented on October 17, 2011 along Commonwealth Avenue in Quezon City and Macapagal Boulevard, which stretches from Parañaque to Pasay City.

The blue lanes are designated with blue and white thermoplastic paint and are non-exclusive motorcycle lanes. Non-exclusivity implies private vehicles, Public Utility Jeepney (PUJ), and other Public Utility Vehicles (PUV) are allowed to use these lanes except Public Utility Busses (PUB) both city and provincial (MMDA Traffic Discipline Office (TDO) Memorandum No. 1 Series of 2012).

1.2 Background

Metro Manila serves as a pilot area for Motorcycle Lanes in the country. In Commonwealth Avenue alone the Metro Manila Accident Recording Analysis System (MMRAS) recorded a total of 87 motorcycle related-accidents from June to October 2011. MMDA is the proponent of the blue lane or MC lane policy and is fully supported by the Metro Manila Council. Unlike international bike lanes, the Commonwealth Blue lanes are located in the 4th lane of the Avenue. This poses some issues in rider visibility, which will be discussed further in this

study. In addition to that, it is interesting to note that in Macapagal Boulevard, where the blue lanes were also implemented on the same date as the ones in Commonwealth, the position of the bike lane is in the first lane of the roadway.

There are differences between the design and policies regarding blue lanes from other countries and those implemented in Metro Manila. The primary distinction in terms of international cycle lanes is that they are exclusive to cyclists and are created for bicycle and non-motorized vehicles. This is in contrast to the Commonwealth blue lanes' non-exclusive motorcycle use. International cycle lanes indicate that motorists are not allowed to enter or cross through the lane. While at intersections along the road where merging traffic takes place, these lanes are marked with white dashed lines to indicate that other vehicles may enter the lane. These white lanes are coupled with the blue colored lane markers, which cover the whole expanse of the lane. A comparison of the bicycle lanes in Demark and the Motorcycle Lanes in Commonwealth Avenue on the bottom left and the MC lanes in Macapagal Boulevard are as seen in Figure 1 below.



Figure 1. Bicycle Lanes and Denmark and Motorcycle Lanes in Metro Manila

According to the City of Portland Office of Transportation, bicycle-motor vehicle crossings are given colored markings to reduce vehicular conflicts. In European countries these colors vary from red (the Netherlands, Germany, Sweden, Denmark, Switzerland, and Belgium) blue (Denmark), yellow (Switzerland), and green (in some parts of Germany and France). These blue lanes serve as a symbolic barrier that delineates zones for specific uses and limit the type of persons allowed to use them. As described by Hollnagel (1999) symbolic barriers are subject to the interpretation of an intelligent agent. Should the agent fail to acknowledge this, the symbol will be disregarded as a barrier. Chiew (2006) adds that urban details create a better understanding of what is meant by a barrier. Simply having these signs does not

guarantee users will follow them automatically. These blue lanes as symbols and urban details need to be visible to motorists. Visibility is important since it defines the boundaries of actions within the urban environment. In addition it clearly shows the legitimate users of the space. And allows to identify offenders as well, Atlas (1999). This strengthens the policy by delineating blue lanes by making offenders very visible and making offenders crossing these barriers easily seen. The fact that barriers cannot be visibly seen is a common excuse for road users to cross specific lane designations. And more often than not, violators in the Philippines have used the excuse of not having seen these barriers and or their corresponding warning signs as reasons for crossing zones with specific uses.

1.3 Statement of the Problem

As for the recorded motorcycle accidents in a time period of two and a half months before and after the implementation of the blue lane policy along Commonwealth, it can be noted that the number of accidents have decreased from 62 from August-October 16, 2011 to 60 accidents beginning October 17 (first day of motorcycle lane policy implementation) to December 31, 2011. However looking at the motorcycle crash incidents (Figure 2) at an even 118 day interval (the 118 interval was decided based on the availability of the most recent crash statistics data which would be able to give an even number of days for comparing the days before and after the blue lane implementation) before and after the blue lanes, the incidence of motorcycle accidents increased from 87 (June 21 to October 16, 2011) to 92 (October 17 to February 11, 2012) Metro Manila Accident Recording Analysis System (MMARAS) Database.

