IMPACT OF OVERPASS BRIDGES ON LAND VALUES ALONG THE PYAY ROAD AND KABARAYE PAGODA ROAD IN YANGON CITY

Aye Su Han[1], Mya Moe Wai[2]

Abstract

Yangon City is situated in the southern part of Myanmar between Yangon, Bago and Hlaing rivers. It is the commercial hub of the country and the domestic and foreign companies have invested in it since 2005, generating job opportunity for the local youth. The population of the city has been increasing as well as its areal extent. The expansion of the city has oriented towards the north as it is separated by the river in the south. Although a greater number of the population are residing in the new satellite towns, whole sale markets such as Theingyi Market, Nyaungpinlay Market, Large shopping centres, wholesale markets and recreation centres are located in the downtown area in the south. Therefore, a greater number of the residents have to go to the downtown area for purchasing goods, recreation, worksites and per suit of education. As such the main roads linking satellite towns and downtown area have become more important. Pyay and Kabaraye Pagoda roads connect the downtown area and satellite towns. The problem of traffic congestion and traffic jam occurs every day along these main roads, especially at the traffic light posts. Under the supervision of YCDC, overpasses have been constructed at suitable places to reduce traffic jam and accident. This research paper studies the positive and negative impacts of overpass bridges on the local people. The change before and after the construction of the overpass bridges will be studied with GIS and satellite images along the areas concerned.

Keyword: Overpass bridges, land value.

Introduction

This research work will study the impact of the construction of overpass bridges on the land value of the areas under the bridges. The upgrading of transport infrastructure is necessary with the expansion of settlement wards. Investment on transport infrastructure supports economic development. Transport infrastructure is a main factor for economic development (Carleigh Ghent, 2018). Smooth transportation is indispensable for the improvement of economic, social and health conditions of the country. Among the 8 overpasses in Yangon, there are 5 overpasses located on the two main roads are under study. The changes of land-use type also changes the value of land. With high population density and job opportunity, traffic jam problem occurs everyday along the main roads of Yangon City. The main roads that connect from east to west are Bogyoke, Anawyahtar, Maha Bandoola, Merchant and Kannar roads. The roads that run from north to south are Pyay, Kabaraye, Insein, Bayintaung, Baho, Lower Kyemyindaing, Lower Mingaladon and Waizayantar roads. These roads join the downtown area and the new satellite towns. Among these main roads of Yangon City this research focuses on the study of the changes in the value of the land plots adjacent to Pyay and Kabaraye Pagoda Roads. In order to solve the problem, YCDC has upgraded the transport infrastructures with Intelligent Traffic System (ITS) and Traffic Impact Assessment (TIA) methods, by installing more traffic light posts and construction of overpass bridges. Overpass bridges were constructed at Hleden road junction in 2014, at Myanigone junction in 2014 and at Kokkine junction and 8 mile junction in 2015. Road infrastructure public service facilities, industrial structure and transportation affect the value of

[1] Department of Geography, East Yangon University
[2] Department of Geography, Sittway University

land (Lastina Fojor Prastion, 2022). This research paper will study the changes in land values and economic activities under the overpass bridges construction.

The construction of overpass bridges causes noise pollution around the area. Noise pollution is a major health problem these days. Millions of people are exposed to high noise pollution levels leading to health effects. Noise pollution causes sleep disorder, learning impairment, hypertension, ischemic heart disease and annoyance. Therefore, noise measurement plan is necessary when constructing overpass bridges. Noise occurs from car types and vehicle speed. Level of noise decreases with the increasing height of the bridge. If the population density is high, the use of car increases for education, health and economic activity, increasing the road of more transport infrastructures. So it is necessary to build overpass bridge at some points to reduce traffic jam. Infrastructure is one of the important aspects in national growth. If more capital is invested on road transport, economic sector will improve. Leading to regional economic growth, the land value will rise of the transportation is good. Transport infrastructures affect land values (Nicolous Tideman 2017). However, after the construction overpass bridge, one of the transport infrastructures, the land values around the bridge on decrease markedly and the economic activities are retarded. This research paper will find the means to reduce the fall of land values and negative impact of the overpass bridge.

