



The Mass Transit System in Metro Manila: From Tranvia to MRT, 1879-2014

University of the Philippines System Emerging Inter-Disciplinary Research 06-008

Railway Transport Planning and Implementation in Metropolitan Manila, 1879 to 2014

Jose Regin F. REGIDOR^a, Dominic S. ALOC^b

^{a,b} Institute of Civil Engineering, College of Engineering, University of the Philippines, Diliman, Quezon City, 1101, Philippines

^a E-mail: jfregidor@up.edu.ph

^b E-mail: dsaloc@up.edu.ph

Abstract: This paper presents a history of rail-based transportation in Metropolitan Manila. This history focuses on urban transport including rail-based streetcars or trams that started operations in the 1880's but were destroyed during the Second World War and never to be revived. Several plans are discussed. Among these plans are proposals for a monorail network, a heavy rail system, and the more current rail transit plans from recent studies like MMUTIS. An assessment of public transportation in Metro Manila is presented with emphasis on the counterfactual scenario of what could have been a very different metropolis if people could commute using an extensive rail transit system compared to what has been realized so far for the metropolis. Recommendations for the way forward for rail transportation in Metro Manila and further studies are stated in conclusion.

Keywords: Transport Planning, Rail Transit, History

1. INTRODUCTION

1.1 Background

Rail-based urban transport has had a relatively long history in Metro Manila despite what now seems to be a backlog of rail transportation in the capital city of the Philippines. In fact, the dominant mode of public transportation used to be rail-based with Manila and its adjoining areas served by a network of electric tranvias (i.e., streetcars) and heavy rail lines. This was prior to the Second World War and the rapid motorization that followed afterwards. At the beginning of the war in the Pacific, the tranvias of Manila was estimated to have carried 28 million passengers per year, which was more than double of the number of passengers the system carried when it became fully electric in 1905.





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Figure 1 shows the introduction and use of land public transportation technologies in the Philippines as related by Iwata (1993). Also indicated in the figure, for reference, are the years of first commercial use of these public transport modes in other countries. This paper presents a history of rail transport planning and development in Metro Manila and the surrounding areas. An assessment of the current state of transportation in general and rail transport in particular is discussed with recommendations for the way forward for rail transportation in Metro Manila and further studies stated in conclusion.

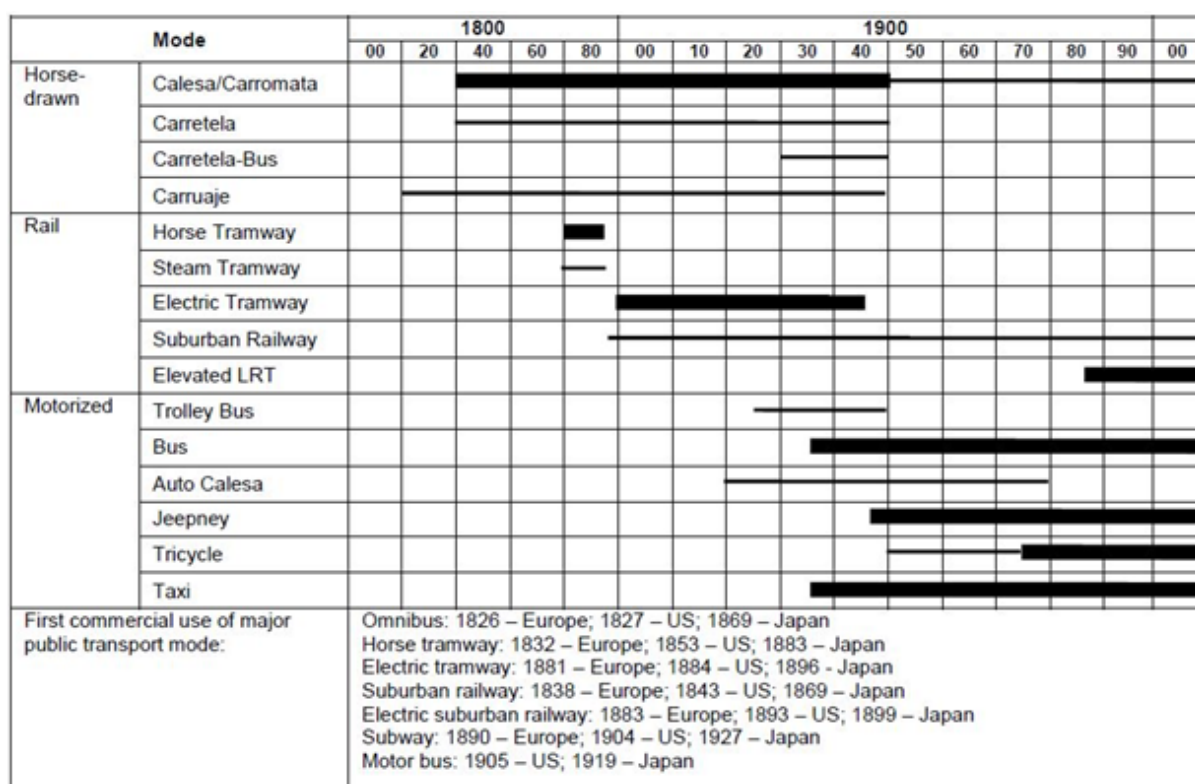


Figure 1. Introduction and use of transport technologies in the Philippines (Iwata, 1993)

1.2 Objectives

The objectives of this paper are the following:

- Present a history of rail-based transportation in metropolitan Manila and its adjacent areas;
- Discuss the planning, implementation and operations of rail transportation over the years;





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- c. Raise questions for further studies; and
- d. Recommend directions for improving transport in Metro Manila based on historical lessons.

