

Section 10

CONCLUSIONS

10.1 ECRL - A VITAL NATIONAL INFRASTRUCTURE

The East Coast Rail Link Phase 2 (ECRL 2) is needed to further realize the need for Phase 1 that is to improve the connectivity between the East Coast and the West Coast. The proposed Project will **enhance the connectivity of ECRL Phase 1** whereby with the extensions in place, the country's largest port at Port Klang will be connected to the largest port on the East Coast which is the Kuantan Port.

The ECRL phase 2 will **enhance freight transport** capacity as it will provide the much-needed freight relief by connecting the existing KTMB Serendah station, enabling transfer of freight to and from the North besides proving the "missing link" between west coast with east coast ports.

The ECRL supports the **aspirations of national and state plans**. It represents the culmination of transport policies laid down in the National Physical Plans 1, 2 and 3 as well as the State Structure Plans of Kelantan and Selangor. The ECRL is a key infrastructure in the East Coast Economic Region (ECER) Master Plan, which aims to accelerate economic growth in the East Coast. The ECRL also represents fulfilment of the strategic objective of the National Land Public Transport Master Plan for Peninsular Malaysia, that is to ensure that **the nation is physically well-connected and the rural and inter-city connectivity is enhanced**.

The ECRL is a **crucial development** that is expected to bring about significant development to the nation and will continue to bring major economic growth and act as a catalyst for further development of both the west and east coasts of Peninsular Malaysia.

10.2 PROJECT PLANNING

In planning and designing the ECRL - from the Feasibility Study to the Railway Scheme - numerous options were examined to ensure that the most optimum and least damaging alignment was adopted. The alignment has been optimized based on ridership, constructability, cost, social and environmental impacts as well as development opportunities and the preferences of the respective State governments. Substantial effort has been made to avoid environmentally sensitive areas; either by adjusting the alignment or incorporating engineering solutions such as tunnels and viaducts. The construction of 10 tunnels to reduce hill cutting and avoid

fragmentation of forests and wildlife habitats as well as 26.6 km of elevated tracks to reduce flood risk represents a major investment on the part of MRL.

10.3 POTENTIAL SIGNIFICANT IMPACTS AND MITIGATION MEASURES

The ECRL traverses through agricultural areas, irrigation canals, rivers, transmission lines, residential zones, forested area as well as along commercial / industrial establishments. The population within the 2-km corridor of the alignment is estimated to be about 2 million. While it brings about significant benefits, at the same time there are potential adverse impacts that have to be addressed and mitigated.

Pre-construction Stage

Land and property acquisition is the main issue faced during the pre-construction stage. Based on the proposed alignment, 5,852 lots (or parts of) may be affected. 37% of the land needed for the Project will be State land and 63% of private land. The Government of Malaysia is expected to compensate the affected parties in a fair manner. Nevertheless, those affected by the acquisition may potentially endure issues linked to displacement, such as disruption of lives and livelihoods, as well as loss of social cohesion. In order to minimize the impacts of acquisition, MRL will provide early and sufficient information to the affected parties to ensure that they are well-informed about acquisition process.

Construction Stage

Earthworks will be a major activity during the construction stage. The railway will traverse almost 108 km over a variety of terrain. Earthen embankments that will be built in flat and low-lying areas, especially in Kelantan will require substantial movement of soil. Although 10 short tunnels will be constructed, slope-cutting will remain a major activity, especially at the tunnel portals. Soil erosion and sedimentation are potentially significant impacts of these earthworks, and calculations have shown that these impacts will be severe if pollution prevention and mitigation measures (P2M2) are not implemented. Many of the waterways that the ECRL traverses serve important beneficial uses, ranging from supplying clean water for domestic use and irrigation schemes in Kelantan, supporting aquaculture, fisheries and recreational activities – all of these waterways must be protected, along with the crucial ecosystem services they provide. MRL and its contractors will give serious attention to the P2M2 and implement the relevant measures outlined in this report.