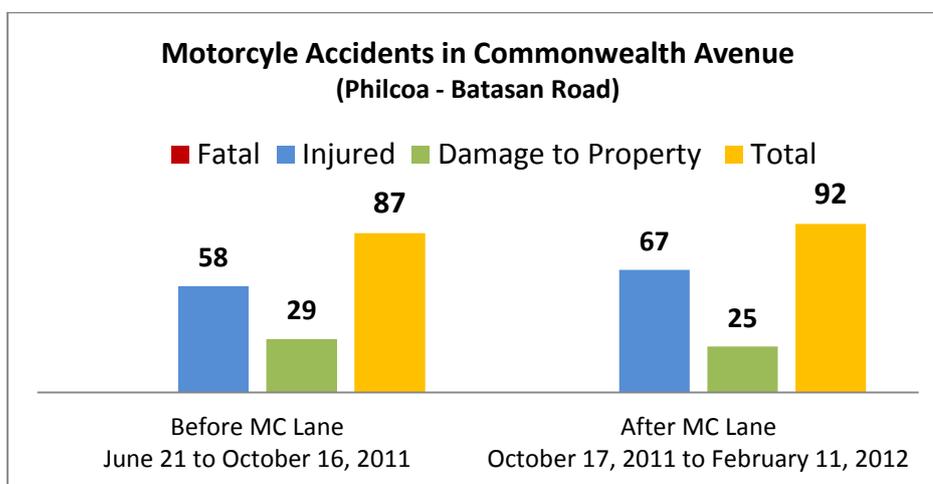


Figure 2. Motorcycle Accidents in Commonwealth Avenue

This paper explores the potential of using blue asphalt as solid lane indicators to enhance the safety of motorcycle users along the major thoroughfare. Prior to the motorcycle lane implementation, numerous vehicular accidents have already occurred along Commonwealth Avenue. The blue lane policy was enacted as a means to reduce the incidence of motorcycle-related accidents. It also becomes evident that the thermoplastic paint used to delineate these blue lanes has been subject to wear and tear and has lessened in terms of visibility.

1.4 Study Objectives

The main objective of the study is to determine the potential of blue asphalt as a means of more visible symbolic barriers for motorcycle lanes.

The specific objectives are as follows;

- to propose a road design that incorporates the use of solid blue lane designations to reduce vehicular conflicts along the thoroughfare;
- to show the effects of Commonwealth blue lanes in terms of accident frequency along the highway; and
- to recommend a policy to improve the visibility and functionality of the motorcycle lanes in terms of motorist safety.

1.5 Conceptual Framework

In order to function as effective barriers in prioritizing motorcycle users, the existing motorcycle lanes should be visible enough for motorists to consider as symbolic barriers and with that regard, adjust their behavior to use them according to the vehicle mode they are driving. Given the purpose of blue lanes, which is to provide priority lanes for motorcycle users, the proposed lane design should incorporate the existing features of road and the characteristics of the vehicles and road users. The final output of the study shall be to propose a road lane design for the Commonwealth Avenue that involves the use of colored asphalt to designate lane markers for specific lane uses on the highway as deemed needed in the study.

1.5 Significance of the Study

The Commonwealth blue lanes have been implemented for six months at the time of this study. As such it becomes useful to assess the effects of the policy implementation on the safety of the motorists along Commonwealth. The goal of the motorcycle lane is to prioritize the safety of motorcycle riders since they have become more prominent road users along the major thoroughfares of Metro Manila in recent time. The study is important in showing the effects of the motorcycle lanes and considers policies that can improve the functionality of these priority lanes for motorcycle users to facilitate the overall safety of motorists and pedestrians alike.

The study will also be a useful reference tool for policy makers and enforcers. It will also assist the MMDA in assessing the effects of the blue lane policy for further implementation. Likewise, since this is a relatively new concept to be used in the Philippines, researchers may benefit from the study, as it would provide vital baseline information on the Commonwealth blue lanes that can also be used in reference to the Macapagal Boulevard, and Epifanio Delos Santos Avenue (EDSA) blue lanes.

1.6 Scope and Limitations

The study is limited to the Commonwealth blue lanes from Philcoa to Batasan Road Quezon City. Another limitation is on the availability of the baseline studies done prior to the implementation of the motorcycle lanes. The location of the motorcycle lanes, according to the MMDA is the result of numerous stakeholder consultations.

The study also uses the frequency of motorcycle accidents along Commonwealth to gauge the safety of motorists using the road. The motorcycle accidents presented only reflect the incidence and not the actual causes of these accidents. With both data and time constraints

considered, it is difficult to evaluate and conclude the effectiveness of the motorcycle lanes in Commonwealth without conducting pilot testing within the study area.

Lastly, while colored asphalt is the preferred medium for lane markings used in this study, the existing thermoplastic paint can also be considered in marking the blue lanes. This paper shows the practices of using blue colored lanes in other countries and how these tried and tested practices can be applied to the blue lanes in Metro Manila.

