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TRAFFIC CONGESTION IN METRO MANILA: IS THE UVVRP STILL EFFECTIVE?

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ABSTRACT

The Unified Vehicular Volume Reduction Program (UVVRP), more popularly known as the "number coding" scheme was originally developed as a short-term travel demand management measure for Metro Manila in the light of on-going construction of transportation infrastructure projects in the 1990's. Although the scheme was not meant to be a long-term policy, the UVVRP is at present still implemented along major roads in Metro Manila albeit with some modifications like the mid-day window. With the completion of those major infrastructure projects, various transportation stakeholders, particularly those who are significantly disrupted by the UVVRP are critical of its continuous implementation, especially now that the authorities are imposing the scheme on public transportation vehicles as well. A study was conducted in 2004 to evaluate the UVVRP. Several scenarios were developed to evaluate traffic performance for variations to the schemes. The conclusion at the time was that UVVRP was effective enough to address traffic congestion. With the present experience of traffic congestion along major roads throughout the day there is a clamor for revisiting the UVVRP and to determine if it is still effective in curbing congestion. This paper revisits the UVVRP and presents the way forward for addressing congestion in the metropolis.

Key Words: *travel demand management, number coding*

1. INTRODUCTION

1.1 Background

With the worsening traffic congestion generally experienced along major roads in Metro Manila seemingly worsening everyday, a question commonly asked is whether the Unified Vehicular Volume Reduction Program (UVVRP), more popularly known as the number coding scheme, was still effective. The reasoning here can be traced from the fact that when the scheme was first formulated and implemented, the main assumption was that if the number of license plates on registered vehicles were equally distributed among the 10 digits (1 to 0), then by restricting 2 digits indicated as the end/last number on a plate we could automatically have a 20% reduction in the number vehicles. This rather simplistic assumption was sound at the time when the scheme was proposed and first implemented but apparently did not take into consideration that eventually, people owning vehicles will be able to adjust to the scheme one way or another.

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A first attempt at evaluating the scheme was undertaken with JICA's Metro Manila Urban Transportation Integration Study (1999) that was conducted from 1996-1999. The study made a preliminary assessment of the traffic scheme, concluding then that private vehicle volumes were not really reduced by 20% as projected by the Metropolitan Manila Development Authority (MMDA) but by a low 4.3%. This value represents people giving up the use of their cars for the day. All others tend to change their times of travel, change routes to use minor roads, or use another vehicle. As such, the impact of the scheme is already significantly diminished at the time (i.e., year 1999).

1.2 Objectives

This paper has the following objectives:

a. Present travel demand management schemes implemented in Metro Manila;
b. Discuss the evolution of the UVVRP in relation to traffic congestion in Metro Manila;
c. Assess the effectiveness of the UVVRP; and
d. Provide recommendations for improving traffic in the metropolis.

This paper revisits the UVVRP and examines its present implementation. Arguments for and against the UVVRP are discussed in the context of transportation infrastructure development in Metro Manila.

2. HISTORY OF THE UVVRP

The evolution of the UVVRP is summarized in the following Table 1, which includes the current inclusion of public transport vehicles in the implementation of the scheme.

Table 1 – Evolution of the UVVRP

Year	Evolution of the scheme
1995	Odd-Even Scheme – for private vehicles with less than 3 passengers; major roads only; 7:00-9:00 AM and 5:00 – 7:00 PM (Odd – banned T, Th, Sa; Even – banned M, W, F)
FEB 1996	Modified Odd-Even Scheme – included public transport and trucks (Banned: M-1,2; T-3,4; W-5,6; Th-7,8; F-9,0)
JUN 1996	UVVRP – all roads, 7:00 A.M. – 7:00 P.M. but not including public transport (Banned: M-1,2; T-3,4; W-5,6; Th-7,8; F-9,0)
2003	Modified UVVRP – window = 10:00 A.M. – 3:00 P.M. (Banned: M-1,2; T-3,4; W-5,6; Th-7,8; F-9,0)
2010	Modified UVVRP including public transport vehicles

