

RAIL TRANSPORT POTENTIAL FOR UNIVERSITIES STUDENTS IN THANLYIN TOWNSHIP

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Abstract

This paper focuses mainly on the use of train by the students attending the universities in Thanlyin Township. The increased use of train can result in the decreasing use of buses (car) by the students, leading to the number of buses between Thanlyin and Yangon City. This will reduce the traffic jam over Yangon–Thanlyin Bridge. This paper identifies the perception of the students on rail transport, the current rail service on this particular segment and the degree of competition between different modes of transportation, particularly between bus service and rail transport service.

Keywords: rail services, traffic jam, students' perception, Yangon-Thanlyin Bridge

Introduction

Thanlyin Township is one of the townships in south district of Yangon Region and also included in Yangon City. It is located between north latitude 16° 40' and 16° 59' east longitude 96° 17' and 96° 25'. Bago River is in the north, Khayan Township and Thongwa Township in the east, Kyauktan Township in the south and Yangon River in the west.

Three bridges across the Bago River connect Thanlyin with other townships of Yangon City. Yangon-Thanlyin Railroad Bridge, Yangon-Thanlyin Bridge No (1) with two Car-roads (one for going and another for return trips) and railroad along the middle between the two car-roads [plate 1] connects Thanlyin with Thakayta Township, opened at 31st July 1993 [Tin Tin Khine., 2020]. The existing Yangon-Thanlyin Bridge No (1) is one way tract. It is the main entrance to CBD of Yangon City by the people of Kyauktan, Khayan, Thonekhwa, in addition to Thanlyin.

Another bridge called Kalaewe (Dagon), open at 2007 [Tin Tin Khine., 2020], can be used for the movement between Thanlyin and Dagon Myothit (East). Kalaewe (Dagon) Bridge is a six ways tract and no YBS bus runs across the bridge. As it is connected with urban fringe (Dagon Myothit (East)), there is no traffic conjunction on this bridge.

Bago Bridge (Thanlyin 3) is being built simultaneously with Yangon-Thanlyin Railroad Bridge at 125 meters downstream. At present (July, 2020) 41 percent has been completed and it will be finished and opened in 2023. [<http://www.newswatch-nw.com/>, 2020]

This indicates that there is only entrance to Thanlyin by rail transport, but two entrances by motor vehicles transport. However, there are seven bus lines (Yangon –Thanlyin and Yangon-Kyauktan/ Thonekhwa –Khayan) currently serving across the bridge, Yangon-Thanlyin Bridge No (1), while traffic jam is not uncommon on that Yangon-Thanlyin Bridge especially in the rush hours. The problem of traffic congestion over the bridge is getting worse.

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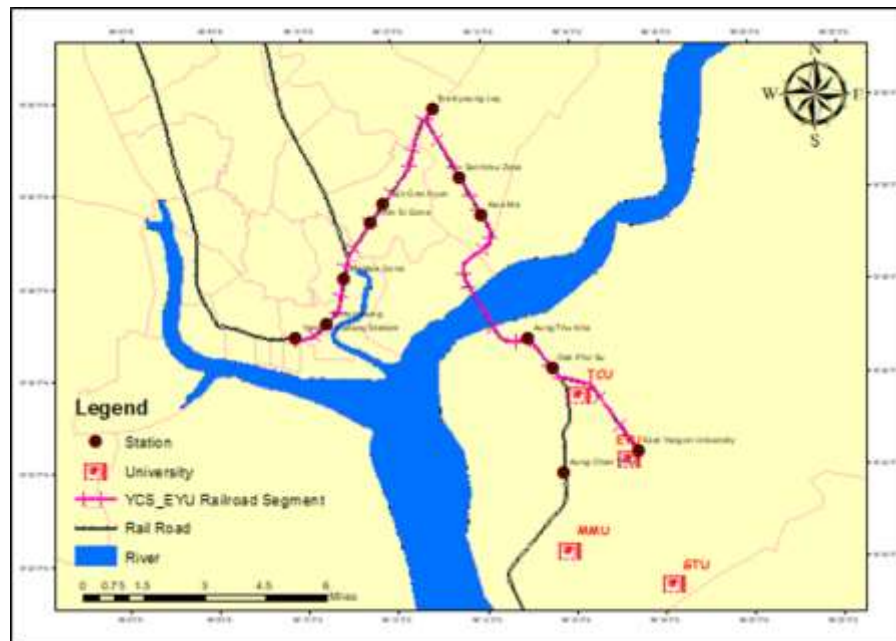
Thanlyin Township currently (2020) has four Universities and these are: (1) East Yangon University, (2) Cooperative University, (3) Myanmar Maritime University and (4) Government Technology University (Thanlyin). These universities are located on either side of Kyaikkhaut Pogoda-Kyauktan road. Although the location of Students of the four universities are not the same, about 50 percent of the students are living in the areas (north of the Bago River) that can use rail transport and the remaining 50 percent cannot use the train to get to their respective universities as they are residing in Kyauktan, Thongwa and Khayan townships [Table 1].

