



**OCCUPATIONAL FRAMEWORK**  
**SECTION H: TRANSPORTATION AND STORAGE**  
**DIVISION 49: LAND TRANSPORT AND**  
**TRANSPORT VIA PIPELINES**

First Printing 2023

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Ministry of Human Resources

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## **ABSTRACT**

The Land Transport and Transport via Pipelines industry is an essential part of the economy for the movement of goods and people. However, the lack of an Occupational Framework (OF) has created significant challenges for employers, workers, and policymakers. The absence of clear occupational standards and guidelines hampers the industry's ability to attract and retain skilled workers, leading to skills gaps, and labor shortages. This situation also makes it difficult for policymakers to develop effective training that address the industry's specific needs. Therefore, there is a pressing need to establish an OF for this sector to provide clear guidance for employers, workers, and policymakers. This OF was established based on the Malaysia Standard Industrial Classification (MSIC) 2008 under Section H: Transportation and Storage; Division 49: Land Transport and Transport via Pipelines; Group 491: Transport via Railways; Group 492: Other Land Transport; and Group 493: Transport via Pipelines. There are five chapters in this document with Chapter I and Chapter II provides an overview and the current situation of Land Transport and Transport via Pipeline. Chapter III describes the methodology utilised, which is a mixed-method approach that incorporates both qualitative and quantitative data. The qualitative research included a review of documents, a Focus Group Discussion (FGD), and interview sessions, whereas the quantitative analysis included a survey instrument. Through the FGD and interview with 24 industry experts, managed to obtain Occupational Structure (OS), Occupational Responsibilities (OR), and Occupational Descriptions (OD). One hundred and thirty-one respondents (131) participated in the survey. This survey identified job in-demand, competencies in-demand, jobs related to the industrial revolution, emerging skills and issues as explained in Chapter IV. Chapter V provides a summary based on each objective and conclusion. Findings showed a total of 18 job areas have been identified for H49, with 77 job titles. A total of 30 job titles have been recognised as important to the current industrial revolution, with 33 of them classed as critical jobs in the Land Transport and Pipeline Transport sectors. The most critical job title for H49 is driver. In conclusion, this document provides a comprehensive overview of the occupational classifications and job descriptions and related issues for industries under Land Transport and Transport via Pipelines in Malaysia.

## ABSTRAK

Industri Pengangkutan Darat dan Pengangkutan melalui Saluran Paip adalah bahagian penting dalam ekonomi untuk pergerakan barangan dan manusia. Walau bagaimanapun, kekurangan Kerangka Pekerjaan (OF) telah mewujudkan cabaran yang ketara kepada majikan, pekerja dan penggubal dasar. Ketiadaan piawaian dan garis panduan pekerjaan yang jelas menghalang keupayaan industri untuk menarik dan mengekalkan pekerja mahir, yang membawa kepada jurang kemahiran, dan kekurangan tenaga kerja. Keadaan ini menyukarkan penggubal dasar membangunkan latihan berkesan yang menangani keperluan khusus industri. Oleh itu, terdapat keperluan mendesak untuk mewujudkan OF bagi sektor ini bagi menyediakan panduan yang jelas kepada majikan, pekerja dan penggubal dasar. OF ini ditubuhkan berdasarkan Klasifikasi Perindustrian Standard Malaysia (MSIC) 2008 di bawah Seksyen H: Pengangkutan dan Penyimpanan; Bahagian 49: Pengangkutan Darat dan Pengangkutan melalui Saluran Paip; Kumpulan 491: Pengangkutan melalui Kereta Api; Kumpulan 492: Pengangkutan Darat Lain; dan Kumpulan 493: Pengangkutan melalui Saluran Paip. Terdapat lima bab dengan Bab I dan Bab II memberikan gambaran keseluruhan Pengangkutan Darat dan Pengangkutan melalui Saluran Paip. Bab III menerangkan metodologi yang digunakan, iaitu pendekatan kaedah campuran yang menggabungkan data kualitatif dan kuantitatif. Penyelidikan kualitatif termasuk semakan dokumen, Perbincangan Kumpulan Fokus (FGD), dan sesi temu bual, manakala analisis kuantitatif termasuk instrumen tinjauan. Menerusi FGD dan temu bual bersama 24 pakar industri, Struktur Pekerjaan (OS), Tanggungjawab Pekerjaan (OR), dan Perincian Pekerjaan (OD) dibentuk. Seratus tiga puluh satu (131) responden terlibat dalam tinjauan ini. Tinjauan ini mengenal pasti pekerjaan dalam permintaan, kecekapan, pekerjaan yang berkaitan dengan revolusi perindustrian, kemahiran dan isu yang muncul seperti yang dijelaskan dalam Bab IV. Bab V menyediakan ringkasan berdasarkan setiap objektif dan kesimpulan. Dapatan menunjukkan sebanyak 18 bidang pekerjaan untuk H49, dengan 77 jawatan. Sebanyak 30 jawatan telah diiktiraf sebagai penting kepada revolusi perindustrian, dengan 33 daripadanya dikelaskan sebagai pekerjaan kritikal dalam sektor Pengangkutan Darat dan Pengangkutan Saluran Paip. Jawatan yang paling kritikal untuk H49 ialah pemandu. Kesimpulannya, dokumen ini memberikan gambaran menyeluruh mengenai klasifikasi pekerjaan serta isu berkaitan untuk industri di bawah Pengangkutan Darat dan Pengangkutan melalui Saluran Paip di Malaysia.

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## **ABBREVIATION**

ADR	Agreement International Carriage of Dangerous Goods by Road
APAD	Land Public Transport Agency
APM	Automated People Mover
ART	Autonomous Rapid Transit
BEM	Board of Engineers Malaysia
BOCC	Bus Operation Control Centre
CIASST	Centre for Instructor and Advanced Skill Training
CIDB	Construction Industry Development Board
CILTM	Chartered Institute of Logistics and Transport Malaysia
CLT	Control Limit Theorem
CRM	Customer Relation Management
CVLP	Commercial Vehicle Licensing Board
DCS	Distributed Control System
DSD	Department of Skills Malaysia
DOSH	Department of Occupational Safety and Health
DOSM	Department of Statistics Malaysia
ECER	East Coast Economic Corridors
EPU	Economic Planning Unit
ES	Emerging Skill
ER	Employer Requirement
ERL	Express Rail Link
ERP	Emergency Response Plan
ETS	Electric Train Service
FGD	Focus Group Discussion
FMM TLC	Federation of Malaysian Manufacturers Transportation and Logistics
GDP	Gross Domestic Product
GPBSM	Malaysian School Bus Association Alliance
GTSM	Malaysian Taxi Association
HAZMAT	Hazardous Material
HEI	Higher Education Institute
HRDC	Human Resources Development Corporation