2. RAIL TRANSIT IN METROPOLITAN MANILA

2.1 Pre-war rail transit

Long before the construction of today's rail transit facilities in Metro Manila, a streetcar system first plied along the streets of the metropolis. The five-line streetcar system was actually a proposal drafted by a Spanish official Leon Monssour in 1878 (Satre, 1998). Monssour submitted a draft to Madrid and, later received from them an affirmative response. Although given a positive remark, it was only through the awarding of the concession to *La Compañía de Tranvias de Filipinas* that gave rise to the execution of the streetcar network. Between 1885 and 1889, five routes were constructed, which a central station located outside of Intramuros, Manila. Of the five lines, only the Manila-Malabon route ran on steam while the rest was pulled by horses.

By 1902, after the years of revolution collapsing the Spanish colony and marking the turn of a new colonizer, the streetcars, more popularly known as tranvias, encountered problems including those pertaining to the care of and environmental concerns pertaining to horses, and stopped expanding. To counter this issue, the Philippine Commission created a law that would award bidders to franchise the revamp of *La Compañía's* facilities by October 1902. Only one bid out, and, by Ordinance 44, the Municipal Board of Manila granted the franchise to Charles M. Swift (Satre, 1998). Swift, together with the other financiers, established the Manila Electric Railroad and Light Company (Meralco), which remains as the power utility company for Metro Manila and many areas around it, to take over tranvia operations.

In 1905, a fully electric streetcar system operated, which, at the time, was double-tracked with an overhead catenary of 500 V maximum to power its vehicles (Satre, 1998). Meralco also added lines for a total of twelve (12) to expand its transport services from the previous five (5) lines of *La Compañía*. By 1925, all the lines were operating and navigated all throughout the metropolis.

Figure 2 shows the tranvia lines operating by the end of 1925. Figure 3 shows an example of an electric-powered tranvia operated by Meralco circa 1924.





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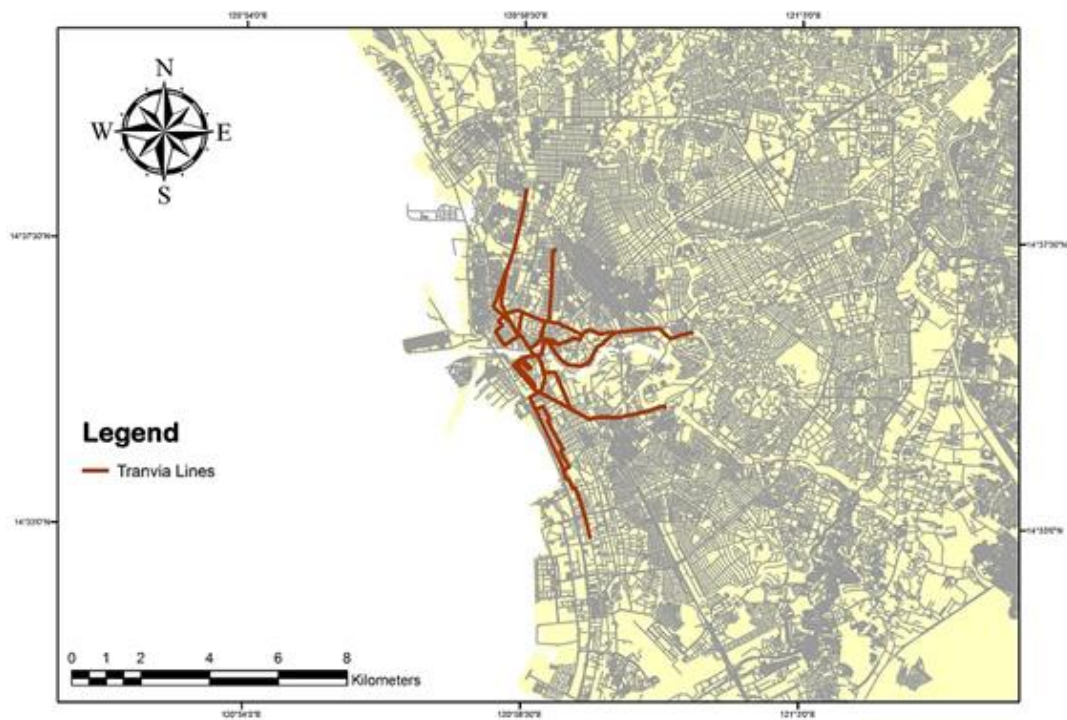


Figure 2. Tranvia lines superimposed on current Metro Manila road network map

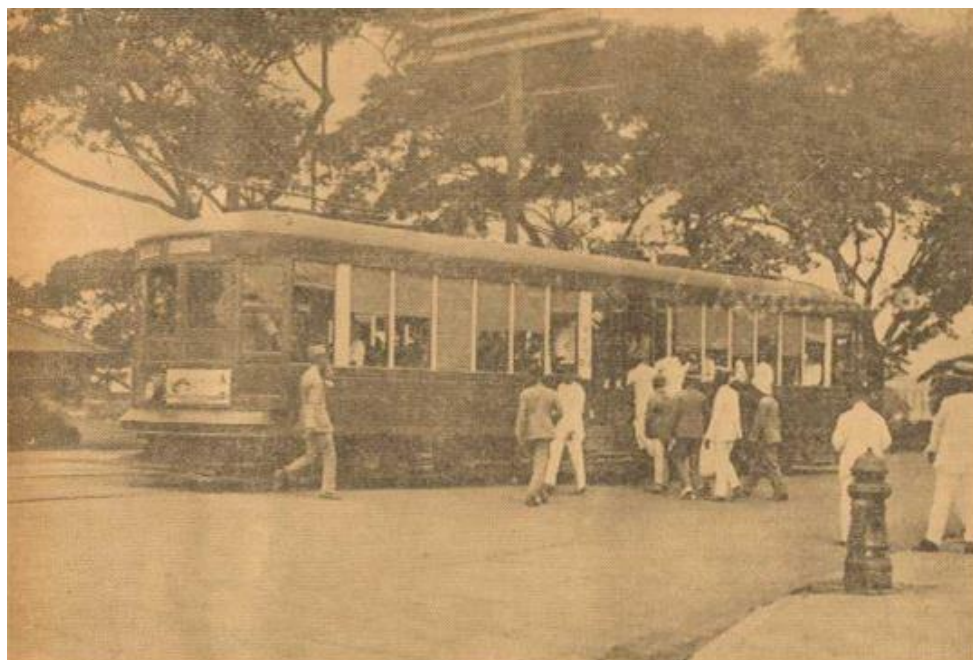


Figure 3. Tranvia operated by Meralco in 1924 (Robb, 1924)





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Damages brought about by the war in the 1940's were severely felt in Metropolitan Manila. The metropolis experienced its devastation, and the operation of tranvia completely halted due to the Battle of Manila in February 1945 (Satre, 1998). Army jeeps were transformed to accommodate transport needs and this probably made the way for contemporary jeepneys to be conceived.

