

TRAFFIC AND TRADE FLOWS DURING 24-HOUR OPERATION AT ICQS, BUKIT KAYU HITAM

Noor Zahirah Mohd Sidek, Ernieza Suhana
Mokhtar, Sahubar Ibrahim Ismail Gani

ABSTRACT

This paper examines the impact of extended hours of operation from 18 hours to 24-hour daily from 18th June 2019 to 17th June 2020 at the Immigration, Customs, Quarantine, and Security (ICQS) Bukit Kayu Hitam entry point at the Malaysia-Thailand border. Results show that the extended hours, especially from 0000 hours to 0559 hours constitute only 0.7% of total daily traffic. Reasons contributing to such low traffic count especially during the extended hours is partly attributed to the fact that logistics companies, forwarding companies, and businesses see no urgency to use the extended hours as the demand for their services do not increase within those hours. In addition, the impact of COVID-19 which led to nationwide lockdown had played a significant role in reduced traffic flows. Lower demand worldwide led to less traffic even at the ICQS, Bukit Kayu Hitam. Hence, the government should maintain the normal operating hours of 18 hours daily and operate from 0600 to 2359 hours.

Keywords: *24-hour operation, traffic flows, Geospatial Analysis (GIS), trade, border*

1. INTRODUCTION

The suggestion for 24-hour operation at the Immigration, Customs, Quarantine, and Security (ICQS), Bukit Kayu Hitam stemmed from two main issues. First, during the construction of ICQS, the lanes were reduced to one lane causing massive traffic jams from Malaysia to Thailand, especially during holiday seasons. Secondly, in an effort to boost the economy of Malaysia and Thailand and to increase investment, trade flows, and connectivity, both governments have agreed to extend the normal 18-hour to 24-hour operation at the ICQS, Bukit Kayu Hitam in Malaysia dan Customs, Immigration, and Quarantine (CIQ), Sadao in Thailand. The 24-hour operation serves as a

double-edge instrument to reduce traffic congestions during normal operating hours and to promote more exports from Malaysia to Thailand. A trial period of 3 months commenced at 12.01 a.m. on 18th June 2019 and lasted until 17th September 2019. The extended hours from 0000 to 0600 hours only involved cargo and goods movements using lorries, container trucks, and other heavy commercial vehicles. Passenger, private, and other commercial vehicles have retained the normal 18-hour operation. The first evaluation report for both Malaysia and Thailand documented that the 3-month trial period is insufficient to determine the effectiveness of the 24-hour operation. Businesses and factories may need time to adjust and make necessary changes to reap the benefits of extended operating hours. Hence, the effectiveness of the 24-hour operation could be hampered due to lagged response from these logistic providers and businesses.

Based on these deliberations, both governments agreed to extend the exercise for the next 9 months to enable proper evaluation and assessment of the effectiveness of the 24-hour operation. The extension is intended to allow stakeholders such as industries, factories, logistics companies, forwarding companies, and Penang Port Sdn. Bhd. (Penang Port) to adjust to the extended hours. The total trial period summed up to 12 months or one year from 18th June 2019 to 17th June 2020. Despite the COVID-19 pandemic which became alarming in February 2020, the 24-hour operation continued. Since humans are the vector for COVID-19 virus transmission, the Malaysian government imposed the movement control order (MCO) on the 18th March 2020 followed by other versions of movement controls to curb the spread of the pandemic. Generally, most countries closed their border to curb the spread of the pandemic. Consequently, trade decreased substantially, and subsequently, the number of traffic reduced significantly.

The objective of this paper is to examine the impact of the extended operating hours from 18-hour to 24-hour operation daily on trade flows and traffic movement. Trade flows and traffic movement of commercial or cargo vehicles are linearly related since more trade could be reflected by the increased number of commercial traffic movements.

This paper is organized as follows. The next section reviews the state of bilateral trade between Malaysia and Thailand. Section III overviews the traffic movement between Malaysia and Thailand through ICQS, Bukit Kayu Hitam entry/exit point. Section IV analyses traffic movements using the Geographical Information System (GIS) and the final section concludes.

2. MALAYSIA-THAILAND TRADE FLOWS

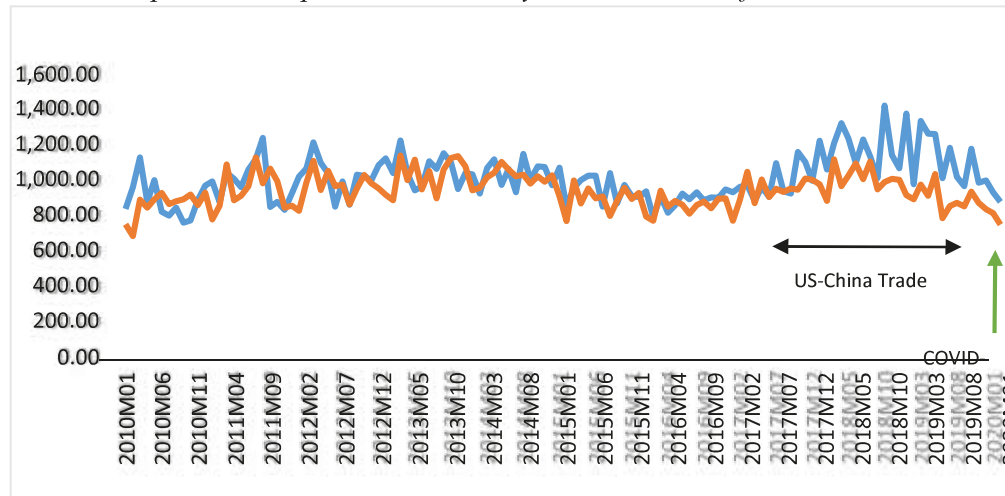
The negative impact of the COVID-19 pandemic on the global economy and trade flows is unprecedented. Although major economic sectors such as food, logistics, finance, and health continue to operate, other economic activities were halted due to lockdown measures to curb the spread of the deadly pandemic. Factories could not operate at their usual capacity which in a way, disrupted the supply chain of raw materials. Non-essential economic sectors such as the cosmetics industry had to temporarily stop operations when a lockdown was imposed. Reduction or non-operation of these non-essential sectors interrupted the supply chain ecosystem especially on the logistics since no production leads to less use of transportation of the goods. For factories that operated, as usual, exports of non-essential goods declined since consumers are curbing their spending on essential goods and tend to save more during this period of uncertainty. This is reflected in the bilateral trade, and traffic movements between Malaysia and Thailand.

Traffic flows from Malaysia to Thailand are largely attributed to both private vehicles and commercial vehicles. The performance of bilateral trade between Malaysia and Thailand effectively determines the number of commercial vehicles that cross the border of both states. In the case of entry of goods and services from Thailand to Malaysia through the Northern Border, the goods can either be for domestic consumption or categorized as 'transit' goods since companies from the southern part of Thailand use Penang Port to export their goods to East Asia countries such as China, Hong Kong, and Japan. Goods from Malaysia are mainly for domestic or industrial use in Thailand. Figure 1 shows the overall bilateral exports and imports between Malaysia and Thailand from 2010 to 2020 (May). In general, bilateral trade between the two countries was following an upward trend albeit with some minor fluctuations, even during the US-China trade war.