Numbers of Students				Townships																				
TCU	MMU	GT	EYU	University	Townships																			
					Kyimyintine	Alone	Sanchaung	Lamadaaw	Latha	Pabaedan	Kyauktada	Botahtaung	Pazundaung	Mingalartaun	Thakeyta	Dawbon	Dala	Seikkyikhanaungto	Thonekha	Kyauktan	Khayan	Thanlyin	Seikkan	Others
		14	443	201	281	88	34	67	89	238	218	422	1944	597	767	194	1155	930	797	2191	14	210	1144	1202
		17	201	281	88	34	67	89	238	218	422	1944	597	767	194	1155	930	797	2191	14	210	1144	1202	
		26	281	88	34	67	89	238	218	422	1944	597	767	194	1155	930	797	2191	14	210	1144	1202		
		24	88	34	67	89	238	218	422	1944	597	767	194	1155	930	797	2191	14	210	1144	1202			
		16	34	67	89	238	218	422	1944	597	767	194	1155	930	797	2191	14	210	1144	1202				
		17	67	89	238	218	422	1944	597	767	194	1155	930	797	2191	14	210	1144	1202					
		38	89	238	218	422	1944	597	767	194	1155	930	797	2191	14	210	1144	1202						
		49	238	218	422	1944	597	767	194	1155	930	797	2191	14	210	1144	1202							
		72	218	422	1944	597	767	194	1155	930	797	2191	14	210	1144	1202								
		142	422	1944	597	767	194	1155	930	797	2191	14	210	1144	1202									
		224	1944	597	767	194	1155	930	797	2191	14	210	1144	1202										
		45	597	767	194	1155	930	797	2191	14	210	1144	1202											
		25	767	194	1155	930	797	2191	14	210	1144	1202												
		3	194	1155	930	797	2191	14	210	1144	1202													
		26	1155	930	797	2191	14	210	1144	1202														
		71	930	797	2191	14	210	1144	1202															
		32	797	2191	14	210	1144	1202																
		190	2191	14	210	1144	1202																	
			14	210	1144	1202																		
		519	210	1144	1202																			
		1052	1144	1202																				
		2682	1202																					
		2010	1202																					

- (1) East Yangon University (EYU) = Yangon Area,
- (2) Cooperative University (TCU) = the whole Myanmar
- (3) Myanmar Maritime University (MMU) = the whole Myanmar
- (4) Government Technology University (GTU) = the whole Myanmar



Note: Yangon-Thanyin Bridge No (1) with two Car-roads (one for going and another for return trips) and railroad along the middle between the two car-roads, and construction site for Bago Bridge (Thanyin 3)



Source: Based on UTM map, Cartographer is Daw Win Thet Myint , 2020

Figure 1 The Pattern of Yangon Central Railway Station-East Yangon University Railroad Segment and Distribution of Universities in Thanlyin

