

## Assessing the Driving Forces behind Economic Development of Aungban, Kalaw Township

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### Abstract

Economic activities are included in the main factors for the development of Aungban. The main economic activities of Aungban are agriculture, livestock, cottage industries, services, transportation, communication and trade. The broker's sale centre plays a major role in the economies of Aungban. As a supporting factor for economic development, transportation network is analyzed by the shortest path matrix method; the result shows that Aungban is seen to be the most accessible town (node) of the network with total mileages of 1,343 miles. Aungban is located at a place from which passengers and commodity transportation can easily be made to other nodes (towns and villages) in the network with a minimum aggregate mileage. Therefore, the transportation section is more important than other activities. The increase of services and, good transportation and trade are the main factors to provide for the economic development of Aungban.

**Keywords:** Aungban, Economic activities, Transportation network, Broker's sale centre,

### Introduction

The main aim of this research is to assess and analyze on the driving forces behind the economic development of Aungban. The economic development of Aungban directly and indirectly depends on the supporting factors such as physical and social factors, agriculture, services, transportation and trade. Therefore, the economic activities of Aungban in Kalaw Township, are studied for this research.

### Materials and methods

The sources of data are mainly collected from field observations, interviews and the local people. The further data are collected from libraries, internet web sites, literature studies from research papers, concerning departments and other books related to economic activities. The transportation network is analyzed by two ways, the shortest path matrix and the mileage matrix.

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### Physical Bases

Aungban, the economic town of Kalaw Township, is situated in Taunggyi District of Southern Shan State. It lies between latitude 20° 38' 58" N and 20° 40' 43" N and between longitude 96° 37' 05" E and 96° 39' 15" E. It is located 4,219 feet above sea level and is 37 miles (59.5 km) northwest of Taunggyi. Aungban is also located on Union Highway (Meiktila–Kalaw–Taunggyi–Tachileik Road), Taunggyi–Aungban–Pindaya Road and Mandalay–Kyaukse–Ywarngan–Taunggyi Road. See Figure (1)

Aungban covers an area of 2.65 square miles (1,698 acres) and includes 12 wards. Aungban is situated on a rolling plain and there is no break in extension of the town area except the western part of the town. Consequently, it has a compact form.

Aungban located in Kalaw Township lies on Shan Highland. The average elevation of Aungban lies between 4,000 and 4,500 feet.

There are no high ranges of hills in the area of Aungban. . It is occupied by undulating upland except the west edge of the town, but the highest mountain peaks are found northwest of the Aungban. About one-third of the town area is lowland part. In the study area, the average temperature is 27.36° C in maximum, 14.46° C in minimum and 20.91° C in mean, respectively.

Aungban has a Humid Subtropical Climate (Cwa). Aungban has average annual rainfall of 981.46 mm (38.64 inches). Its favourable climate is attraction for economic activities and suitable for agriculture.

