Automation Transaction of Motor Vehicle Registrations in Land Transportation Office (LTO) of the Philippines[1]

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Abstract

Motor Vehicle (MV) Registration issue per se has been plaguing the National Capital Region (NCR) and resulted in many temporary remedies and changes in the LTO system. This eventually has caused headaches both for LTO and private owners, as having lost in productivity, time and effort, extra cost and contracting fixers in the area. The growing demand for a fixed viable process has caused havoc in the LTO and thirst for a new methodology in its system. In an attempt to solve this particular issue, a new automation and auto verification (AutoCheck) via online of MV may address the issue.

Keywords
Emission Testing, MV Online Registration, AutoCheck, Reliable-Dependable-Fixed, Viable LTO System

1. Introduction

1.1. Background of the Study

The laws and regulations imposed are the breathing ground for civilization to be in order, without it man will be in chaos. From time in the beginning to modern period, transportation has been a service, a mode of life and a lifestyle. In fact, the invention of automobile (or MV) made life easier in moving people and goods from one place to another and back. In the Philippines, as the population grows, MVs have also been growing rapidly each year. Almost all Filipino households own at least one mode of transportation and, laws will have to govern their mobility. This brought about the creation of the Philippine LTO, to strictly implement and enforce the laws regarding land transportation. It is a Sectoral Office of the Department of Transportation (DOTr), formerly known as the Department of Transportation and Communication (DOTC).

The first law relating to transportation was **_Act No. 2159_** of 1912, enacted to regulate MVs and to provide for regulation and licensing of operators. The provision of the law created a Section tasked to take charge of MVs and drivers' licenses. In 1922, **_Act No. 3045_** was passed into law compiling and incorporating all previous laws governing MVs; while in 1933, **_Act No. 3992_**, Revised Motor Vehicle Law, was enacted renaming the Automobile Division to Division of Motor Vehicles (DMV); and in 1947, **_Executive Order No. 94_** was promulgated upgrading the office of DMV to Motor Vehicles Office (MVO) and categorized it as a Bureau.

Consequently, industrialization advanced and the Department of Public Works and Highways (DPWH), in 1961, transferred the function of collecting the registration fees from city treasurers to various vehicle agencies of the MVO. In 1964, **_Republic Act_** (RA) **_4136_** or the Land Transportation and Traffic Code was enacted abolishing the MVO and created the Land Transportation Commission (LTC). Its function, mainly, to "_control as far as they apply, the registration and operation of motor vehicles and the licensing of owners, dealers, conductors, drivers and similar matters_ (_LTO Press Release, 2016)_." Similar matters include enforcing traffic rules and regulations, and adjudicating apprehensions. With this mandate, LTC established several regional offices in various parts of the Philippines. In 1979, **_Executive Order No. 546_** was promulgated and renamed the LTC as Bureau of Land Transportation (BLT). In

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[1] drawn from previous IE110-OR topic proposal, "_A Review of Philippine Land Transportation Office (LTO) in Dealing with Online Transactions Incorporating The System of Automobile Checking (AutoCheck)._"

1980, **_Batas Pambansa Bilang 43_** was passed providing for the issuance of permanent number plates to owners of MVs. In 1987, LTC was abolished, and 2 offices were created. One was the LTO, and the other was the Land Transportation Franchising and Regulatory Board (LTFRB).

Despite all changes in the LTO, its basic functions on land transportation system remain the same, "T*he promotion of safety and comfort in land travel is its continuing commitment* (*LTO Press Release, 2016)*." LTO simply started with only 13 regions and 3 were later on created by law and all attached to the DOTr, reporting to LTO Central Office on matters of registration of MVs, issuance of drivers' licenses and enforcement of land transportation laws, rules and regulations.

Over the years, various transactions in LTO are rapidly increasing and to meet public demands, LTO introduced the computerization of its transactions in 1998. Now, LTO offices are computerized, except those still encountering issues in manpower, telecommunications and security.