Another railway system was present at the time and operated under the then Manila Railroad Company (MRC), which eventually became the Philippine National Railways (Corpuz, 1999). There were two lines then that are now located in Metro Manila and its suburbs in the province of Rizal – the Antipolo Line and the Marikina Line. The Antipolo Line originated in Manila and terminated in Antipolo, Rizal, and operated from 1905 to 1936 with the Taytay-Antipolo segment ceasing operations in 1917. The Marikina Line branched out from the Antipolo Line at Rosario, Pasig and ended in Montalban (now Rodriguez), Rizal, and operated from 1906 to 1936. Both lines ceased operations due to unprofitable operations and railway tracks were dismantled to be used elsewhere including the construction of the MRC's south line from Manila to Laguna, Batangas, Cavite, Quezon and the Bicol region. Note that the areas along these lines were undeveloped and the likely attractions like religious and tourist attractions in Antipolo and Montalban were the only ones generating trips. Figure 4 shows a map of the MRC-operated lines together with the tranvia network.

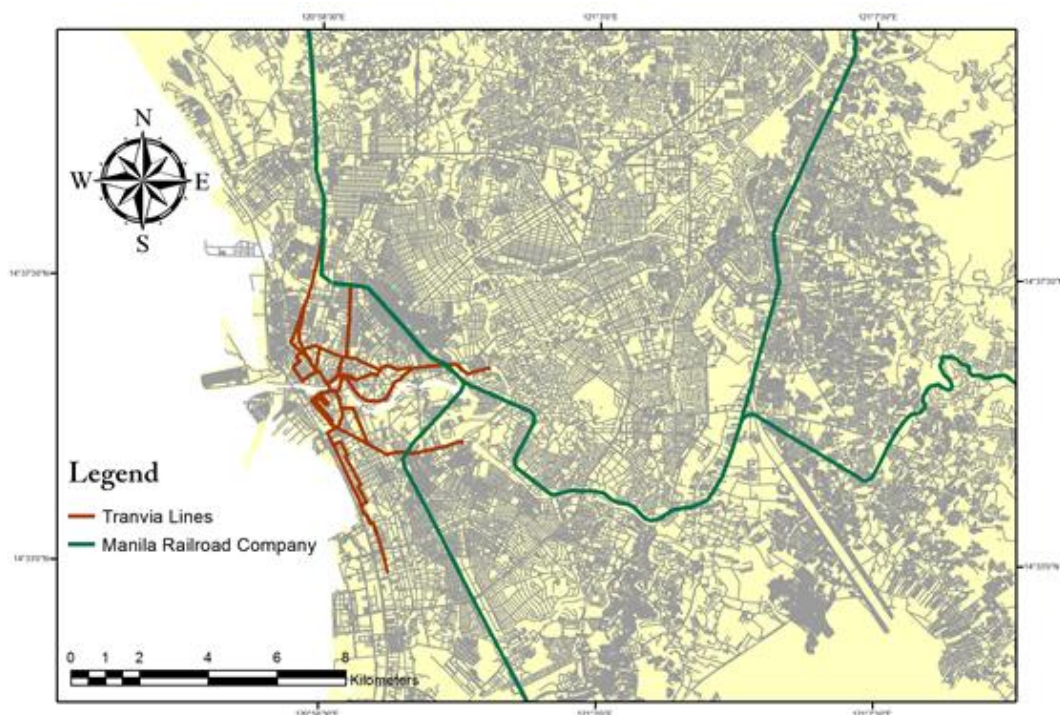


Figure 4. Map of MRC lines and tranvia network





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Figure 5. Manila Railroad Company train to Antipolo, Rizal

2.2 Monorail Transit System for Metropolitan Manila

During the succeeding years, there was a great demand for better mode of transportation. Public transportation, particularly the jeepneys, seemed to lack in terms of providing comfort to commuters; and the proliferation of private cars aggravated the inconvenience. Traffic congestion was experienced along the major streets of Metropolitan Manila, and the public clamored for improvement on transport services. This was deemed answered by the granting of a legislative franchise, in 1966, to Philippine Monorail Transit System, Inc. (PMTS) by Republic Act No. 4652 (Reyes, 1968). Project Technologists, Inc. was commissioned by PMTS to carry out the feasibility study for a monorail network in accordance with the contract signed by both parties on January 2, 1968.

On May 22, 1969, a feasibility study was given to PMTS by Project Technologists, Inc. entitled Monorail Transit System for Metropolitan Manila (Project Technologists, Inc., 1969). On the report's cover letter, it texted that the completion would be done in three (3) years and the whole system would be operational by June 1972.

The monorail transit system was planned to consist of five (5) radial and two (2) circumferential routes as shown in Table 1 and Figure 6 (Project Technologists, Inc., 1969).