HSR	High Speed Rail
IEM	The Institution of Engineers Malaysia
IKBN	Institut Kemahiran Belia Negara
ILP	Institut Latihan Perindustrian
ILS	Integrated Logistics Services
IMDG	International Maritime Dangerous Goods Code
IMP3	Third Industrial Master Plan
INSTEP	PETRONAS Institute of Petroleum Technology
IR	Industrial Revolution
IRSE	Institute of Railway Signal Engineers
ISIC	International Standard Industrial Classification of All Economic Activities
IWA	International Water Association
KEGA	Key Economic Growth Activity
KTMB	Keretapi Tanah Melayu Berhad
LLL	Lifelong Learning
LPI	Logistic Performance Index
LRT	Light Rail Transit
MAA	Malaysia Airports Academy
MAHB	Malaysia Airports Holdings Berhad
MARA	Majlis Amanah Rakyat
MARIC	Malaysia Rail Industry Corporation
MASCO	Malaysia Standard Classification of Occupations
MATTA	Malaysia Association of Tour and Travel Agents
MBAM	Master Builders Association Malaysia
MBOT	Malaysia Board of Technologists
MeHDA	Malaysia E-Hailing Drivers Association
MIDA	Malaysian Investment Development Authority
MIGHT	Malaysian Industry-Government Group
MIROS	Malaysian Institute of Road Safety Research
MITI	Ministry of International Trade and Industry
MOE	Ministry of Economy
MOGSC	Malaysian Oil, Gas and Energy Services Council

MOSQF	Malaysian Occupational Skills Qualification Framework
MOT	Ministry of Transport
MPM	Malaysia Petroleum Management
MQF	Malaysian Qualification Framework
MPRC	Malaysia Petroleum Resources Corporation
MRDC	Malaysia Railway Development Corporation
MRT	Mass Rapid Transit
MSIC	Malaysia Standard Industrial Classification
MyRA	Malaysia Rail Academy
MyWA	Malaysian Water Academy
NAHRIM	National Water Research Institute of Malaysia
NCER	North Coast Economic Corridors
NEC	National Education Code
NEP	National Energy Plan
NIOSH	National Institute for Occupational Safety and Health
NJT	No Job Title
NOSS	National Occupational Skills Standard
NRECC	Ministry of Natural Resources, Environment and Climate Change
NTP	National Transport Policy
NWRC	National Water Resources Council
OA	Occupational Analysis
OD	Occupational Description
OCC	Operation Control Centre
OECD	Organisation for Economic Co-operation and Development
OS	Occupational Structure
OSHA	Occupational Safety and Health Administration Regulations
O&M	Operation and Maintenance
PAAB	Pengurusan Aset Air Berhad
PACE	Prasarana Learning & Culture Unit
PBA	Prasarana Bus Academy
PDA	Petroleum Development Act
Pembawa	Peninsular Malaysia Express Bus Operators Association
PINTAR	Prasarana International Training Academy of Rail

PMBOA	Pan-Malaysian Bus Operators Association
PUSPAKOM	Pusat Pemeriksaan Kenderaan Berkomputer
PWI	Permanent Way Institution Malaysia Section
PWSA	Penang Water Service Academy
RAC	Railway Asset Corporation
REAM	Road Engineering Association of Malaysia
RTD	Road Transport Department
SCADA	Supervisory Control and Data Acquisition
SHE	Safety, Health and Environment
SME	Subject Matter Expert
SOP	Standard Operating Procedure
SPAN	Suruhanjaya Perkhidmatan Air Negara
SSM	Suruhanjaya Syarikat Malaysia
S&TC	Signal and Train Control
TNA	Training Need Analysis
TVET	Technical and Vocational Education and Training
UN	United Nation
WIM	Written Instructional Materials
WSIA	Water Services Industry Act

## GLOSSARY

Competency in Demand	Refers to the ability in performing the tasks efficiently according to the industry requirements.
Critical Job	Jobs in demand but hard to fill and are always short of supply due to the nature of the jobs which require certain skills set.
Dangerous Good	A dangerous good, abbreviated DG, (also known as hazardous material or hazmat) are substances that when transported are a risk to health, safety, property or the environment.
Emerging Skills	Skills predicted to be imperative to the industry in the near future, based on the recent development, trend or study.
Fleet	A group of motor vehicles comprising all transport vehicles owned by the company, government or agency or other business.
Funicular	Operating by cable with ascending and descending cars counterbalanced, particularly for the railways on the mountainside.
Interurban	Pertaining to, connecting between two or more urban centres.
Job	Job is defined as a set of tasks and duties performed by a person.
Job in Demand	Jobs that are required and important in the smooth running of the main operations of the company.
Land Transport	Land transport in this document covers all land-based transportation systems that provide for the movement of people, goods and services except type of transport as mentioned in Malaysian Industry Classification 2008.
MSIC	The industrial classification of productive economic activities in Malaysia is registered by the Department of Statistics Malaysia.
Malaysian Skills Certification System	Skill and work-based certification system in Malaysia that is achieved through assessment and training.
MASCO	National benchmark for the classification of occupations in the employment structure of the country.
Occupation	Occupation is defined as a set of jobs whose main tasks and



obligations are characterised by a high degree of similarity. In other words, persons who perform similar main tasks are considered doing the same type of work and are classified in the same occupational group, regardless of the level of authority, responsibility or work experience.

Occupational Analysis	Process considers industry requirements as well as studies of relevant occupational structures.
Occupational Description	A broad, general, and written statement of a specific job, based on the findings of the job analysis.
Occupational Framework	The comprehensive job structure includes work fields and job titles according to level for an industry in Malaysia based on the classification of economic activities in the Malaysian Industry Classification Standard (MSIC) 2008.
Occupational Responsibilities	A duty or obligation to satisfactorily perform or complete a task (assigned by someone or created by one's own promise or circumstances) that one must fulfil, and which has a consequent penalty failure.
Occupational Structure	Occupational Structure refers to the aggregate distribution of occupations in society, defined by skill level, economic function, or social rank.
Operation Control Centre	The centre that manages the transport operators' day-to-day activities.
Pipeline Transport	Pipeline transport is the long-distance transportation of a liquid or gas or any items through a system of pipes.
Shunt	Push or pull (a train or part of a train) from the main line to a siding or from one line of rails to another.
Suburban	Related to the area on the outskirts of a city.
Urban	Related to the city.

# **CHAPTER I**

## **INTRODUCTION**

### **1.1 Introduction**

This chapter presents an overview of the Land Transport and Transport via Pipelines Services (under H49), as outlined in Malaysia Standard Industrial Classification 2008 (MSIC 2008). This division includes all land transport services. It excludes own account transport. Three main groups covered in this division as described in the following section. This chapter starts with a concise overview of the background of land transport and pipeline transport. Then, there is a problem statement that highlights issues related to transportation network, existing Occupational Framework documents related to rail, land and pipelines transport, and safety matters in transportation. It is followed by objectives, scope, and the significance of the study. It ends with the structure of chapters inside this Occupational Framework's document.