1.2. Rationale and Scope of the Study

The study will survey and try to exhaust all studies on registration of MVs in all types of classifications, but limits to statistical data as of December 2019. Primarily, a look into the emission testing waiting time, its current and recommended procedures, online registration, auto checking of MVs via internet, proper scheduling, and payment of fees online. It will involve some critical examinations of the legal aspects and general technical details in relation to the imposition and adoption of a new process flow incorporating Online MV Registration. Though, not the details of other functions of LTO in terms of driver's licensing, registration of all types of motorcycles, electronic MVs, government vehicles, public transportation vehicles, diplomat and etcetera. Subsidiarily, relevant facts, LTO practices and laws being implemented and not yet being implemented in registering a MV. Also, only the National Capital Region (NCR) and computation base on Las Piñas branch LTO Office will be involved in the study.

1.3. Objective of the Study

Despite many advances in the field of transportation and communication, there still is a dearth of research to be done in the Philippines, albeit in other countries there have been extensive studies and implementations of modernization, it is, at the most, descriptive, and effective. Hence, the study will dwell on the following aspects. First, on assessment of current LTO system with regard to reporting on an existing practice, procedure and ways in registering MVs, specifically in Las Piñas branch. Second, on identifying causes and conditions of delay or waiting time in every LTO activity. Lastly, on the recommendation of providing an automated process via online procedure, an automation or auto verification of MV online with scheduling and method of payment.

2. **Literature Review**
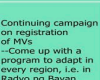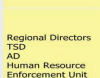
Roadworthy vehicles are, MVs and its relevant parts, compliant with national standards and international vehicle safety conventions (*LTO Road Safety Action Plan, 2019)*. In ensuring roadworthiness of vehicles will decrease the likelihood of failure in vehicle functioning that will reduce the risk of a road crash.

Ensuring roadworthiness, the Bureau needs to verify the authenticity of both Certificate of Registration (CR) and Official Receipt (OR) of buying a second hand MV, which is only done at the LTO Property Section, East Avenue in Quezon City. Although, verification may be done at any online LTO District Office, it has to ensure that the integrity and security of information relating to the MV ownership and details, any and all requests from private individuals shall be coursed through the office of the LTO Assistant Secretary for approval (*LTO FAQ, 2017)*.

In another aspect, during the administration of President Benigno Aquino III, the now-DOTr released a **_Department Order 2012-10_**, in compliance with **_RA 8749_** or the Philippine Clean Air Act of 1999 that prevents, regulates and abatements of air pollution. DOTr is mandated by the law to [1] inspect and monitor the emissions of MVs; [2] prohibits or enjoin the use of MVs or a class of MVs in any area or street at specified times; and [3] authorize private emission testing centers duly accredited by the Department of Trade and Industry (DTI). DOTr has the role to establish the procedures for the inspection of MVs and the testing of their emission for the purpose of determining the concentration and/or rate of emission of pollutants discharge. Thus, no MV Registration (MVR) shall be issued by

the LTO, unless the MV passes the emission testing requirement promulgated in accordance with the law as evidenced by a Certificate of Conformity (COC) issued by the Department of Environment and Natural Resources (DENR) or authorized Private Emission Testing Centers (PETCs). This is done within 60 days prior to date of registration (*Samsung Engineering, 2013*).

Below is the underlying policy framework of LTO, establishing 5 pillars of road safety (*LTO Road Safety Action Plan, 2019)*:

Components	Activities	Output	Timeline	Reponsible Person/Office	Components	Activities	Output	Timeline	Reponsible Person/Office
COMPONENT 1: Automation of motor vehicle registration process	Accreditation of private motor vehicle inspection centers (PMVICs) using automated process	Automated inspection centers	Ongoing	LTO - DOTr	COMPONENT 3: Capability-building for inspectors	Set appropriate qualifications for inspectors, i.e. National Certificate (NC) or Certificate of Competency or equivalent educational course	Revised Qualification Standards for MV Inspectors	By 2nd Quarter 2020	Regional Directors ADMIN, Human Resource and Department Enforcement Unit
COMPONENT 2: Implementation of education and awareness campaigns	Advocate for a regular MV service maintenance	Campaigns, notices, posting of tarpaulin and social media campaign on preventive maintenance	Continuing IECs	LTO CO and RO	COMPONENT 4: Re-registration of MVs which have been inactive for more than 10 years	1. Issuance of policy on retiring MVs 2. Campaign/Ads to encourage inactive MV owners to register 3. Re-registration	1. Policy 2. IECs 3. Implementation	4th Quarter 2019 Ongoing Ongoing	Operations Division (Ops) TSD Ops
	Continuing campaign on registration of MVs ~Come up with a program to adapt in every region, i.e. in Radyo ng Bayan	- Barangay or Community Outreach program - Quad-media IECs - Focused IECs	Continuing	LTO CO RO and District Offices (DO)	COMPONENT 5: Development of road crash investigation capacity	Road crash investigator training for LTO employees	Well-trained technical road crash investigators	1st Quarter 2020	TSD/Ops
						Develop training facility/laboratory for road crash investigation	Training facility	1st Quarter 2020	TSD
	LTO Employees Continuing Training and Education of MV Inspectors	Pool of well-trained inspectors who will effectively implement policies/ standards	4th Quarter 2019	Regional Directors TSD AD Human Resource Enforcement Unit	COMPONENT 6: Formulation of policies	Policy regulating unauthorized changes in motor vehicles	Memorandum Circular on MV Modification	For implementation during the 4th Quarter of 2019	Ops Legal officers
						Policy to address the influx of Electric Motor Vehicle	Policy on Safer Electric Motor Vehicles	By 4th Quarter of 2019	Ops