However, the COVID-19 outbreak had significantly reduced bilateral trade between the two countries. The border was generally closed since both Malaysia and Thailand implemented different forms of lockdowns to curb the spread of the deadly virus. Although infections were temporarily reduced in Malaysia after the first Movement Control Order (MCO), the public had been relatively careful with their consumption spending due to uncertainty and loss of jobs during the MCO. Similarly, companies postponed some of their investments due to movement restrictions which impeded business activities. The third wave of infection was more severe compared to the first and second waves with an average of around 3000 daily cases. It was a difficult situation for the government since lifting restrictions on movement was necessary for economic recovery, but more movements lead to higher infection. Borders are generally closed but illegal immigrants continue to arrive which led to the spread of the virus. This was the common problem faced by Malaysia and Thailand. Malaysia faced the threat of illegal immigrants from Myanmar and the Philippines which partly contributed to the outbreak in the state of Sabah, and later, to Peninsular Malaysia whilst Thailand which houses borders from five different countries were threatened by these illegal immigrants which later transmitted local infections.

Figure 1

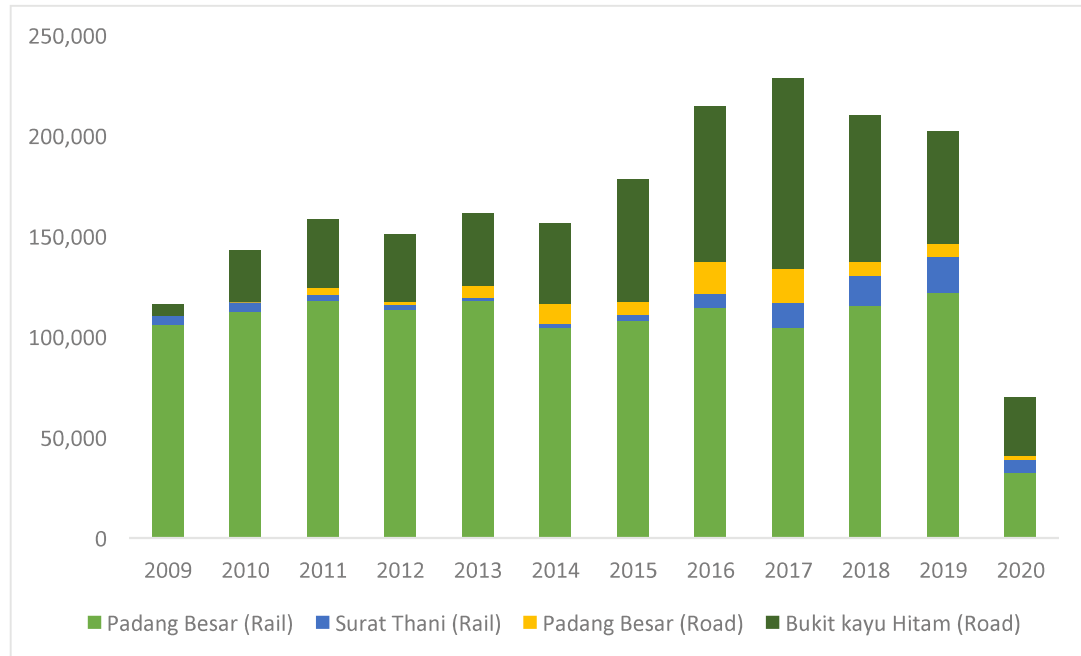
Bilateral Exports and Import between Malaysia and Thailand from 2010 to 2020



Source: IMF (2020). Notes: The blue line indicates exports, and the orange line indicates imports.

Figure 2

The Number of Containers (TEUs) from Thailand to Malaysia (Penang Port – transit goods)



Source: PPSB (2020). Notes: For 2020, data is from January to May.

Figure 2 shows the number of containers (TEUs) from Thailand to Penang Port, Malaysia which would be exported to China, Hong Kong, Japan, other East Asian countries, Australia and New Zealand. The containers are mainly from companies and industries operating in the South of Thailand which uses Penang Port for cost and distance reasons. The transport cost of exporting via shipping through Penang Port is much cheaper compared to transporting the goods to other ports in Thailand such as Bangkok Port or Laem Chabang. The proximity of Penang Port vis-à-vis Bangkok Port or Laem Chabang Port allows further cost savings. Figure 2 also shows the more popular mode of transport of containers. Railways are relatively more popular compared to the road since the cost per container is much cheaper. Since the container movements are for export purposes, the US-China trade war had affected such movements.

Figure 2 shows a slight decrease in container movement during the trade war which began to take effect in 2018 and 2019. The US-China trade war started in 2017 when the US initiated investigations on goods from China using the Trade Act of 1974 and the Trade Expansion Act of 1962. On the 22nd January 2018, the US enforced trade protectionism on solar panels and washing machines from China which further ignited the trade tensions between the two economic powerhouses. The trade conflict escalated with the imposition of an additional tariff on aluminum and steel imports from China under section 232, Trade Expansion Act of 1962. Any trade conflict between the US and China would have a significant impact on Malaysia and Thailand. US and China are the second and third largest export destination for Malaysia, accounting for 23.1% of total export in 2019 (Department of Statistics, 2020). China is the destination of 38.7% of the electric and electronic (EE) products and the exports of EE to the US is approximately 53.5% between July 2018 - July 2019 (MIDA, 2020). The slight fall in the number of containers from Thailand was due to reduction of exports of rubberwood to furniture industries in China. Reduction in exports of furniture to the US simultaneously reduces the need for rubberwood from Thailand which is reflected in the reduction of the number of containers from Thailand to Penang Port in 2018 and 2019. The plunge in the number of containers in 2020 was due to both Malaysia and Thailand closing the borders to curb COVID-19.

3. TRAFFIC FLOWS OF TRUCK / CONTAINER DURING 24-HOURS OPERATION AT ICQS, BUKIT KAYU HITAM

Table 1 illustrates the percentage of trade movements for imports and exports between Malaysia and Thailand. The number of lorries is less than 1% of total trade flows. Figure 3 shows the total number of truck movements from Malaysia to Thailand between June 2019 to May 2020. A few interesting points can be highlighted based on Figure 3. The number of lorries without cargo is greater than the number of lorries with cargo. Lorries during the extended hours (0000 to 0559 hours) are almost negligible and the trend is consistent throughout the sample period. On average, the daily number of lorries through the ICQS Bukit Kayu Hitam is around 8200 to 9000 lorries. The data in June 2019 starts from 18th June to 30th June, hence the number is half of the average numbers. The sudden spike in April 2020 was due to the movement control order (MCO) and other entry points in the north of Peninsular Malaysia were closed to curb the transmission of COVID-19. Traffic through entry points of Padang Besar, Wang Kelian and During

Burung was diverted to ICQS Bukit Kayu Hitam. The disruptions in manufacturing sectors and non- essential economic sectors were translated into lower production and eventually, lower trade. This is shown by the lower number of lorries in May 2020 where the economy begins to show signs of contraction.