### **1.2 Background**

Malaysia is famous in the eyes of the world for its positive and encouraging economic growth in line with the desire to reach the level of a developed country. Developed countries not only have a strong economy but also have a network of services and transport that are interconnected but do not burden the people. Transport sector has been the major contributors to Malaysia's development and continue to serve as one of the Government's main sources of income. Economically, the transport sector in Malaysia has grown rapidly, exceeding 5% since 2004 and projected to contribute 9.5% into Gross Domestic Products (GDP) in 2022 (Ministry of Transport 2022).

In addition, the Malaysian transport services industry group had a total revenue of \$15.0 billion in 2020, representing a compound annual growth rate of 1.5% between 2016 and 2020. The value of the Malaysian transport services industry group decreased by 2.6% in 2020 due to the situation of the COVID-19 pandemic which disrupting the supply and demand of goods, as well as their flow through means of transport (Research and Markets 2021).

Therefore, a strategic policy was formed to ensure the transport sector is robust and stable. Thus, among Malaysia's latest policies, the National Transport Policy (NTP) 2019-2030 has outlined a detailed strategy in providing a smart, connected, easy and safe transport system that meets the needs of the people. The NTP 2019-2030 also focuses and gives direction to the transport-related sector through the creation of a conducive ecosystem to facilitate the movement of goods and passengers and reduce the cost of business operations (Ministry of Transport 2018). In addition, the transport sector is also seen to be moving in parallel with Industrial Revolution (IR) and sustainability goals.

Land Transport and Transport via Pipelines are under Section H, which deals with transportation and storage. There are five divisions under Section H according to MSIC 2008. However, only Land Transport and Pipeline Transport under Division H49 are covered in this study. This division includes the transport of passengers and freight via road and rail, as well as freight transport via pipelines. Table 1.1 shows the basic description of these three groups under H49 (MSIC 2008). Detailed information related to these three groups will be presented in Chapter 2.

Table 1.1: Basic Description of H49

Group	Basic Description
491: Transport via railways	This group includes rail transportation of passengers and/or freight using railroad rolling stock on mainline networks, usually spread over an extensive geographic area. Freight rail transport over short-line freight railroads is included here.  This group excludes urban and suburban passenger land transport, related activities such as switching and shunting and operation of railroad infrastructure.
492: Other land	This group includes all land-based transport activities other

Group	Basic Description
transport	than rail transport. However, rail transport as part of urban or suburban transport system is included here.
493: Transport via pipeline	This group includes transport or operation of gases, liquids, water, slurry and other commodities via pipelines. It also includes haulage.

Referring to Table 1.1, Section H49 includes the provision of passenger or freight transport, whether scheduled or not, by rail, road and pipeline. This section excludes maintenance and repair of motor vehicles and other transportation equipment, the construction, maintenance and repair of roads, railroads, as well as the renting of transport equipment without driver or operator. In addition, this sector did not cover associated activities such as terminal and parking facilities. Figure 1.1 shows the specific exclusion activities for H49.

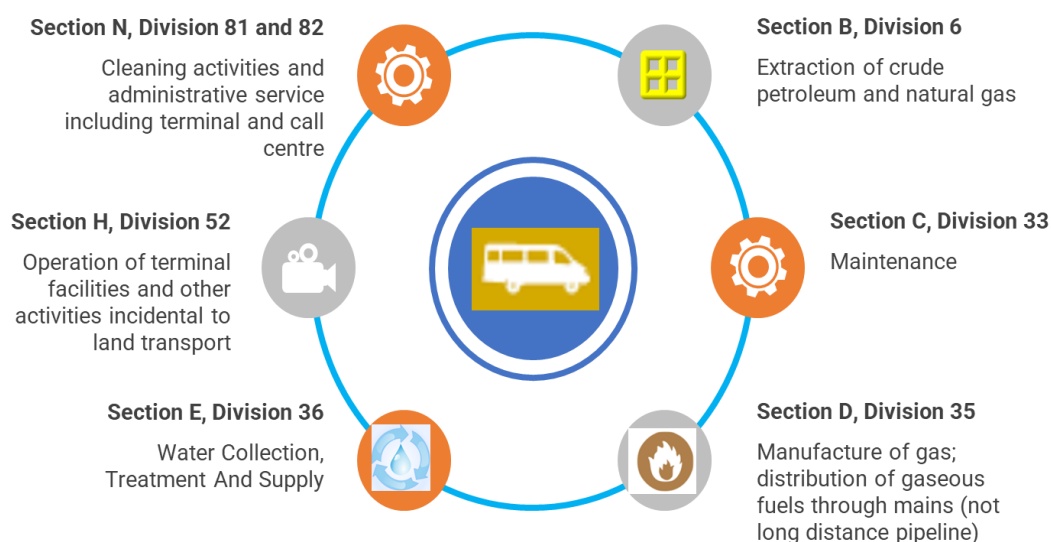


Figure 1.1: Exclusion Activities for H49

The transport sector is considered an important service in moving the country's economy. In line with this goal, Malaysia has developed various institutions and organizations that have contributed to economic growth. In the transport sector particularly for land transport, the Malaysian Ministry of Transport is responsible for

ensuring the provision of safe, efficient, and sustainable transport services throughout Malaysia to improve the quality of life and support a competitive economy. Malaysia's economic growth has been supported by development in the transport sector. Malaysia has built over 200,000 km of road and 2,900 km of rail (Ministry of Transport 2018).

Rail and road transport (under group H491 and H492) are the main mode of transport in Malaysia. Rail transport in Malaysia cover under these groups consists of heavy rail (including commuter rail), light rapid transit (LRT), mass rapid transit (MRT), monorails, airport rail links, hill tram and a cable railway line. In the future this scenario will be change concurrent with Malaysia Rail Roadmap 2030. The rail networks that were originally restricted to the Klang Valley would have become nationwide by 2030 to include all of Malaysia. The main trunk of the Keretapi Tanah Melayu Berhad (KTMB) tracks, which run from north to south, have been upgraded and added to, and they currently extend from Peninsular Malaysia's west coast to its east coast. Moreover, there are a number of spur lines that link important ports with important industrial parks in the Iskandar Malaysia in the south, the North Coast Economic Corridors (NCER), and the East Coast Economic Corridors (ECER). High speed rail, which is run by a private enterprise and runs parallel to the current trunk line, is quickly gaining favour. The train is now operating on the Singapore-Johor-Kuala Lumpur route, with intentions to extend as far as Bangkok. Figure 1.2 shows a few recent and incoming rail projects that have been completed recently and are under construction. In addition, Figure 1.2 also shows the planning for rail industry to cater for future demand.

Thus, to coordinate all activities, the Land Division function an important role as a generator and driving the development and implementation of NTP. To meet the general requirements, the various public transport policy designed to ensure that public land transport sector remains a safe and efficient based on current needs. According to the Road Transport Act 1987 (Act 333), Land Public Transport Act 2010 (Act 715), and the Railways Act 1991 (Act 463), the enforcement and regulatory duties are under the roles and responsibilities of agencies such as the Road Transport Department (RTD) and Land Public Agency (APAD).