The National Capital Region (NCR) is the only region in the Philippines without any province. It is subdivided into 17 local government units (LGUs) comprising of 16 cities and 1 municipality (*NCR Profile, 2020*). They are also known as Metro Manila, as follows: 1) Caloocan City; 2) Las Piñas City; 3) Makati City; 4) Malabon City; 5) Mandaluyong City; 6) Manila City; 7) Marikina City; 8) Muntinlupa City; 9) Navotas City; 10) Parañaque City; 11) Pasay City; 12) Pasig City; 13) Quezon City; 14) San Juan City; 15) Taguig City; 16) Valenzuela City; and 17) Pateros Municipality.

3. Methodology

In the analysis of existing laws being implemented by LTO, a Network Planning Techniques: Program Evaluation & Review Technique, and Critical Path Method (PERT-CPM) via MS Project will be used in this study. In order to arrive at a possible consistent, low maintenance and cost efficient proper LTO online processes and procedures. Another, is a look into a better understanding on how LTO may operate online, improve its processes and contribute to a "road worthiness" slogan being portrait by the Bureau in improving registration of MV, at least in the NCR.

Table 1 shows LTO Management Information Division (MID) Statistics Section data on the type of MVs registered as new and renewal by denominations only in the NCR. The types of MVs are as follows:

(a) **Cars**, from Light (L) vehicles with gross weight of up to 1600 kilograms; Medium (M) vehicles with gross weight range of 1601-2300 kilograms; and Heavy (H) vehicles with gross weight of more than 2300 kilograms;

(b) **Utility Vehicles (UVs)**, whose gross weight shall not exceed 4500 kilograms and passenger capacity of less than 18. This includes local pick-ups (locally manufactured UVs); imported pick-ups (completely built unit [CBU]); and imported passenger van/wagon (commuter vehicle transporting people and not used to carry cargo);

(c) **Sports Utility Vehicle (SUV)**, specially designed to transport persons and not primarily used for cargo, and having the characteristics, features and amenities similar to a car;

(d) **Motorcycles (MCs)**, including mopeds, with or without sidecars, with seat/saddle use for riding, design to travel;

(e) **Trailers**, Trailer Light (TRL) whose gross weight is 1600 kilograms and below; Trailer Medium (TRM) whose gross weight is 1601-4500 kilograms; and Trailer Heavy (TRH) whose gross weight is 4501 kilograms and above;

(f) **Trucks** (T), such as stake, platform, pick-up, trucks for gravel and sand, and others of the same configuration; includes van and tanker types with gross weight exceeds 4500 kilograms; and

(g) **Buses** (TB), buses and coaches whose passenger capacity range is at 18 and above.

