

PERSPECTIVE

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Assessing Challenges Facing the ECRL’s Economic Accelerator Projects (EAPs)

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A general view of the Dungun Tunnel is pictured during a ceremony at the East Coast Rail Link (ECRL) project in Dungun, Terengganu, on 25 July 2019. On this day, Malaysia restarted a \$10-billion, China-backed rail project. Photo: Rushdi Samsudin, AFP.

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EXECUTIVE SUMMARY

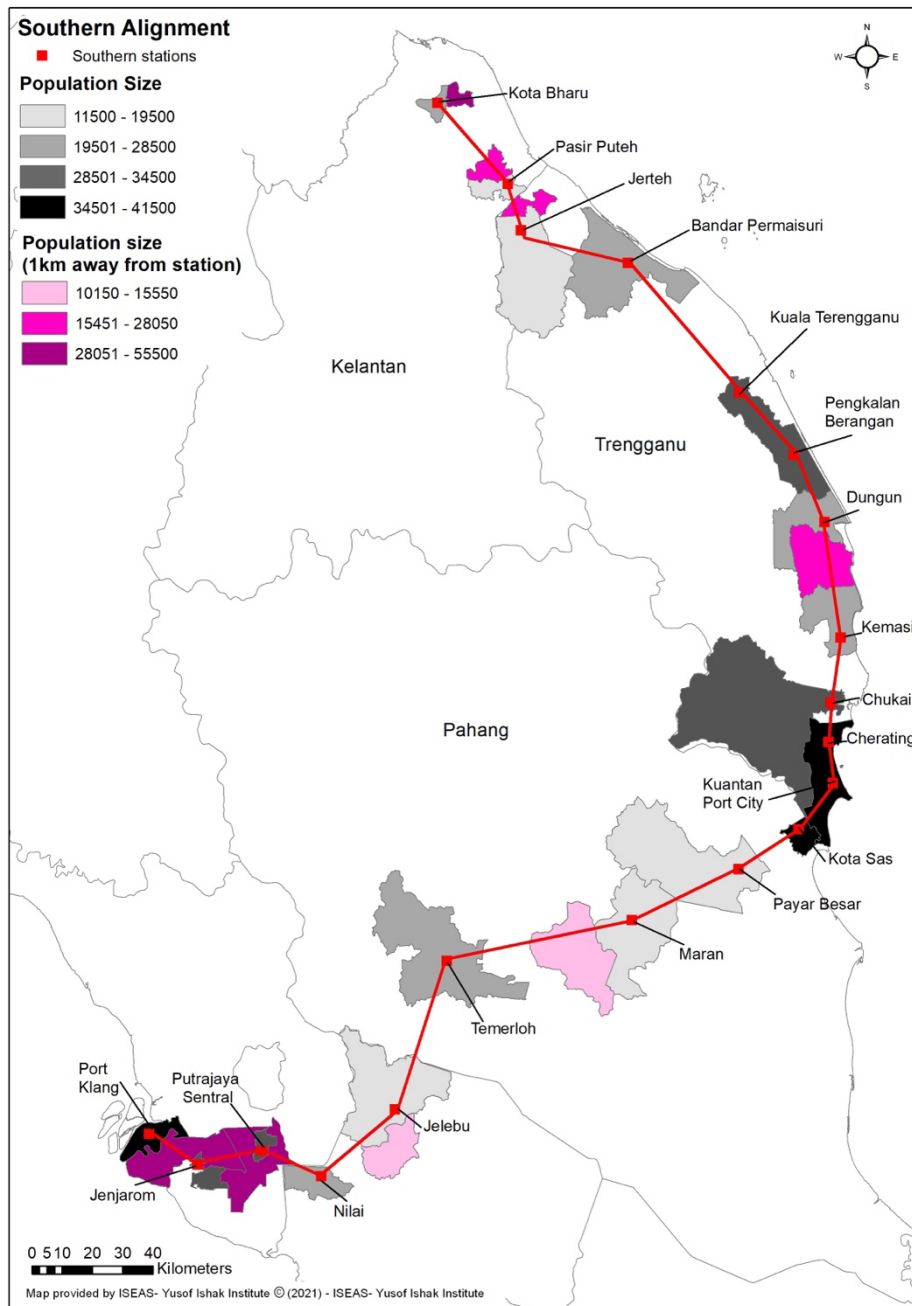
- The East Coast Rail Link (ECRL) launched in 2017 to enhance connectivity between the west and east coast of Peninsular Malaysia was renegotiated and rebooted in 2019. It is currently proceeding on track, towards completion by 2027.
- The Malaysian Investment Development Authority (MIDA) launched Economic Accelerator Projects (EAPs) in 2019 to drive up demand for freight and passenger services by increasing economic activities along the ECRL routes, by means of industrial parks, and logistic hubs and Transit-Oriented Developments (TODs).
- If industrial parks are to be used to attract investments to the less developed states in Peninsular Malaysia, reforms to local institutions and upgrading of the investment environment there will be needed.
- Having inter-modal transportation centres such as dry ports and TODs along the ECRL route are promising; however, the location of these centres should be determined according to technical criteria, rather than by changes in administration.
- Successful implementation of intermodal transportation centres, be it dry ports or TODs, requires cooperation and collaboration among all relevant stakeholders, including local governments, key transportation players and local communities.
- The government continues to have an important role to play in the establishment of these intermodal centres, especially in planning and ensuring last-mile connectivity.