Land transport via pipeline (under H493) is usually focused on transport of gases, liquids, water, and other commodities via pipelines. Water services industry, oil and gas

industry are among of the areas within H493. Approximately 0.8% of Malaysia's GDP in 2018 is expected to come from Malaysian water business in 2020, as projected by Human Resources Development Corporation (HRDC 2021). The Water Services Industry Act (WSIA) has several regulations aimed at improving efficiency, one of which is the licensing of water and sewerage operators for both public and private systems. As part of the financial reforms, the government has established *Pengurusan Aset Air Berhad* (PAAB), a water asset holding company entrusted with facilitating the raising of money from the Ministry of Finance for the industry at the most cost-effective rate. In addition, PAAB work closely with the respective stakeholders in the planning of new water infrastructure and pipe rehabilitation and replacement programme.

### COMPLETE

**Klang Valley Double Tracking Phase 2 (KVDT2):** The KVDT2 covers two lines; From Kuala Lumpur to Port Klang and from Salak Selatan to Seremban. Start its operation in 2022.

**MRT Line 2:** The Mass Rapid Transit (MRT) Line 2 project is a 52.2km long line with 37 stations that connects Sungai Buloh in Selangor to Putrajaya in Kuala Lumpur. Start its operation in March 2023.

### IN-PROGRESS

**LRT3:** The Light Rail Transit (LRT) 3 project is a 37km line with 26 stations that connects Bandar Utama in Selangor to Johan Setia in Klang. The project is currently under construction and is expected to be completed by 2025.

**East Coast Rail Link (ECRL):** The ECRL is a 665km long rail link that connects the east coast of Peninsular Malaysia to the west coast. The project is currently under construction and is expected to be completed by 2026.

**Rail Transit System (RTS) Link:** The RTS Link Project is a railway shuttle link approximately 4km length with two stations, one in Bukit Chagar, Johor Bahru, Malaysia and one in Woodlands, Singapore. The link will have a capacity of 10,000 passengers per hour, per direction.

### FUTURE PLANNING

**MRT Line 3:** The MRT3 Circle Line, is said to be the critical final piece to complete Kuala Lumpur's urban rail network, with its 50.8km alignment running along the perimeter of the city.

**High-Speed Rail (HSR):** The HSR project is a 350km long rail link that connects Kuala Lumpur to Singapore. Currently, the project is still pending.

**Penang Transport Master Plan:** The Penang Transport Master Plan is a comprehensive plan to improve the public transport system in Penang. It includes the construction of a light rail transit system, a bus rapid transit system, and a ferry service.

Figure 1.2: Recent and Future Projects related to Rail Industry

These days, the emergence of various new and potentially changing technologies such as Cloud system, e-commerce, Internet of Things and autonomous vehicles. New technologies are emerging rapidly and governments around the world are struggling to keep up with the needs of civil society and businesses. Therefore, there is a need to monitor the Occupational Framework (OF) consist of its Occupational Structure (OS), its Occupational Responsibility (OR), and its Occupational Description (OR) in the land and pipeline transport sector to ensure that it remains relevant and in line with current technology, whether at a local or international level. In an industry where innovation and technology development are moving rapidly, the legal fraternity should also be ready to contribute towards providing an up-to-date legal service to support the objective of positioning Malaysia in the eye of the world.

### **1.3 Problem Statement**

The transportation network (i.e., rail and land transport) remains the backbone of Malaysia's current and future transport system. However, there is a pressing demand for more skilled workers in the transportation sector. It is consistent with NTP 2019-2030's Strategy 1.2, which addressed the transportation industry's need for qualified workers and how to improve the public's perception of the transportation industry as a career (MOT 2018). Furthermore, the strategy for a long-term and environmentally friendly transportation network was mapped out in NTP 2019-2030.

According to the Global Competitiveness Report 2020, Malaysia scores well in terms of quality of infrastructure and compares very favourably within ASEAN (World Economic Forum 2020). Moreover, based on the World Bank's Logistics Performance Index (LPI) 2023, Malaysia performs well on international shipments with timeliness also quite better compared to previous LPI record in 2018, from score of 3.46 to 3.7 (The World Bank 2023). Malaysia's liner-shipping connections with other countries have significantly improved since 2006. The Malaysian government has classified logistics including transportation as a priority industry and there are several government initiatives in the sector, including the National Transport Policy 2019-2030 (OECD 2021).

In addition to the NTP 2019–2030, plenty of other government initiatives are in the way to enhance the transportation system. Transportation was also singled out as a Key Economic Growth Activity (KEGA) under KEGA 8 in 2019, produced by the



Ministry of Economy's Shared Prosperity Vision 2030 (Ministry of Economy 2019). Malaysia's increasing rail transportation sector will benefit from the roadmap laid out in the Malaysian Rail Supporting Industry Roadmap 2030 (MIGHT 2014). Industry 4WRD, which was created by Ministry of Economy (MOE), also brought attention to the country's pressing need for a new approach transformation of socioeconomic to social and economic growth (EPU 2021).

Based on the database from the Department of Skills and Development (DSD), Division H has produced one Occupational Analysis (OA) for the Rail Industry in 2012, one OF for Transport via Railways in 2016 (Department of Skills Development 2022). In addition, there were two OF documents related to Division H were produced in 2019, namely OF in Warehousing and Support Activities for Transportation (section H52) and OF for Postal and Courier Activities (Section H53). When it comes to land transport and transport via pipelines such as bus, truck, and pipeline transportation on land, there is no specific OF for Section H49. Transport via pipeline, however, encompasses a single OF for the Water Services Industry in 2016 and a single OS for the Oil, Gas, and Petrochemical Industries in 2011. Documents that have been previously produced in relation to this study are listed in Figure 1.3 and Table 1.2.