Table 1.   CONSOLIDATED: for NCR, per annum, Number of MVs
REGISTERED, NEW-RENEWAL. As of December 2019

	NEW	RENEWAL	TOTAL
CAR	60,560	435,159	**495,719**
UV	100,279	563,355	**663,634**
SUV	56,978	239,313	**296,291**
Motorcycle	434,527	1,035,521	**1,470,048**
Trailers	4,005	25,815	**29,820**
Trucks	19,237	84,409	**103,646**
Buses	3,168	13,762	**16,930**
	678,754	2,397,334	**3,076,088**

OR/Optimization Tool:

In computing for the work-hour of LTO personnel for the year 2019, the working day to be used with fiscal year shall be 261 working days (*Working Day, 2019*). Based on Presidential **Proclamation No. 555**, it has been declared that the regular holidays and special non-working days for 2019 are totaled 19. There are at least 53 LTO branches within Metro Manila (*Sulit Stories, 2020*). Although the regular working day would be 8 hours, from 8:00am until 5:00pm (with 1 hour break). However, the MV registrations, at least in Las Piñas LTO branch, is open from Monday to Friday, 8:00am until 8:00pm, without breaks. This means that Las Piñas LTO branch has 12-hour working days per week, except holidays. Computation is under 4. Discussions and Results. It will demonstrate the old process flow which is existing in the LTO, as supposed to a new process flow which is recommended in this study. The approach will concentrate on the latter, which is the "critical path algorithm," on Network Planning Techniques: Program Evaluation & Review Technique; and Critical Path Method (PERT-CPM) using MS Project.

Process Flow (in the old process):

In the old process, please see **Figure 1**, all transactions are physically done in the LTO branch, where an individual processing a MV Registration must bring a copy of **CR and previous OR** of the MV. If one has an insurance, **third party liability (TPL)**, other than the comprehensive insurance, one can proceed to be in queue (waiting time: 30 minutes to 2 hours, depending on the number of queues) in the **Emission (PETC)**. If one does not have a current issued TPL, one has to be in queue (waiting time: 30 minutes to 1 hour, depending on the number of queues) before moving to Emission (PETC).

After submitting the TPL and copy of CR and previous OR to the Emission (PETC) booth, there is a waiting time of 30 minutes to 2 hours, depending on the number of queues. Once the MV is being tested for **MV Emission Testing**, the tester must take a picture of the emission at the back of the MV for the issuance of the Certificate of Conformity (COC), together with the copy of the CR/OR and TPL, will now proceed to be in queue for the **MV Stencil** (waiting time: 30 minutes to 1 hour, depending on the number of queues).

Fill out the stencil form (in conformity with the MV File No., Chassis No., and Engine No.). In other countries, the Vehicle Identification Number or VIN (found either on the lower side of the drivers' windshield or at the side of the

door with serial numbers), would suffice. Furthermore, MV with VIN means that the vehicle has passed an international standard quality check, if not, it means that the vehicle has been manufactured or assembled locally for use within its jurisdiction.

Afterwards, once an inspector at MV Stencil signs the filled-up stencil form, one can proceed to be in queue for the **Document Assessment for Registration** (waiting time: 30 minutes to 1 hour, depending on the number of queues). The LTO inspector will write or tell you to wait in queue at an LTO Window No. for the **Online Verification of the MV possible Apprehension** (waiting time: 30 minutes to 1 hour, depending on the number of queues). If the MV has a registered apprehension, one will have to settle and come back another day. However, if there is no registered apprehension, one can proceed to be in queue at an LTO Window No. for the **Cashier** (waiting time: 30 minutes to 2 hours, depending on the number of queues, and usually has the longest queue among the procedures).

At the end of the actual procedures, once payment for the MV fees is made, one can proceed to an LTO Window No. to **get the latest issued OR** for the MV and usually one is issued a sticker to be placed inside the upper right-side of the windshield, as well as small stickers for the plates, of the year the MV is showing its current registration. However, due to the pandemic situation of 2020, all LTO branches no longer issue stickers. Henceforth, after payment and receiving the latest OR, one may now go home.

Figure 1. LTO Current System Flowchart

Analysis:

Actual and physical LTO branch visit for the MVs Registration, in the old process:

Based on *Table 1* data, in computing for the number of MVs per hour and per LTO branch in Metro Manila (LTO Las Piñas branch will be the model), hence, arrived at the following computation:

Total Number of MVs in NCR: 3,076,088   (based on *Table 1*)
Number of Working Days, 2019:   261 days / annum
Holidays in 2019:   19 days / annum
LTO Las Piñas Working Hours: 12 hours / day (from Monday to Friday, except on holidays)
                                                 261 working days - 19 holidays = 242 days per year

$$\frac{3,076,088 \text{ MVs}}{\text{year}} \times \frac{\text{year}}{242 \text{ days}} = 12,711.11 \text{ MVs per day}$$

$$\frac{12,711.11 \text{ MVs}}{\text{day}} \times \frac{\text{day}}{12 \text{ hours}} = 1,059.26 \text{ MVs per hour}$$

$$\frac{1,059.26 \text{ MVs}}{\text{hour}} \times \frac{}{53 \text{ branches}} = 19.98 \text{ approximately} = 20 \text{ MVs per hour per branch in NCR}$$

Ideally, and if no additional holidays nor cause of delays in each LTO branch in Metro Manila, there are 20 MVs per hour transaction that can be processed. On the other hand, **by actual practice**, due to the turn around time including actual hand-over of documents of these MVs inside each LTO branch, finishing 20 MVs per hour may be small in number. This output is based on 2019 data, which means that in 2021 and further period, the data will have an incrementing factor which deliberately lowers productivity and efficiency ratings.

With the new process, MV online registration, delays may be eradicated and consistency will be established. For instance, in an LTO branch, where a particular MV will be registered, via online processing through automation using AutoCheck, will have an increase number of transaction per day. As such, an online advantage of consistency,

efficiency, and effectively done will have a 24-hour transaction without exhausting manpower, except the IT infrastructure maintenance, and in real time response.

Process Flow (in the new process - recommended study):
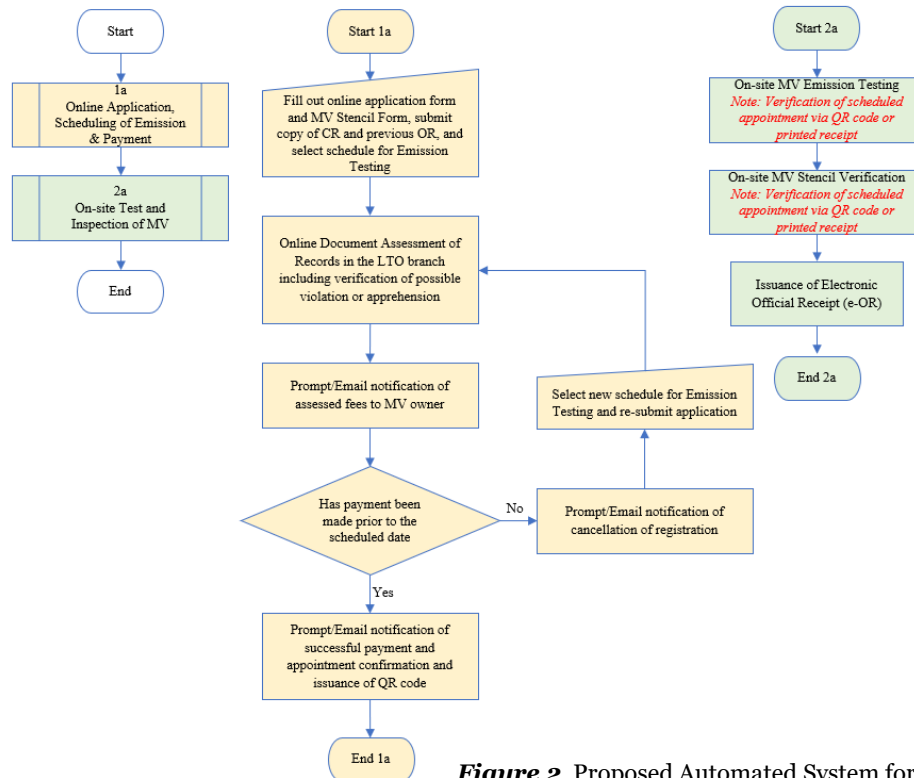
Figure 2. Proposed Automated System for LTO Flowchart

In the new process, almost all transactions are done online. Sub-process 1 is from filling out the application form, MV stencil form, scheduling of emission testing and verification via AutoCheck; to payments. While, sub-process 2 is a shortened and only process to be done in the chosen LTO branch of physical testing and inspection of MV.