INTRODUCTION

The East Coast Rail Link (ECRL), upon completion, will provide a rail link between the more developed west coast and the less developed east coast of Peninsular Malaysia. The project agreement was signed in November 2016 between the owner Malaysia Rail Link Sdn Bhd (MRL)¹ – an entity wholly-owned by the Malaysian Ministry of Finance – and the general contractor China Communications Construction Company Ltd (CCCC), in the presence of then-Prime Minister Najib Razak.² The project cost was an estimated RM46 billion when the agreement was first inked, but that escalated to RM 65.5 billion by 2018 due to an expansion of its scope, among other reasons. When the Pakatan Harapan (PH) administration took over from Barisan Nasional (BN) after the 2018 General Election, the future of ECRL became uncertain. It was, however, relaunched in 2019 after some renegotiations.

The renegotiated project shaved off RM21.5 billion from its price tag, down to RM44 billion, with Export-Import (Exim) Bank of China financing 85 percent through a loan. Debt servicing costs were estimated at RM24 billion.³ The ECRL was rerouted to achieve the cost reduction.⁴ Instead of travelling along the coastal area of Kelantan and Terengganu, the line was amended to serve localities further inland.⁵ The main change was for the rail line to be rerouted southwards to go through Negeri Sembilan before heading north to Port Klang, thus skipping Bentong and central Selangor (see Map 1).

Map 1: Population along ECRL stations (southern alignment) according to the number of registered voters in various state constituencies



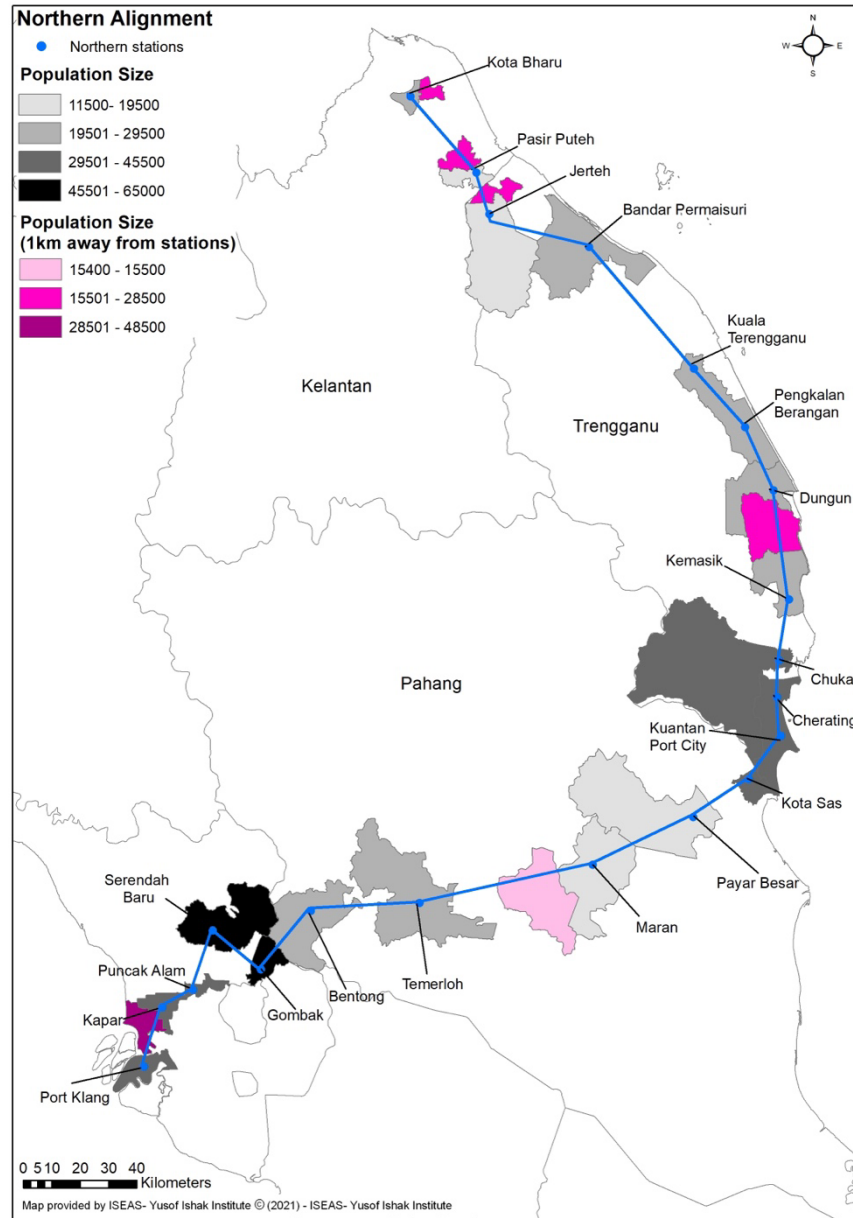
Note: There are *two* state seats with similar population size between Cherating and Kota SAS, which are not reflected in the map due to similar colour tones.

Source: SPR Malaysia, Jabatan Perancangan Bandar dan Desa, Pusat Geospasial Negara, Tindak Malaysia. See endnote 32 for disclaimer.