Research Background

The accelerated pace of urbanization with rapid growth of population and diverse economic activities demands more land for the construction of transport infrastructure, residential and commercial buildings. This has led to the extension of urban area of Yangon City. Accordingly, the transport routes between the newly established towns and the downtown area have become more significant. This study essentially focuses on annual changes in land values and the causes of spatial variations in land use changes along Pyay Road and Kabaraye Pagoda Road. Although new towns were established within Yangon City, most townships did not have full urban infrastructural facilities. Most townships have to depend on the commercial hub of the city, located at the southern extreme. Under such situation, the main connection lines between the northern townships and business centre of the south have become more important and the land values of the wards adjacent to the main roads have risen sharply and changed drastically. Out of the total number of overpasses in Yangon, there are 5 overpasses along Pyay Road and Kabaraye Pagoda Road, which is why those 2 highways were chosen as the study area. Land value are considered as the key driving force behind regional development. The change in land-use type also changes the value of land. With high population density and job opportunity, traffic jam problem occurs everyday along the main roads of Yangon City. In order to solve the problem, YCDC has upgraded the transport infrastructures with Intelligent Traffic System (ITS) and Traffic Impact Assessment (TIA) methods, by installing more traffic light post and construction of overpass bridges. This paper will study the impact of overpass bridges on land values and economic activities along the Pyay and Kabaraye Pagoda Roads.

Aim

To examine the impact of overpass bridges on land values along Pyay and Kabaraye Pagoda Road in Yangon City area.

Study Area

Yangon City is located between north latitudes 16˚ 44″ and 17˚ 5″ and between east longitudes 96˚ 00″ and 96˚ 44″. The areal extent of Yangon City in 2023 is 896 square miles (2320.6 square kilometre) and the population is over 6 million. It is the only megacity in the country. It is bordered with Hmawbi Township on the north, Hlegu Township on the northeast, Thanlyin Township on the south, Twantay Township on southeast and Htantapin Township on the west. The Yangon river and Bago river flow in the southwest and Hlaing, Yangon, Bago rivers and Ngumoeyeik creek flow through the city. Yangon City constitutes 33 townships. The overpass bridges along Pyay road and Kabaraye Pagoda road in Yangon City will be studied in details. Pyay road starts from the Thayettaw traffic light post and ends at Khayepin junction. Kabaraye Pagoda road starts from the U Htaung Bo round and ends at 8-mile junction of Mayangone Township. There are 8 townships that adjacent with Pyay road and 3 overpasses Mayanigone overpass bridge in Sanchaung Township, Hledan overpass bridge in Kamaryut Township and 8-mile overpass bridge in Mayangone Township. Four townships are adjacent to Kabaraye Pagoda road. The road has two overpass bridge and these are Shwegondaing and Kokkine overpass bridges located in Bahan Township. This esearch focuses the causes of the fall of land value after the construction of overpass bridge

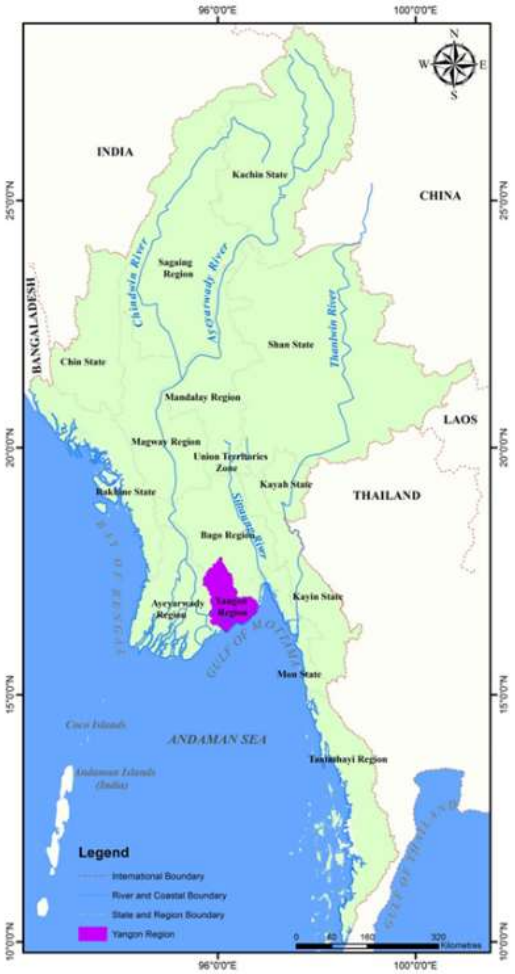

Figure 1. Location of Yangon Region in Myanmar

Source: Myanmar Survey Department

Figure 2. Location of Study Area in Yangon City

Source: Yangon City Development Committee (YCDC)