Source: Tiglao, Regidor and Teodoro (2007)

Some peripheral LGUs do not implement the UVVRP since traffic in these LGUs is essentially lighter compared to the central cities where vehicles converge. These peripheral LGUs include Marikina City and Pateros. The Cities of Makati and Pasay did not implement the 2003 modified UVVRP, citing the traffic conditions in those cities during the 10:00 AM to 3:00 PM

window. Meanwhile, Pasig City implements a longer window from 9:00 AM to 4:00 PM, again justifying this according to the traffic situation in that city.

There are other TDM schemes applied in Metro Manila including those that are not necessarily sanctioned or implemented by government but still fall under the TDM category. These include flexible schedules by offices and shifted schedules of schools. Such have become popular but are generally initiatives by the private sector.

3. ADJUSTING TO THE UVVRP

One way to adjust when the number coding scheme was implemented was to change traveling times. Everyone knew that the scheme was enforced from 7:00 AM to 7:00 PM (i.e., there was no 10:00 AM to 3:00 PM window at the time) and so people only had to travel from the origins to their destinations before 7:00 AM. Similarly, they would travel back after 7:00 PM, which partly explains why after 7:00 PM there is usually traffic congestion due to "coding" vehicles coming out to travel. In effect, the "coding" vehicle is not absent from the streets that day. Instead, it is only used during the time outside of the "coding" or restricted period.

Another way that was actually a desired impact of the coding scheme was for people to shift to public transport, at least for the day when their vehicle was "coding." That way, the vehicle is left at home and there is one less vehicle for every person who opted to take public transport. This, however, was not to be and people did not shift to public transport. Perhaps the quality of services available or provided to them were just not acceptable to most people and so they didn't take public transport and a significant number instead opted for a third way.

That third way to adjust was one that was the least desirable of the consequences of number coding – people who could afford it bought another vehicle. This was actually a result that could have been expected or foreseen given the trends and direct relationship between increases in income associated with economic growth where people would eventually be able to afford to buy a vehicle. Actually, there is no problem with owning a car. The concern is when one uses it and when he opts to travel. Of course, this does not necessarily mean that people started buying new cars outright, making this something like an overnight phenomenon. It happened over several years and involved a cycle that starts when the wealthier people decide to purchase a new vehicle and discards their old ones. These used vehicles become available on the "second hand" market and are purchased by those with smaller budgets. Some of these people may have even older vehicles that they will in turn discard, and eventually be owned by other people with even less budget. Note that in this cycle, very few vehicles are actually retired, if at all considering this country has no retirement policy for old vehicles. The end result is that there is more cars on the roads and consequently, more severe and more frequent congestion are experienced. Ultimately, this diminishes the effectiveness of the UVVRP although the scheme remains to be a deterrent for driving during the periods when the scheme is enforced.

4. TRAFFIC IN METRO MANILA

In the past decade, there has been a sharp rise in the motorcycle ownership around the country and especially in Metro Manila. From about 1 million motorcycles registered in 2000, the number has increased to 3.2 million in 2009, a 320% increase over a period of 10 years. Motorcycles have become associated with mobility, in this case the motorized kind, and have become the mode of

choice for many who choose to have their own vehicles but cannot afford a four-wheeler. These people also choose not to take public transport for a variety of reasons but mainly as they perceive their mobility to be limited should they use public transport services that are available to them. This rise of the motorcycle is also a response to the restrictions brought about by UVVRP with the scheme not covering motorcycles. In fact, should motorcycles be included in the UVVRP, it would be a nightmare for traffic enforcers to apprehend riders considering how they maneuver in traffic. Add to this the perception and attitude of riders that motorcycles are practically exempt from traffic rules and regulations (and traffic schemes!) due to the relative difficulty of apprehending them for violations.