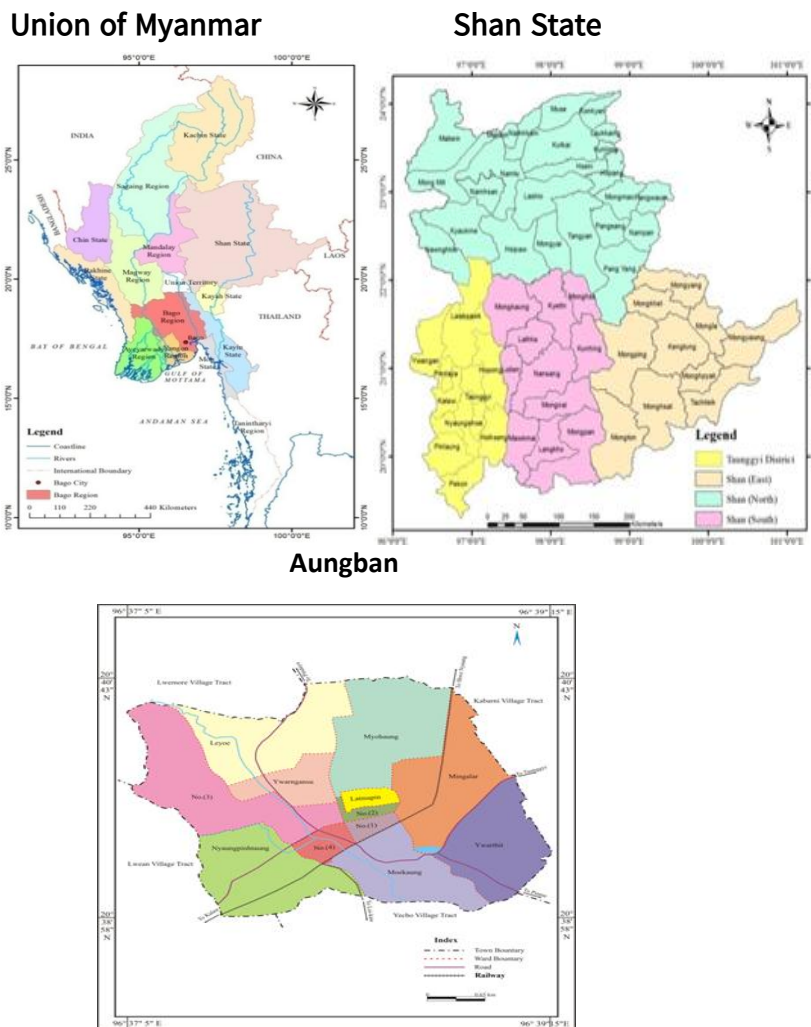
There are three main soil types, being classified in the study area. They are Red Earth and yellow Earth, Mountainous Brown Forest Soils and Meadow and Meadow Alluvial Soils. Being located in the Eastern Highland of Myanmar, and also at the height of 4,219 feet above sea level, in the natural vegetation includes ever green forest, dry hill forest and pine forest.

### (2) Social Bases

The increase of population after 1996 was gradually the influence of the economic system which was significantly changed after 1988. In 2006, the total population was 27,385 persons. In 2018, the total population of Aungban was 38,948 persons. During the 12 years period from 2006 to 2018, the population which had increased was 10,563 persons with the growth rate (2.1%).

The prime factors of the population increase in Aungban are good transportation and communication systems, and opportunity of job and business. Population distribution and density of Aungban differ from ward to ward and year after year, depending upon topography, economic activities, trading and transportation services.





**Figure 1. Location of Aungban in Kalaw Township**

Source: Land Records Department, Kalaw Township

Aungban is about 2.65 square mile or 1,698 acres. It is composed of 12 wards. In 2018, the average density for the whole town was 14,697 persons per square mile.

In 2018, the working population was 11,497 persons (34%) of the total population of Aungban. Among them, nearly 36 per cent of amounting to 4,138 persons was engaged as manual labourers and workers earning bare living or daily wage-earners. About 17 per cent (1,955 persons) was traders. There were 1,151 persons with 10 per cent and 805 persons with 7 per cent who were engaged in activities connected with agriculture and animal breeding, respectively. About 5 per cent (576 persons) of the working population was engaged in government services and departments. There were only 230 persons (2%) in industrial activities. About 3 per cent (345 persons) was engaged in other service activities. They formed 20 per cent of the working population amounting to 2,237 persons was engaged in occupation which could not be classified specifically. High Education leveled students and elders are included in this group.

### (3) Assessment on Economic Activities of Aungban

Economic activities are included in the main factors for the development of Aungban. The main economic activities of Aungban are agriculture, livestock, cottage industries, broker's sale centre services, other services and transportation, communication and trade.

#### a. Agriculture

In 2017-18, the main cultivated crops are paddy, rainy crops, winter crops and perennial crops in Aungban. Paddy is cultivated on 'Le' lands and Ya lands. It is the second largest cultivated land of Aungban in 2017-2018. They are monsoon paddy.

Monsoon crop is the largest cultivated crops of this town in 2017-2018. Total cultivated area for monsoon crop is 131 acres. The monsoon crops include maize, cabbages, cauliflowers, tomatoes, passion fruits, pigeon pea, soya bean, rice bean and other beans. Among them, the largest cultivated crop is bean with the net sown acreages 28 acres.

Winter Crop is cultivated on Ya land. It is the third largest cultivated crop of Aungban in 2017-2018. Total cultivated area for winter crop is 102 acres. The main cultivated crops are Garlic, Cabbage, Cauliflower, Tomato and, pea and bean. Out of these winter crops, pea and bean are the largest cultivated crops in Aungban.