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Figure 6. Proposed monorail lines (Reyes, 1968)

Table 1. Routes for the monorail network

Type	Route	Description
Radial	North Route	From Plaza Lawton to Bonifacio Monument Circle at the North end of Epifanio de los Santos Circumferential Avenue in Caloocan City.
	Northeast Route	From Plaza Lawton to the Quezon Boulevard-Epifanio de los Santos Circumferential Avenue intersection in Baclaran Parañaque.
	East Route	From Plaza Lawton to the Aurora Boulevard-Epifanio de los Santos Circumferential Avenue intersection in Cubao, Quezon City.
	Southeast Route	From Plaza Lawton to the Shaw Boulevard-Epifanio de los Santos Avenue Circumferential intersection in Mandaluyong.
	South Route	From Plaza Lawton to the Taft Avenue Extension-Epifanio de los Santos Circumferential Avenue intersection in Baclaran, Parañaque.
Circumferential	Inner Circumferential Route	From San Andres Rotonda at Taft Avenue to the Claro M. Recto Boulevard-Jose Abad Santos Avenue intersection, linking the innermost stations of the first five routes.
	Outer Circumferential Route	From Baclaran, Parañaque to the Bonifacio Monument Circle in Caloocan City along Epifanio de los Santos Circumferential Avenue, linking all the outer terminals of the first five routes.





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Figure 7 shows another map of the proposed monorail network superimposed on the current road network map of Metro Manila.

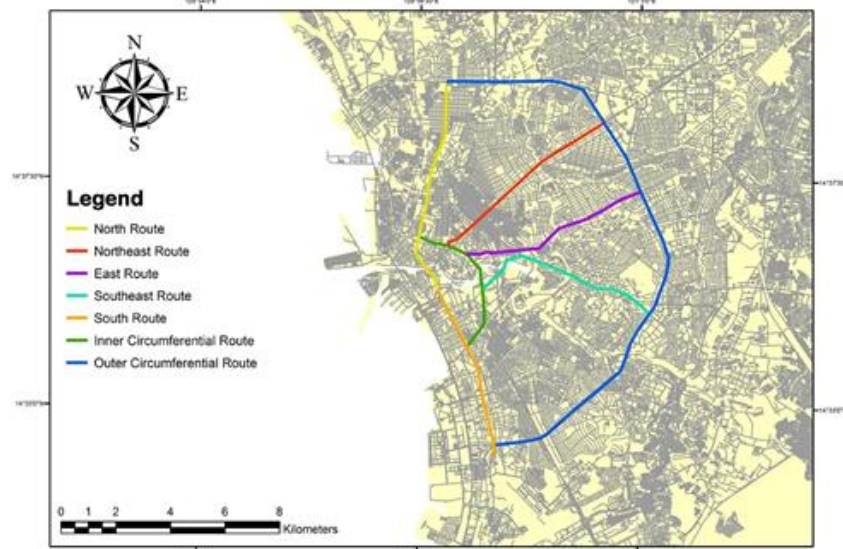


Figure 7. Proposed monorail network superimposed on current Metro Manila road network map

2.3 Urban Transport Study in Manila Metropolitan Area

This pioneering study was conducted with the intent of undertaking an urban transport study that would recommend plans and strategies to solve the foreseeable urban expansion and traffic congestion in what was then termed as the Manila Metropolitan Area (MMA). The two-year study, implemented from March 1971, was called Urban Transport Study in Manila Metropolitan Area (UTSMMA) and was completed in September 1973. The Government of Japan provided technical support for the study through the Overseas Technical Cooperation Agency (OTCA), which is the precursor of today's Japan International Cooperation Agency (JICA).

Population was represented by 6,185 households that were randomly sampled from 686,441 households living in the Manila Metropolitan Area at the time (OTCA, 1973). From the results gathered, the Japanese survey team applied the concept of travel demand forecasting to estimate the traffic demand of MMA in 1987. The processes included trip production, trip generation and attraction, trip distribution, external traffic, modal split and traffic assignment.





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The study area was divided into fifty-one (51) internal zones and adjacent to it are the six (6) external zones. The first trip production was calculated by occupation and by car ownership from the results gathered in the person trip survey. The correspondence was multiplied to future population both for the original and alternative land use plans. This method classified the trips generated and attracted by trip purpose on a per zone basis. An Origin-Destination (OD) table of person trips was constructed based on the transition probability between trip purposes and gravity model was performed where the time distance was decided under certain conditions and its exponent was attributed to the trip purpose relating to the zone pairs. The 51 internal zones were re-divided into 15 sectors to ease computation and the result was done for the two cases of land use plans. Some factors were considered for external traffic before modal split was employed. Future OD table per mode of travel was calculated from the OD table of person trips. The travel mode was classified into four: drivers of cars and trucks (i.e., drivers), passengers of cars and trucks (i.e., passengers), taxi passengers (i.e., taxis) and mass transit. Lastly, traffic assignment was carried out to estimate the traffic volume for the proposed transport system (i.e., expressways and subways). Given an OD pair, the closest route was used and an all-or-nothing scenario was adopted. The value of the future number of passengers of railway established from the processes mentioned above was calculated to be 6,327,000 trips/day (OTCA, 1973).

UTSMMA could propose a new transport system from the existing configuration of transportation network of Manila Metropolitan Area at the time, supplemented by the output derived from the travel demand forecasting. Regarding rail transport, the proposal highlighted the need of a railway transport system that constituted the building of a five-line heavy rail transit system and improvement of Philippine National Railways. Brief descriptions of the proposed railway transport system are as provided in Table 2 and illustrated in Figure 8.





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Table 2. Rail transport projects proposed under UTSMMA

Proposed Line	Length (km)	Description
No. 1	27.1	from Construction Hill to Talon via central Quezon Boulevard, Manila downtown and the International Airport
No. 2	36.0	from Novaliches to Cainta via Manila downtown and Pasig
No. 3	24.3	Along Highway 54 (C-4): half a circle route about 12 km from Manila downtown
No. 4	30.1	from Marikina to Zapote via Cubao, Manila downtown and the Manila Bay area
No. 5	17.6	from Meycauayan to Manila downtown running between Line No. 2 and PNR
PNR (improvement)	56.4	from Bocaue to Muntinglupa via Tutuban Station