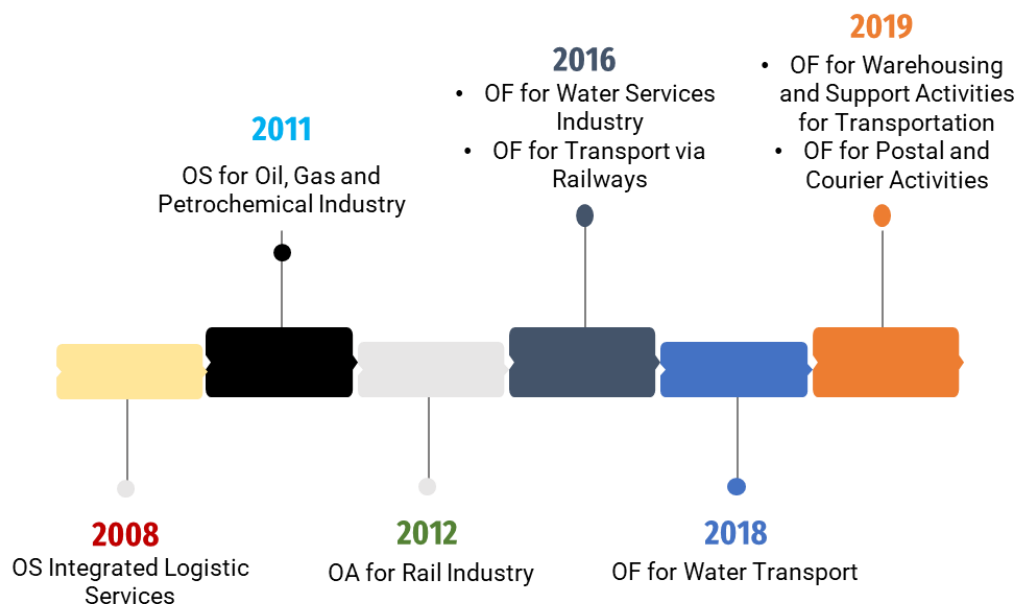


Figure 1.3: Development of Related Documents under Department of Skill Development

Table 1.2: The previous document related to this study from 2008 to 2019

Year	Document Title	Remarks
2008	OS Integrated Logistics Services Industry	General information related to this logistic and transport service industry and scope of study is more on development of OS.
2011	OS for Oil, Gas and Petrochemical Industry	General information related to this industry and scope of study is more on development of OS.
2012	OA for Rail Industry	General information related to this industry and scope of study is more on development of OA.
2016	OF for Water Services Industry	General information related to this industry.
2016	OF for Transport via Railways	Specific to H491 and H492, however the information needs to be revised.
2018	OF for Water Transport	Different Division according to MSIC 2008. Specific to H50, not H49.
2019	OF for Warehousing and Support Activities for Transportation	Different Division according to MSIC 2008. Specific to H52, not H49. Part of logistic units.
2019	OF for Postal and Courier Activities	Different Division according to MSIC 2008. Specific to H53, not H49.

As there are currently two existing OA and OF for the Rail Industry in 2012 and Railways Transport in 2016, the description of the OA or OF for this sector still does not meet the guidelines outlined in the Malaysia Standard Industrial Classification (MSIC) 2008 for the land transport service sector under H49. The previous OF consists of a combination of information for groups H491 and H492. As preserved in MSIC 2008, railways services have been split into two groups. It depends on the type of distance and place of service, whether it serves between interurban or urban and suburban. With regards to OF for Water Services Industry and OS for Oil, Gas and Petrochemical Industry, the OF and OS's information for this industry is too general, where all the OS developed related to the water and oil, gas and petrochemical industry were presented in

these documents. It does not specifically emphasize services related to transport via pipelines.

The Land Transport and Pipeline Transport industry is an integral component of the economy for the transportation of goods and people. However, the absence of an OF that is directly focusing on Land Transport and Pipeline Transport as defined by MSIC 2008, has posed significant obstacles for employers, employees, and policymakers. The lack of defined occupational standards and guidelines hinders the industry's ability to recruit and retain skilled workers, resulting in skill gaps and labour shortages. This circumstance also makes it difficult for policymakers to develop effective training that addresses the specific requirements of the industry. Therefore, there is an urgent need to establish an OF for this sector to provide employers, employees, and policymakers with unambiguous guidance.

Issues related to transportation of dangerous goods also one of the elements that have been important to look at for this sector. On a daily basis, things that are classified as dangerous goods are shipped via road, rail, water, and air transport. Accidents can be caused by the influence of random causes and events, and these accidents might result in the release of potentially harmful substances. These kinds of occurrences pose a risk not only to the reliability of the rail, land, and pipeline transportation systems, but also to human life, the environment, and property.

The transportation of dangerous goods in Malaysia is governed by a number of acceptable standards or codes of practise, such as Road Transport Act 1987 (Act 333), Motor Vehicles (Vehicles Carrying Dangerous Goods) Rules 2015, United Nation Recommendations on Transport of Dangerous Goods (UN Standard), International Maritime Dangerous Goods Code (IMDG Code), European Agreement on Road Transport of Dangerous Goods (ADR Standard), Land Public Transport Act 2010 (Act 715), International Safety Guide for Oil Tankers and Terminal, Factories and Machinery Act 1967 (Act 139) and Weight Restrictions (Federal Road) (Amendment Orders 2003), and Environmental Quality (Amendment) Act 2012 (Act A1441). Whenever it comes to maintaining the security and dependability of delivery, the handling of dangerous good vehicles is of utmost importance for sectors that are associated to it. It should be a primary priority for any industry to determine the required and most recent levels of training,

ability, and understanding for the management of potentially hazardous code.

Apart from the safety issues related to handling of dangerous good, a driver is known as one of the major individuals for maintaining the smoothness and safety of operation, particularly in the rail and land transportation sector. A driver shortage and looming capacity crisis make this a pressing problem for transportation sector. However, most incidents are referred to as "human factor-related accidents," and they are brought on by the poor performance of drivers. Another significant contributor to the occurrence of accidents is fatigue (Fan et al. 2022; Useche et al. 2017).

It is recommended that relevant agencies or industries look into ways to control drivers' fatigue and distractions in order to reduce the number of accidents that take place on the rail and road systems in particular. Among the major factors are health condition, work hour and schedule, work-life balance, driving on the similar route in the same locomotives or heavy vehicles or cars, behaviors of passengers and fallback strategies of the automatic systems (Batson et al. 2022; Ji-Hyland & Allen 2022; Boyce 2016; Qiu et al. 2011). This is a critical issue that has largely been overlooked in the transportation sector.

Hence, the development of the new OF is vital as it serves as a fundamental reference for revising the existing National Occupational Skills Standard (NOSS) and the development of additional NOSS. Employers and policymakers can use it to comprehend the current state of the industry. This is essential due to the current trend in the demand and supply of labour, which requires the identification of critical jobs, required competencies, and jobs relevant to the advancement of technology and industrial revolution. All these factors may influence the occupational landscape, hence demanding the revisiting and updating of the existing NOSS based on the new Occupational Structures that will be developed in this OF. This also underlines the need for research into the overall Occupational Structure and available career paths in this sector.

In addition, it is expected to provide further clarity about the industry insight on OS, OD, skills in demand, job titles, competency level and identification of the critical tasks required in the job classification corresponds to the development of the future NOSS based on MSIC 2008 sections and divisions, produced by the Department of Statistics Malaysia (DOSM). The OF for H49 is developed with a target to encourage employers

covered under Section H49 to train and upgrade the skills of their local employees, apprentices, and trainees in line with their business needs and development strategy of the organisation.