According to the interview with some local farmers, paddy, pigeon pea, cabbage, cauliflower, passion-fruit, garlic and tomato are directly exported to Naypyi taw, Yangon, and Tachileik, and some are sold to broker's sale centers in Aungban. The remaining crops are grown for subsistence. The surplus crops are sold only in local markets.

The cultivated area of perennial crop was 35.5 acres in 2017-18. The main cultivated perennial crops were Sloes, Pears, mango, Avocado, Banana and jengkol in Aungban. The pear plantations (45.1%) occupy the largest area of the total cultivated area of perennial crop and are mostly found in Ywarthit Ward. The pears are exported to proper Myanmar according to interview with horticulturists. The rest fruits are sold only in local markets.

#### b. Livestock

About 780 persons are practiced in animal husbandry. The livestock include cow, pig, chicken, fowls, goats and ducks, etc. Draught cattle (88 buffaloes and about 100 cows), are raised only for crops cultivation. About 250 cows are raised for dairy products in Nyaungpinhtaung Ward of Aungban. About 6,570 Chickens for eggs and about 4,650 chickens for meat are raised in Aungban. Eggs and chicken for meat are distributed and sold to the local markets near the towns and villages. The rest domestic animals are raised for subsistence.

#### c. Cottage Industries

In Aungban, the main cottage industries are Shan traditional food stuff industries such as fried potato sheets, glutinous cake (Hkaoe-poke), tofu, wine and multi fruit gems. Aungban is also famous for sloe gems and fried potato sheets. The fried potato sheets industry is the largest in Aungban. Shan traditional food stuffs such as several of the fruit gems, fried potato sheets, tofu and glutinous cake (Hkaoe-poke), are brought by visitors as the souvenirs from Shan State.

#### d. Services

**Broker's sale centre** (Pwe Yone) services play a major role in the economy of Aungban. The broker's sale centres are distributed in all wards of Aungban. The total numbers of broker's sale centres are 130 in Aungban. Among them, large scale broker's sale centres are 87 and the rest is small scale broker's sale centres that are mostly located in Pyitharyar Market.

At least five kinds of crop or goods have been sold and bought in large scale broker's sale centres and only one or two kinds of crops or goods have been sold and bought in small scale broker's sale centres.

The main imported commodities to in broker's sale centres are agricultural products that are mostly flowed from Taunggyi, Kalaw, Pindaya, Pinlaung, Naungtayar Sub-township, Yaksawk and Ywarngan Townships. And then, these commodities are mainly exported to Mandalay, Naypyitaw, Nyaung U, Yangon and Tachileik. Some brokers buy and sell at markets and bazzars located surrounding Aungban, especially in local market days. (See Figure 2 and 3)

As the number of broker's sale centres is increasing in Aungban, the manual workers and crop brokers get the job opportunities because they mostly depend on these broker's sale centres.

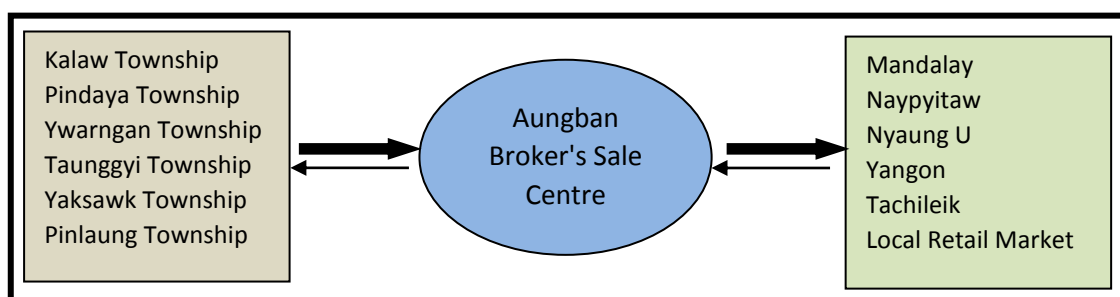
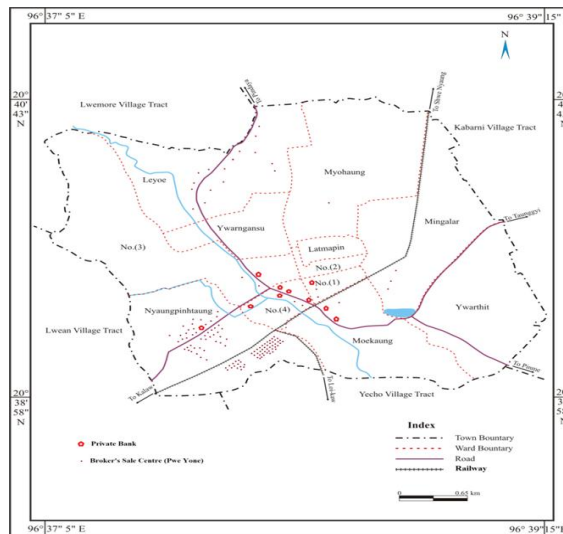