However, the PH government that did the renegotiations collapsed in February 2020 and was replaced by a government led by Perikatan Nasional (PN). Malaysia’s current Transport Minister Dr Wee Ka Siong announced on 5 April 2021 that the PN government was reverting the ECRL back to the northern alignment. Specifically, the change involves

Section C of the line, running between Port Klang in Selangor and Temerloh in Pahang (see Map 2).

Map 2: Population along ECRL stations (northern alignment) according to the number of registered voters in various state constituencies



Note: There are *three* state seats of similar population size between Chukai and Kota SAS, which are not reflected in the map due to similar colour tones.

Source: SPR Malaysia, Jabatan Perancangan Bandar dan Desa, Pusat Geospasial Negara, Tindak Malaysia. See endnote 32 for disclaimer.

Despite the many changes in route, in costing and with the emergence of the Covid-19 pandemic in 2020, the construction of the ECRL is ahead of schedule.⁶ In 2019, after the relaunch of the ECRL, an additional agreement was signed between the Malaysian

Investment Development Authority (MIDA) and CCCC to develop the corridors along the ECRL with industrial parks, infrastructure, logistics hubs and Transit-Oriented Developments (TODs).⁷ These EAP projects were placed under the jurisdiction of MIDA, as attracting private domestic and foreign investments was deemed the key for implementing the EAPs. MIDA subsequently launched a dedicated ECRL unit to facilitate the promotion and development of Economic Accelerator Projects (EAPs) along the ECRL corridor, primarily as investment projects.⁸ This paper assesses challenges facing the EAPs in driving demand for ECRL’s freight and passenger services.

THE ECRL: PROJECTIONS AND EAPS

Freight Cargo and Ridership Projections

Revenue for ECRL is to come from freight and passenger transport, at an estimated ratio of 7:3 respectively. Although the estimated revenue amount is not revealed, the 2017 and 2020 Environmental Impact Assessment (EIA) does provide estimates on the freight and passenger volume.⁹

The projected freight cargo for the ECRL has been brought down substantially in the 2020 EIA report,¹⁰ when compared to the 2017 EIA report (see Table 1).¹¹ The bulk of freight goods ferried within the first year of operation, based on the 2020 EIA, are expected to be Export/Import containers and Iron Ore. Other goods, including palm oil, steel and coal only constitute a small share of overall goods transported.

Table 1. Estimated ECRL freight volume and passenger ridership, based on 2017 and 2020 EIA

Estimated freight, volume in million tonnes	2027	2030	2032	2040
2017 EIA	NA	37.28	NA	44.08
2020 EIA	9.0	NA	15.8	NA
Estimated ridership, numbers in millions	2027	2030	2032	2040
2017 EIA	4.8	5.6	5.9	8.1
2020 EIA	4.1	5.6	6.6	7.9

Note: NA - not available

Source: EIA reports 2017 and 2020

The passenger forecast was similarly revised downwards in the 2020 EIA report, compared to the 2017 EIA (see Table 1).

Despite the revised estimates, the projected freight and passenger figures for ECRL remain rather optimistic, if Keretapi Tanah Melayu (KTM)’s annual figures are to serve as a reference point. Comparing these projections with the total freight freight traffic for KTM Cargo for Peninsular Malaysia, which includes the landbridge right up to Songkla in Thailand, the total freight traffic for KTM Cargo peaked in 2014 at 7.83 million tonnes of

carried cargo. And since then, the numbers have declined to just under six million tonnes for 2017 and 2018 (Table 2).

Table 2. KTM freight volume between 2014 and 2018

	2014	2017	2018
Freight volume by KTM in million tonnes	7.1	5.6	5.8

Source: Ministry of Transport Malaysia ¹²

The forecasted number for ECRL in 2027 according to the 2020 plan – at nine million tonnes, is 50 percent higher than the total cargo freight carried by KTM for the whole of Peninsular Malaysia. This appears optimistic. Likewise, the forecasted ECRL ridership number for 2027 in the 2020 report – at 4.1 million – also appears unlikely since the KTM passenger ridership on long-distance trains (for both intercity and ETS) was just under 8 million in 2019.¹³ Most of these trips were made along the Peninsula’s West Coast, with the existing rail line between Kelantan and Negri Sembilan (through Pahang) only recording a fraction of the total ridership. As the population density in Kelantan, Terengganu and Pahang are much lower than in the West Coast, the ECRL will have to provide reliable and affordable pricing to attract passengers.

Clearly, driving up the demand for freight cargo and passenger traffic by rail is critical for achieving the aspired targeted freight cargo. But the current preferred mode of freight transportation in Malaysia is via road haulage while rail freight service is unattractive due to service issues such as the time factor, frequency, and flexibility in fulfilling customer needs. Passenger rail traffic also needs to compete with alternative modes of transport such as buses, private vehicles and low-cost air carriers. Pahang and Terengganu (excluding northern Terengganu) are well served by the East Coast Expressway which provides direct and fast access to Kuala Lumpur. Each of the three state capitals on the east coast (Kota Bahru, Kuantan and Kuala Terengganu) are also well served by low-cost carriers. This provides invaluable lessons on the critical importance of operational efficiency for the ECRL. Even if the ECRL can attain the required operational efficiency, demand-generating effects that are to be derived from the EAPs are badly needed.