2. COMMONWEALTH MOTORCYCLE LANES

The blue lanes marked on the fourth lanes can be seen from Philcoa to Batasan Road Quezon City in both north and southbound routes. The blue lanes were successful in keeping motorists to a certain zone in the expanse of the road. In support of the MC lane policy the MMDA is active in prohibiting Public Utility Buses (PUB) from using the Commonwealth MC lanes. The Traffic Discipline Office (TDO) Traffic Ticket Division was able to record the following statistics of PUB MC lane violators along Commonwealth Avenue from October 2011 to August 2012 as seen in Figure 3 below.

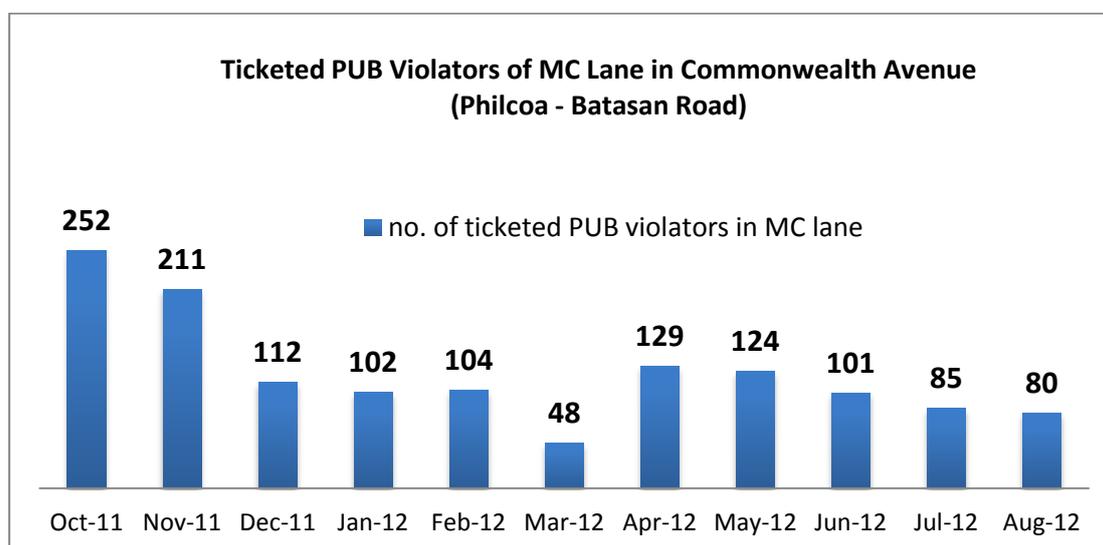


Figure 3. Number of PUB Violators of MC Lane

One notable observation is the lowest recorded number of ticketed violations occurred in March 2012, almost six months after the implementation of the MC lane policy. Although it is also important to note that after the decline, the number of violators increased again. On a good note, the general trend shows that there is a decreasing incidence of ticketed PUB violators using MC lanes in Commonwealth Avenue. It can be inferred that as the MC lane policy is implemented longer, it follows that motorists become more aware of the policy and therefore abide by the lane designation of the MC lane policy. The chart above also shows after the first two months of implementation, the incidence of violators is reduced by almost 100-ticketed violations (December 2011).



Figure 4. Observed Motorist Behavior at Commonwealth Avenue

One effect of the motorcycle lane is to keep motorcycle users close together when passing Commonwealth Avenue, the negative effect of this policy in relation to the location of the motorcycle lane is to place them in the middle of passing larger vehicles. And while it may be common knowledge that the blue lanes in Commonwealth are located in the 4th lane, this does not prevent violators from crossing them. Figure 4 above shows the observed motorist behavior along Commonwealth Avenue.

Jeepneys are not included in the ticketed violators for crossing motorcycle lanes. Although MMDA Memorandum for the use of MC lanes is only prohibited for public buses, it can be noticed that jeepneys can block the path of motorcycle users. With this information in mind, it is essential to adapt stronger policies that limit the lane use of public utility vehicles (PUJ, PUB) in order for the road to become more efficient, visible, and safer for motorcycle users and other motorists alike. The scenario above (Fig 4) located along Commonwealth Avenue is not uncommon for most motorists passing through the highway. It should be noted that this is not an isolated case. Instances like these also take place along different thoroughfares across Metro Manila.

What makes this case different is that there are supposed to be clear symbolic and physical barriers that limit the use of certain lanes in the road. With this scenario, it can be clear that there is a safety risk for motorcycle riders in the area. It is due to the fact that other larger vehicles at times disregarded the barriers that are supposed to keep them within their respective zones. As a result, the intended users of the motorcycle lanes experience difficulty in staying within their own lanes.