Figure 2. Commodity Flow Pattern in Broker's Sale Centres of Aungban

Source: Field Observation.

Other activities include banking services, hotel and tourism service. In 2009, there were only one state-owned bank and three private banks in Aungban. The number of private bank is increased to nine banks during the ten years period between 2009 and 2018. The banks are carrying out to serve financial services for businessmen and local people, conveniently. According to the data of Hotel and Tourism Industry, there were

four hotels, one motel and six guesthouses in 2018. The number of international tourist arrivals in Aungban was 4,211 visitors in 2012, and increased to over 20,000 visitors in 2018. Therefore, the number of arrivals had increased over four-fold within the 6-years period between 2012 and 2018.



**Figure 3. The Distributions of Pwe Yone and Private Banks in Aungban (2017–2018)**  
 Source: Field Survey and Land Records Departments, Kalaw Township

#### e. Analysis of Transportation Network

The nearness and distance of transportation manipulated to serve the economic activities in the development of a town. Therefore, the transportation section is more important than other sections. Now, transportation network (especially for road transport) of Aungban is analyzed and presented by networks analysis in this portion. The linkages (transportation routes) and nodes or vertices (main assessable points or intersection points) are the basic structural elements of a transportation network. The network is analyzed in two ways, the shortest path matrix and the mileage matrix. There are 24 nodes and 27 links in the transportation network. See Figure (5) and Table (2&3)

The ranks of accessibility of Aungban ( $V_{11}$ ) in the network are seen to be "1" according to the calculations of both the shortest path matrix and mileage matrix methods, respectively. According to the analysis by the shortest path matrix method, the town of Aungban ( $V_{11}$ ) is seen to be the most accessible town (node) of the network that is shown in the shortest path matrix. According to the analysis by the mileage matrix method, Aungban ( $V_{11}$ ) is also the least total mileages with 1,343 miles.

Therefore, Aungban ( $V_{11}$ ) is seen to be the location from which journeys and commodity transportation can easily be made to other nodes (towns and villages) in the network with a minimum aggregate mileage. Aungban has a railway station named Aungban Railway Station. Thazi-Kalaw-Shwenyaung, Shwenyaung-Pinlaung-Loikaw and Thazi-Yauksawk railways pass through the town of Aungban.

The local travellers send their products by trains less than by car because the sending of the products by car is more convenient than by train. Heho Airport plays an important role in the transport network of Aungban. See Figure (4)

Postal service system is similar to other towns and is now running 1 post offices and 1 telegraph Services in Aungban. Internet, telephone and email communications are mainly available in Aungban.