The analysis in UTSMMA also estimated the future number of person trips shown in Table 3 that would be observed once the proposed railway system was completely constructed. Table 4 shows the construction costs that would cover the portions of structural works, track cost, building cost, electrical and mechanical facilities cost, side expenses and administration cost for each line. It can also be seen that the total distance of PNR improvement was underestimated and different compared to the preceding pages presented in UTSMMA. Meanwhile, the benefits that could be derived from the proposed railway system were tabulated in Table 5

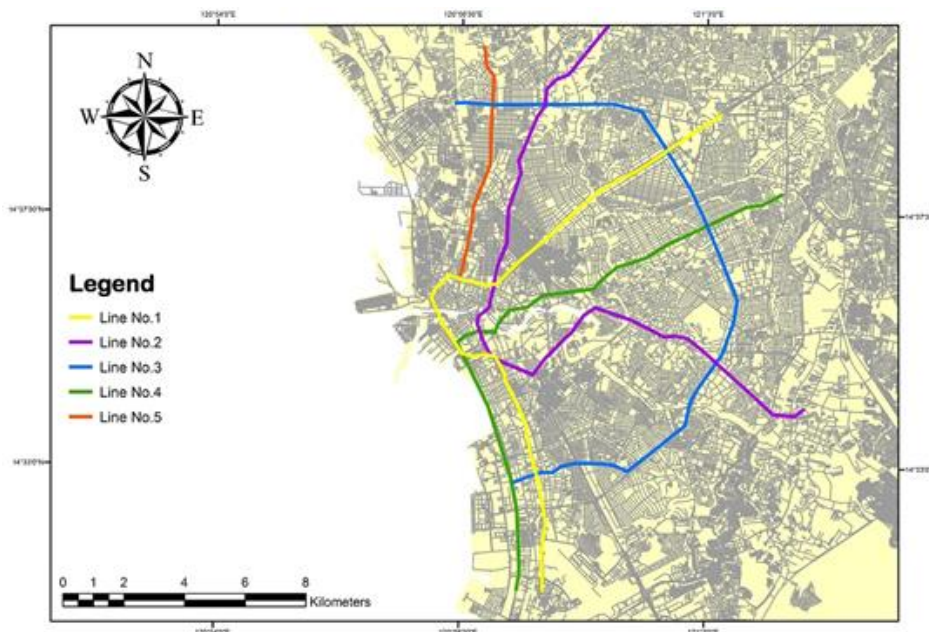


Figure 8. UTSMMA's RRT network superimposed on current Metro Manila road network map





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Table 3. Estimated number of person trips in the proposed rail system under UTSMMA

Proposed Line	Number of Person Trips (x1000 trips/day)
No. 1	1,239
No. 2	1,208
No. 3	1,013
No. 4	1,052
No. 5	502
PNR (improvement)	1,314

Table 4. Estimated construction cost of the proposed railway system under UTSMMA

Proposed Line	Length (km)	Total Cost (Million PhP)	Average Cost (Million PhP/km)
No. 1	27.1	2,340	86.4
No. 2	36.0	2,928	81.4
No. 3	24.3	3,032	124.8
No. 4	30.1	2,832	94.0
No. 5	17.6	1,168	66.2
PNR (improvement)	48.3	1,770	36.6

Table 5. Estimated benefit cost from the proposed railway system under UTSMMA

Benefits	Amount (Million PhP)
Savings of travel time	36,347
Saving of investments for roads	4,770
Savings of investments for buses and operating expenses	15,265
Increase of land use value	7,320

To enhance the reception of the proposal, a feasibility study, The Feasibility Study for Manila Rapid Transit Railway Line No.1, was executed by JICA and was completed on June 1976. This study highlighted the projected traffic demand specifically for Line No. 1. An environmental impact assessment was also employed throughout the study as well as the analysis on the economic and financial implication for the construction of Line No. 1. Unfortunately, this heavy rail transit line and others recommended by UTSMMA never came to be and a World Bank report explicitly opposed its implementation (Napalang and Regidor, 2015).





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2.4 Metro Manila Transport, Land Use and Development Planning Project

The Metro Manila Transport, Land Use and Development Planning Project (MMETROPLAN) was implemented from January 1976 to February 1977. It was funded by the World Bank (WB), which commissioned Freeman Fox and Associates to undertake the study with a counterpart team comprised of senior government officials dealing with transport at the time. The steering and technical working committees were comprised of officials and staff of the Department of Public Works, Transportation and Communications (DPWTC), Department of Public Highways (DPH), National Economic Development Authority (NEDA), Metro Manila Transit Corporation (MMTC), and Philippine National Railways (PNR) (Freeman Fox and Associates, 1977).

Resolving the current transport and planning problems paved the way for this study. Specifically, based on the cover letter, the objective was 'to arrive at a meaningful plan and program to guide transport investment and operations within the context of a rational land use pattern.' The output should yield maximum feasible economic growth, promotion of social development, more equitable distribution of income and wealth, maximum labor force utilization and preservation of environmental stability. Strategic recommendations for the planning of transport and urban development in Metropolitan Manila both in the short (i.e., immediate action program) and longer terms (i.e., long range transportation plan) were aimed to be achieved through this project. It must be noted that short-term transport actions are made to aid the present traffic situation to the 1980s, while the subsequent years to 1990s are the main timeframe for longer term transport actions (Freeman Fox and Associates, 1977).

The analysis of urban development in MMETROPLAN included the forecast of population, employment and education for both short term (i.e., until 1980) and longer term (i.e., until 1990). Ten (10) sectors were grouped based from the traffic zones of MMA jurisdiction and other neighboring cities and municipalities outside of MMA. This projection was referred to as the Central Estimate. The estimate of population for the MMA jurisdiction was derived by examining the absolute increases in population, rate of growth, and increases in gross density while complemented with data on the amount of development, availability of land for new development, aerial photograph of each jurisdiction and site visit. On the other hand, a 4.7% average growth was determined to occur in the areas outside MMA from 1970-75 and that, the same percentage would take place from 1975-80. Estimation of employed persons per sector was calculated through a participation rate of 48% for population aged 10 and over and employed person by workplace covering the primary, secondary and tertiary





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increase of employment. The ratio of school attendance per 1,000 people was obtained for MMA jurisdiction and the rest of the study area. These proportions were used to estimate the expected increase of the population. Resulting data were used to forecast the future distribution of population, employment and education for 1980 and 1990 for the study area (Freeman Fox and Associates, 1977).