#### **1.4 Objectives of Study**

The objectives of the study are as below:

- i. To establish Occupational Structure (OS) for the Land Transport and Transport Via Pipelines sector based on MSIC 2008 by examining job areas, job titles and relevant competency level;
- ii. To establish Occupational Responsibilities (OR) that outline the main work activities and tasks for each job titles;
- iii. To establish Occupational Descriptions (OD) for each job title in demand based on the proposed OS;
- iv. To identify the critical jobs titles in the Land Transport and Transport Via Pipelines sector; and
- v. To determine job title related to technology and industrial revolution for the Land Transport and Transport via Pipelines.

#### **1.5 Scope of Study**

The study only covers Section H, Division 49 – Land Transport and Transport via Pipelines. The respondents of this study will only be those who are working under economic activities related to H49, as highlighted in MSIC 2008 that are registered with the Companies Commission of Malaysia (*Suruhanjaya Syarikat Malaysia, SSM*). This document excludes activities as demonstrated in Figure 1.1. Document analysis procedure is employed to illustrate current overview of the industry relevant to the research objective and industrial need. This study is based on organisational level where only executive and management personnel in Rail, Land and Pipeline Transport industry players in all over Malaysia will be chosen as the target respondent for responding to the survey questionnaire. Focus Group Discussion and interview approach also been chosen in which it involves 24 industry experts representing different types of Land Transport and Transport via Pipelines. Furthermore, the study is limited to the occupation being

practiced within Malaysia only; whilst taking note of certain local establishment that follows their parent companies' international practices.

## 1.6 Significance of Study

By creating an OF for the H49 section, the sector gains a high-level overview of the breadth of occupations as well as the most important job categories and titles in the sector as a whole. The framework captures the consensus opinion of a representative group of employers, subject matter experts, and expert workers on the key job functions and competencies that an individual would need to demonstrate to be successful in a particular profession, as well as the underlying knowledge and skills that are deemed critical to the development of those competencies. Therefore, organisations that adopt this framework should embrace OF as a jumping-off point and develop capabilities that match their needs and requirements.

Additionally, this OF will be the reference in developing the NOSS and it will also enrich the Malaysia Standard Classification of Occupations (MASCO 2020). In addition, this OF can be used by employers and policymakers to comprehend the current state of the industry. Furthermore, this document can be used by the Higher Education Institutes. The knowledge, expertise, and skill mastery in the transportation service sector can be used as a guide by individuals, companies, and training providers. Additionally, the created job matrix could be used as a guide for career advancement within the concerned industry. Furthermore, the needs of the workforce require a comprehensive development of all sectors including the education and skills training as well as input from the industry.

## 1.7 Structure of Chapter

This chapter concludes with a brief description of the entire study, which includes the following:

- i. **Chapter I** explains about brief introduction, background, problem statement, objective, scope, and significance of this study.
- ii. **Chapter II** provides a literature review about the research that give a further understanding about the research purpose.
- iii. **Chapter III** shows the overall approach of the study and the methods used to

achieve the objective of this study.

- iv. **Chapter IV** analyses the findings derived from the study methods employed in Chapter III, which are compatible with the research objectives indicated in Chapter I.
- v. **Chapter V** summarises the overall research findings and presents recommendations that incorporate the input of industry professionals. This chapter concludes the analysis of the Land Transport and Transport via Pipelines sector's Occupational Framework.

## **CHAPTER II**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter explores the current state of the Land Transport and Transport via Pipelines and other relevant matters around this occupation sector that are important to be included in this document. Further information related to relationship between National Skills Development Act 2006 (Act 652) and Occupational Framework also have been presented in this chapter. Following to that, an overview of Malaysia Standard Industrial Classification (MSIC) 2008, Malaysian Occupational Skills Qualification Framework (MOSQF) and National Occupational Skills Standard (NOSS) will be described in this chapter. The chapter continues with list of key stakeholders, government legislations, policies and initiatives, industry and market intelligence as well as overview of land transport and transport via pipelines. An overview of relation between this sector with Industrial Revolution is also explained in this chapter.

#### **2.2 National Skills Development Act 2006 (Act 652)**

The National Skills Development Act 2006 (Act 652) was officially gazetted on 29 June 2006 and went into effect on September 1, 2006 with the goal of encouraging individuals to acquire and hone the skills necessary for gainful employment and to make other provisions related thereto through skill training. Considering that no other national law in Malaysia's history has ever been enacted specifically for skills training and development, Act 652 is a landmark piece of legislation. Furthermore, a statutory interpretation of the purpose and scope of skills training has been provided, allowing it to be segregated from other elements of the country's national education and training system. The Malaysian Skills Certification System (MSCS), leading to the award of five levels of national skills qualification, is also established by Act 652. These levels are the Malaysian Skills Certificate (Level 1, 2, and 3), the Malaysian Skills Diploma,



and the Malaysian Skills Advanced Diploma.

These awards are an integral part of the concept of curriculum development, which is driven by industry demands. Figure 2.1 depicts the overarching concept of curriculum development as a cyclical process that varies slightly between the industry. Following the collection of industry requirements and demands, the Occupational Framework (OF) and the National Occupational Skill Standard (NOSS) are developed. The subsequent section will elaborate on the OF, which was developed in response to customer needs. OF is a central procedure within the MSCS that helps advance the country's goals as outlined in Act 652. This highlights the significance of Occupational Framework development in a wide range of critical areas, including in Land Transport and Pipeline Transport.

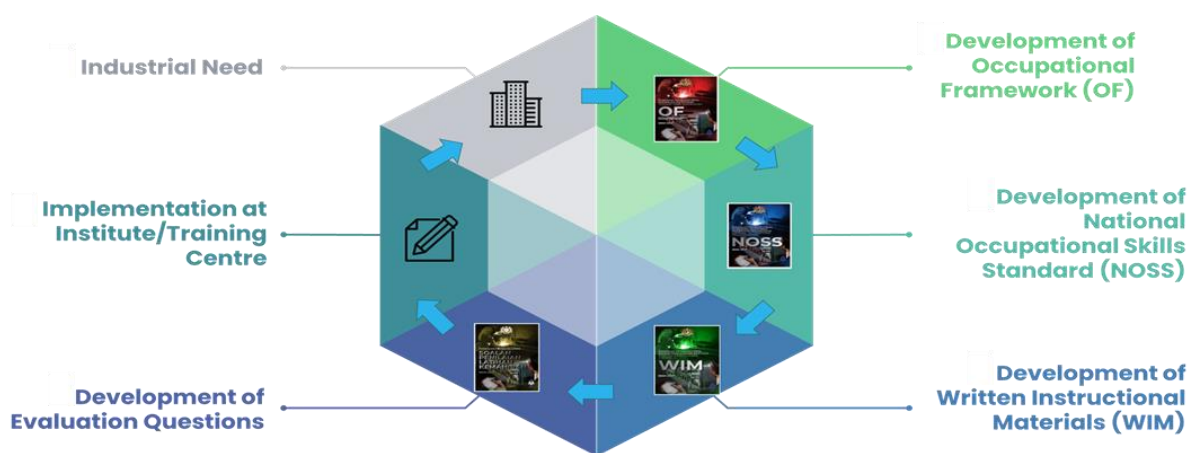


Figure 2.1: Cycle of Malaysian Skills Certification Ecosystem

(Source: Adapted from Department of Skills Development (2021))

### 2.2.1 Occupational Framework (OF)

This document, known as the Occupational Framework (OF), provides guidance to industry players in regard to specific Sections under MSIC 2008. The MSIC 2008 will be discussed in depth in Section 2.3. OF is defined as the result of conducting an occupational analysis (OA) in order to determine the industry's occupational structure. Formerly known as OA, OF is founded on the Malaysian government's Third Industrial Master Plan (IMP3) for the years 2005-2016 (Department of Skills Development 2022b).