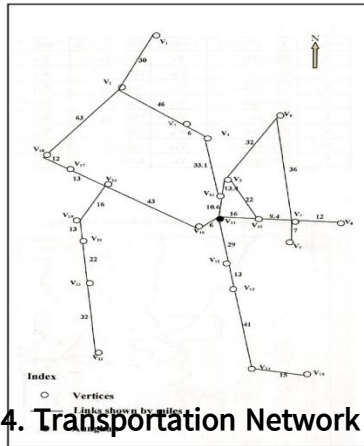


Figure 4. Transportation Network in Kalaw Township

Source: UTM Map

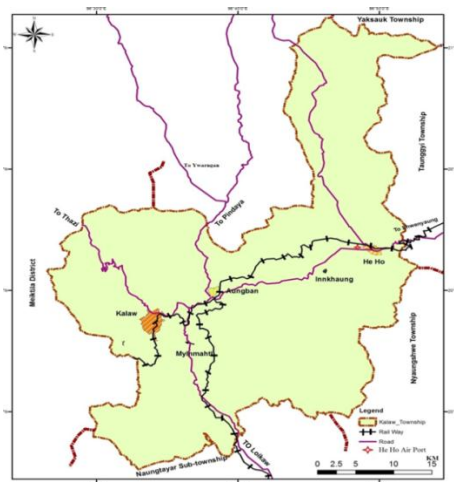


Figure 5. A Stimulated Planer Graph for (Cars) Road Network

Source: Ministry of Construction, Taunggyi Township

Table 1. The Vertices for Motor Road Network in 2018

Vertices	Town/Village	Vertices	Town/Village	Vertices	Town/Village
V <sub>1</sub>	Mandalay	V <sub>9</sub>	Nyaungshwe	V <sub>17</sub>	Thazi
V <sub>2</sub>	Kyaukse	V <sub>10</sub>	Heho	V <sub>18</sub>	Meiktila
V <sub>3</sub>	Ye U Village	V <sub>11</sub>	Aungban	V <sub>19</sub>	Pyawbwe
V <sub>4</sub>	Ywarngan	V <sub>12</sub>	Naungtayar	V <sub>20</sub>	Yamathin
V <sub>5</sub>	Pindaya	V <sub>13</sub>	Pinlaung	V <sub>21</sub>	Tatkone
V <sub>6</sub>	Yaksawk	V <sub>14</sub>	Pekon	V <sub>22</sub>	Naypyitaw
V <sub>7</sub>	Shwenyaung	V <sub>15</sub>	Loi-kaw	V <sub>23</sub>	Kyone Village
V <sub>8</sub>	Taunggyi	V <sub>16</sub>	Kalaw	V <sub>24</sub>	Payangasu

Source: Ministry of Construction, Taunggyi Township



Table 2. The Shortest Path Matrix for 2018 (Car) Road Network

V	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Accessibility	
	Total	Rank																								
1	-	0	1	2	4	5	6	7	7	5	4	5	6	7	8	4	2	1	4	5	6	7	3	3	102	21
2	0	-	0	1	3	4	5	6	6	4	3	4	5	6	7	3	1	0	3	4	5	6	2	2	80	15
3	1	0	-	0	2	3	4	5	5	3	2	3	4	5	6	3	2	1	4	5	6	7	1	3	75	12
4	2	1	0	-	1	2	3	4	4	2	1	2	3	4	5	2	3	2	4	5	6	7	0	3	66	8
5	4	3	2	1	-	0	1	2	2	0	1	2	3	4	5	2	4	4	4	5	6	7	0	3	65	7
6	5	4	3	2	0	-	0	1	1	1	2	3	4	5	6	3	5	5	5	6	7	8	1	4	81	16
7	6	5	4	3	1	0	-	0	0	0	1	2	3	4	5	2	4	5	4	5	6	7	2	3	72	11
8	7	6	5	4	2	1	0	-	1	1	2	3	4	5	6	3	5	6	5	6	7	8	3	4	94	19
9	7	5	4	3	2	1	0	1	-	1	2	3	4	5	6	3	5	6	5	6	7	8	3	4	91	18
10	5	4	3	2	0	1	0	1	1	-	0	1	2	3	4	1	3	4	3	4	5	6	1	2	56	5
11	4	3	2	1	1	2	1	2	2	0	-	0	1	2	3	0	2	3	2	3	4	5	0	1	44	1
12	5	4	3	2	2	3	2	3	3	1	0	-	0	1	2	1	3	4	3	4	5	6	1	2	60	6
13	6	5	4	3	3	4	3	4	4	2	1	0	-	0	1	2	4	5	4	5	6	7	2	3	78	13
14	7	6	5	4	4	5	4	5	5	3	2	1	0	-	0	3	5	6	5	6	7	8	3	4	98	20
15	8	7	6	5	5	6	5	6	6	4	3	2	1	0	-	4	6	7	6	7	8	9	4	5	120	23
16	4	3	3	2	2	3	2	3	3	1	0	1	2	3	4	-	1	2	1	2	3	4	1	0	50	2
17	2	1	2	3	4	5	4	5	5	3	2	3	4	5	6	1	-	0	1	2	3	4	3	0	68	9
18	1	0	1	2	4	5	5	6	5	4	3	4	5	6	7	2	0	-	2	3	4	5	3	1	78	13
19	4	3	4	4	4	5	4	5	5	3	2	3	4	5	6	1	1	2	-	0	1	2	3	0	71	10
20	5	4	5	5	5	6	5	6	6	4	3	4	5	6	7	2	2	3	0	-	0	1	4	1	89	17
21	6	5	6	6	6	6	7	7	7	5	4	5	6	7	8	3	3	4	1	0	-	0	5	2	109	22
22	7	6	7	7	7	8	7	8	8	6	5	6	7	8	9	4	4	5	2	1	0	-	6	3	131	24
23	3	2	1	0	0	1	2	3	3	1	0	1	2	3	4	1	3	4	3	4	5	6	-	2	54	3
24	3	2	3	3	3	4	3	4	4	2	1	2	3	4	5	0	0	1	0	1	2	3	2	-	55	4