Transportation planning was initiated with the formulation of a land use–transportation model. Five sub-models were classified for the calibration of the land use – transportation model, namely: household categorization, trip end estimation, trip distribution, modal choice, and trip assignment/capacity restraint.

MMETROPLAN used the existing data obtained from the results of the 1971 person trip survey conducted in UTSMMA. Households were first characterized into 12 categories comprising combinations of two car-ownership groups (i.e., car-owning and non-car-owning) and six household structures. Estimation of the number of households per category was employed for each zone. Trips generated and trips attracted were tallied per zone, and generation trip rates and attraction trip rates were applied. The trip distribution sub-model made use of the entropy maximizing method, which utilizes generalized cost of travel between two zones to estimate the future trips. Meanwhile, it was concluded that two modes of travel were to be used being car occupants and public transport passengers as classifications. A modal split model was also formulated for this stage, which was dependent on the sensitivity of the modal split to changes in generalized cost between two modes and the modal handicap cost associated with public transport. An all-or-nothing assignment of trips was carried out for public transport passengers whereas taxi and truck users were extracted from the car occupants before assigning to the road network (Freeman Fox and Associates, 1977).

A full land use – transportation model was formulated after the calibration, which is also referred to in the study as the Network Model. This model was used to forecast trips for the main corridors of movement. The results of the forecast were used for the Corridor Analysis Model, which was the ground support in examining the alternative policies and public transport infrastructure options.

From the analysis, MMETROPLAN also recommended strategies on cordon pricing, bus/jeepney lanes, and the conceptualization of an LRT system. The LRT system recommended was planned to be completed in the early 1980's and it would be composed of a Central Area network and four (4) lines tracing along Rizal Avenue, España/Quezon Boulevard, Shaw Boulevard and Taft Avenue. Table 6 shows the proposed routes (i.e., A to E) and the distance traversed on the basis of the specified direction. Five routes were possible in the proposed railway network and could





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accommodate cycle times shown in Table 7. Cycle time in this sense is defined as the amount of time consumed when traveling back and forth for each route.

Table 6. Distance of each route of the LRT system under MMETROPLAN

Route	Description	Distance (km)	Direction
A	Rizal - Taft	13.84	one-way
B	Quezon (Ellipse) – Central - Quezon (Ellipse)	23.5	round trip
C	Quezon (Roosevelt) – Central - Quezon (Roosevelt)	14.4	round trip
D	Shaw – Taft	11.6	one-way
E	Shaw - Rizal	15.0	one-way

Table 7. Distance of each route of the LRT system under MMETROPLAN

Route	Description	Cycle Time (mins.)
A	Rizal - Taft - Rizal	105
B	Quezon (Ellipse) – Central - Quezon (Ellipse)	90
C	Quezon (Roosevelt) – Central - Quezon (Roosevelt)	60
D	Shaw - Taft - Shaw	92
E	Shaw - Rizal - Shaw	108

Figure 9 shows the railway lines proposed under MMETROPLAN. Note the scaled down routes as well as this line being referred to as light rail instead of heavy rail.

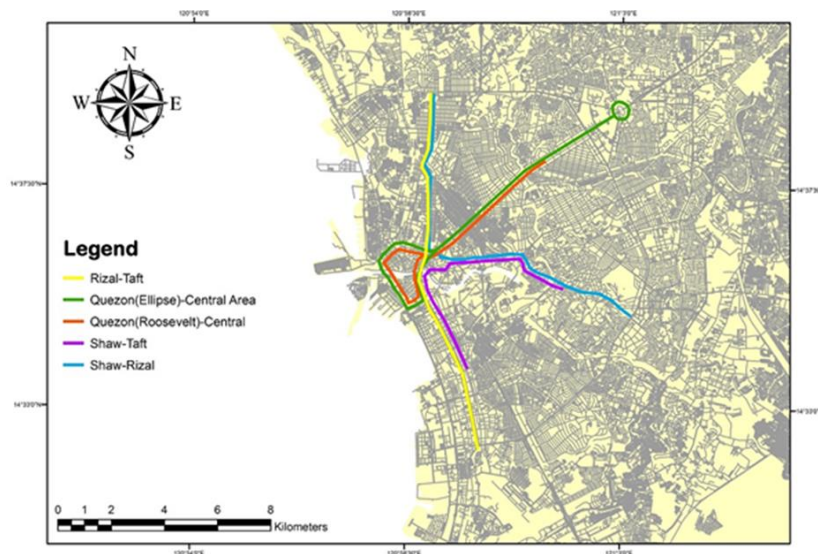


Figure 9. Routes for the proposed light rail transit network under MMETROPLAN





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2.5 Metro Manila Urban Transportation Integration Study

The Metro Manila Urban Transportation Integration Study (MMUTIS), funded by JICA, was implemented from March 1996 to March 1999 and came up with many recommendations to improve transport and traffic in Metro Manila, particularly a master plan for implementation in the next 15 years. The implementing agency for MMUTIS was the Department of Transportation and Communication (DOTC) and the beneficiary agency was the Metro Manila Development Authority (MMDA).

The study area was composed of the whole of Metro Manila and its neighboring provinces such as Cavite, Laguna, Rizal and Bulacan. The data used in the study included information from a comprehensive Household Interview Survey (HIS), and were put together in a database for the formulation of the transportation demand models.

Regression models for trip generation and attraction by trip purpose and car ownership were developed. Trip distribution was carried out by developing intra-zonal and inter-zonal models. After which, the ability of private mode users to transfer to public mode when public transport becomes convenient was measured. Two models for traffic assignment were adopted, namely: highway-type assignment for private and public modes, and transit assignment for public mode and highway assignment for private mode. The traditional incremental assignment was used for the former while the latter was executed by JICA's developed model – the model that assigns routes for public transport that was affected by the fare system – in which the remaining trips were subjected to highway assignment (JICA, 1999).