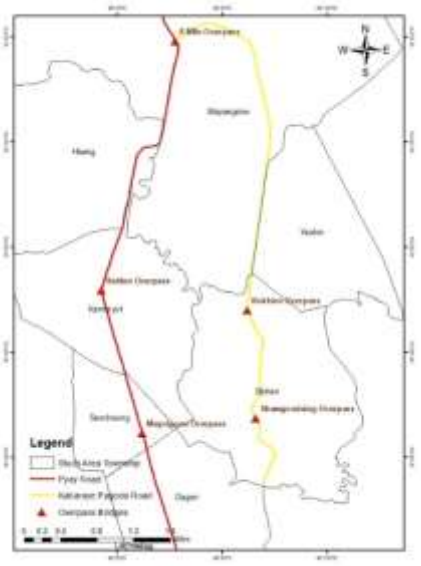

Figure 3. Location of Overpass Bridges in Study Area

Source: Yangon City Development Committee

Methodology

This research focuses the fall of land values and the changes of economic activities along Pyay road and Kabaraye Pagoda road due to the construction of overpass bridges. It will use both primary data and secondary data. Primary data include the responses of the real estate dealer and land owners, the local residents to know the price of land value change, the construction of overpass bridges and the entrepreneur to know the economic conditions before and after the construction of overpass bridges. The secondary data includes the recognition of Pyay and Kabaraye pagoda road the years, objectives and method used in the construction of the bridges, and the government fixed prices of the areas concerned from the Department of Human Settlement and Housing Development. The changes of land use before and after the construction of overpass bridges will be identified by field observations and satellite images. The land use changes of the approach road sections of the overpass and the road junctions that have no overpass bridges will be studied in overpassing before and after the construction of the bridges. It will also study how the changes of land use affect the value of land. 3D Analysis based on field observation, satellite images and building heights acquired from YCDC. Moreover, the controlling factor of the difference in the land values of the road sections with overpass and that with no overpass is the presence of overpass, identified by using partial correlation method.

Results and Findings

Prior to the construction of overpass bridges on Pyay road and Kabaraye Pagoda road, the areas at these road sections were festive with buyers and sellers of different levels and provision of services, comparatively more developed than other areas. The prices of land were highest along the two main roads. The prices of land value around Maynigone junction, Hledan junction and 8th mile junction were higher by 50000 kyats to 80000 kyats per square feet than other

sections of these roads. However, after the construction of overpass bridges the land prices of these areas have fallen by 50000 kyats to 100000 kyats per square feet.

At the junction point between Pyay road and Barkayar road had City Mart and Dagon Centre 1 and it was crowded with buyers and other economic activities prior to the construction of the overpass bridge and the land values around the junction point was much higher than other places. The construction of the bridges was complete in 2014. By that time there was no change in the land use patterm around the bridge. However, the land use of the area between Pyay road and Manawhari road has changed. Since August, 15, 1994 the height of building was limited not to construct any building higher than the skyline of the Shwedagon Pagoda in the area of People Park and supreme legislative body building which are parts of the approach road of the bridge. As no large and high rise condominium cannot be constructed there, the land prices of these areas were not much higher than other road junction areas.

After the construction of the Bridge, Pyay Garden and Jasmin Palace emerged between Barkayar road Hantharwady Round. The area around Hledan Overpass Bridge was a festive place. After the construction of the Bridge, several international universities were established around the area. However, there learning centres had to close down due to difficulty for car parking and being distant from the bus-stops. After the construction of Hledan and 8th mile overpass bridges, the area between the two overpass bridges have developed rapidly with the emerging Market Place, Lotteia Hotel, Kantharyar Hospital and Shwehinthar Condominium smooth transportation to Yangon International Airport. To improve the transportation service, the government installed more traffic-light posts by using Traffic Impact Assessment method.

Improvement in transportation can change the land use patterm. The change of land use patterm also changes the price of land. Before the construction of Kokkine overpass bridge, Traffic jam usually occurred around the junction of Kabaraye Pagoda road, Saya San road and Kokkine overpass bridge, Myanmar Plaza and Mellia Hotel emerged beside the approach road of the bridge due to smooth flow of transport vehicles. The staff of their Plaza and Hotel relocated in area near their worksites, increasing the land price of the nearby wards.