To understand UVVRP, it must also be assessed in the context of its original implementation when Metro Manila had to contend with congestion due to infrastructure projects being constructed everywhere during the 1990's. EDSA MRT was being constructed, interchanges were also being put up, and a number of bridges were being widened to accommodate the increasing travel demand. Road widening projects generally benefit private vehicle users more than public transport users. In the case of Metro Manila, many areas are already built-up and acquisition of right of way for widening is quite difficult for existing roads. As such, it is very difficult to increase road capacities to accommodate the steady increase in the number of vehicles.

5. TEM AND TDM

In transportation engineering, when traffic/transport systems management (TEM) techniques are no longer effective or yield marginal improvements we turn to travel demand management (TDM) schemes to alleviate congestion. In the former, we try to address congestion by tweaking the system (i.e., infrastructure) through road widening, adjustment of traffic signal settings, etc. while in the latter, we go to the root of the problem and try to manage the trips emanating from the trip generation characteristics of various land uses interacting with each other. By addressing the trip generation characteristics through restrictions, we influence travel demand and hopefully lessen traffic during the peak periods while distributing these to others.

This is the essence of UVVRP where the coding scheme targets particular groups of private cars (according to the end number on the license plate) each weekday. Meanwhile, the scheme is not implemented during weekends due to the perception that, perhaps, travel demand is less or more spread out during Saturdays and Sundays. However, there is a problem with this approach as the traffic taken away from the peak hours are transferred to other times of the day, thereby causing in some cases the extension of what was originally a peak hour unto a longer period. What was before a morning peak of, for example, 7:30 – 8:30 AM becomes spread out into a peak period of 7:00 – 9:00 AM. The problem here is when you have major traffic generators like central business districts (e.g., Makati and Ortigas) where congestion is experience for more than 2 hours (e.g., 7:00 – 10:00 AM or 4:00 – 7:00 PM).

The UVVRP is not implemented in all of Metro Manila. Several LGUs, particularly those in the outer areas like Marikina City and Pateros. This is simply due to the information and observations of these cities that their roads are not affected by the build-up of traffic since most traffic is bound for the CBDs located in Makati, Pasig, Mandaluyong, Quezon City and Manila. This is the case also for LGUs in the periphery of Metro Manila like the towns in the province of Rizal, which is to the east of the metropolis, where the typical behavior of traffic is outbound in the morning and inbound in the afternoon. The great disparity between inbound and outbound traffic is evident in the traffic along Ortigas Avenue where authorities have even implemented a counter-flow scheme to increase westbound road capacity.

There have also been observations of traffic easing up during the mid-day. As such, the MMDA introduced a window from 10:00 AM to 3:00 PM to allow all vehicles to travel during that period while retaining the restrictions of the number coding scheme from 7:00 – 10:00 AM and 3:00 – 7:00 PM. However, while many LGUs applied the window, some and particularly those found in central part of the Metropolis like Makati, retained the 7:00 AM – 7:00 PM ban. This stems from their perspective that traffic does not ease up at all (e.g., try driving along Gil Puyat Ave. during lunchtime) along their streets during the window period.

Nowadays, there seems to be the general perception that one can no longer distinguish between traffic during the coding period and the window. Traffic congestion is everywhere and there are few opportunities for road widening. Traffic signal control adjustments are limited to those intersections where signals have been retained (mostly in Makati) since the MMDA replaced signalized intersections with U-turn slots during a past administration where the U-turn was hailed as the solution to the traffic mess.

6. EVALUATING TRAFFIC IN METRO MANILA

The MMDA always reports what it claims as improvements in travel speeds along EDSA in the past years. They have pointed to this as evidence that traffic congestion is being addressed and that programs like the UVVRP are effective in curbing congestion. However, caution must be made when making generalizations pertaining to the effectiveness of schemes especially if the evidence put forward is limited and where it is unclear how speeds were measured along the roads. Table 2 shows the estimated travel speeds along selected major roads in Metro Manila.