Economic Accelerator Projects (EAPs)

Economic Accelerator Projects (EAP) in the form of industrial parks, transit-oriented development (TODs) and logistics hubs are currently planned along the ECRL route to increase both passenger and freight volumes.¹⁴ Two industrial parks are planned, one on the east coast and one on the west coast, but each with a different focus. The planned industrial park on the east coast, in Terengganu, will focus on downstream metal and minerals processing, manufacturing, e-commerce, construction, and petrochemical industry (except the mining of oil, gas and minerals). The industrial park on the west coast is to be located in Negeri Sembilan, and it will focus on hi-technology industries and energy sector (possibly including a high technology park). The three logistics hubs are to be located at Kuantan Port City, Temerloh and Port Klang while seven TODs are earmarked based on the 2020 route

configuration. The stations listed for TODs are Kota Bharu, Kuala Terengganu, Kota SAS, Temerloh, Nilai, Putrajaya Sentral and Jenjarom.¹⁵

While the goal of designating specific projects to raise demand and investment along the ECRL corridor is commendable and appropriate, the identified projects face serious challenges.

CHALLENGES FACING THE EAPS

Building Industrial Parks in the less developed states of Malaysia

Industrial parks are not new in Malaysia. In fact, there are, listed in MIDA's directory, a total of 63 industrial parks in the country (Table 3).

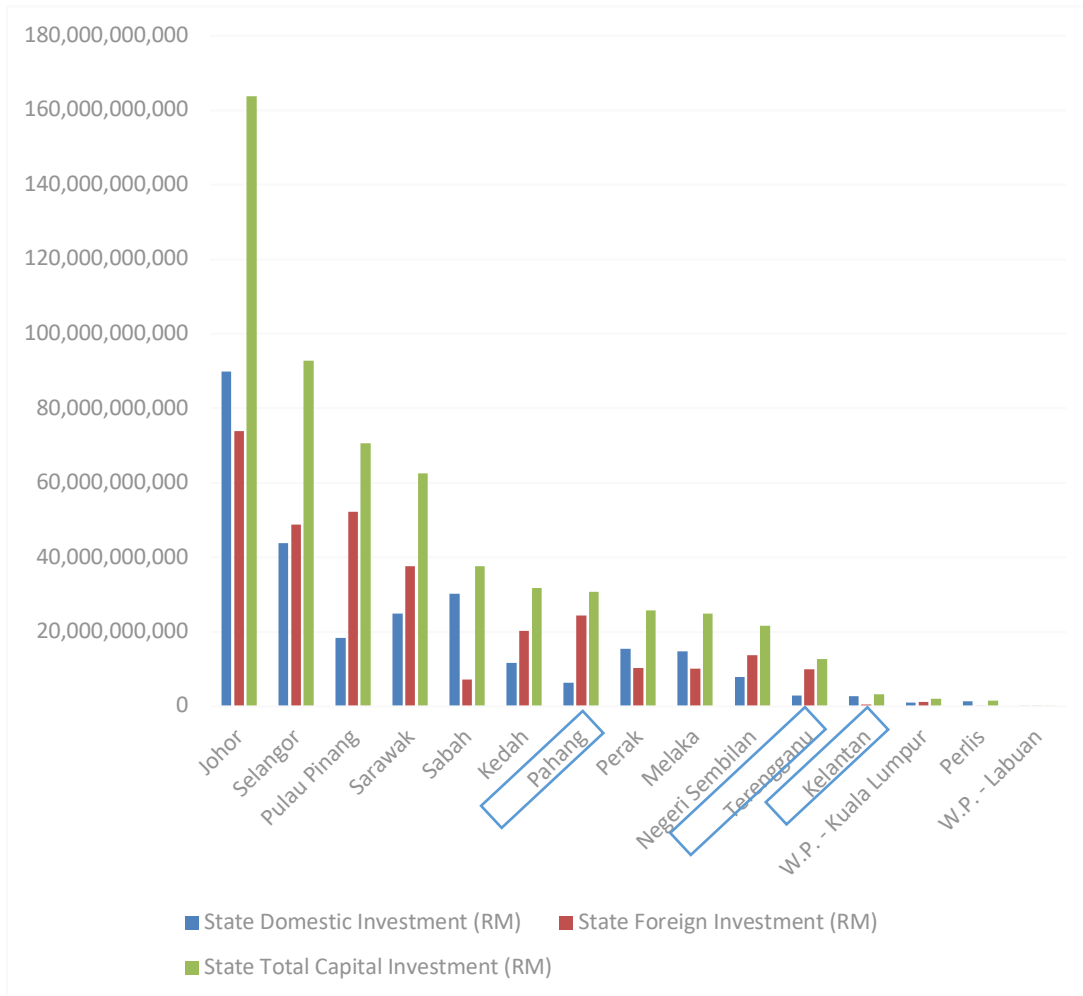
Table 3. Industrial parks in ECRL states

Selangor	16
N. Sembilan	15
Kelantan	8
Terengganu	13
Pahang	11

Source: *MIDA*
(<https://www.fmm.org.my/images/articles/publication/Malaysia%20Industrial%20Park%20Directory.pdf>)

Given that there are already existing industrial parks in the states traversed by the ECRL, the priority should not be building another one, especially in states where the record of approved and implemented FDI and DDI are low (Negeri Sembilan, Pahang, Kelantan, and Terengganu) (see Figure 1 and Figure 2) relative to Selangor, Johor and Penang, the top three states for both types of investments.