4. **Discussions and Results**

In the process flow above, under the old process: (in **_Figure 1_**)

In all these procedures, an actual running time of 6 LTO processes will only take about 5-15 minutes per transaction, if processed properly, in orderly manner and done online; while in a 30-minute waiting time period per process, at least **2 1/2 hours wasted time** is already allotted, meaning one will at least spend half day at an LTO branch, if one comes in before 8:00 am; in an hour waiting time period per process, a **5-hour wasted time** is allotted; and in a 2-hour waiting time period per process, a **10-hour wasted time** is allotted, meaning one will stay at an LTO branch the whole day or possibly have to return the next working day to finish the registration process. Notwithstanding, one may no longer have a parking while waiting for the MV to be tested at the PETC.

In the process flow above, under the new process: (in **_Figure 2_**)

In this new process, it is highly possible to require only **one document** to take to an LTO branch in registering the MV or possibly a **mere scanning of a certain QR code** upon entry on a scheduled time or by appointment. The best thing in this online procedure is a **shortened waiting time period spent** at an LTO branch. Even the issuance of the **MV's OR may even be electronically done**. This will also lessen the crowd in all LTO branches.

In this regard, LEAN in operations management creates opportunities for development. As technology automates and improves processes, LTO can up-skill manpower, information technology infrastructure and other related transformation strategy. This will help boost productivity and reduce wasted time through greater retention (*Ciraldo, 2021*). Not to mention that cost reduction is achievable. Environment friendly, with paperless or less paper usage, with more consistent transactions in processing means more income generation for the Bureau.

Eventually, the new process suggests that the modernization of online processing of automobile checking and the approach needed to still secure the critical information in the system to maintain its integrity. Enabling online users to view the MV history, from manufacturer to owner of vehicles, as well as second-hand ones that they intend to buy. Making all vehicle workshops, dealers and the so-called "casa" to enter vital information of vehicles which are under their care, repair or maintenance. Centralized information check and virtual processing of LTO documents. Although, the Motor Vehicle Inspection System (MVIS), authorizing the Private Motor Vehicle Inspection Systems (PMVIS) to collect new fees and inspect MVs, in answer to several enacted laws pertaining to road safety and MVs, has yet to be implemented. Now, it is merely an optional undertaking or as the President of the Philippines declared it as no longer mandatory (*Galvez, 2021*). The optional system has its advantage, such as rendering MV report or result every after conducted inspection via internet to LTO IT system or to Land Transportation Management System (LTMS) which handles all its online, website, live updates, and IT transactions for the whole LTO.

Table 2. MV User's Charge (MVUC) rates for private vehicles based on type and gross weight (*Zoleta, 2021*).

Vehicle Type	Gross Weight	MVUC
Light passenger cars	Up to 1,600 kg	PHP 1,600
Medium passenger cars	1,601 kg to 2,300 kg	PHP 3,600
Heavy passenger cars	2,301 kg and above	PHP 8,000
Utility vehicles	Up to 2,700 kg	PHP 2,000
Utility vehicles	2,701 kg to 4,500 kg	PHP 2,000 + 0.40 x gross weight in excess of 2,700 kg
SUVs (1991 models and above)	Up to 2,700 kg	PHP 2,300
SUVs (1991 models and above)	2,701 kg to 4,500 kg	PHP 2,300 + 0.46 x gross weight in excess of 2,700 kg
Motorcycles without sidecar	N/A	PHP 240
Motorcycles with sidecar	N/A	PHP 300
Trucks	4,501 kg and above	0.24 x gross weight

Let's take CARS for the computation:

Total Number of CARS in NCR: 495,719 (based on ***Table 1***)
Number of Working Days in 2019: 261 days / annum
Holidays in 2019: 19 days / annum
LTO Las Piñas Working Hours: 12 hours / day (from Monday to Friday, except on holidays)
261 working days - 19 holidays = 242 days per year

CARS (L):

$$\frac{495,719 \text{ CARS}}{\text{year}} \times \frac{\text{year}}{242 \text{ days}} = 2,048.42562 \text{ CARS per day}$$

$$\frac{2,048.42562 \text{ CARS}}{\text{day}} \times \frac{\text{day}}{12 \text{ hours}} = 170.702135 \text{ CARS per hour}$$

$$\frac{170.702135 \text{ CARS}}{\text{hour}} \times \frac{}{53 \text{ branches}} = 3.220795 \text{ approximately} = 4 \text{ CARS per hour per branch in NCR}$$