Rail Segment Service System

This rail segment of Yangon Central Railway Station-East Yangon University was opened on 1.6.2006, kilometers 32.2 km (20 miles) long, having 12 stations on the way. These stations are Yangon Central Station, Puzundaung, Malwagone, Hninsigone, Thingangyun, Ngamoeyeik, Toegyaunggale, Industrial Zone 1, Kawema, Aungthukha, Oakphosu, Thama (Nyaungthonbin) and East Yango University. There are 4 railway stations in Thanlyin Township and these are Aungthukha, Okphosu, Thama or Nyaungthonpin or Cooperative University and East Yangon University. The distribution of railway stations and universities are presented in figure 1 and Locomotive and Suburban (Thanlyin) Railroad Pattern in figure 3.

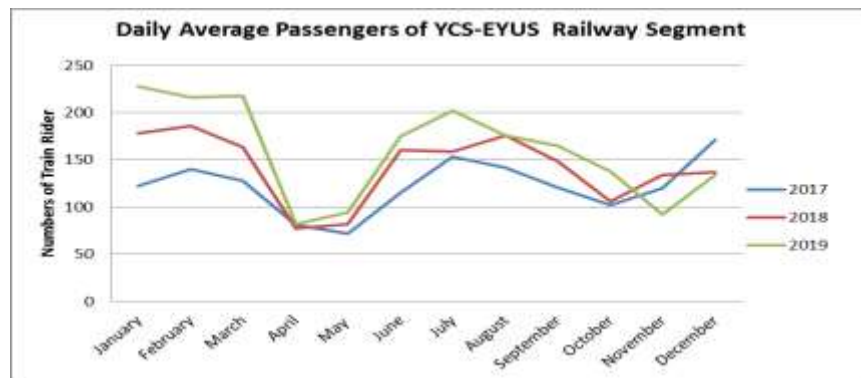
The rail service is auto system between Yangon Central Station and Toegyaunggale and the segment between Toegyaunggale and East Yangon University is “Absolute Block System”. It takes time at Toegyaunggale station because it needs to turn the locomotive there. It usually takes about 15 minutes. The train also has to wait for some time if there is freight train or Yangon-Mandalay train moving across the station. As Toegyaunggale station is located at the most popular part of Dagon north-south road junction; it takes about 15 minutes to get across the rail and road junction. And then, Thama or Nyaungthonbin or Cooperative University has no real railway station. The train stops for a few minutes by the sign of carriage control system.

Rail transport serves 5 up and down trips daily (see table 3 & 4). The speed limit is 15 miles per hour. It takes about two hours (one hour and 55 minutes) to get to East Yangon University from the Yangon Central Station. The charge rate is Ks 100 for 15 miles. The monthly charge rate for an ordinary traveller is Ks 3150, but special rate has been practiced for the student with Ks 2250. Daily average numbers of passengers of this Railway Segment is shown by table 2.

Table 2 Daily Average Passengers of YCS_EYUS Railway Segment

Months Year	January	February	March	April	May	June	July	August	September	October	November	December
2017	110	124	116	75	70	107	115	116	113	96	116	149
2018	150	148	147	69	76	138	129	144	129	96	126	117
2019	198	186	196	76	88	167	146	142	147	128	84	112

Source: Manager, Yangon Region, Myanmar Railway Service, June, 2020



Source: Based on Table 2

Figure 2 Daily Average Numbers of Passengers of YCS_EYUS Railway Segment**Table 3 Railway Trip Schedule from Central Station to East Yangon University Station**