Figure 1. Approved manufacturing investments, by states (domestic and foreign sources), 2013-2020

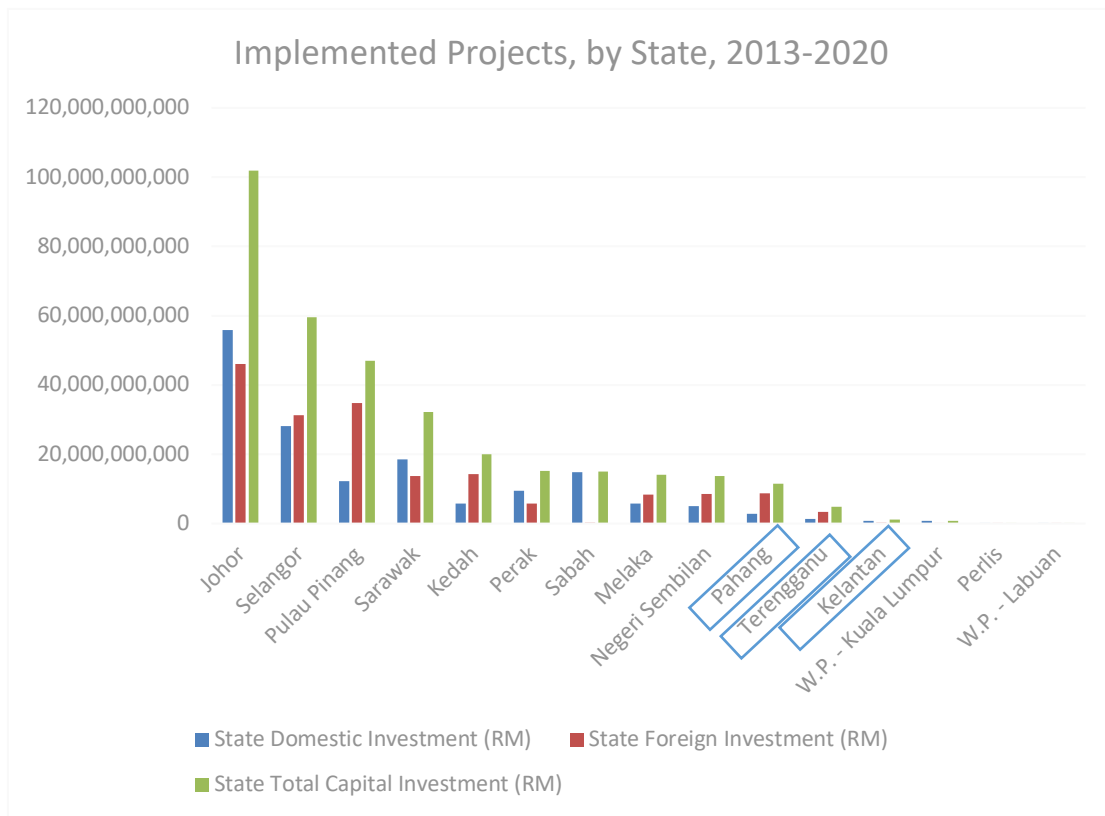


Source: MIDA

The approved investments for the east coast states of Pahang, Terengganu and Kelantan (Figure1) continued to remain substantially smaller relative to the more developed states on the west coast despite the launch of the East Coast Development Region (ECDR) as one of the development corridors in 2008. This reflects the relatively poorer investment climate there, despite dedicated promotion efforts.¹⁶

The figures for approved FDI do not reveal whether these projects took off or will take off or not. A more accurate picture would be one that shows realized investments in the form of implemented projects (Figure 2).

Figure 2. Implemented manufacturing projects, by state, 2013-2020



Source: MIDA

Table 4 shows that the ratio of implemented to approved investments for Pahang, Terengganu and Kelantan are much lower than of those for the top three states for hosting investments, namely Johor, Selangor and Penang, which have a ratio at around 0.6. Although Negeri Sembilan performs just as well, its approved investments are much less than the top three states (Figure 1).

Table 4. Ratio of Implemented to Approved Investments, 2013-2020

Ratio of Implemented/ Approved	Domestic Investments	Foreign Investments	Total Investments
Johor	0.62	0.62	0.62
Selangor	0.64	0.64	0.64
Penang	0.66	0.67	0.66
Sarawak	0.74	0.36	0.51
Sabah	0.49	0.04	0.40
Kedah	0.49	0.70	0.63
Pahang	0.43	0.36	0.37
Perak	0.62	0.55	0.59
Melaka	0.39	0.82	0.56
Negeri Sembilan	0.64	0.62	0.63
Terengganu	0.49	0.34	0.37
Kelantan	0.28	0.59	0.33
W.P. - Kuala Lumpur	0.72	0.05	0.37
Perlis	0.06	1.00	0.10
W.P. - Labuan	0.24	1.00	0.32
Total	0.59	0.57	0.58

Source: MIDA

Given the above data, it appears far more important to address the gaps in investors' expectations which are causing the discrepancies in approved investments between the states, especially between the west coast and the east coast, as well as the much lower implementation in Pahang, Terengganu and Kelantan. In this regard, local institutions play an important part, especially in implementation, since investors have to deal with local authorities over business licenses, real estate issues, access to public utilities, tax incentives, and other administrative matters where building and operating a factory are concerned. It is the respective state's institutions such as the land and local authorities that affect the implementation of projects.¹⁷ A poorer implementation record also contributes towards a less favourable investment climate.