₱ 1,600 : Registration Fee per CAR for light vehicle (L) (based on ***Table 2***)

$$\frac{₱ 1,600}{\text{CARS}} \times \frac{4 \text{ CARS}}{\text{hour/branch in NCR}} = ₱ 6,400 \text{ per hour/ branch x 12 hours} = ₱ 76,800 \text{ per day}$$

Critical Path Algorithm:

The red arrows represent the way to "critical path." The last task in sequence, j, will give the minimum time of the new process to finish, which is from 30 minutes to 1 hour only, to stay in any LTO branch (actual waiting time).
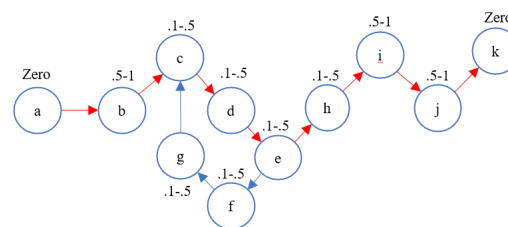

Figure 3. Network Diagram

Duration (in hour):

- A and K = 0
  hour, calculating at min. = .5
- B = within .5 - 1 hour,
  C, D, E, and H = .1 - .5 hour,
             calculated at min. = 0

Projected Time (in total):

- I and J = .5 - 1 hour = 30 minutes - 1

- I + J + K = .5 hours = 0
- Total = .5 - 1 hour only of actual waiting time at any LTO branch.

Critical Path (online waiting time to CLEAR documents submitted):

- I, J, K = on-site processes, within .5 - 1 hour, still calculated at minimum = 0

- However: Any common activities in sequences will generate 0, since the critical paths, from A to K are crucial, having possible ranges of .1 - .5 and .5 - 1 hour online (verification) waiting time to on-site processes, equals 0.

Earliest Start (ES) time:

- earliest possible time that a task can begin

- If all of its predecessors also at their ES

- ES = 0

Earliest Finish (EF) time:

- If time to complete a task is (t)

- By analogous, EF will be, ES + t

- EF = .5 to 1 hour only

Table 3. MS Project: Gantt Task Sheet (New Process with less actual waiting time)

Job No.	Description	Predecesssors	Duration (hours)
a	Online Application & Emission Testing/MVIS Scheduling - **START**		0
b	Fill-out Forms: (in REAL TIME, see duration) - Application for Registration and Stencil	a	.5 - 1
	Submit Copies: CR & previous OR - digital copy online		.1 - .5
c	**AutoCheck**: (Online Verification) - depending on the extent of verification Document Assessment of Records: authenticity & transfer of documents	b, g	.1 - .5
	AutoCheck: - duration will depend on when the person will settle Settlement of Discrepancies: if there is/are any registered Violation/Apprehension (V/A)		.1 - .5
d	Prompt/Email Notification: (in REAL TIME, see duration) - Documents received and Availability of ET/MVIS Schedules	c	.1 - .5
e	Prompt/Email Notification: (AutoCheck Results) - Settlement of V/A; deadline of payment; where and how to pay	d	.1 - .5
f	Prompt/Email Notification: (AutoCheck Results) - includes ET/MVIS fees - Charges, transfer fee, possible late registration fee, miscellaneous fees	e	.1 - .5
g	Scheduled: Emission Testing (ET)/MVIS (in REAL TIME, see duration)	f	.1 - .5
h	Prompt/Email Notification: Successful payment & appt. confirm.; & issuance of QR code	d	.1 - .5
i	Proceed to LTO: (TOTAL possible waiting time at LTO selected branch - on schedule) (Bring evidence of paid and AutoCheck [QR code or printed receipt]) - ET/MVIS and Verify MC Stencil	h	.5 - 1
j	Proceed to LTO: on-site MV Stencil Verification	i	.5 - 1
k	Receive OR (may even be **e-OR**) - issuance new OR - **END**	j	0

Based on **_Figure 3_** and as elaborated on **_Table 3_**, the process flow of the proposed automated system is systematized with less actual waiting time.

In this regard, the impending situations and other circumstances happening, whether avoidable or unavoidable delay, in all transactions or activities in the LTO would be dependent on allowance factors. An **_avoidable delay_** happens when an operation or transaction to be done in an LTO branch is interrupted, which is solely under the control of the Bureau or LTO in registering a MV that could have been prevented under any normal operating time in the LTO. In this case, limiting the number of queues in the process of actually or physically bringing a MV for all transactions and based on the on-site capacity of the LTO.