Table 1

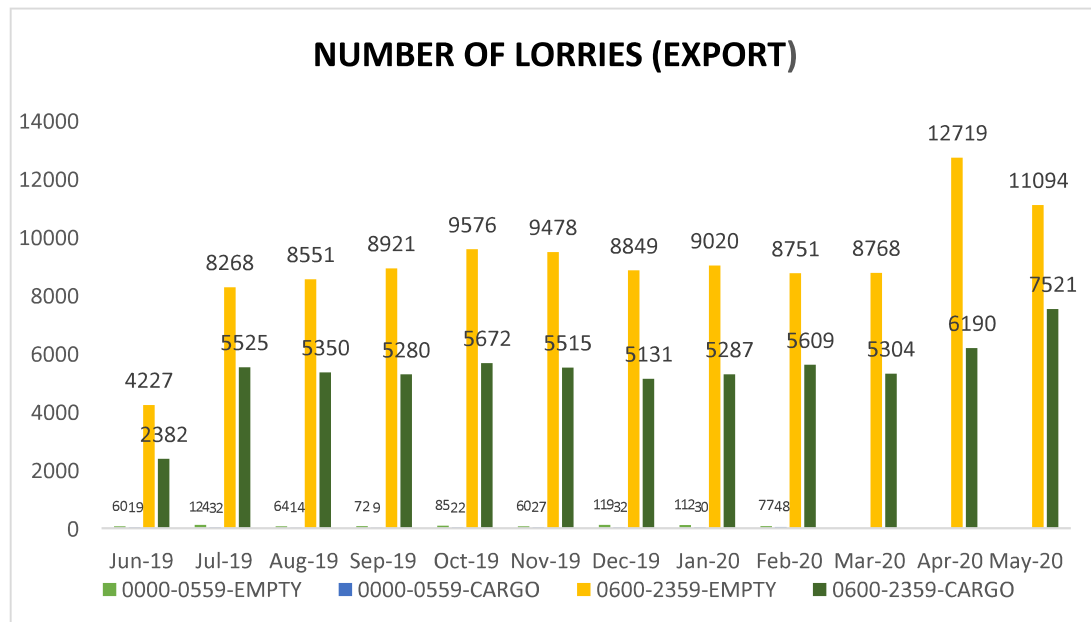
Percentage of entry and exit of lorries for exports and Imports from June 2019 to February 2020 through ICQS Bukit Kayu Hitam

Month	Exports		Imports		Total	
	% Lorries 0000-0559	% Lorries 0600-2359	% Lorries 0000-0559	% Lorries 0600-2359	% Lorries 0000-0559	% Lorries 0600-2359
JUNE 2019	1.18	98.82	0.25	99.75	0.71	99.29
JUL 2019	1.12	98.88	0.14	99.86	0.61	99.39
AUG 2019	0.56	99.44	0.21	99.79	0.38	99.62
SEPT 2019	0.57	99.43	0.04	99.96	0.30	99.70
OCT 2019	0.70	99.30	0.23	99.77	0.46	99.54
NOV 2019	0.58	99.42	0.09	99.91	0.33	99.67
DEC 2019	1.07	98.93	0.15	99.85	0.59	99.41
JAN 2020	0.98	99.02	0.55	99.45	0.76	99.24
FEB 2020	0.86	99.14	0.35	99.65	0.60	99.40

Source: JKDM, BKH (2020). Data entry and exit of commercial vehicles from 0000 to 0559 hour is only available from June 2019 to February 2020. .

Figure 3

Number of Lorries from Malaysia to Thailand (Malaysia's Exports to Thailand) from June 2019 to May 2020

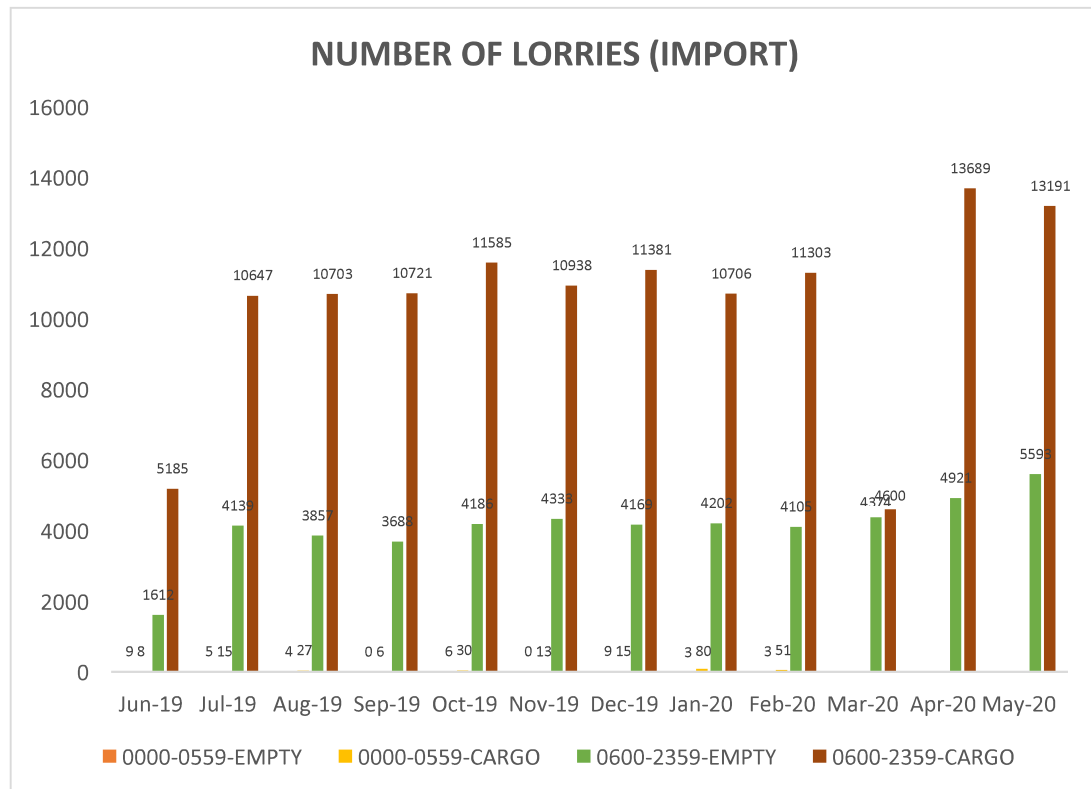


Source: JKDM, BKH (2020)

Figure 4 shows the movement of lorries from Thailand to Malaysia (Imports). The influx of lorries from Thailand ranges between 10,600 to 11,500 lorries daily. The number of lorries with cargo far exceeds lorries without cargo. Both Figures 3 and 4 suggest that imports from Thailand via ICQS, Bukit Kayu Hitam is higher than exports based on the number of lorries with cargo and without cargo for both entry and exit. The COVID-19 pandemic had reduced imports, and this is shown in March 2020 with the number of lorries plunging from 15,563 in February to only 8,974 in March which is equivalent to almost a 42.34% reduction. The numbers picked up in April and May 2020 due to the closure of other entry points, which makes ICQS Bukit Kayu Hitam the only entry point in the north-west of Peninsular Malaysia.

Figure 4

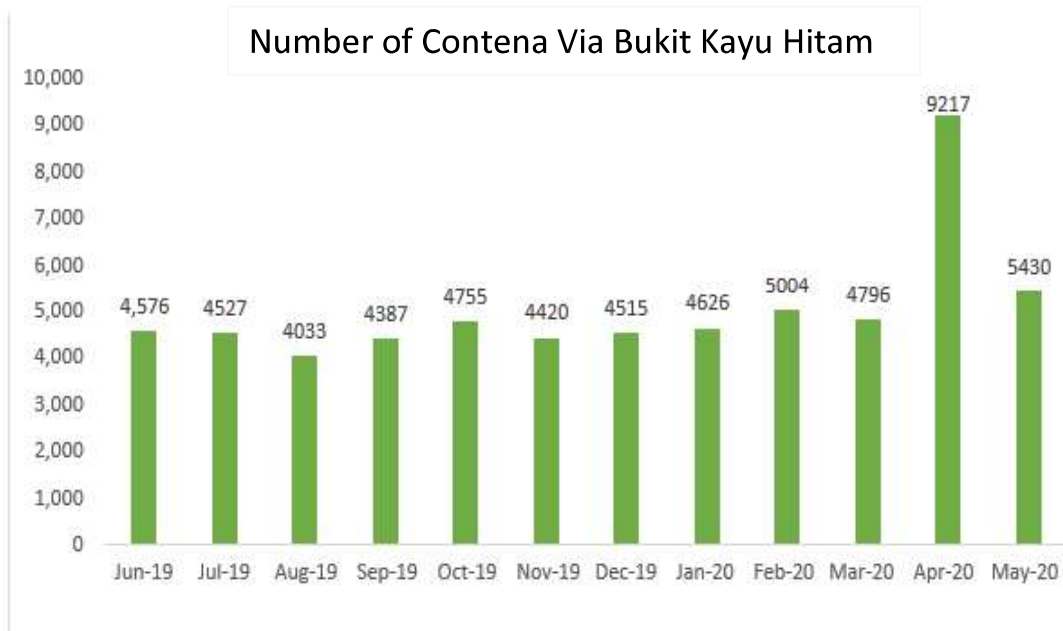
Number of Lorries from Thailand to Malaysia (Malaysia's Import from Thailand) from June 2019 to May 2020