Enhancing Intermodal Connectivity: Dry Ports

MIDA's EAPs focus on the establishment of logistics hubs around Kuantan, Temerloh and Port Klang. However, such hubs will not necessarily shift current freight transport preferences from road to rail, due to door-to-door delivery, cost-effectiveness in terms of timeliness, and the flexibility and reliability of road haulage as compared to rail freight. Road haulage permits direct point-to-point transport between sender and receiver, while rail haulage requires the freight to be first transported by road to the rail station or intermodal terminal before being loaded onto a cargo train. The process is repeated at the destination; this increases the time required to transport goods. The current imbalance between road and rail freight has been noted in numerous Malaysian Plans, such as the Logistics and Trade

Facilitation Master Plan (2015-2020),¹⁸ with rail haulage comprising only a very small fraction of the total freight transported despite the extensive KTM network. The National Transportation Plan that was launched in 2019 is aimed at increasing rail freight.¹⁹ What appears needed is enhanced road-rail intermodal connectivity in order to promote the much-needed modal shift from road to rail freight, improve the modal balance between road and rail in freight transport as well as reduce the negative environmental impact of road haulage.²⁰ Improving intermodal connectivity will also help Malaysia utilise the ECRL and its ports to compete against ASEAN neighbours who are performing better in multimodal transport, such as Singapore, Vietnam and Thailand.²¹

Intermodal transportation for KTM was facilitated by the development of dry ports along especially the north-south bound of KTM.²² Hence, establishing dry ports or intermodal terminals along the ECRL route is important for facilitating the intermodal shift from road to rail. There is only one dry port along the 2020 proposed route; this is at Nilai. This may not hold though if the ECRL is again rerouted, as announced in the 2021 plan.

Location is one of the critical factors in determining dry ports' success. Unfortunately, as seen in the KTM case, not all Malaysian dry ports are strategically located to assist stakeholders, including seaports. Some of the existing inland ports in Malaysia are not located close to seaports, and due to a lack of adequate connecting infrastructure are unable to meet the demands of firms.²³ The example of Segamat Inland Port (SIP) is illustrative. Established by the Transport Ministry and as a fully state-owned intermodal terminal, the port ceased operations seven years after it began operations; this was due to limited road infrastructure for accessing SIP, and to high container charges.²⁴

Other dry ports along KTM's intermodal routes were developed under joint investment schemes between the private sector and the government.²⁵ Malaysia has dry ports in Padang Besar, Ipoh, Tanjung Pelapas, Nilai and Segamat. For the last 10 years, only two important intermodal corridors have been in operation, namely (i) Port Klang-Ipoh corridor and (ii) Penang Port-Padang Besar corridor.²⁶

Dry ports should be located strategically near manufacturing activities such as industrial parks, include land for future expansion, and promote functional cooperation with seaports rather than pose as external competition against them. Last-mile connectivity is also important, as highlighted by National Logistics Plan, as are good infrastructure connections linking dry ports to the hinterlands and railway. The key stakeholders to invest in need to include strategic players such as the ports, and logistics players such as freight forwarders. Engaging sea ports operators, especially in terms of investments will facilitate cooperation and the regionalisation of these ports by extending their hinterland, in turn further enhancing the use of these dry ports along the ECRL route.²⁷

Promoting Transit-Oriented Development (TOD) projects

TOD are projects developed and centred around transportation hubs with the goal of creating an urban environment that is pedestrian friendly. This is meant to encourage the

use of public transport and decrease the need for private transport.²⁸ Typically, TOD projects cater for intermodal public transport—with the inclusion of rail networks—to facilitate connectivity. Through optimal land usage, the immediate vicinity of transport hubs caters to the residents' various needs, including facilitating commercial and recreational facilities being interspersed among residential buildings.²⁹ TOD projects tend to support a population density that is moderate to high, while simultaneously serving as an economic catalyst within the area.³⁰

Presently there are seven proposed TOD projects along ECRL. The criteria used for the identification of these TOD stations are not made known. Nevertheless, as in the case of the location of dry ports, the location of TODs is important. They have to be chosen based on a host of scientific criteria in order to ensure successful implementation. Although no specific development and planning guidelines relating to TOD have been gazetted at the federal level in Malaysia, there are nevertheless some available for the state of Selangor.³¹ These include mixed-land use development, high-density and connectivity which are in line with principles used in other countries. Other typical planning guidelines for TODs include frequent and regular public transport services (particularly rail), and access to employment centres. This is aimed at creating compact development so as to provide the highest benefit to the public and to ensure success for the planned TOD transit station.

In applying population as one of the criteria for determining the viability of TOD stations, as seen in Maps 1 and 2, the more viable stretch on the east coast is from Cukai to Kota SAS, rather than around Kota Bharu and Kuala Terengganu.³² Cukai and Kota SAS are located not far from Kuantan, and the region has numerous existing (and upcoming) industrial parks and port facilities. While population can increase if investments increase in these two states, these are subject to an upgrading in local institutions, as explained earlier.

For section C on the ECRL, which is still being considered for changes, the northern alignment that passes through central Selangor before heading to Port Klang covers an area with a significantly higher population compared to the southern route through Negri Sembilan and Putrajaya. In particular, Gombak and Serendah Baru have the highest population along the entire ECRL; Puncak Alam and Kapar also serve an area with a moderately high population. In contrast, Klawang and (to a lesser extent) Nilai serves an area that is relatively sparse, even if Putrajaya and Jenjarom in Selangor have a moderately high population.