Source: Self Calculation.

Table 3. The Shortest Path Matrix (Mileage) for 2018 (Car) Road Network

Vertices	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Accessibility
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																								Total	Rank	
1	0	30	76	82	128.5	160.5	151.1	163.1	158.1	141.8	125.8	154.8	167.8	208.8	223.8	131.8	105	93	134	147	169	201	115.1	118	3186	22
2	30	0	46	52	98.5	130.5	121.1	133.1	128.1	111.8	95.8	124.8	137.8	178.8	193.8	101.8	75	63	104	117	139	171	85.1	88	2526	19
3	76	46	0	6	52.5	84.5	75.1	87.1	82.1	65.8	49.8	78.8	91.8	132.8	147.8	55.8	111.8	109	114.8	127.8	14.8	181.8	39.1	98.8	1930	11
4	82	52	6	0	46.5	78.5	69.1	81.1	76.1	59.8	43.8	72.8	85.8	126.8	141.8	49.8	105.8	118	108.8	121.8	143.8	175.8	33.1	92.8	1972	14
5	128.5	98.5	52.5	46.5	0	32	31.4	43.4	38.4	22	24	53	66	107	122	30	86	97	89	101	123	155	13.4	73	1633	5
6	160.5	130.5	84.5	78.5	32	0	36	48	43	54	56	85	98	139	154	62	118	129	121	134	167	199	45.4	105	2279	18
7	151.1	121.1	75.1	69.1	31.4	36	0	12	7	9.4	25.4	54.4	67.4	108.4	123.4	31.4	87.4	99	90.4	103.4	125	157	36	74.4	1696	6
8	163.1	133.1	87.1	81.1	43.4	48	12	0	19	21.4	37.4	66.4	79.4	120.4	135.4	43.4	99.4	111	102.4	115.4	137.4	169.4	48	86.4	1960	13
9	158.1	128.1	82.1	76.1	38.4	43	7	9	0	16.4	32.4	61.4	74.4	115.4	130.4	38.4	94.4	106	97.4	110.4	132.4	164.4	43	81.4	1840	9
10	141.8	111.8	65.8	59.8	22	54	9.4	21.4	16.4	0	16	45	58	99	114	22	78	90	81	94	116	148	26.6	65	1555	4
11	125.8	95.8	49.8	43.8	24	56	25.4	37.4	32.4	16	0	29	42	83	98	6	62	74	65	78	108	132	10.6	49	1343	1
12	154.8	124.8	78.8	72.8	53	85	54.4	66.4	61.4	45	29	0	13	54	69	35	91	103	94	107	129	161	39.6	78	1799	8
13	167.8	137.8	91.8	85.8	66	98	67.4	79.4	74.4	58	42	13	0	41	56	48	104	116	107	120	142	174	52.6	91	2033	15
14	208.8	178.8	132.8	126.8	107	139	108.4	120.4	115.4	99	83	54	41	0	15	89	145	157	148	161	183	215	93.6	132	2853	21
15	223.8	198.8	147.8	141.8	122	154	123.4	135.4	130.4	114	98	69	56	15	0	104	160	172	163	176	198	230	108.6	147	3188	23
16	131.8	101.8	55.8	49.8	30	62	31.4	43.4	38.4	22	6	35	48	89	104	0	56	68	59	72	94	126	16.6	43	1383	2
17	105	75	111.8	105.8	86	118	87.4	99.4	94.4	78	62	91	104	145	160	56	0	12	29	42	64	96	72.6	13	1907	10
18	93	63	109	117.8	97	129	99.4	111.4	106.4	90	74	103	116	157	172	68	12	0	41	54	76	108	84.6	25	2107	16
19	134	104	114.8	108.8	89	121	90.4	102.4	97.4	81	65	94	107	148	163	59	29	41	0	13	35	67	75.6	16	1955	12
20	147	117	127.8	121.8	101	134	103.4	115.4	110.4	94	78	107	120	161	176	72	42	54	13	0	22	54	88.6	29	2188	17
21	169	139	149.8	143.8	123	167	125	137.4	132.4	116	108	129	142	183	198	94	64	76	35	22	0	32	110.6	51	2647	20
22	201	171	181.8	175.8	155	199	157	169.4	164.4	148	132	161	174	215	230	126	96	108	67	54	32	0	142.6	83	3343	24
23	115.1	85.1	39.1	33.1	13.4	45.4	36	48	43	26.6	10.6	39.6	52.6	93.6	108.6	16.6	72.6	85	75.6	88.6	110.6	142.6	0	59.6	1441	3
24	118	88	98.8	92.8	73	105	74.4	86.4	81.4	65	49	78	91	132	147	43	13	25	16	29	51	83	59.6	0	1699	7