However, a more detailed document including particular aspects is needed because of a change in emphasis by the Department of Statistics (DOSM) on industrial code entities, and this is reflected in the OF. The new version of OF includes the Occupational Structure (OS), Occupational Responsibility (OR), Occupational Description (OD), Critical Job Titles,

Competency in Demand, Job Titles related to current technology and Emerging skill. The development of the OF is a preliminary process in developing relevant NOSS. Following its completion, the NOSS will provide a solid foundation upon creating training programmes and credential qualified workers. The next subsection explains elements of OF.

The OF is made up of the three important parts: Occupational Structure (OS), Occupational Responsibilities (OR), and Occupational Description (OD). Table 2.1 depicts the description of each part in the OF. In general, OF responds to demands in the Malaysian labour market by giving an overarching perspective on the breadth of OR and OD involved in various occupations for a specific industry. The previous and current OF document can be obtained in the website of Department of Skills Development under Occupational Framework (Department of Skills Development 2022c).

Table 2.1: Main Parts and Descriptions in the Occupational Framework

Part	Description
Occupational Structure (OS)	<ul style="list-style-type: none"> <li>• Aggregate composition of an organization's workforce in terms of the variety of jobs available and how they are distributed within the company by considering skill level, economic function, and social status. It depicts the occupational areas and possible career trajectories for a certain occupation.</li> <li>• Must have three sub-elements: i) area, ii) level according to Malaysian Occupational Skills Qualification Framework (MOSQF), and iii) job title (JT).</li> <li>• Different with organizational charts or structures, that not associated with MOSQF.</li> </ul>
Occupational Responsibilities (OR)	<ul style="list-style-type: none"> <li>• A factual and organised description of the duties, function and responsibilities of a given job position, listed under the Occupational Structure (OS), which also corresponds with the particular job's respective area and level.</li> </ul>
Occupational Description (OD)	<ul style="list-style-type: none"> <li>• Describes the summary of responsibilities, job level, and competency set such as knowledge, skills and attributes particular to the job</li> </ul>

The current OF document serve as a guide for the activities inside the industry. Along with the OS, OR, and OD as described in the above subsection, other considerations for OF development include: (1) jobs in demand; (2) critical job; (3) competency in demand; (4) jobs related to national technological advancement and industrial revolution; and (5) emerging skills. Table 2.2 shows these parts and its descriptions. The need to identify these five relevant parts is necessary for fulfilling the industry's requirements and also for OF development.

Table 2.2: Additional Parts in Occupational Framework and its Description

Part	Description
Job in demand	Jobs that are required and important in the smooth running of the main operations of the company.
Critical job	Present jobs title/s in the respective sectors that are hard to fill due to several reasons including the shortage of supply or require workers with a certain level of skills in performing the tasks (TalentCorp 2021). Example of factors that affect critical job are legislative requirements, global trades, and the introduction of new processes and emerging technologies.
Competency in demand	Reflects on the ability in performing the tasks efficiently according to the industry requirements. Involved behavioural traits required by the industry or organization, such as knowledge and attitude.
Jobs related to technological advancement and industrial revolution	Given current technology and the industrial revolution, this section estimates the likelihood that the entire occupation will be automated. Technologies relevant to the industrial revolution include those that improve customer interaction and business efficiency.
Emerging skills	Skills predicted to be imperative to the industry soon, based on the recent development, trend or study. Generally associated with the rapid change of technological advancement and industrial revolution.

Generally, development of OF is vital as it serves as a fundamental reference for revising the existing NOSS and the development of additional NOSS, according to industry demand. In developing OF, several documents are used as the main guide in planning and shaping the process structure. The classification of the OF section is based on MSIC 2008 issued by DOSM. This document is a classification of controlled areas that aims to reorganize the industry sector to be in line with national and international standards as a whole according to the type of activity in the industry. Basically, the development of the Occupational Structure (OS) which is one of the OF elements is a preliminary process in developing relevant National Occupational Skills Standard (NOSS). The NOSS in turn will be developed to be used as the basis to conduct skills training and certification of competent personnel. The next section presents NOSS and its function.

### **2.2.2 Development of National Occupational Skills Standard (NOSS)**

The National Occupational Skills Standard (NOSS) is described in Part IV of the National Skills Development Act of 2006 (Act 652) as a specification of the abilities expected of a skilled worker who is gainfully employed in Malaysia for an occupational field, level, and pathway to acquire the competencies. NOSS is used as the primary tool in the implementation of the Malaysian Skills Certification System, in which the performance of current industry workers and trainees is assessed based on the NOSS to award the Malaysian Skills Certificate. NOSS was developed by industry experts based on the needs of the industry.

The DSD has developed around 30 NOSS related to MSIC 2008 Division H49, including NOSS under Section C as of April 2022. The summary of NOSS title, according to NOSS Registry April 2022, is provided in the Table 2.3 below (Department of Skills and Development 2022d). The previous and current NOSS document can be obtained in the website of Department of Skills Development under Standard Registry and Sistem Pengurusan Integrasi Kemahiran Malaysia (MySPIKE) (Department of Skills Development 2022d; MySPIKE 2023).