Table 2 – Travel speeds along major roads in Metro Manila

Road	Travel speed (kph)			
	2008	**2009**	**2010**	**2011**
EDSA	32.78	36.24	32.07	36.09
Marcos Highway	28.19	28.02	27.92	27.10
Road 10	28.97	32.54	36.78	36.67
Quezon Avenue	27.73	26.36	32.58	32.34
McArthur Higwhay	No data	19.99	17.31	18.21
Commonwealth Avenue	35.93	36.06	41.54	39.35
C5	No data	27.84	35.24	29.37

(Source: MMDA)

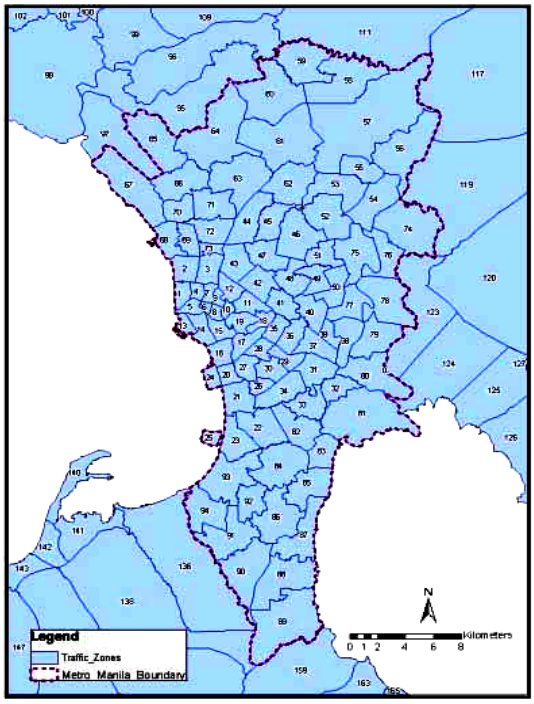
Typically, travel speed estimation should be undertaken during the morning and afternoon peak periods as well as the daytime off-peak (e.g., noon), and weighted according to the length of sections. Corridor travel speeds would probably have significant variations throughout the five weekdays and the two weekends. Such important details are not reflected in the preceding table.

The MMDA also has been using micro-simulation software that it employs to demonstrate the potential effectiveness of its proposed traffic schemes. The software has an excellent animation feature that can make the untrained eye believe in what is being shown as if there were no problems resulting from the schemes. The problem here is when one realizes that computer software will only show what the programmer/operator wants, and is perhaps an example where the term "garbage in, garbage out" is very much applicable. And this is especially true should the computer model be un-calibrated and un-validated according to guidelines that are well established, and extensively discussed and deliberated in a wealth of academic references. The fallacy of employing advanced tools to demonstrate how one's proposal is better than another was highlighted when the DPWH acquired the same tool and came up with an entirely different result for an analysis being made for the same project by that agency and the MMDA. Surely, this resulted in confusion as the outcomes of the simulation efforts of both agencies practically negated each other.

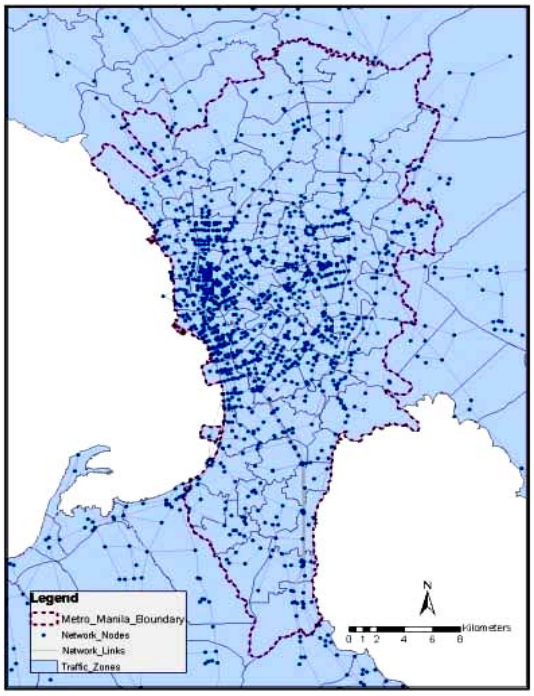
It should be pointed out that such micro-simulation software alone is unsuitable for the task of determining whether metro-wide schemes such as the UVVRP is still effective given the actions of those affected by the scheme. What is required is a macroscopic model that would take into account the travel characteristics of populations in Metro Manila and its surrounding areas (cities and towns in the provinces of Rizal, Bulacan, Cavite, Laguna).