After the transportation demand model was employed, the future traffic demand was finalized including the growth of trips by purpose, growth of trips by mode, growth of trips by zone and OD table. Demand and supply was also assessed to provide basis for the proposed projects covering all modes of land-based transport. Do-nothing situations were analyzed for both 1996 and 2015 that used the 1996 road network. On the other hand, do-committed situations were also investigated once the proposed networks have been completed (Japan International Cooperation Agency, 1999).

Rail transport projects identified under MMUTIS include the following lines and facilities shown in Table 8 and Figure 10.





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Table 8. Proposed rail transport project under MMUTIS

Proposed	Description
Line 1 Extension or Line 6	The line will extend to Dasmariñas, Cavite in the south (30 km elevated).
Line 2 Extension	The line will extend to Antipolo in the east (12 km elevated) and to the west across Line 1 to the Port Area from where the line passes along Roxas Boulevard and Buendia to link Makati and Fort Bonifacio (17 km underground). Then the line will further lead to Binangonan in the east (20 km elevated/at-grade).
Line 3 Extension	The line will extend to Navotas and Obando (16 km elevated) in the north across Line 1 and PNR. The line in the south will extend to the reclamation area across Line 1 and further extend to Kawit (15 km elevated/at-grade) in the south.
Line 4	The line will extend to San Mateo in the north via a branch line. In the city center, instead of terminating on Recto Avenue, it can take over the extension portion of Line 2.
North Rail and Extension	A suburban commuter service will be provided between Malolos and Caloocan (30 km at-grade). From there, the line links Fort Bonifacio (20 km underground) and extends to General Trias in the south (25 km underground/elevated/at-grade).
MCX and Extension	A suburban commuter service will link Calamba with Alabang (28 km at-grade) from where the line will be elevated up to Paco (42 km). The line will then proceed toward the north across EDSA (11 km underground) and further extend northward to San Jose del Monte (18 km elevated).

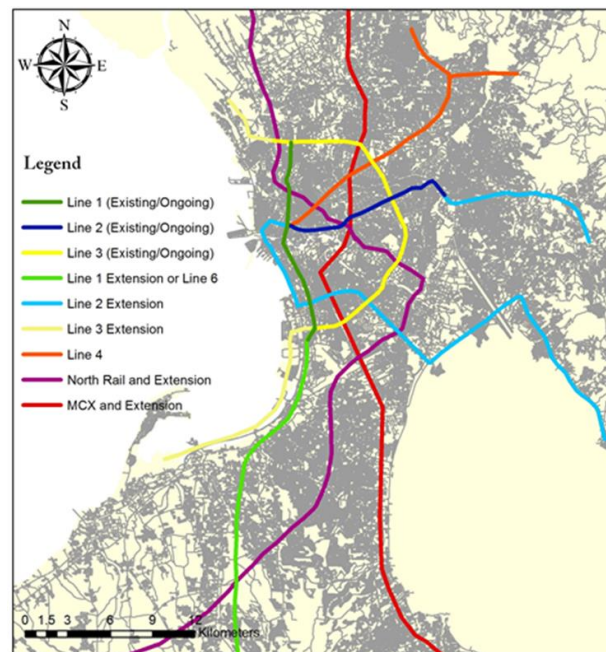


Figure 10. Rail improvements proposed under MMUTIS





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2.6 JICA Dream Plan

The JICA Dream Plan (JICA, 2014) is drawn very similarly to the MMUTIS recommendations. This was formulated a part of a transportation infrastructure framework for Mega Manila, which is roughly Metro Manila plus the adjoining provinces of Regions 3 (Bulacan, Pampanga and Bataan) and 4A (Rizal, Laguna, Cavite and Batangas). The proposed rail network from the JICA Dream Plan is reproduced in the following Figure 11.

The plan called for an expansion of the rail transport network for Mega Manila including a proposal for a subway as well as recommendations to adapt automated guideway transit (AGT) or monorail along certain corridors. It also called for the rehabilitation of the PNR with particular emphasis on a connection between Metro Manila and Clark where an international airport is proposed for expansion and an option as the primary gateway in lieu of the airport in Manila (i.e., Ninoy Aquino International Airport), which is already congested and cannot be further expanded.

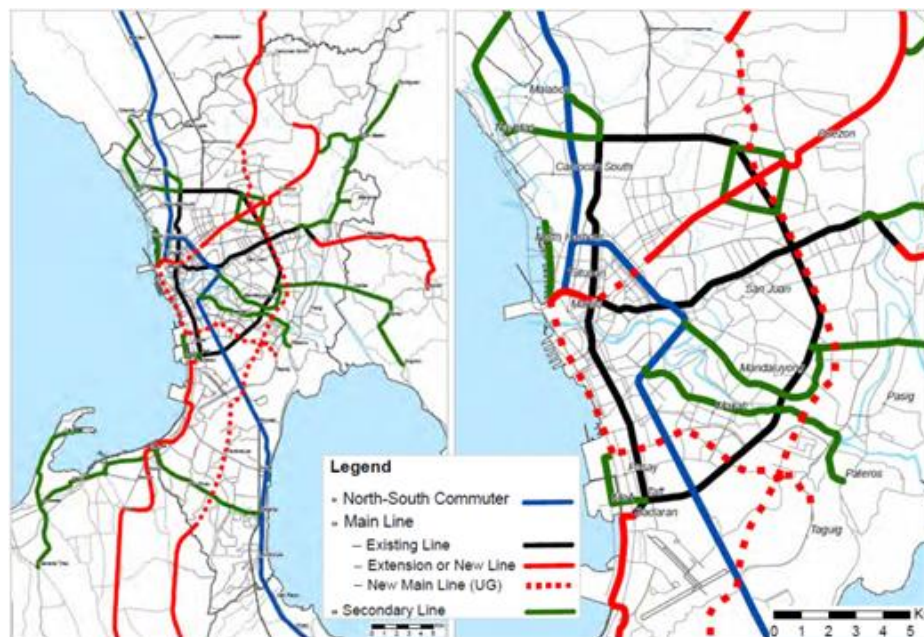


Figure 11. Proposed urban and suburban rail lines for Mega Manila (JICA, 2014)

The plan also illustrated scenarios for optimistic and pessimistic development of Mega Manila's transport network. This included forecast congestion by year 2030 for both do-nothing and do-all projects cases. There are high hopes for the proposed rail lines in this study to be implemented under the current regime especially as the Philippine government hopes to have a renaissance of sorts for transport infrastructure development throughout the country.