Source: Self Calculation.

## Conclusion

### Findings, Results and Discussion

Aungban, a commercial town of Kalaw Township and is located on the Union Highway, thus there are direct accessible from both Upper and Lower Myanmar by highway buses. Road transport can serve more smoothly to every nook and corner of the town of Aungban than other transports.

Aungban is also famous for sloe gems and fried potato sheets. The industry of fried potato sheets is the largest in Aungban. Shan traditional food stuffs such as several of the fruit gems, fried potato sheets, tofu and glutinous cake (Hkaoe-poke), are bought by visitors as the souvenirs from Shan State.

As the number of broker's sale centres increasing in Aungban, the manual workers and crop brokers get the job opportunities because they mostly depend on these broker's sale centres. Aungban is the trading centre of agricultural products in Kalaw Township. Broker's sale centre (Pwe Yone) services and banking services play a major role in the economies of Aungban. There are 10 banks that are carrying out to serve financial services for businessmen and local people, conveniently.

The transportation network is analyzed by the shortest path matrix method; the town of Aungban ( $V_{11}$ ) is seen to be the most accessible town (node) of the network that is shown in the shortest path matrix. According to the analysis by the mileage matrix method, Aungban ( $V_{11}$ ) is also the least total mileages with 1,343 miles. Therefore, Aungban ( $V_{11}$ ) is seen to be the location from which journeys and commodity transportation can easily be made to other nodes (towns and villages) in the network with a minimum aggregate mileage.

The local travellers are less to send their products by trains because the sending of the products by car is more convenient than by train. With the good transportation and communication system, the economic activities develop more and the living standard of local people is higher in Aungban than in the past time.

After the study on the economic activities of Aungban, the following factors are suggested:

- \* Instead of the residential lands in Aungban have been expanded into agricultural lands, the buildings should be built as high buildings.
- \* Entrepreneurs and businesses should invest in Aungban because of its location, favourable climate and assessable connectivity.

\* With more development in economy and urban infrastructure, and increase in the number of population in Aungban, Myoma Market, the main market, should be upgraded as high storeyed buildings.

\* Some streets within the town should be upgraded for easily accessible to anywhere especially in northern parts of Mingalar and Ward No.3.

\*Traffic congestions and traffic jams occur at the junction of Union Highway and Aungban-Pindaya Road and the environment of Myoma Market as there are broker's sales centers where loading and unloading of goods are carried out. Therefore, the car and motorbike parking should be exactly and systematically designated.

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