The objective of the construction of Shwegondaing overpass bridge was to reduce the problem of traffic jam. After the construction of the bridge, the transportation is smooth along the road, but the price of land decreases around the area and it has also affected the economic activities, due to having no space for car parking and other essential purposes and high level of noise pollution, causing negative impact to the local residents around the Bridge. Future construction of overpass bridge should consider meticulously mot to affect negative impact over the residents of the nearby area. When comparing the land price of the land where the flyover is located and the land price of the land without the overpass, the land price of the land located in the area where the flyover is not built is found to be around 50,000 to 100,000 more per 1sq ft compared to other intersections along the road before the construction of the overpass. When the overpass was built, the land price of those areas decreased significantly by 50,000 to 100,000 per 1 sq ft compared to the land price of the land at the intersection without the overpass. Therefore, the partial correlation method was used to control the changes in the land price according to the location along those main roads.

The land use type along Pyay and Kabaraye Pagoda Roads has changed during the study period. The change is manifested by vertical expansion or high-rise buildings due to more investment both by domestic and foreign entrepreneurs. However, the road sections around the

overpasses have no vertical expansion. The road sections with vertical expansion are presented, based on building height data, field observation and satellite images which are analyzed by 3D Analysis. As shown in Figure (4), there has been no change along the Myanigone overpass after the construction of the overpass. Figure 5 shows the road section between Hanthawady round and Myanigone overpass before the construction of the overpass. Figure 6 shows the vertical expansion along that section after the construction of overpass. Figure 7 shows the road section around Hledan overpass and figure 10 shows 8th mile overpass. Figure 9 is the road section between Hledan and 8th mile overpass which includes the wellknown frame of Inya Lake before the construction of overpasses. Figure 8 shows the emerging of high-rise buildings between the two overpasses after the construction of their overpasses, pretended by using 3D Analysis. Figure 11 shows the location of Kokkine overpass on Kabaraye Pagoda Road and Figure 12 presents the location of Shwegondaing overpass. Figure 13 and 14 are the road sections between No 1 Industry Road and Kanbae Road. Figure 13 shows the cindition of land use along Kabaraye Pagoda Road before the construction of overpass and figure 14 shows the change of land use with vertical expansion after the construction of overpasses.

In Pyay Road the relationship between Servant Leadership (SL) Life Satisfaction (LS) was explored using partial correlation while controlling for experience. There was a weak positive partial correlation between SL and LS, controlling r = .316, n = 76, P< .005 with increase in road section, significantly related to higher overpass. An inspection of the zero-order correlation (r= .841) suggested that controlling for overpass had very little effect on the strength of the relationship between these two variables. Table (1)

In Kabaraye Pagoda Raod the relationship between Servant Leadership (SL) Life Satisfaction (LS) was explored using partial correlation while controlling for experience. There was a moderate positive partial correlation between SL and LS, controlling r = .695, n = 34, P< .001 with increase in road section, significantly related to higher overpass. An inspection of the zero-order correlation (r= .726) suggested that controlling for overpass had very little effect on the strength of the relationship between these two variables. Table (2)

Table 1 Partial Correlation of Pyay Road

Control Variables			LandValue	RoadSection	Overpass
-none-[a]	LandValue	Correlation	1.000	.841	.876
		Significance (2-tailed)	.	.000	.000
		df	0	77	77
	RoadSection	Correlation	.841	1.000	.877
		Significance (2-tailed)	.000	.	.000
		df	77	0	77
	Overpass	Correlation	.876	.877	1.000
		Significance (2-tailed)	.000	.000	.
		df	77	77	0
Overpass	LandValue	Correlation	1.000	.316	
		Significance (2-tailed)	.	.005	

Control Variables			LandValue	RoadSection	Overpass
		df	0	76	
	RoadSection	Correlation	.316	1.000	
		Significance (2-tailed)	.005	.	
		df	76	0	