No.	Station	Ba-2	Nya-1	Da-4	Ma-7	Da-6
1	Central Station	06:05	06:55	09:40	13:05	13:50
2	Puzundaung	06:13/06:14	07:03/07:04	09:48/09:49	13:13/13:14	13:58/13:59
3	Mahlwagone	06:22/06:23	07:12/07:13	09:57/09:58	13:22/13:23	14:07/14:08
4	Hninsigone	06:28/06:29	07:18/07:19	10:03/10:04	13:28/13:29	14:13/14:14
5	Thingangyun	06:32/06:33	07:22/07:23	10:07/10:08	13:32/13:33	14:17/14:18
6	Ngamoeyeik	06:38/06:39	07:28/07:29	10:13/10:14	13:38/13:39	14:23/14:24
7	Toegyaunggale	06:45/06:55	07:35/07:50	10:20/10:35	13:45/14:00	14:30/14:45
8	Industrial Zone.1	07:07/07:08	08:02/08:03	10:47/10:48	14:12/14:13	14:57/14:58
9	Kawayma	07:13/07:14	08:08/08:09	10:53/10:54	14:18/14:19	15:03/15:04
10	Aungthukha	07:31/07:32	08:26/08:27	11:11/11:12	14:36/14:37	15:21/15:22
11	Oakphosu	07:39/07:40	08:34/08:35	11:19/11:20	14:44/14:45	15:30/15:40
*	Thama					
12	East Yangon University	07:55	08:50	11:35	15:00	15:55

Source: East Yangon University Station (March 2020)

Table 4 Railway Trips Schedule from East Yangon University Station to Central Station

No.	Station	Ba-3	Nya-2	Ma-8	Da-7
1	East Yangon University	08:15	09:20	15:20	16:05
*	Thama				
2	Oakphosu	08:30/08:40	09:35/09:36	15:35/15:36	16:20/16:21
3	Aungthukha	08:47/08:48	09:43/09:44	15:43/15:44	16:20/16:21
4	Kwaema	09:05/09:06	10:01/10:02	16:01/16:02	16:46/16:47
5	Industrial Zone.1	09:11/09:12	10:07/10:08	16:07/16:08	16:52/16:53
6	Toegyaunggale	09:25/09:45	10:20/10:30	16:20/16:30	17:05/17:15
7	Ngamoeyeik	09:51/09:52	10:36/10:37	16:36/16:37	17:21/17:22
8	Thingangyun	09:57/09:58	10:42/10:43	16:42/16:43	17:27/17:28
9	Hninsigone	10:01/10:02	10:46/10:47	16:46/16:47	17:31/17:32
10	Mahlwagone	10:07/10:08	10:52/10:53	16:52/16:53	17:37/17:38
11	Puzundaung	10:16/10:17	11:01/11:02	17:01/17:02	17:46/17:47
12	Central Station	10:25	11:10	17:10	17:55

Source: East Yangon University Station (March 2020)



Source: Photograph taken by Daw Let Let Myat, February 2020

Plates 2. Students are waiting train for go back home at East Yangon University Station

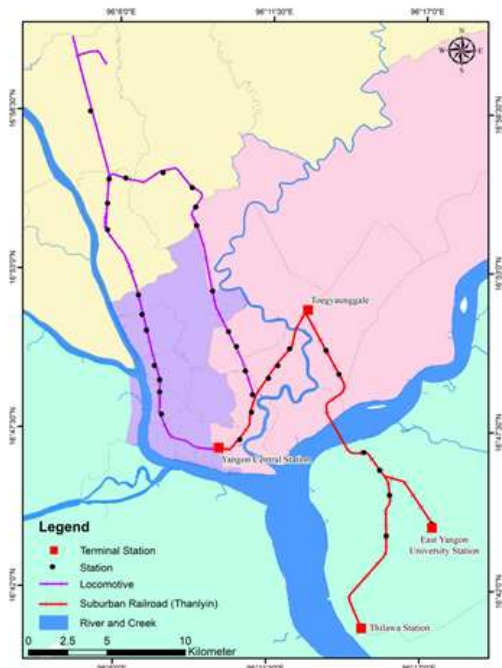
Source: Photograph taken by Daw Let Let Myat, February 2020