There are quite a few of these models available but most if not all were derived from the one developed under the Metro Manila Urban Transport Integration Study (MMUTIS) that was completed in 1999. The main beneficiary from the outcomes of MMUTIS happens to be the MMDA but for some reason, that agency failed to build capacity for maintaining and updating/upgrading the model. As such, the agency missed a great opportunity to invest in something that they could have used to develop and evaluate traffic schemes to address congestion and other traffic issues in Metro Manila, as well as to assess the impacts of new developments. Figure 1 shows the traffic zones and link and node system developed and used for MMUTIS.

At present, there are efforts to update an upgrade the MMUTIS model in order to incorporate the current road network, transport services and land use for the study area, as well as to include an expanded area that is now being referred to as Mega Manila. Such an updated and upgraded model would be very useful for evaluating schemes that are implemented or are proposed for implementation over a wide area of the NCR that are expected to affect not only Metro Manila but also an extended influence area that includes not only towns in Bulacan, Rizal, Cavite and Laguna but also those in Bataan, Pampanga, Quezon and Batangas as well. Figure 2 shows the traffic zones being considered in a current study being implemented by the National Center for Transportation Studies of the University of the Philippines.



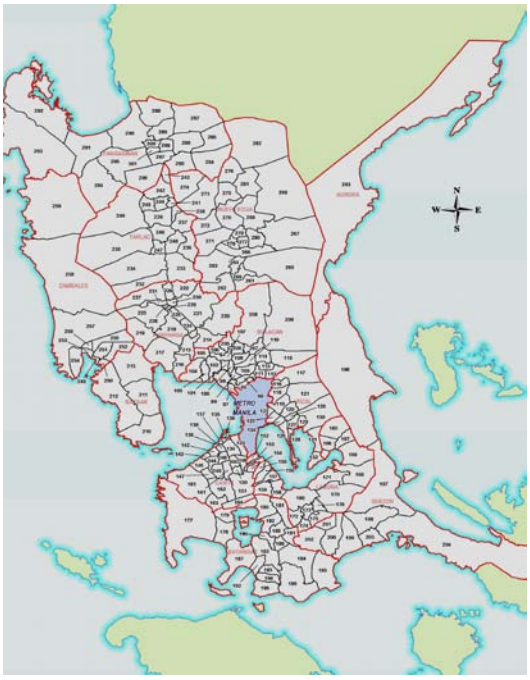
(a) Traffic zones



(b) Link and node system

Figure 1 – Traffic zones, and link and node system developed in MMUTIS
(Source: JICA, 1999)

(a) Metro Manila traffic zones



(b) Mega Manila traffic zones

Figure 2 – Traffic zones used in model development in MMPTPSS
(Source: MMPTPSS, 2011)

The effort mentioned is part of the project that aims to develop a public transportation planning support system for Mega Manila. The original MMUTIS model that was developed and run using the JICA-STRADA software is being migrated to a platform using CUBE, which also happens to be the software being used by Hongkong and the Bangkok Metropolitan Area, among others, for their transport planning needs. The link and node system for the model under development is shown in Figure 3.