Source: JKDM, BKH (2020)

Figure 5

Number of Containers from Thailand to Penang Port via ICQS, Bukit Kayu Hitam (June 2019 to May 2020)



Source: PPSB (2020)

Figure 5 shows the number of containers from Thailand to Penang Port during the 24-hour extended operation at the ICQS, Bukit Kayu Hitam. There is no significant increment in the traffic flow of containers except in April 2020. The abrupt increase of almost 92.18% in April 2020 was due to the closure of other entry points for heavy goods vehicles (HGV) with ICQS Bukit Kayu Hitam as the only entry point. In May 2020, the number of container movements reduced to 5,430 which is the normal range prior to the COVID-19 pandemic. However, since ICQS Bukit Kayu Hitam is the only entry point after March 2020, this situation reflects an actual net reduction of containers or exports of Thailand to other countries via Penang Port. Figures 1 and 2 in the previous section reflect the reduction in total trade between Malaysia and Thailand and total containers via Penang Port.

4. TRAFFIC FLOW ANALYSIS USING GEOSPATIAL ANALYSIS

Traffic flows obtained from Google Map (<https://www.google.com/maps>) were marked from sixteen (16) observation points around the entrance and exit of the ICQS using the Geographical Information System (GIS) technique (Figure 6). The geospatial analysis, a kriging tool, was used to map the traffic flow for three (3) days between 10 to 15th August 2019 to capture trade flows during different periods and on different days. The days chosen were Sunday and Tuesday, which are working days in Kedah, whilst Friday is a non-working day. For Tuesday and Friday, it is working day for both countries, Malaysia and Thailand. Table 4 shows the entrance and exit location, which is selected near several buildings such as Oliver Hotel Danok, Orange Grand, and Queen Park, which are located in Thailand, while Ping Hang Timepiece Sdn. Bhd, Police Station Bukit Kayu Hitam (BKH) and Fire and Rescue Station BKH in Malaysia.

Table 2

Location of Entry and Exit Point at the Bukit Kayu Hitam Border

Exit	Entry	Location
A	I	Oliver Hotel Danok
B	J	Orange Grand
C	K	Queen Park
D	L	
E	M	Ping Hang Timepiece Sdn. Bhd
F	N	
G	O	Police Station BKH
H	P	Fire and Rescue Station BKH

Figure 6

Location of Observation Points



i. Traffic Flow on 3rd August 2019

Traffic flows were observed at 9 a.m. (a, b), 12 p.m. (c, d), and 6 p.m. (e, f) at the entrance and exit of ICQS (Figure 7). Figure 7a shows the traffic movement at the exit point of the ICQS, Bukit Kayu Hitam, which was relatively slow-moving at 9 a.m. It is due to the increment numbers of the vehicle crossing the Malaysia – Thailand border. However, the traffic volume decreases from 12 p.m. (Figure 7c) until 6 p.m. (Figure 7e). In opposite flow, the heavy traffic volume entrance ICQS center has been identified at 12 p.m. (Figure 7d) and keep rising until 6 p.m. starting from Thailand to Malaysia sides (Figure 7f). The road was congested due to the end of working hours at the entrance and along Malaysia's roadside.

ii. Traffic Flow on 11th August 2019

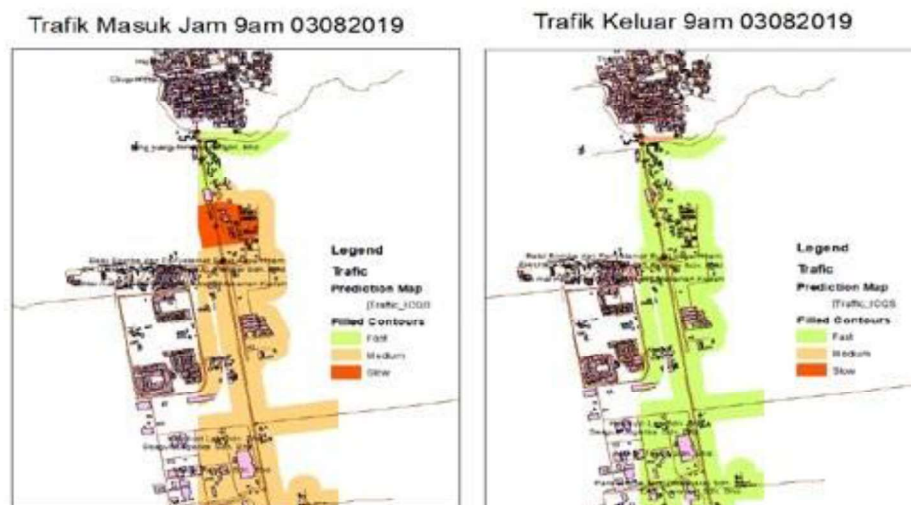
On 11th August 2019, traffic inflow into Malaysia was relatively slow. The traffic volume was indicated as a medium and fast flow at 9 a.m. (Figures 8a and 8b) and 6 p.m. (Figures 8e and 8f) respectively at the entrance – exit of ICQS. Nevertheless, the situation was exacerbated at 12 p.m. due to the public holiday on 10th August 2019 at the exit of ICQS, which is Malaysia to Thailand (Figure 8c). The situation was quite different on 3rd August 2019, especially at the Malaysia entrance from 12 p.m. until 6 p.m.

iii. Traffic Flow on 13th August 2019

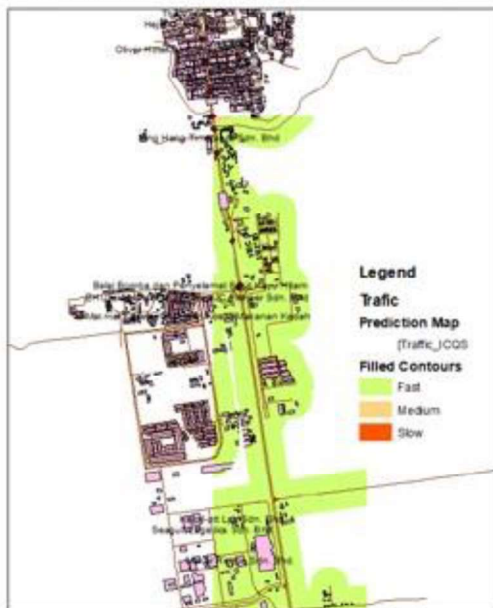
The traffic movement at the entrance and exit point of the ICQS, Bukit Kayu Hitam, was relatively slow-moving at 9 a.m. (Figures 9a and 9b). The road became congested starting 12 noon to 6 p.m. for entrance and exit of ICQS, which happened in the Thailand area. It presents some problems in Thailand's traffic operation.