Plates 3 Relaxed, Comfort and Safe Train Riders on Train

Other Mode of Transport Service System

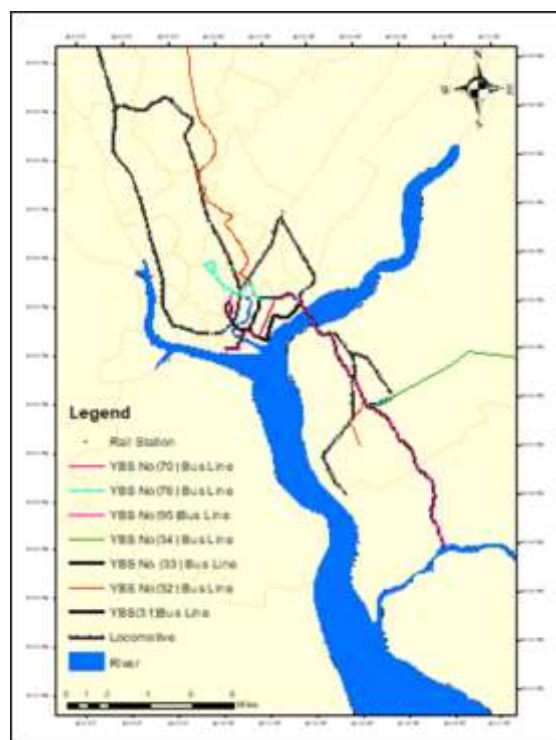
There are 7 buslines serving between Thanlyin and Yangon. The students can get directly to East Yangon University by using YBS No.31, 34, 76 buslines. The students can change to YBS No.33, 70 and 95 at Phayargone bus-stop. There are three YBS bus lines to get directly to Government Technological University, while only YBS No.32 can be used to get directly to

Myanmar Maritimes University. Cooperative University is accessible by all seven bus lines, but the students have to change from the bus-stop to Cooperative University by other hire vehicles. Figure 4 shows the routes of bus lines. There are “Private ferry Services” run between students home town and universities.



Source: UTM map, MIMU, 2020

Figure 3 Locomotive and Suburban (Thanlyin) Railroad Pattern



Source: YBS Busline.com

Figure 4 Railroad and Seven Bus Lines Pattern in Thanlyin

Research Questions

1. Do the university students desire to use rail transport to attending their universities?
2. Is the rail service attractive to these students?
3. What are the competitive conditions of rail transport with other modes of transport?

Aim

This paper intends to provide practicable suggestion for the important of rail transportations in Thanlyin Township. This will lead to the reduction of traffic congestion and smooth flow of the commuters. It depends on the rail service and the use of train by the students in attending their respective universities. This research work focuses on rail transport potential for the students of universities in Thanlyin Township.

The objectives are: to understand the advantages and disadvantages of using rail transport in compare with other mode of transports and to examine the perspectives of university students on using rail transport in their daily commuting.

Materials and Method

In acquiring primary data related to rail service along the Yangon Central Station-East Yangon University segment, field observation, open talk and interviews are conducted with the station master of East Yangon University Station, Kawema Station and Toegyauungale Station.

To know the perception of the students on rail transport, a total of 400 questionnaires, 150 questionnaires are distributed to those who usually take the train, 200 questionnaires to non-train rider students of East Yangon University, including those who take bus lines, motorcycle carriers, and ferry) and 50 questionnaires to Thanlyin Cooperative University.

Buffer Analysis is used to reveal this different distances from the station with and interval of 5-minute walk-distance (<https://www.healthline.com>, 2021), including three circles, the innermost circle for 5 minutes, the middle circle for 10 minutes and the outer circle for 15 minutes, of which the area between the 5 minutes circle is the best to get to the nearest station and the area outside the 15 minutes circle may take a long time to get to the station.

In acquiring information related to the competition of other modes of transportation, the bus line service between Thanlyin and Yangon as well as private ferry services, taxi and cycle-carrier services are studied, in addition to literature survey. Comparative analysis is conducted on time distance, energy distance and cost distance among the different modes of transportation.

The analysis is essentially based on the data related to the students of EYU, as they are the main riders of the train.