Site clearing, tunneling, hill cutting and demolition will generate substantial amount of construction waste and spoil material. Disposal of such material has the potential

to cause sedimentation and localized flooding. Some 385,000 tonnes of demolition waste will be generated while another 71,500 tonnes of construction waste is estimated during the construction stage. Part of this will be reused in the construction works where as the unusable portion will be disposed of at approved disposal sites. The process of excavating, transporting and final disposal will be done systematically and carefully, with tracking of the waste disposal chain-of-custody, to ensure minimal residual impacts. In addition, an estimated 43,500 tonnes of biomass will be generated from the clearing of vegetation works along the alignment. Biomass will be disposed of on-site within the existing plantation at phases that are yet to be developed.

Construction activities may cause local air pollution and elevated noise levels. In terms of air pollution, areas of concern are at the stations and maintenance bases, where large construction sites will be involved. Dust dispersion calculations have identified certain critical areas when dust levels may be elevated, and adequate P2M2 have been formulated for these areas. Similarly, elevated noise levels may occur in the vicinity of residential areas and schools. However, by implementing adequate safeguards such as appropriate construction methods and installation of temporary noise barriers, the impacts of noise from construction can be controlled.

There is potential risk of flooding due to the construction of the ECRL, especially in low-lying areas in Kelantan where embankments will be built. About 8.3 km of the alignment in Kelantan will be elevated above the current flood levels. However, the creation of these embankments (and stations) may also restrict surface runoff and thereby aggravate flooding. Although 40 bridges have been provided and balancing culverts will be installed under most of the embankments, the risk of flooding still has to be treated seriously. Potential hotspots for flooding have therefore been identified and MRL is currently developing the detailed engineering design and flood mitigation measures to ensure that there will be no increase in existing flood levels after the Project completion.

About 18.7 km of the alignment will tunnel through a variety of geological formations. There are several risks associated with tunneling and it must be considered in selecting suitable construction techniques for the tunneling, excavation and retaining structures. Detailed soil investigation (SI) and geotechnical assessment will be conducted for the preliminary and detailed engineering design prior to commencement of construction work and during the construction work. Any ground movement due to the construction works will be properly controlled and kept within acceptable limits.

The ecological impacts caused by linear infrastructure are habitat loss and fragmentation, and consequently, the displacement of wild animals. While care has been taken to skirt around them, an estimated 55 ha of land will be separated from the whole 3,431 ha of land of the Rantau Panjang Forest reserve. In this regard, MRL will provide adequate wildlife crossings, including balancing culverts to limit the

ecological impacts of the alignment. In addition, MRL is developing a comprehensive Wildlife Management Plan to be implemented during the construction phase.

Traffic congestion is one of the major impact resulting from the roadside construction. Construction work at the roadside and/or shoulder will reduce the effective lane width of the road which causes capacity reduction. In addition, the access of the construction traffic on roads which move at a slower speed creates temporary moving bottleneck that causes the queue to build up quickly. Traffic congestion causes traffic delay and inconvenient to the road users especially to those who are regular users. Traffic Management Plans will be prepared for each construction site to ensure that inconvenience to road users will be kept at a minimum.

Public perception surveys and stakeholder engagements have indicated that the main concerns of affected communities are potential flood risks, land acquisition and relocation. Respondents were also concerned about elevated risks of accidents due to the volume of heavy construction vehicles, traffic congestion as well as safety and socio issues due to the presence of construction workers in their neighborhood. Respondents were also concerned about the potential noise and air pollution during the construction stage.

The Project will also bring about many positive socio-economic impacts. The proposed ECRL will provide quick, easy and safe means of transportation as well as savings in journey time and increases productivity. Besides this, the proposed Project will also benefit the industrial sector in which it will reduce travel time and increase freight transport capacity between East and West Coast region.