Figure 7

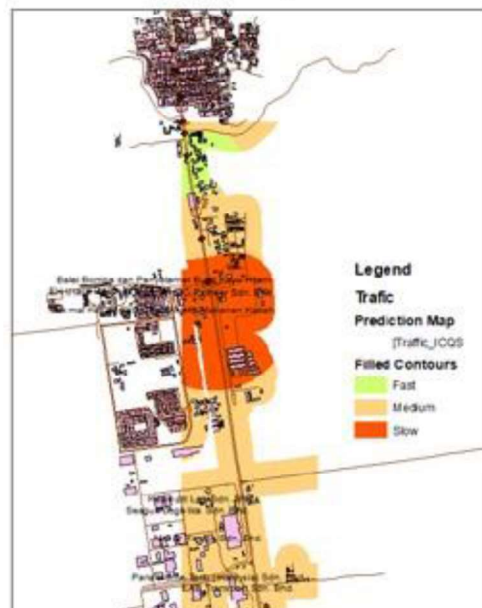
Traffic Flow on 3rd August 2019 (Saturday) for Entrance (a, c, e) and Exit (b, d, f) of ICQS



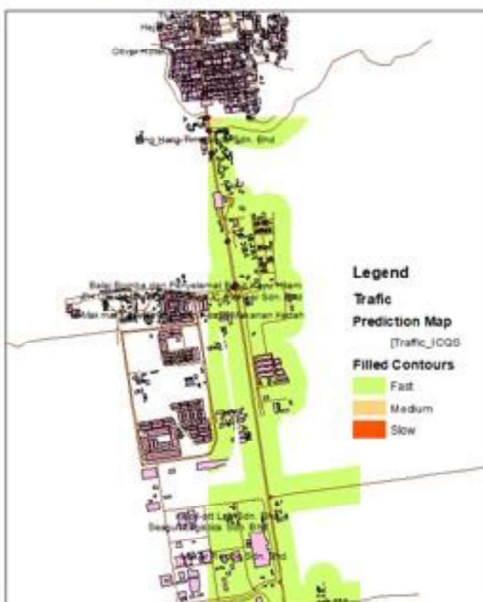
Trafik Masuk Jam 12pm 03082019



Trafik Keluar Jam 12pm 03082019



Trafik Masuk Jam 18pm 03082019



Trafik Keluar Jam 18pm 03082019

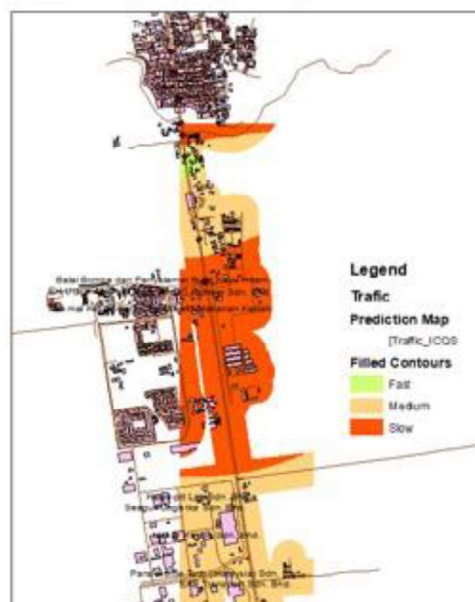
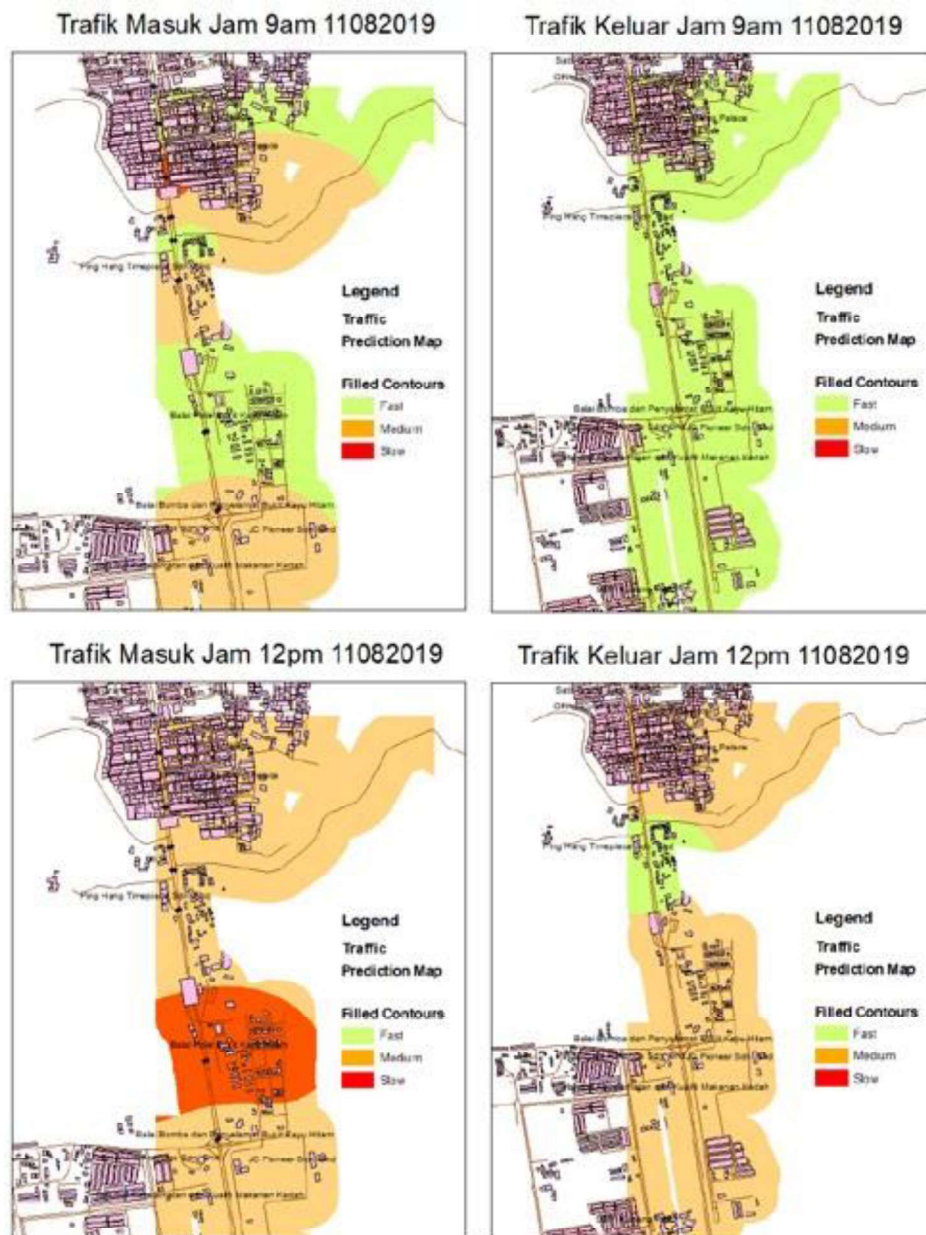


Figure 8

Traffic Flow on 11th August 2019 (Saturday) for Entrance (a, c, e) and Exit (b, d, f) of ICQS