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3. DISCUSSION

The review of the history of rail transport planning and implementation for Metropolitan Manila invites many questions. Among these are the following questions:

- a. Were the assumptions for rail transport development sound given the information/data available at the time?
- b. What were the adverse issues faced by the planners of rail transport?
- c. Was there regulation and oversight from the government on how the railway system was to be built?
- d. What was the pricing structure for the services offered by the railway system?
- e. Who were the intended users of the railway system?
- f. How were the railways maintained or allowed to deteriorate?
- g. In terms of utilization, how did it fare vis-à-vis other transport systems (i.e., road-based) in the metropolis?
- h. Were the projected benefits to the public of the railway system realized?
- i. As the railway operated and serviced the public through the years, were there other plans being drawn to either supplement or supplant the existing railway system?

Answering these questions will entail identifying the issues as presented in reports, and perhaps attempting to trace these issues and others from key informant interviews of transport officials and other key persons from those times. This will also include an assessment of how such issues were overcome or addressed at the time. Perhaps, too, insights to whether these key people now think they could have had better information or data and formulated better decisions towards rail transport development would be important. Too often, the final reports of such studies are already the result of many revisions and likely to have been edited for them to be palatable to the government if not pushing for the agenda of the studies' proponents or funders. Such is the political economy that is involved or embedded in the planning and implementation of transport projects in Metro Manila. This political economy was discussed in detail by Napalang and Regidor (2015) as they made the assessment that there were missed opportunities due to the inherent weaknesses in government particularly in agencies dealing with transportation including inter-agency politics. In one specific case, a World Bank study (World Bank, 1976) contradicted and opposed the recommendations of UTSMMA (1973) for a heavy rail network for Metro Manila and proposed instead a light rail system. The light rail proposal was reinforced in MMETROPLAN (1977), which was funded by the WB, but a revival of heavy rail





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proposals was recommended by MMUTIS (1999) and the JICA Dream Plan (2014) including a subway line for the metropolis. Such information allows us to understand past circumstances and how we could have otherwise had a more extensive rail transit network that may have changed the way people commute in Metro Manila today.

Koizumi, Nishimiya and Kaneko (2013) described the relationship of GDP per capita to urban population of cities in Southeast Asia from 1960 to 2010. The data shows Metro Manila to have a significant increase in population but with low increase in GDP per capita. Such data is important in contextualizing and understanding the economic situation at different times that can also explain why certain projects were shelved in favor of others. However, such data also indicates that it may be more challenging to build such transit systems if the projects are delayed further.

Meanwhile, Fillone (2015) presented an approach for analyzing the co-benefits of transportation projects based on the methodology developed by the Institute for Global Environmental Studies (IGES). Such quantitative analysis and tools could be useful in quantifying what could have been the benefits of proposed transit lines for Metro Manila.

There is also the role of government in planning and implementing railway projects. How involved agencies like the transport department (i.e., DOTr) in rail transportation development would likely influence implementation including prioritization of certain lines over others including the decision to opt for heavy rail systems over light rail even considering their cost implications. Subsidies and other forms of incentives provided by government to rail transport proponents other than itself could also have influenced rail transport development. Note that projects formulated in the 1970s and 1980s did not have the benefit of having the option of Public Private Partnership (PPP) as a mode for building transit lines. Also, there were very limited options for variations in the mix of funds from government, development assistance and private companies including consortiums that are, for example, now heavily involved in transport infrastructure development.

Commitment to building an extensive rail transport network could have been a game-changer, a disruptor for what is then and now land transportation dominated by road-based modes. Evidence about commuters who shifted to rail from road-based transport for the cases of Metro Manila's rail transport lines could be consolidated and analyzed to determine their individual and collective potential for improving transportation and traffic in the metropolis and its adjoining areas.





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4. CONCLUSION

This paper presented on the history of rail transport in the Metropolitan Manila area. It was mentioned in the preceding discussions that to understand how rail transport in particular and public transport in general evolved in Metro Manila there need to be other references other than the extant reports of studies. It was also previously mentioned that the preparation or writing of reports on such studies can be subject to political economy and that these could have essentially led to missed opportunities in as far as public transport infrastructure development was concerned.

Perhaps there could be lessons learned from this history particularly when experiences among cities in other countries such as those in ASEAN are compared. Morichi (1993), for example, presented and compared proposed rail transport projects in Bangkok, Manila and Jakarta. Among those proposals, Bangkok could implement their plans (i.e., BTS Skytrain) more effectively than Manila. What did other cities do that differed from Metro Manila's approach? What were the situations or conditions that allowed these cities to build their rail transit systems faster than Metro Manila?

Clearly, there are many other factors to consider here including those pertaining to the economies and political leaderships in these countries. This underlines the diverse factors affecting transportation system development including disruptors like war and social, economic and political challenges that countries like the Philippines have gone through. Ultimately, however, there is a need for rail transport to become the disruptor itself to effect significant changes (i.e., reforms or rationalization) to the entire transport system of a megalopolis much. This potential impact of rail transportation (i.e., an extensive rail transportation network) on a metropolis like Metro Manila is currently also being evaluated in a parallel effort. This effort should involve modeling the counterfactual scenarios for rail transportation network development and is expected to show the benefits of an extensive rail transport network in relation to accessibility and mobility.

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