Findings and Discussions

User-friendliness

According to field observation, rail road pattern and distribution of railway stations in Thanlyin Township, if the students of Myanmar Maritime University and Government Technology University want to take the train service, they have to change to bus service at Aungthuka Station. Not only there is no railway station near Cooperative University and the students have to take the train at Nyaungthonpin but also Thama or Nyaungthonbin or Cooperative University has no real railway station. The train stops for a few minutes by the sign of carriage control system. In addition, the path that connects with Nyaungthonbin station and road in Cooperative University (Thanlyin) is very poor condition for use especially in rainy season. East Yangon University is the most easily accessible by train. Hence the majority of train riders are the students of East Yangon University. According to field observation, 2 or 3 students take the trains to get to Myanmar Maritime University and 4 Students to Government Technological University.

In north of Bago River, the locations of stations are not at the same places where the students are residing. The students have to attend the university close to the address (place of home) mentioned in the matriculation examination form. Others include: (1) those who have change the census paper, university change, (2) those who take the subject not being taught in East Yangon University (e.g Library Study) and (3) those whose parent have been transferred from other place.

According to four-class Buffer Analysis, there are only a few students within 5 minute circle and great majorities are living outside 15 minute circle. The students have to spend the time not only between the home and station, but it takes about 5 to 10 minutes to get on the train, after reaching the station. There are only one to four students, who get on the train from every 12 stations.

Rail service it taken about 2 hours (one hours and 55 minutes) by train to get to East Yangon University. To reach the university at 9:00 am one must take the train which leaves Yangon Central station at 6.55 pm. To get in time before the train leaves the station one must leave one's home at

5.30 am. Classes are finished at 2:30 pm, but this train leaves East Yangon University station at 3:20 pm and one reaches Yangon Central Station at 5:20 pm and gets back home at 6:00 pm.

Based on the responses to the questionnaires, there are more or less students, who get on the train from all 12 stations of which 68.42 percent get on this train from Kawema Station, table 5 According to open talk interview, 80 to 100 students take the train at Kawema station. Most students take the train at Kawema Station, mostly living in Ward No. 22 of Dagon Myothit (south). The students of this ward are not coinciding to attend EYU but they are enlisted in 'other' townships.

According to bus line pattern and distribution of bus stops, road network and bus services are effective in the area north of the Bago River. All the 7 bus lines enter Thanlyin from different routes, providing chance for the students to take buses. The students can get different bus lines. If one bus breaks down on the way the students can change another bus. They can also take taxi. And the bus-gate releases each bus at every 10 minute interval and 7 buses reach Thanlyin Township in every 10 minutes. Thus the students can take the bus almost at any time.

Although the students have to pay the highest cost for "Private ferry Services"; 30,000 Kyats per month to 40,000 Kyats per month per capita, it is less time consumption, comfortable and more safe than the buses.

The perception of the students

The reasons for those who like to take the train are because of more comfortable and less dangerous. Taking the bus is less comfortable and more dangerous because of competition between the buses on the same route to get more commuters, road damage, traffic jam, dizziness or vomiting due to the movement of the bus and crowded traveler (plates 2 and 3). There is also the danger of pick-pocketed and sexual abuse, being ease on the way, easiness to guess the arriving and moving times of the train, less congestion, having seat, being able to take freely on the train, receiving fresh air from outside, seeing the natural and man-made surrounding clearly, good for health, no road congestion, feeling secure on the train, proximate to the station, being able to attend the class on time and costing only Ks 100 per day.

According to responses to the questionnaires, 88.6 percent of the students taking the trains like to ride it and 54.59 percent of these respondents, including train riders and non-train riders, like to take the train. The responses also reveal that 55 percent that do not go to the universities by train also like to take the train. Among the non-train riders 45 percent dislike to take the train and 45.41 percent of these respondents, including train riders and non-train riders, dislike taking the train, see table 5 and 6.