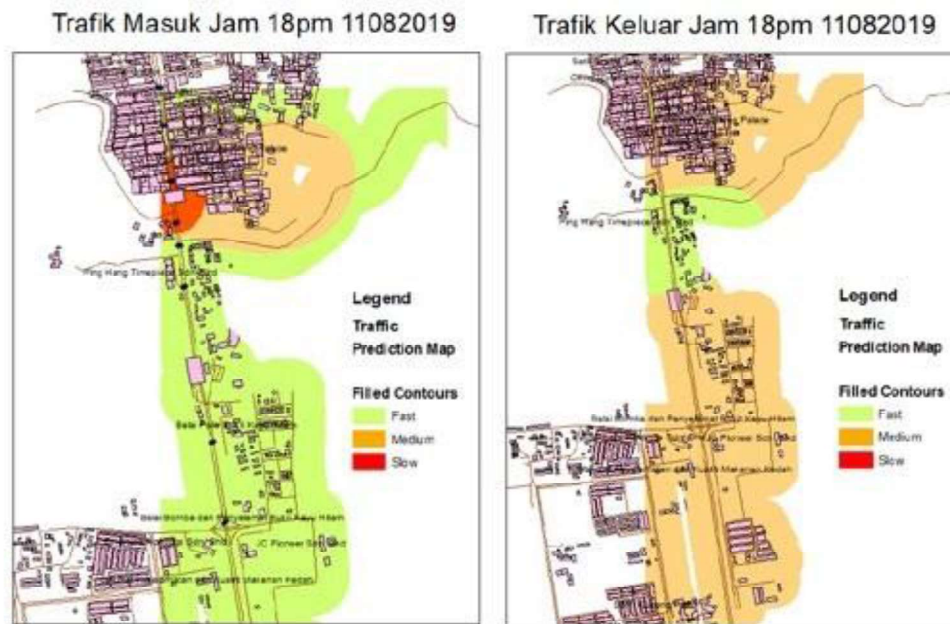
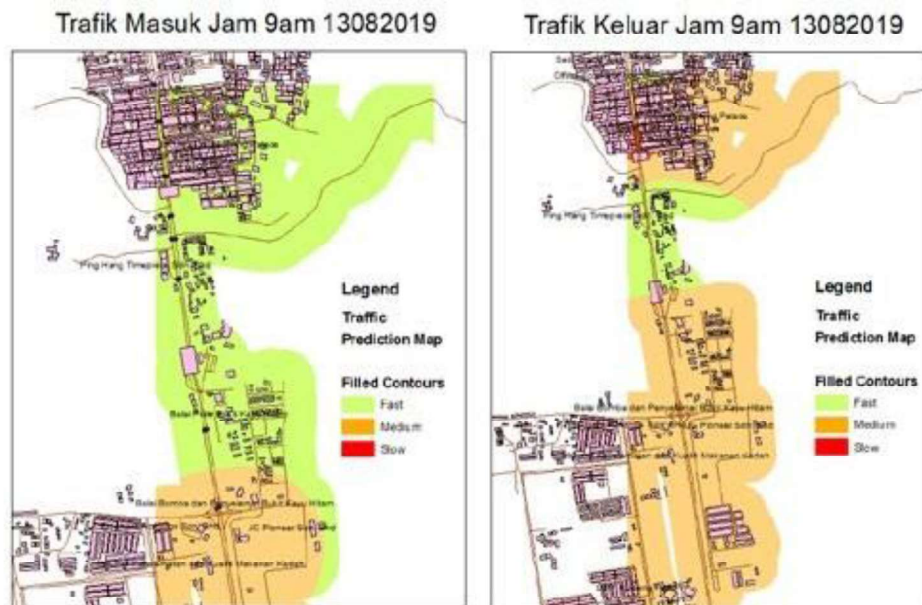
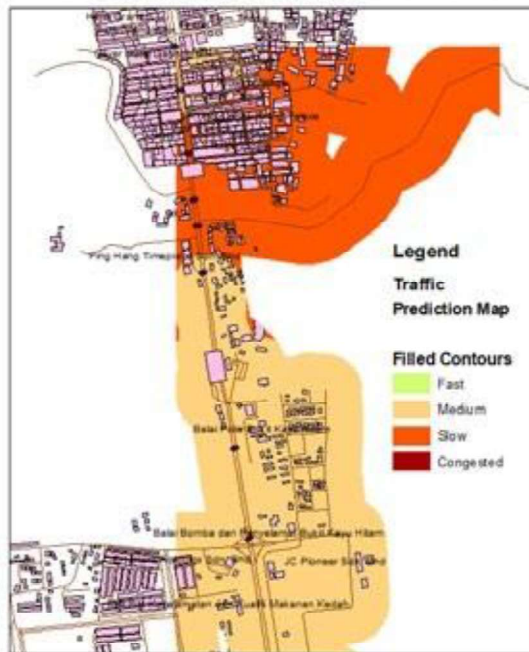


Figure 9

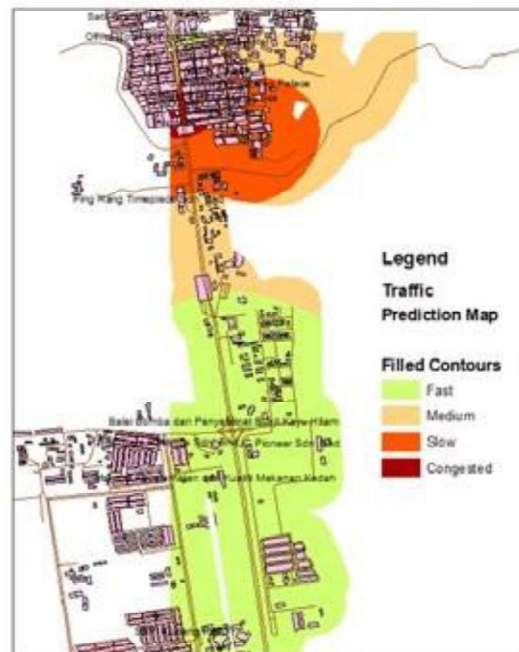
Traffic Flow on 13th August 2019 (Saturday) for Entrance (a, c, e) and Exit (b, d, f) of ICQS