On the other hand, an **_unavoidable delay_** occurs when a transaction is postponed due to an uncontrollable situation or circumstance happening outside the LTO's responsibility, or the person registering the MV. For instance, _force majeure_ or unforeseeable circumstances that may happen and cannot be prevented. Fire or flood may occur, all computers become offline, or the person registering a MV had an emergency.

The current LTO system (in **_Figure 1_**), being implemented and practiced, takes longer time and requires physical presence at an LTO branch in all 7 steps of the registration process. On the other hand, the proposed automated system will prove to be more efficient and convenient in the processing time. Only the last 3 steps of current LTO system is required to be processed on-site, as it is mandatory to have the MV inspected at the chosen LTO branch, while the first 4 steps are done online or in an automated transaction at the convenience of the MV owner's time.

5.   Recommendation and Conclusion

The study examined the Philippine LTO in its enforcement of or implementation of the applicable and existing laws of the land with regard to MV Registration. Such examination exposed the fundamental flaws in the Bureau with corresponding delays in checking the MV records, antiquated methods, practices of registration and issuing of the ORs. This has been chronic from time in memorial. Adding insult to the injury, the limited period imposed per LTO district on the number of individuals allowed to transact in a day has been chaotic at all times. The fact that the LTO is a bureau that generate income, did not avail of the opportunity offered in the modern 21st century. It did not take advantage of modernizing its equipment and utilities. The lack of information, advancement and improvement have placed the Bureau to a testing ground, proved to be necessary, of calling a new process or system that will be consistent for all generations to come. There is a need to recalibrate its system to adapt to the modern technology of online MV registration, at least conduct an online AutoChecking of MV in a speedy manner. It is expected that there are other ways of recalibration/reconfiguration of the systems to be undertaken in the future. The writers are hoping that this proposal-study becomes a proverbial pebble that will cause ripples to emerging online MV Registration of the LTO system. Gradual changes are good, but actual transition of modernizing a system is even better.

It is not farfetched for the LTO to implement a better and modern online means of MV Registration and AutoCheck, aside from the fact that the Bureau is an earning agency, its LTMS has already established LIVE websites to 138 identified sites of all LTOs in the Philippines, with 113 sites already been awarded to private operators. It means that these 138 sites are already running, pilot tested, and actual testing connectivity from those sites rendering MV reports to LTO LTMS website. This does not have a public users accessibility yet, which means it is still under restriction that only an exclusive accessing of result-data by the Bureau only. However, during an interview with LTO-Information and Communication Technology (ICT), it was discussed that the LTMS is new within the LTO online system. It is an online registration, wherein PMVIC renders its result or report of inspection right after every MV inspection conducted. Mr. MJ Datu, LTO-ICT Consultant, mentioned that the LTMS website will eventually be open to public users to easily access an online registration, not just for MV but for other LTO services. Sadly, as of 29 January 2021 of the interview date, LTMS website is not yet for public users' advantage.

In reiterating the writers' hope that this proposal-study will eventually be an eye-opener that the LTO Philippines is capable of having an interactive AutoChecking system and capable of finding easier methods despite the pandemic, and inspite of the IT issues of internet connectivity. Therefore, there must be a reliable-dependable-fixed and viable LTO system for public online users. Also, this proposal-study is timely applicable as the pandemic requires all to have social distancing, having an Online MV Registration befits the current environmental scenario.

These findings about the system utilized by LTO suggest a need for future research that can either suggest an integrated study on MV online registration or in another separate but limited research on other services provided by LTO, such as driver's license application to be online, other classifications of MVs and electric powered-vehicles.

Initially, assessment of an old process flow identifies the contextual factors and procedures that are associated without online users' involvement. Also, it identifies a possible research in diverse studies, highlighting important contextual factors of delays. The avoidable and unavoidable delays specified various outcomes in improving the quality of LTO implementations in all MV Registrations. The writers successfully satisfied all 3 objectives, however, without any recommended studies, given the resources or earning capacity of the Bureau, including governance issues that it may entail, the writers regretfully conclude that this would not be feasible without allowing the online users' involvement in the online MV registration.

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