It is important to note that successful implementation of TODs cannot be left to the investor alone. The government has to provide the overall planning, policy framework and connecting infrastructure.³³ The private sector is a collaborator and partner but will not have the macro planning perspective that a government should have in developing TODs. In particular, last-mile connectivity requires public provisions such as making connecting roads pedestrian friendly and with shelter in view of Malaysia's climate. The TOD design also needs to involve local authorities and stakeholders, especially as land use and land rights fall under state government jurisdiction, and cater to the needs of the local community.

CONCLUSION

The EAPs are being launched to drive up the demand for rail cargo and rail passenger services for the ECRL. MIDA therefore aims to increase private investments and accelerate economic activities along the ECRL route through the provision of industrial parks, logistics hubs and TODs. Although industrial parks can serve as a tool for drawing in new investments, it may be more important to address sub-locational issues such as improving local institutions and investment environment to improve the attractiveness of these locations relative to the more popular states for hosting investment such as Selangor, Penang and Johor.

While the establishment of inter-modal transportation centres such as dry ports and TODs along the ECRL route are appropriate strategies to facilitate intermodal shifts in the use of transportation, the locations of these centres have to be determined based on technical criteria, rather than on changes in administration. In the near term, another change of administration cannot be ruled out considering the razor-thin majority of the PN coalition in parliament, and the possibility of a snap election soon. With Malaysia facing protracted political uncertainty, it is paramount that technical criteria, instead of changing political fortunes, determine the development plans of the ECRL.

Successful implementation of intermodal transportation centres, be it dry ports or TODs, requires cooperation and collaboration among all relevant stakeholders, including local government, key transportation players and local communities. The government must continue to play an important role in the establishment of these intermodal centres through planning and execution of last-mile connectivity; this is an important determinant in the usage of different transportation modes.

¹ Malaysia Rail Link Sdn Bhd (MRL) is the project and asset owner of the ECRL project.

² The contract was awarded without any open tender, and initially involved a sum of RM46 billion. Under the bilateral agreement, the Chinese side would provide RM55 billion for the project, of which 85 percent was to be borrowed from Exim Bank of China at a low interest rate of 3.35 per cent, with an amortization period of 20 years with the first seven years being free of repayments, including interest and with the Malaysian government as guarantor. The difference in the two amounts was explained by a Minister in <https://www.malaysiakini.com/news/362231> <Accessed 13 June 2021>.

³ The Business Times, 26 July 2019, “Malaysia restarts rail project with China after cost cut”, <https://www.businesstimes.com.sg/transport/malaysia-restarts-rail-project-with-china-after-cost-cut> <Accessed 23 June 2021>.

⁴ The length of the railway lines was shaved by 40 km. See <https://www.thestar.com.my/news/nation/2019/04/13/ecrl-is-up-and-running-again/> <Accessed 24 June 2021>.

⁵ According to former Minister of Transportation Anthony Loke in <https://www.thesundaily.my/local/no-downsizing-of-ecrl-project-scope-anthony-loke-YX1088221> <Accessed 13 June 2021>.

⁶ See The Star, 10 April 2021, “ECRL records first tunnel breakthrough in Paka ahead of schedule”, <https://www.thestar.com.my/news/nation/2021/04/10/ecrl-records-first-tunnel-breakthrough-in-paka-ahead-of-schedule> <Accessed 8 June 2021>; The Star, 02 June April 2021, “ECRL says Dungun tunnel breakthrough 6 months ahead of schedule”, <https://www.thestar.com.my/business/2021/06/02/ecrl-says-dungun-tunnel-breakthrough-6-months-ahead-of-schedule> <Accessed 13 June 2021>.

⁷ See <https://www.channelnewsasia.com/news/asia/malaysia-see-more-chinese-investments-along-ecrl-anthony-loke-11482594> <Accessed 23 June 2021>.

⁸ See <https://www.mida.gov.my/media-release/mida-urges-domestic-companies-to-join-the-economic-accelerator-projects/> <Accessed 23 June 2021>.

⁹ There is so far only one independent study of the quality of EIA assessments. According to Rahman, et al., 2021, the quality is dependent on cost of EIA preparation, sufficient time to conduct EIA study, skills and expertise and adequate training of consultants and Department of Environment (DOE) officers. The study also suggests three ways for improving EIA assessments, in terms of training of the officers, enhancement of EIA database and the understanding of the project developer. See https://www.researchgate.net/publication/349677174_Faktor_mempengaruhi_kualiti_Laporan_Pe_nilaian_Kesan_Alam_Sekitar_di_Malaysia <Accessed 25 June 2021>.

¹⁰ See <https://enviro2.doe.gov.my/ekmc/wp-content/uploads/2020/03/ECRL-Section-C-Volume-1-ES-RE-Part-1.pdf> <Accessed 11 June 2021>.

¹¹ See Malaysian Government document archives at <https://govdocs.sinarproject.org/documents/ministry-of-natural-resources-and-environment/eia-reports/362980465-ecrl-volume-1-executive-summary.pdf/view> <Accessed 11 June 2021>. It should be noted that the method and models used for projections are not made known to the public and therefore the differences in projections are not explained nor made transparent.

¹² Ministry of Transport Malaysia. Quarterly statistics of rail transport. <https://www.mot.gov.my/en/land/reports/quarterly-statistics-of-rail-transport> <Accessed 13 June 2021>.