As symbolic barriers, this is evidence that the road users are either not able to comprehend the function of the blue lanes showed by the number of the number of PUB violators as well as common examples of the behavior of other road users. It can be noted that although symbolic barriers are present, the behavior of motorists are still dependent on the dynamics of the urban activities and the urban environment as a whole, Chiew (2006).

2.1 Colored Asphalt Lane Designations

Asphalt is commonly used to overlay roads in the Philippines. It is usually in black and gray color and is preferred since it is convenient and easy to apply especially on surfaces that need to be used immediately. In Brooklyn New York, the Ride-A-Way (2009) is a blue bike lane that clearly defines space for bicycle users. The color of the asphalt signals other motorists to slow down when crossing. The colored asphalt provides the ability to differentiate road uses from bus lanes, provide bike lanes more visibility even from far distances and is capable of making road users safer while they are staying on their respective lanes, Wilson (2011).

3. PROPOSED MOTORCYCLE LANE DESIGN

From the results of the recorded accidents and observations during the implementation of MC lanes it can be seen that there are some areas for improvement. The following are considerations in the MC lane location and design. Clearly it is not enough to have the lanes marked with broken blue and white lines as a means of delineating symbolic boundaries on roads since they are not easily seen by motorists. Added to this problem of visibility is the nonobservance for lane boundaries by other road users, which can cause safety issues toward motorcycle riders, other motorists, and even pedestrians alike.

In the proposed motorcycle lane design the entire expanse of the lane is marked with blue asphalt. Instead of the broken white lines, a solid laneline is used to connote that other road users may not cross these lanes. The exclusivity of MC lane is one policy that can be suggested to reduce the risk of accidents caused by larger vehicle modes entering the motorcycle priority lanes. It is suggested that the blue lanes be transferred to the first lane or the right outermost lane following the pedestrian buffer area. As seen from the examples above, some road users in Commonwealth area do not acknowledge the purpose of these MC lanes. Having the blue lanes clearly marked makes violators clearly visible and may serve as a stronger disincentive for other vehicle modes in crossing the area.

Another point of concern is the width of the existing blue lanes. One plausible reason why other vehicle modes occupy blue lanes is because they are the same width as a regular lane. In some occasions, motorcycles are not that many in number along the highway and thus need far lesser space than private cars, PUVs, PUJs, and PUBs. Reducing the width of the blue lanes is another viable option to provide other road users space when the blue lanes are made exclusive to motorcycles.

Lastly, among these considerations it is vital to include the necessary signs, warning devices, and of course, information education materials that promote the visibility and safety of motorcyclists together with the strict implementation of these policies by the Authority.

4. CONCLUSIONS AND RECOMMENDATIONS

The implementation of the MC lane is a good effort in giving priority to motorcycle riders using major thoroughfares in Metro Manila. The MC lane policy is currently implemented along three (3) major thoroughfares namely Commonwealth Avenue, Macapagal Boulevard, and EDSA. And it is evident from the frequency of traffic accidents along Commonwealth Avenue that MC lanes are not effective in preventing motorcycle-related accidents. There was also an increase in the number of accidents that have taken place along the highway after the policy implementation. Moreover, a recent study conducted by Satura, S.G., et.al (2013) concluded that motorcycle-related accidents along EDSA also increased with the implementation of the MC lane.

Along with the suggestions discussed in the proposed blue asphalt lane design, it is important to the success of the MC lane that other highway users clearly understand the policy of the MC lanes in order for them to keep to their respective lanes. It is also recommended that the MC lane become exclusive to motorcycle users only to reduce the possibility of collisions between larger vehicle modes and motorcycles using the same lane. In line with this, further studies on how an exclusive motorcycle lane will affect the road capacity should also be considered. And as with most policies, the strict implementation among enforcers and discipline of road users is important to seeing the decline of accidents occurring along Commonwealth Avenue.

It is recommended for further studies on the MC lane to look into the nature and locations of the motorcycle-related accidents to be able to understand what caused these accidents to occur. It is also recommended to conduct survey interviews with motorists to inquire on the behavior of different road users, which include motorcycle riders, private car users, and public transport (PUB, PUJ, PUV) drivers on whether or not they are more likely to react positively and follow MC lanes if solid blue asphalt is used for the MC lane.

Given the results of this study it is highly recommended for the MMDA to re-evaluate the effectiveness of their motorcycle lane policy to better accommodate road users that are more responsive in ensuring their safety along the thoroughfares.

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