Source Field Observation

Table 2 Partial Correlation of Kabaraye Pagoda Road

Control Variables			RoadSection	LandValue	Overpass
-none-[a]	RoadSection	Correlation	1.000	.726	-.814
		Significance (2-tailed)	.	.000	.000
		df	0	35	35
	LandValue	Correlation	.726	1.000	-.453
		Significance (2-tailed)	.000	.	.005
		df	35	0	35
	Overpass	Correlation	-.814	-.453	1.000
		Significance (2-tailed)	.000	.005	.
		df	35	35	0
Overpass	RoadSection	Correlation	1.000	.690	
		Significance (2-tailed)	.	.000	
		df	0	34	
	LandValue	Correlation	.690	1.000	
		Significance (2-tailed)	.000	.	
		df	34	0	

Source Field Observation

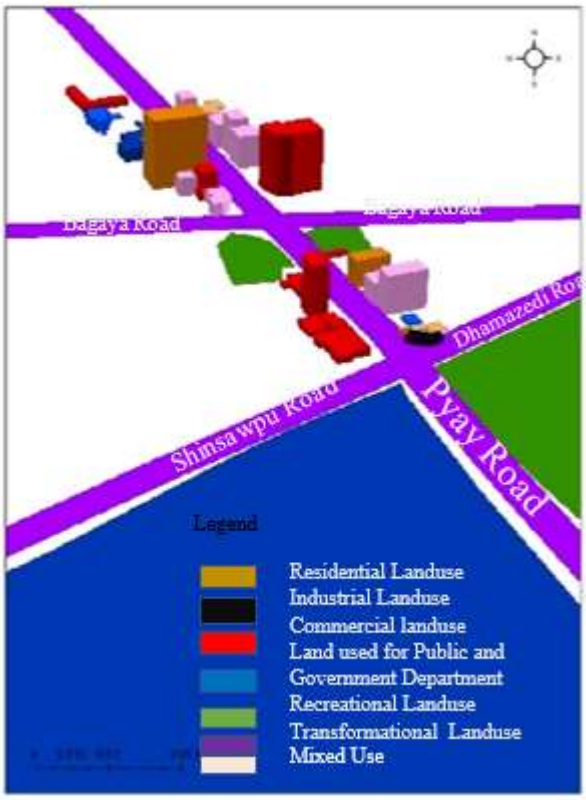

Figure 4. Myaynigone Overpass Bridge

Source: Yangon City Development Committee

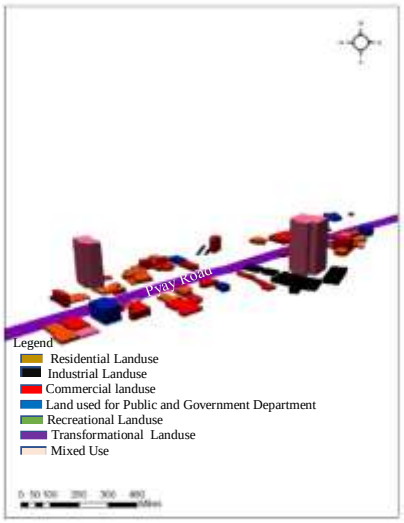

Figure 5. Prior to the Construction of the Overpass Bridge around Hantharwaddy Circle and Pyay Garden

Source: Yangon City Development Committee

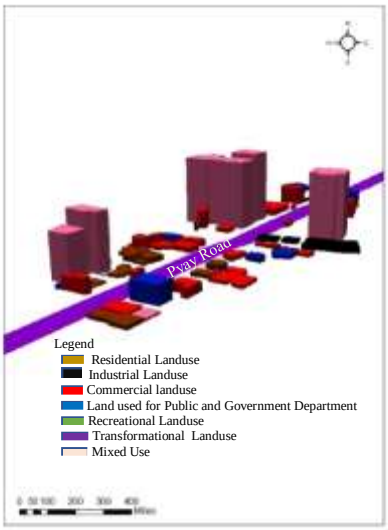

Figure 6. After the Construction of the Overpass Bridge Around Hantharwaddy Circle and Pyay Garden