¹³ Ibid.

¹⁴ See MIDA 2020. https://www.mida.gov.my/wp-content/uploads/2020/07/20200304180553_01_MIDA.pdf <Accessed 8 June 2021>.

¹⁵ Ibid.

¹⁶ For further details on the ECER, see https://acde.crawford.anu.edu.au/sites/default/files/publication/acde_crawford_anu_edu_au/2018-01/2017-14_2_athukoralapc_acde_wp_economic_corridor_malaysia.pdf <Accessed 24 June 2021>.

¹⁷ See for example, Nielsen, Bo & Asmussen, Christian & Weatherall, Cecilie, 2017. “The location choice of foreign direct investments: Empirical evidence and methodological challenges”. *Journal of World Business*. 52: 62-82. 10.1016/j.jwb.2016.10.006. and Meyer, K. E., & Nguyen, H. V., 2005. *Foreign Investment Strategies and Sub-national Institutions in Emerging Markets: Evidence from Vietnam**. *Journal of Management Studies*, 42(1), 63–93. doi:10.1111/j.1467-6486.2005.00489.x.

¹⁸ See <https://www.mot.gov.my/en/Penerbitan%20Rasmi/Executive%20Summary%20Logistics%20and%20Trade%20Facilitation%20Masterplan.pdf> <Accessed 8 June 2021>.

¹⁹ See <https://www.theedgemarkets.com/article/ntp-2019-optimising-full-potential-rail-connectivity> <Accessed 8 June 2021>.

²⁰ The carbon footprint of rail is generally lower than that of flight and road transportation.

- ²¹ Smith, Michael & Wimalasuriya, Rukman & Gunasekera & Voak, Adam, 2019. "Better transport connectivity in ASEAN: Impacts on commodity trade," 2019 Conference (63rd), February 12-15, 2019, Melbourne, Australia 285090, Australian Agricultural and Resource Economics Society (AARES).
- ²² Jeevan, J., NHM.Salleh, K.B. Loke and A.H.Saharuddin, 2017. "Preparation of dry ports for a competitive environment in the container seaport system: A process benchmarking", *International Journal of e-Navigation and Maritime Economy*, Volume 7, June 2017: 19-33; Othman, M.R., Jeeva, J. and Rizal, S., 2016. "The Malaysian Intermodal Terminal System: The Implication on the Malaysian Maritime Cluster", *International Journal of e-Navigation and Maritime Economy*, Vol. 4, June 2016: 40-61.
- ²³ Zainuddin, Nizamuddin & Mohd Saifudin, Adam & Zalazilah, Mohd & Bahaudin, Ahmad & Khalid, Ruzelan. (2019). "Inland Port Logistical Issues In Northern Region Of Peninsular Malaysia", *Journal of Humanities, Language, Culture and Business*, Volume 3, No. 12. May 2019: 51-65.
- ²⁴ The Star, 18 December 2015, "RM 245 mil. revival of Segamat Inland Port", <https://www.thestar.com.my/business/business-news/2015/12/18/rm245mil-revival-of-segamat-inland-port> <Accessed 13 June 2021>.
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- ²⁶ Shahrin Nasir 2014. Intermodal container transport logistics to and from Malaysian ports Evaluation of Customer requirements and environmental effects. Doctoral thesis in transport science, Sweden. <https://www.diva-portal.org/smash/get/diva2:781452/FULLTEXT02.pdf> <Accessed 8 June 2021>.
- ²⁷ Op. cit. Shahrin Nasir 2014.
- ²⁸ Gomez, Christy & Omar, Masitah & Nallusamy, Rameson, 2019. "A Study on the Benefits of Transit Oriented Development in Malaysia And Incorporation of Those Benefits in Planning," MATEC Web of Conferences. <https://doi.org/10.1051/mateconf/201926606016>.
- ²⁹ See optimal usage in World Bank, 2014. *Formulating an Urban Transport Policy: Choosing between Options..* <https://openknowledge.worldbank.org/handle/10986/20950>.
- ³⁰ National Academies of Sciences, Engineering, and Medicine, 2004. "Transit-Oriented Development in the United States: Experiences, Challenges, and Prospects." Washington, DC: The National Academies Press. <https://doi.org/10.17226/23360>.
- ³¹ See Azmi, N.A. et al., 2021. "A comparative analysis of transit oriented development guidelines between Malaysia and other countries, *PLANNING MALAYSIA: Journal of the Malaysian Institute of Planners*, VOLUME 19 ISSUE 1 (2021), Page 186 – 199. <file:///C:/Users/user/Downloads/935-1736-1-SM.pdf>.
- ³² Ridership for public transport, including train services, is typically positively correlated to the population size around the train station. DOS Malaysia only provides population data at district level rather than for township. Hence, we have had to estimate population data for the ECRL stations based on the number of registered electorates within the DUN seat (state constituency) in which the ECRL station is located. DUN seats which, though not served by the ECRL station, lie within a one-kilometre distance from the stations are also included (shaded as pink). Since foreigners are not captured in the registered electorate data, and due to the absence of automatic voter registration in Malaysia, the population numbers provided should be seen as conservative estimates.
- ³³ Rowe, W. undated. "Is Transit-Oriented Development the Answer?" <http://eps.mbpj.gov.my/SlideTOD/Is%20Transit%20Oriented%20Development.pdf> <Accessed 10 June 2021>.

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