The reasons for those dislike to take the train are irregularity of the arrival of the train, taking more time in transit, long time interval between one and the next train, the late arrival of the train, difficulty to get to the destination if there is engine problem on the way, less resistance of the carriages, and being distant from the station. Some students from Cooperative University said that it is dangerous for the students in getting on and off the train because of hand sign showing by the staff of the station without caring the movement of the travellers.

Among the 400 questionnaires, 79 responses are received from those who usually take train, 100 from those who do not take the train and 50 from Thanlyin Cooperative University. 104 responses questionnaires dislike taking the train in going to their respective universities in Thanlyin. The reaming 171 questionnaires have no responses and this group can be considered those who do not interesting taking the train, which accounted for 42.75percent. Therefore, it can be concluded that 275 of 400 (68.75%) questionnaires dislike and do not interesting taking the train in going to their respective universities in Thanlyin.

Table 5 Respondents and their Opinion for Taking Railway by Respective Stations

Starting Point (Terminal)	Central Station	Puzundaung	Mahlwagone	Hninsigone	Thingangyun	Ngamoeyeik	Toegyauungale	Industrial Zone.1	Kaweyma	Aungthukha	Oakphosu	Thama (Nyaungthongpin)	East Yangon University	Total	%
Number of Questionnaires	1	4	7	5	2	-	3	-	52	1	2	-	-	79	
Like	0	4	6	5	2	-	3	-	45	1	2	-	-	70	88.6
Dislike	1	0	1	0	0	-	0	-	7	0	0	-	-	8	11.4

Source: Questionnaire Survey, December, 2019- February, 2020

Table 4 Questionnaire analysis of Rail Transport Potential for Students of Universities

No	Students	Total Numbers of Questionnaire	Respondents		Non respondent s		Like		Dislike	
			No.	%	No.	%	No.	%	No.	%
1	Train Rider	150	79	52.67	71	47.33	70	88.6	9	11.4
2	Non- Train Rider	200	100	50	100	50	55	55	45	45
3	Cooperative university	50	50	100	-	-	-	-	50	100
	Total	400	229	57.25	171	42.75	125	54.59	104	45.41

Source: Questionnaire Survey, December, 2019- February, 2020

Conclusion

According to the responses to the questionnaires the decision on the choice of vehicle service by the university students depend on: (1) time in transits, (2) being comfortable and free from accident, and (3) low cost. However, there is no mode of transport that can satisfy all the three requirements. Based on the user demand, the existing mode of transport can be categorized into three classes. 'Class A' is characterized by moderate time span in transit, but comfortable and uncertain as regard to accident and the cost is low; bus services. 'Class B' is speedy and takes little time and it is comfortable and has no danger of accident, but the cost is high; private ferry services. 'Class C' takes the longest time in transit, but it is comfortable, free from the danger of accident and low in cost; rail service. As a result, the numbers of universities students who take train is rather small.

There are three main reasons for why university students do not take the train. First reason is that the locations of stations are not at the same places where the students are residing, second, it takes more time to get to the destination by train and third is the advantages conditions of bus lines road network.

These factors can be seen clear in for instance of university students in No.22 of Dagon Myothit (South), the daily number of students that take train at Kaweyma Station is 80 to 100. They live in Ward No.22 of Dagon Myothit (South) Township; near to the Kaweyma Station (within 10 minute buffer cycle). As the train usually leaves Kaweyma station at 8:08-8:10 am, the students need not leave their home early. From Kaweyma station it takes about an hour to get to East Yangon

University. It costs only Ks 100 daily and Ks 2250 per month. Rail service is suitable for these students; no time in transits, being comfortable and free from danger (accident), and low cost. If they take the buses, the two steps bus fare for getting to the university is Ks 500 and another Ks 500 for the return trip, costing Ks 1000 daily. If the students take ferry, it will cost Ks 1500 daily. If the class is finished at 2:30 pm, the students will get home at 3:00 pm and they can save time. Therefore, using train for those students in Ward No.22 of Dagon Myothit (South) is in 'Class A'.