Source: Yangon City Development Committee

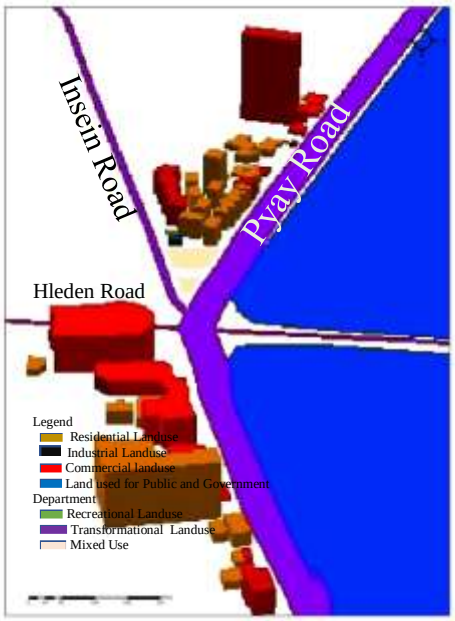

Figure 7. Hleden Overpass Bridge

Source: Yangon City Development Committee

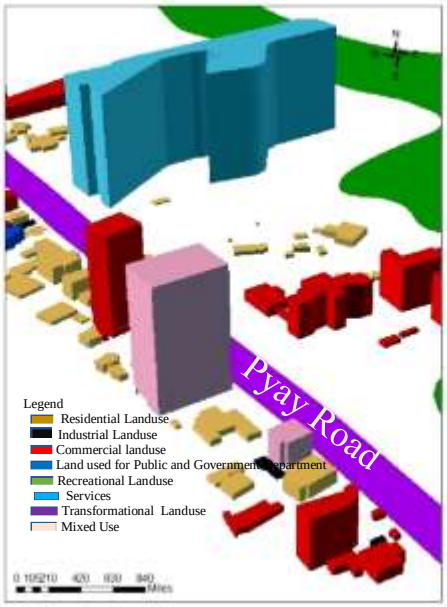

Figure 8 After the Construction of the Overpass Bridge around 7th mile area

Source: Yangon City Development Committee

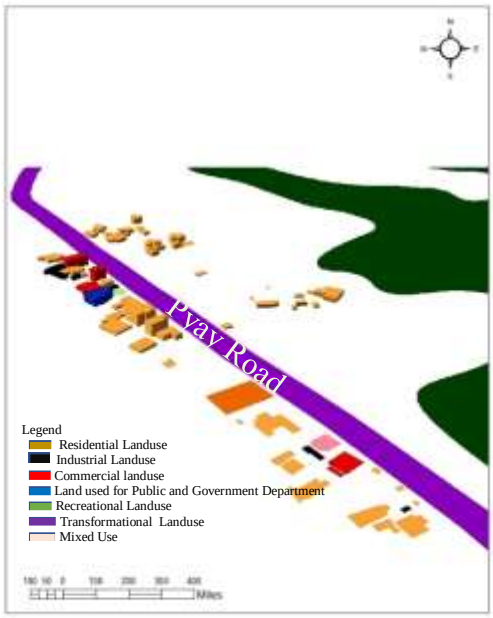

Figure 9. Prior to the Construction of Overpass Bridge around 7th mile area

Source: Yangon City Development Committee

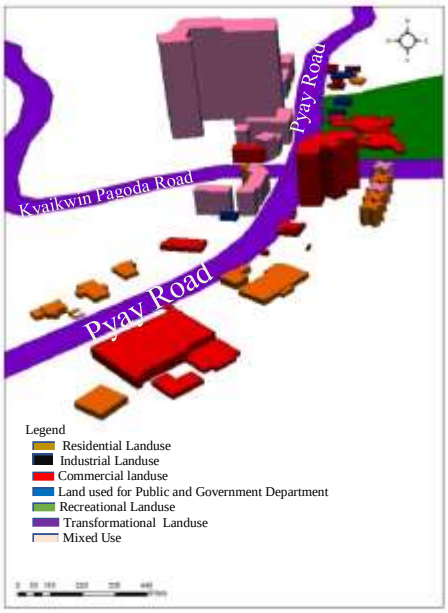

Figure 10. 8th mile Overpass Bridge

Source: Yangon City Development Committee

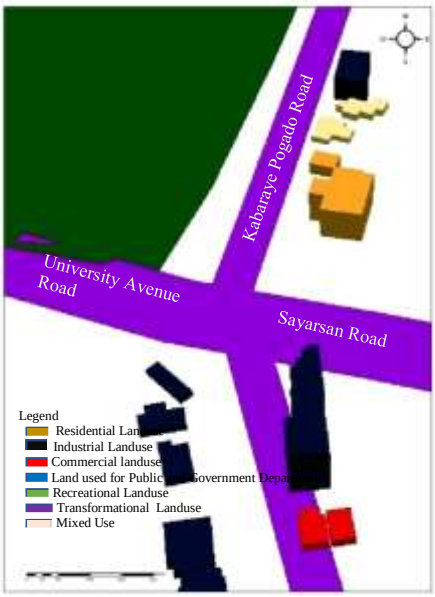

Figure 11. Kokkine Overpass Bridge

Source: Yangon City Development Committee

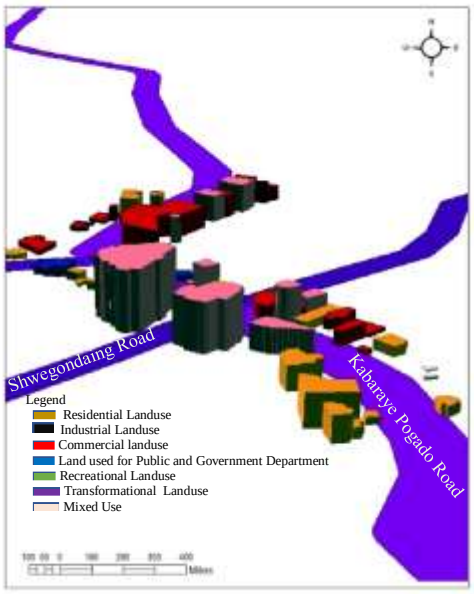

Figure 12. Shwegondaing Overpass Bridge

Source: Yangon City Development Committee

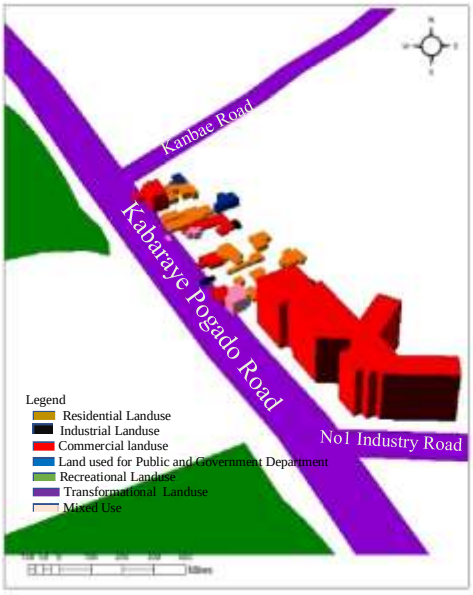

Figure13. Prior to the Construction of Overpass Bridge around Myanmar Plaza