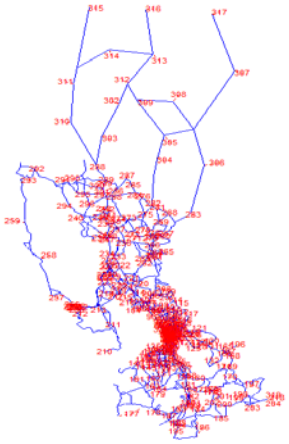


Figure 3 –Link and node system for traffic model under development in MMPTPSS (Source: MMPTPSS, 2011)

Such may eventually be used to objectively evaluate schemes for Mega Manila. But for now, the MMUTIS model should be sufficient enough for assessment. In fact, the MMUTIS model was used to evaluate two metro-wide schemes in the UVVRP and the truck ban (Tiglao, Regidor and Teodoro, 2005), which indicated that the UVVRP has been effective in addressing congestion while concluding that the truck ban, another TDM scheme, may be eased along Metro Manila roads. In the latter case, the issue on overloading and the resulting damage to pavements, however, was not discussed in the paper. There is currently a Japanese-funded project with the DOTC to update the MMUTIS model. Such updating would already incorporate land use and transport developments over the 12 years that will again allow for a more suitable tool to be used in assessing the overall effectiveness of UVVRP.

7. CONCLUSIONS

Metro Manila has come to a point where its options for alleviating congestion are becoming more and more limited. The combination of a still increasing rate of motorization and private vehicle use has definitely contributed to congestion while there are also perceptions of a decline in public transport use in the metropolis. The share of public transport users in most Philippine cities and municipalities range from 80 – 90 %, while in many highly urbanized cities the tendency seems to be a decline for this share as more people are choosing to purchase motorcycles to enhance their mobility and as a substitute to cars. This trend towards motorcycle use cannot be denied based on the steep increase in ownership and the sheer number of motorcycles we observe in traffic everyday.

Metro Manila needs to retain the substantial public transport share (currently about 70%) while accepting that motorcycle ownership will continue to chip off this share of commuters. The latter phenomenon can be slowed down should authorities strictly enforce traffic rules and regulations on motorcyclists, effectively erasing the notion that the latter group is "exempted" from such. The bigger and more urgent issue, however, is how to put up long overdue mass transport infrastructure that is direly needed in order to create the best opportunity and conditions for rationalization of transport services.

We seem to like that word "rationalization" without really understanding and acting on what is required to once and for all address transport problems in the metropolis. We are not lacking for examples of good practices that are both effective and sustainable, including those in the capital cities of our ASEAN neighbors. However, we seem to be unable to deliver on the infrastructure part that we have tended to over-rely on a TDM scheme that has long lost much of its effectiveness. This includes using the UVVRP to address the perceived over-supply of public transport vehicles that totally misses the point of addressing the roots of the problem (e.g., too many PUV units due to inconsistencies and flaws in the franchising of public transport). Low quality of public transportation would lead people to strive to own private vehicles including motorcycles.

The evidence is quite strong for this conclusion and perhaps we should stop being in denial in as far as the UVVRP's effectiveness is concerned since it continues to be diminished as time goes by. Nevertheless, for now, the UVVRP should be retained even if only as a deterrent against congestion in general and as a tool to modify travel behavior for those who would otherwise travel during the peak periods. Not everyone, after all, has second cars or has made efforts to adjust to the congestion caused by increasing dependence of private vehicles (i.e., both cars and motorcycles). It must be emphasized though that efforts should be turned towards building the necessary infrastructure and making public transport attractive so that private car and motorcycle users will be left with no excuse to shift to public transport use. It is inevitable that at some time they will understand and appreciate the cost of congestion and that they will have to pay for their part in congestion like what is being done along tollways or, in the more sophisticated and mature example, Singapore. But this cannot be realized if we continue to fail in putting up the infrastructure Metro Manila so direly requires.

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