Although 88.6 percent of the students taking the trains and 55 percent of non-train riders like to take the train, the daily number of students that go by train to the university is very small. The daily number of students taking the train is 168 to 198 which account for only 1.08 percent of the total students of 4 universities.

The effectiveness of rail service on the university students of Thanlyin Township is very limited. The number of students that use train has been declining. Therefore, the rail service related to university students has no effect on the traffic congestion over Thanlyin Bridge.

According to field observations, there are not only university students but also a few local resident passengers in Thanlyin use rail transport. Although it expenses less to use the train, long commuting time on the way limit the local resident passengers to use rail. To reduce the time it is necessary to upgrade the locomotives, the bridges on the way and transport system. It may cost a large sum of expense. As the number of travelers is small on this rail segment, the authority concerned has no budget to upgrade. Myanmar Railway Enterprise is supported by the government. The condition of rail transport depends on the budget. The weakness of rail transport is slow speed, long transit time and small number of passengers, resulting in low income. This result of low income restricts the upgrading of rail facilities.

Two suggestions are given for better use of rail in daily commuting of students. The first one is to speed up the movement of the train to reduce the travelling time from 2 hours to one and a half hours to be able to compete with bus service. The speed of the train is needed to be raised from 15 miles per hour to 20 miles per hour. By doing so, the rail transport will become speedy, comfortable, free from danger with comparatively low cost. If the train takes less time to get to the destination, more students from Pazundaung and Mingalartaungnyint townships likely to take the train. And local resident passengers' choice to rail will be increased.

Another recommendation is to extend the railroad segment from East Yangon University Station to No (6) high way road which is about merely (190 m) in length. By such extension, the commuters from Tarwa village and villages around it can easily get to the CBD of Yangon City. In addition No (6) highway road is the main transportation route connecting Thongwa, Khayan townships. The villagers in the hinterland of these townships can also take the train from that 'node'. Furthermore, that node is proximate to another node that is junction of Thanlyin-Kyauktan road and No (6) highway road. The villagers in the hinterland of Kyauktan townships can also take the train through that 'node'. The location of Government Technology University (Thanlyin) and Myanmar Maritime University become closer to the node. If there is bus service between node and MMU and GTU, the students of MMU and GTU can easily get to this respective university. Likewise, wage earners and low-income family can take the train with low cost.

Fortunately, Toegyauhgale-East Yangon University rail segment is the branches line of Toegyauhgale-Thilawa railroad. It is learnt that Oakphosu-Thilawa section is to be upgraded soon. After the upgrading, the condition of railroad up to Oakphosu Station would be smooth and safer to accelerate the speed of the train.

The extension of railroad to No.6 highway main road and upgrading of the railroad segment between Oakphosu and East Yangon University Station may cost a fairly substantial amount of money (budget). Myanmar rail enterprise is under the control and support of the government. If

the budget allotment is not available or not enough to implement the tasks, it can still try for fund from such intervening opportunities as local authority, chronicles or foreign aid or contribution of certain INGO.

Acknowledgement

First of all, we would like to express our gratitude to U Kyaw Ko Ko Zaw, deputy station master, East Yangon University Station, for his kind help, who explains us with running condition on YCS-EYU segment.

We are grateful to U Kyaw Soe Linn, station master of Kawema Station for his helpful and valuable advice. We are also indebted to station master, Toegyauungale Station, for his help.

This acknowledgement cannot be complete without expressing gratitude to U Zaw Lwin, Manager, Yangon Region, Myanmar Railway Service who give us a lot of time for open talk interview and discussions.

We would also like to accord our thanks to heads and members of faculty departments of four Universities in Thanlyin for their kind help, who gave us much evidences of students' location.

In additions, we are more thankful to the respondents to the questionnaire, and those who have in some way help in answering the questions.

Last, but not the least, I would like to convey my gratitude for their unfailing help and encouragement to Sayargyi U Min Htwe Naung, Professor and head of Geography Department, Bago University (Retired) for this English Language Paper.

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