Source: Yangon City Development Committee

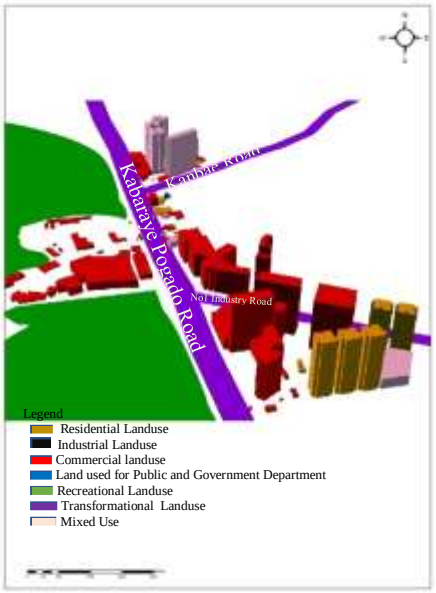

Figure14. After the Construction of Overpass Bridge around Myanmar Plaza

Source: Yangon City Development Committee

Conclusion

In constructing overpass bridges, it affects the price of nearby land and economic activities because of having no vacant space between the bridge and residential area. The road junctions along Pyay road and Kabaraye Pagoda road were festive and land value was much higher before the construction of overpass bridges. After the construction of bridge, the road infrastructures have improved and cars can move smoothly and it supports the development of economic activities. However, it causes negative impact on the price of land and economic activities in areas close to the bridge having no space for car parking, obstruction of visibility and being distant from the bus-stops. The land-use pattern of the area close to the bridges has not changed