Operational Stage

Noise and vibration are a concern during the ECRL operations, and locations where noise barriers are required have been identified. Although the trains are electrical and designed to emit low noise levels, noise modeling has predicted that noise will exceed the limits in some locations where noise barriers are needed. In addition to noise barriers, the adoption of continuous welded tracks and acoustic absorption on track sides will further reduce noise levels. Vibration is a concern especially at the tunnel sections. Several types of vibration-reduction measures will be adopted, including use of under-sleeper pads on ballast tracks.

The operation of the trains, stations and maintenance bases have the potential to generate wastes and water pollution. Sewage treatment facilities at these locations will be designed to meet all regulatory requirements and also to have sufficient capacity to cater for future expansion.

The ECRL is expected to contribute towards alleviating road traffic congestion and improving air quality. By reducing the vehicular traffic, the ECRL will reduce the

amount of pollutants that will be emitted into the atmosphere. It has been calculated that the calculated cumulative net CO₂e emissions avoided for year 2025, 2035 and 2045 are 74,487 MT CO₂e/yr, 128,437 MT CO₂e/yr and 202,637 MT CO₂e/yr respectively. With the shift from private vehicles to rail, air pollution related to vehicular emission, i.e. particulate matters (PM₁₀, and PM_{2.5}) and gaseous (NO_x, SO₂, CO_x) pollutants will also be reduced accordingly.

Public safety during the operations of the ECRL is an important matter to be addressed. The ECRL is expected to transport iron ore, coal, cement, steel, rubber, polyethylene and palm biomass; all of which are generally not hazardous. Adequate safeguards have therefore been adopted to minimize any risks to people and property. Calculations to estimate worst-case consequences should the ERL carry flammable cargo show that areas within 164m may be at risk if P2M2 is not implemented. Additional risk assessments will be carried out and emergency response plans prepared in the event that dangerous cargo will be carried in the future.

Potential ecological issues during the operational phase include restriction of wildlife movement, wildlife collisions and mortality and human-wildlife conflicts. The railway will act as barrier and will hinder the wildlife movement within the forests. The railway will be fenced with precast walls to prevent human and wildlife encroachment onto the alignment. The presence of the railway may lead to human-wildlife conflict which will include potential wildlife encroachment onto the tracks which could potentially lead to wildlife mortality. As such, constant monitoring of wildlife, and incidences of human-wildlife conflicts along the alignment will be necessary.

When operational, the ECRL is expected to bring a host of benefits in many ways. As an extension of ECRL Phase 1, the alignment will continue to bring major economic growth and act as catalyst for further development of both the west and east coasts of Peninsular Malaysia. The ECRL Phase 2 will facilitate long distance travel and transport of bulk good that are not easily transported through motor vehicles. It will also strengthen Port Klang linkages with Kuantan Port, connecting the Western Gateway with Eastern Gateway and further to the international market.

The benefits of ECRL Phase 2 veer more towards economic because this railway is built on the premise it would open up the East Coast region to investment, creating opportunities for business growth and jobs

The major traffic impact during the operational stage of the ECRL stations is the localized traffic congestion in the vicinity of the stations. It is expected the stations will generate/attract traffic from/to the stations. It is important to study the potential impacts of the localized traffic condition, especially those stations which are situated at urban areas. It is assumed that the background traffic growth rate is 3% for Pengkalan Kubor station and Wakaf Bharu station. For stations in Selangor, the

growth rate is 1.5%. Various mitigation measures will be put in place to improve traffic circulation and accessibility of each station.

10.4 CONCLUSIONS

In order to maximize the benefits of the Project and to minimize its economic and environmental costs, it is crucial that all the P2M2 identified in this report are implemented effectively and the construction process be monitored diligently. The governance mechanism (monitoring, reporting, auditing, etc) have been formulated and the MRL will implement them comprehensively.

MRL is committed to mainstreaming environmental protection into the Project and towards self-regulation to ensure that the quality of the environment is protected during the construction and operation of the ECRL. MRL will ensure organizational commitment to environmental regulatory compliance by all personnel at all levels of the organization; including its consultants, contractors, suppliers and all other parties involved in the Project implementation. MRL is also committed to continuous communication with all stakeholders.