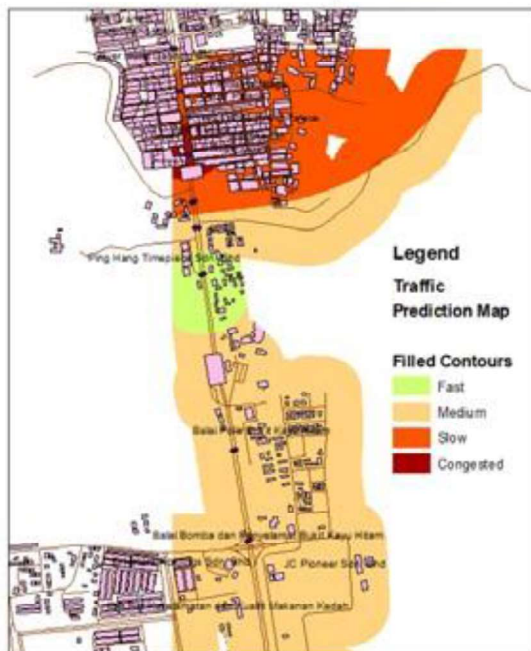
Trafik Masuk Jam 12am 13082019



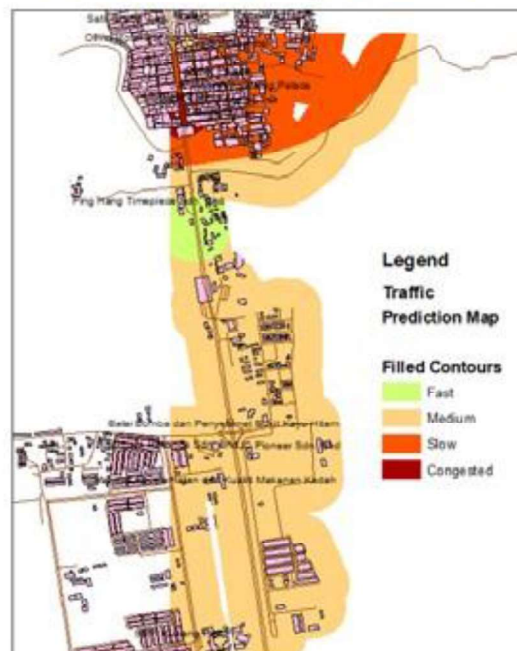
Trafik Keluar Jam 12am 13082019



Trafik Masuk Jam 18pm 13082019



Trafik Keluar Jam 18pm 13082019



5. OBSERVATION OF TRAFFIC FLOWS WITHIN 24 HOURS ICQS OPERATION

Table 3 illustrates private vehicles' traffic movement such as cars, lorries, buses, and vans at the border on the 10th and 15th August 2019. The study was conducted at four sections of ICQS building; Blocks A and E (truck stop), B and D (bus stop), and C (public transport), for 24 hours starting from 9 a.m. (0900 hours) until 7 a.m. (0700 hours) the next day. The majority of transportation modes were private vehicles such as cars followed by lorries and buses/van.

Table 3

Volume of Traffic: Entry and Exit at Bukit Kayu Hitam-Sadao Border

	Lorries				Cars				Bus/Van			
	MAL-THAI		THAI-MAL		MAL-THAI		THAI-MAL		MAL-THAI		THAI-MAL	
	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date
Time (Hour)	10.8	15.8	10.8	15.8	10.8	15.8	10.8	15.8	10.8	15.8	10.8	15.8
0800 - 1159	55	96	64	91	324	250	308	339	49	4	12	5
1200 - 1359	87	79	40	37	177	192	217	324	24	0	9	11
1400 - 1659	35	46	61	92	311	251	371	458	9	9	5	11
1700 - 2359	95	140	55	130	644	384	601	919	20	3	2	5
0000-0559	3	6	0	0	0	0	0	0	8	16	0	0
Total	275	367	220	350	1456	1077	1497	2040	110	32	28	32

Notes: MAL – Malaysia, THAI – Thailand. The dates are written as follows: 10.8 denotes 10th August 2020.

(i) Traffic Flows for Buses and Van

The traffic flows from Malaysia to Thailand on the 10th August 2019 is a public holiday for Malaysia, whilst 15th August 2019 is a normal working day for both countries. About 110 buses were recorded on the 10th August 2019, and only 32 buses were recorded on 15th August 2019, which shows that Malaysian travel to Thailand for short holidays, usually at peak hours between 2- 5 p.m.

For the Thailand – Malaysia route, no major changes were recorded on a normal working day and during public holidays, with 32 and 28 buses recorded. No peak hours are recorded since traffic is almost consistent throughout the day. The influx of buses and vans from Thailand to Malaysia is also less compared to outflows from Malaysia to Thailand. The results indicate that tourist from Malaysia to Thailand is much higher compared to tourist from Thailand to Malaysia.

From the observation, the bus and van vehicle types have not crossed the border of Malaysia – Thailand after midnight. It can be concluded that there are fewer travelers who chose bus or van as transportation in either direction after midnight.

(ii) Traffic Flows for Lorries

For the Malaysia-Thailand route, 275 and 367 lorries were recorded on the 10th and 15th August 2019, respectively. From the observation, the result found that the peak hours for lorries crossing the border to be within 1200 -1359 p.m. with 87 (10th August 2019) and 79 (15th August 2019), whilst at 5 p.m. to midnight, it was about 95 (10th August 2019) and 140 (15th August 2019). The lowest traffic movement volume for lorries found between 2 – 5 p.m. Furthermore, between midnight to 6 a.m., only 3 and 6 lorries were recorded on the 10th and 15th August 2019, indicating very low traffic movements during the extended hours.

For the Thailand-Malaysia route, 220 and 350 lorries were recorded during the same dates. Peak entry time was between 8 a.m. to 12 noon for both dates. During this time, piling up of traffic is due to forwarders waiting for

document release from the respective agencies at the ICQS, Bukit Kayu Hitam. On a similar note, between 12 a.m. to 6 a.m., no lorries were recorded on both dates.

(iii) Traffic Flows for Private Vehicle (Car)

The findings show that private vehicle usage (car) was the most mode of transportation chosen by travellers to cross Malaysia and Thailand border. Table 3 indicates that the heavy movement's peak hours were between 5 p.m. to midnight and followed by 8 a.m. to 12 p.m. About 60% and 22% of the total number of private vehicles travelled to Thailand on 10th August 2021 at 5 p.m. to midnight and 8 a.m. to 12 p.m., respectively. The lowest car movement was at 12 p.m. to 1.59 p.m. on both dates.

6. ROUTE TIME TRAVEL ESTIMATION

A route-based distance is estimated to calculate the length of commercial vehicles such as lorries from the departure warehouse to the destination warehouse. This method estimated the distance based on the type and location of the road and route used. Figure 10 shows the difference between flying distance (shortest-path) from Stesen Bomba Bukit Kayu Hitam to Syarikat JC Pioneer Sdn. Bhd.

Distance is estimated using a route-based distance technique. Figure 10 demonstrates the duration of travel time from toll and entry points at the Lebuhraya PLUS in Kedah and Perlis to the ICQS, Bukit Kayu Hitam. The speed limit of 90 km/hour is used since it is the speed limit for commercial vehicles weighing 7.5 tonnes and below. Speed limit 80 km/hour is designated for commercial vehicles weighing more than 7.5 tonnes. An example of the scenario is as follows: A 7.5 tonnes commercial vehicles travel from Plaza Tol Gurun at 8 a.m. is expected to arrive at the ICQS, Bukit Kayu Hitam at approximately 8.54 a.m. since the estimated time of arrival (ETA) at 90km/hour for the distance of 81.6 km is approximately 54 minutes. Table 4 presents the estimation arrival time from destination to ICQS building based on estimation distance and speed limits.

Figure 10

Route Estimation Method

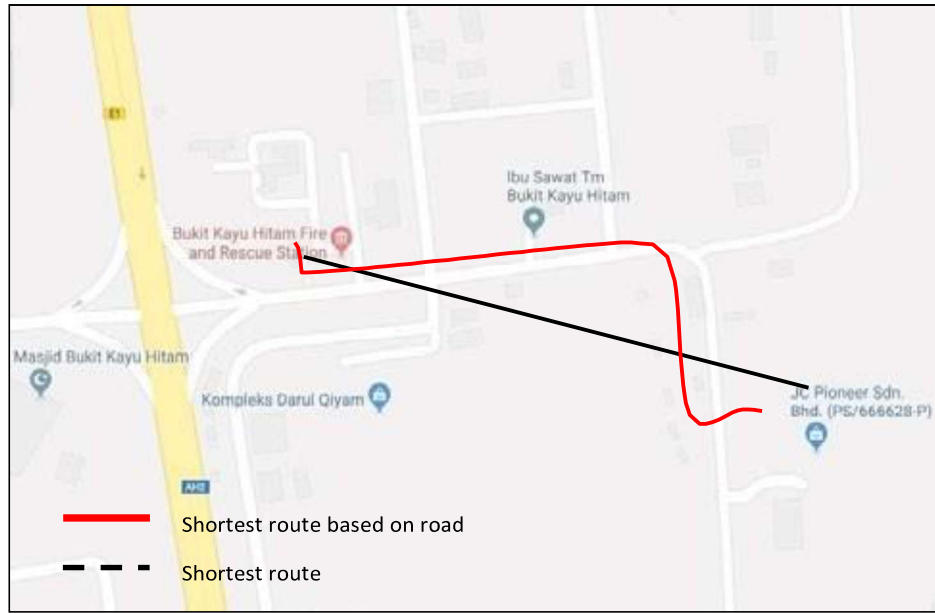


Table 4

Estimated Time of Arrival (ETA)