Noise pollution is felt more at the upper stories than the ground floor. Noise pollution is caused by different building materials and different heights of overpass. It is learned that if the height of the overpass increases the level of noise decreases. Therefore, overpass bridge should be constructed in accord with the noise measurement plan. Then only will there be no negative impact of noise on the residents living close to the bridge and on the social and economic activities and on the value of the land. The installation of traffic lights has made traffic more convenient, and businesses have increased on that stretch of road. As the population in Yangon, the business capital of Myanmar, has increased, the city area has also expanded to provide housing, which is what people want to live in. Therefore, the highways that connect the satellite town and the downtown area have also become important. Overpasses have been built to facilitate traffic on those highways and to solve traffic problems. However, air pollution and noise pollution measurement plans should be systematically measured. However, due to the fact that there is no systematic consideration of the positive and negative impacts that will be caused by the overpasses, it has been observed that there are negative effects on business activities and land prices under the overpasses. However, due to the systematic use of ITS and TIA technology in the installation of traffic lights as transport infrastructure, transportation will become easy and convenient, and the commercial activities of the plots of land in that section will change, and the land use pattern will change, and the land price of those plots will increase from 30,000 to 50,000 per 1 sq ft. Therefore, in supporting transport infrastructure, which is essential for urban development, the positive and negative impacts that may affect the interests of the local people should be carefully considered. The aim of construction of overpasses along the main roads in Yangon City is to enhance smooth transportation and to reduce traffic congestion problem. Although overpasses reduce traffic jam the area around the road junctions that have overpass have retarded the economic development momentum and decreased the value of land. The road sections that have no overpasses as the area between the overpasses have developed rapidly with more investment leading to the emergence of Shopping Mall, Condominiums, Hotels and Hospitals. As a result, these road sections encounter the problem of traffic congestion. This research work mainly presents the effects of overpasses which reduces traffic conjestion around the overpasses, but not along the approach road sections of the overpasses.

As mentioned earlier, the presence of overpasses increases the noise pollution level to the residents living around the areas, and the luck of space for car parking is also a problem. Therefore, the authority concerned should take consideration to reduce the negative impact when constructing overpasses.

Acknowledgements

I am very much grateful to Dr Nay Win Oo, Rector, East Yangon University, for his systematic guidance and valuable suggestions in this research. I also thanks to Dr. Zin Nwe Myint, Professor and Head, Department of Geography, Yangon University, provided to the research by her suggestions and advices. I would like to express my great indebtedness to Dr. Nyein Nyein Win, Professor and Head, Department of Geography, East Yangon University, for her permission to carry out this field training and research work.Many special thanks to Yangon City Development Committee (YCDC) for providing in data collecting work.

References

Abdul Rashid B. Mohamed Shariff (2014): "Predicting the Effects of Urban Development on Land Transition and Spatial Patterns of Landuse in Western Peninsular Malaysia" Geospatial Information Science Research Centre (GIS RC), Faculty of Engineering, University Putra Malaysia.

Carleigh Ghent, (2018) "Mitigating the Effects of Transport Infrastructure Development on Ecosystems" The Journal of Sustainable Development, Columbia University, Vol. 18, Iss. 1 (2018), Pp. 58–68.

Chi-Chwen Lin, Yen-Ping Peng, (2018) "Impact and Control of Reflected Noise from on Overpass Bottom" Applied Sciences Journal, vol.8, pp.1-16.

Nicolaus Tideman, Florenz Plassmann(2017) "The effect of transportation improvements on the separate values of land and buildings" State University of New York

Sarch Colenbrander, (2016) Cities as engines of Economic Growth, the Case for Providing Basic Infrastructure and Services in Urban Areas. International Institute for Environment and Development (2016) Stable URL: http://www.jstor.com/stable/resrep0272.

Lustina Fajar Prastiwi, (2021) "The Impact of Infrastructure of South Cross Road Line Toward Land Value" Jurnal Ekonomi dan Pembangunan, State University of Malang, vol 11, No. 2, 212-223.

Imtiaz Ahmed Chandio, Fahad Ahmed Shaikh, (2018) "Urban Land Use Planning Trend and Sustainable Challenges in Socio-Economic Development" Research Journal of Engineering & Technology, Mehran University, Vol. 37, No. 2, 397-404.

မဟာရန်ကုန်မြို့ပြဖွံ့ဖြိုးမှု မဟာဗျူဟာစီမံကိန်း၊ YCDC ၂၀၁၃။

ရန်ကုန်တိုင်းဒေသကြီး ဖွံ့ဖြိုးတိုးတက်မှု မဟာဗျူဟာစီမံကိန်း၊ ရန်ကုန်တိုင်းဒေသကြီးအစိုးရအဖွဲ့၊ ၂၀၁၉။