FROM	DISTANCE (km)	TIME (SPEED) - (90KM/J)	TIME (SPEED) - (80KM/J)
Bukit Kayu Hitam	0.8	00:00:32	00:00:36
Changlun	7.5	00:05:00	00:05:37
Jitra Utara	26.1	00:17:24	00:19:35
Plaza Tol Jitra	30.9	00:20:36	00:23:11
Jitra Selatan	31.5	00:21:00	00:23:37
Kepala Batas	35.5	00:23:40	00:26:37
Plaza Tol Alor	44.3	00:29:32	00:33:14
Setar Utara			

Plaza Tol Alor Setar Selatan	51.7	00:34:28	00:38:46
Plaza Tol Gurun	81.6	00:54:24	01:01:12
Plaza Tol Sungai Petani Utara	101	01:07:20	01:15:45
Plaza Tol Sungai Petani Selatan	110	01:13:20	01:22:30

7. FUTURE MEASURES TO INCREASE ECONOMIC ACTIVITIES AND SIMULTANEOUSLY INCREASE TRAFFIC FLOW

The 24-hour operation can be re-introduced when economic activities begin to pick up post-COVID-19 pandemic. Such extension in operation hours only makes sense when the trade between Malaysia and Thailand doubles the existing amount. Planned infrastructure projects should be continued. The Economic Planning Division (Bahagian Perancang Ekonomi Negeri Kedah – BPEN) had proposed two major development projects, (i) Kota Perdana Special Border Economic Zone (KP SBEZ) owned by Northern Gateway Sdn. Bhd., and (ii) Kedah Science and Technology Park (KSTP). Figure X shows the location of the two potential projects.

The SBEZ project consists of three major parts – (i) IMT-GT Logistics Corridor System, (ii) Industrial Hub, and (iii) Border Trade Township. If this project and its components take off and succeed, it is estimated that 40,000 new jobs would be created by 2030. The IMT-GT Logistics Corridor System is a platform designated for intra-ASEAN trade. The state government planned to develop and upgrade transportation facilities, create logistics hubs, logistics centers, storage, delivery centers, and free trade zones. The truck depot development project costing RM25 billion should be continued to provide the infrastructure to support the movement of goods between Malaysia and Thailand. Figure X shows the location of the truck depot at KP SBEZ. This new depot will offer single clearance with maximum security to allow truck drivers to rest whilst ensuring the safety of their consignments. This depot will be equipped with warehousing facilities under contract and a non-contract basis for the storage of export cargo or cargo awaiting regulatory clearance by MAQIS. Freight forwards will be allocated office space. The

development of the truck depot aims to eventually reduce cost and reduce transport time.

Figure 11

Location of KP SBEZ and KSTP



Source: BPEN, Kedah (2020)

Figure 12

Location of Truck Depot Development at KP SBEZ



Source: BPEN, Kedah (2020)

The state and federal government aim to build an Inland Container Depot (ICD) in Kota Perdana within the next 2-5 years. The goal of ICD is to be the facilitator for transhippers which provide a smooth inter-mode or inter-capital network and a safe, modern, and competitive logistics area. It will serve as a feeder dry port to promote exports. It is estimated that exports would increase by 30% or 500,000 TEUs to Penang Port (seaport).

Other supporting infrastructures such as the construction of 28 kilometers of railway routes connecting the dry port (ICD) and seaport (Penang Port) through Kodiang to Bukit Kayu Hitam and up to Songkhla. The Industrial hub consists of three main components, (i) Free Industrial Zone (FIZ) at KP SBEZ, (ii) Kedah Science and Technology Park (KSTP), and Bukit Kayu Hitam Industrial Park (near KSTP). The Free Industrial Zone will focus on polymer (gloves and synthetic gloves) and food technology especially on repackaging with the '*halal*' status. Kedah Science and Technology Park (KSTP) will focus on advanced material, agro-technology and the science of '*halal*', education, research and development, renewable energy, and other technology-based industries. Finally, the Bukit Kayu Hitam Industrial Park will focus on logistics and advance material. The IMT-GT Business Centre will be the border trade township that focuses on local and foreign ownerships. Other components include the Bukit Kayu Hitam Central Business District and Free Commercial Zones with premium outlets.

Finally, more trade mission to Thailand needs to be undertaken from time to time to increase bilateral trade between the two countries. Given the economic downturn due to the pandemic, the government must continue to spend and invest in infrastructure projects to create more jobs, increase businesses and continue to emulate the latest technology and development.

8. CONCLUSION

The aim of this paper is to examine the impact of 24-hour operation at the ICQS, Bukit Kayu Hitam on trade and traffic. The reason for extending operation hours from 18-hour (0600 hours to 2359 hours) to 24-hour is to boost trade and other economic activities between Malaysia and Thailand. The spill-over effect of increased trade and economic activities would promote development near the border and areas surrounding Bukit Kayu Hitam. The analysis is conducted using traffic count data during the 24 hours with the sample from June 2019 to May 2020 whilst detailed movement of traffic is between June 2019 to February 2021. To complement the analysis, the GIS is used to map traffic flows at the ICQS, Bukit Kayu Hitam. No massive traffic jam was recorded during the normal operating hours. Even during peak hours, no major traffic bottlenecks were recorded based on our GIS analysis. Results suggest that the extended hours did not lead to an increased number of traffic inflows and outflows for lorries, HGV, and other vehicles carrying commercial goods, hence, defeating the purpose for such extension in operating hours. The number of traffic inflows and outflows for the extended hours at ICQS Bukit Kayu Hitam, on average, is less than 1% throughout the sample. Hence, reverting to the original operating hours would be a better solution until logistic and business operators are ready to fully utilize and maximize the 24-hour operation.

Acknowledgement

This paper is based on *Laporan Interim Pengoperasian 24 Jam di ICQS Bukit Kayu Hitam* and *Laporan Akhir Pengoperasian 24 Jam ICQS Bukit Kayu Hitam*. The usual disclaimer applies.

References

- Bahagian Pembangunan Ekonomi Negeri Kedah (BPEN) (2020). Pelan Pembangunan Negeri Kedah. Kedah Darul Aman.
- Department of Statistics (various issues). Monthly Trade Statistics. Department of Statistics, Putrajaya, Malaysia.
- Jabatan Kastam Diraja Malaysia (2019, 2020). Data. Ministry of International Trade and Industry (2020). Trade Data. MITI, Kuala Lumpur, Malaysia.
- Ministry of Home Affairs (2019). Laporan Interim Pengoperasian 24 Jam di ICQS, Bukit Kayu Hitam, IPSOM, KDN, Malaysia.
- Ministry of Home Affairs (2020). Laporan Akhir Pengoperasian 24 Jam di ICQS, BukitHitam, IPSOM, KDN, Malaysia.
- Penang Port Sdn. Bhd. (2020). TEU Data from Thailand. PPSB, Pulau Pinang, Malaysia.