Table 2.3 Summary of NOSS developed under the Division H49  
(Source: Department of Skills and Development 2022d; MySPIKE 2023)

<b>MSIC 2008 GROUP</b>	<b>CORRESPONDING NOSS/LEVEL</b>
<b>H491, and H492 (rail operation)</b>	<ul style="list-style-type: none"> <li>a) H491-001-5:2017 Railway Signalling and Communication Management</li> <li>b) H491-001-4:2017 Railway Signalling and Communication Coordination</li> <li>c) H491-001-3:2017 Railway Signalling and Communication Maintenance Control</li> <li>d) H491-001-2:2017 Railway Signalling and Communication Maintenance</li> <li>e) H491-002-5:2017 Rolling Stock Maintenance Management</li> <li>f) H491-002-4:2017 Rolling Stock Maintenance Planning and Controlling</li> <li>g) H491-002-3:2017 Rolling Stock Maintenance Quality Control</li> <li>h) H491-002-2:2017 Rolling Stock Maintenance</li> <li>i) H491-004-3:2020 Rail Operation Control</li> <li>j) H491-003-3:2020 Railways On-Board Service Operation Quality Inspection</li> <li>k) H491-003-2:2020 Railways On-Board Service Operation Inspection</li> <li>l) TP-710-5:2016 Railway Operations &amp; Control Management</li> <li>m) TP-710-4:2016 Railway Operations &amp; Control Administration</li> <li>n) TP-711-3:2014 EMU Operation Supervision</li> <li>o) TP-720-3:2014 Locomotive Driver Supervision</li> <li>p) H491-005-3:2020 Railways Station Operation Supervision</li> <li>q) TP-711-2:2014 EMU Operation</li> <li>r) TP-720-2:2014 Locomotive Driving Operation</li> <li>s) H491-005-2:2020 Railways Station Operation</li> <li>t) TP-720-1:2014 Locomotive Inspection Operation</li> </ul>
<b>492</b>	<ul style="list-style-type: none"> <li>a) H492-001-3:2017 Road Transport Safety Management</li> <li>b) IL-010-5:2012 Public Transport Terminal Operation Management</li> <li>c) IL-010-4:2012 Public Transport Terminal Operation Management</li> <li>d) IL-010-3:2012 Public Transport Terminal Operation</li> </ul>
<b>493</b>	<ul style="list-style-type: none"> <li>a) H493-001-3:2019 Pipeline Installation Supervision</li> <li>b) H493-001-2:2019 Pipeline Installation Supervision</li> <li>c) CM-021-5:2014 Water Distribution Management</li> <li>d) CM-021-4:2014 Water Distribution Operation Management</li> <li>e) CM-021-3:2014 Water Distribution Supervision</li> <li>f) CM-021-2:2014 Water Distribution Operation</li> </ul>

### **2.2.3 Development of Written Instructional Materials (WIM)**

The development of the Written Instructional Materials (WIM) is a part of revolutionary of Department of Skill Development (DSD) towards the transformation of Technical and Vocational Education and Training (TVET) in Malaysia. Along with the development technology, systematic WIM shall provide best practice of learning either in theory or practical to equip the students with the latest lesson or module before entering the industry. Development of WIM will provide references to the main subject of study, to ensure learning outcome meet the requirements and to ensure lecturers master the subject taught. The WIM document can be obtained from the accredited training centres.

### **2.2.4 Development of Evaluation Question**

The development of evaluation questions involves defining the purpose and goals of the evaluation, identifying key aspects or criteria, crafting clear and specific questions, testing and refining the questions, using them to collect data, analyzing the data to draw conclusions, and using the findings to inform decision-making.

### **2.2.5 Institute/Training Centre/Industry Implementation**

The implementation of a program at DSD Malaysia involves planning, mobilizing resources, delivering training, assessing participants, awarding certification, and continuous improvement through evaluation and feedback. The goal is to enhance the skills and competencies of the Malaysian workforce.

### **2.2.6 Industrial Demand**

The industrial demand on DSD Malaysia refers to the skills and competencies required by industries and employers in Malaysia. DSD Malaysia works with industry partners to identify these needs and develops training programs that prepare the workforce with the necessary skills and knowledge. The department collaborates with training providers to deliver industry-standard training. The demand for skills is constantly evolving, requiring JPK Malaysia to stay current with the latest trends and adapt their training programs to meet the demands of the job market.

## 2.3 Malaysia Standard Industrial Classification (MSIC) 2008

This section provides the economic activities based on MSIC 2008 scope for the Land Transport and Transport via Pipeline. The overview of MSIC 2008 and scope of title selection criteria are explained in this section.

### 2.3.1 MSIC Overview

As a benchmark for categorising economic activities, the MSIC 2008 is widely accepted as the gold standard. MSIC aims to provide a certain set of activity categories in order to classify entities in accordance with the economic activity that an industry engages in. The MSIC 2008 Version 1.0 is nearly identical to the International Standard Industrial Classification of All Economic Activities (ISIC) Revision 4 for the purposes of international comparability, with some minor alterations to fulfil national requirements. An industrial classification system's goal is to categorise economic data into groups of activities, each of which will have comparable features. Instead of classifying specific occupations or products, the MSIC 2008 classifies the entire economic activities. Figure 2.2 shows the structure of the MSIC 2008 as specified by Department of Statistics Malaysia (2022). The next subsection shows the scope of the OF document.

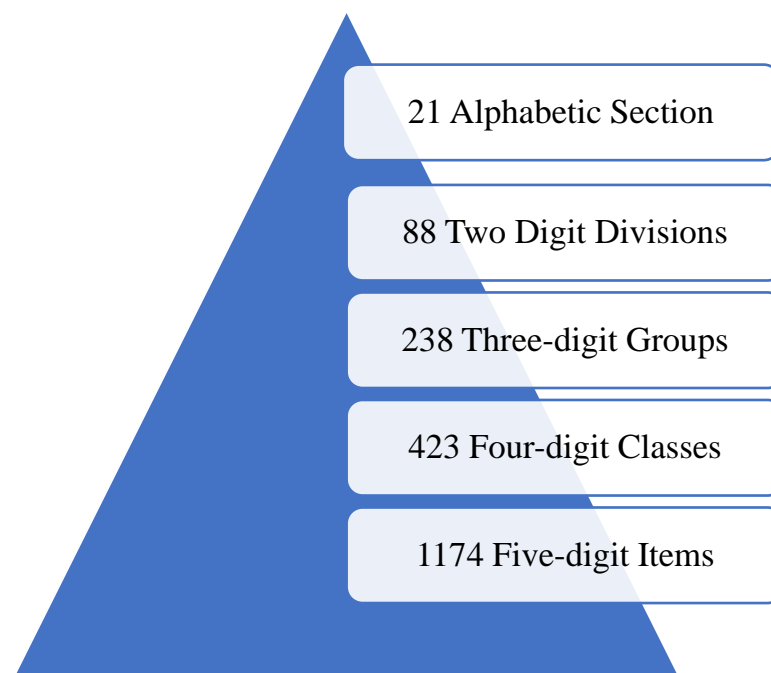


Figure 2.2: MSIC 2008 Structure

Malaysia utilises MSIC, Malaysian Standard Classification of Occupations (MASCO), and National Education Code (NEC) coding to classify industries, vocations, and educational programmes, respectively. Despite the fact that each of the three coding systems serves a distinct purpose, there may be some overlap between the codes employed by each system. Yet, there are significant distinctions between them:

- MSIC codes are generally used to classify industries and economic activities, whereas MASCO codes are used to classify occupations and job titles. On the other side, NEC coding is used to classify educational programmes.
- MSIC coding and MASCO coding are both extremely exact, with numerous layers of sub-categories that permit the classification of industries and occupations in great detail. The NEC uses broader categories to define educational programmes, resulting in less specific classification.
- MSIC coding and MASCO coding designate industries and vocations, respectively, using numerical codes. In contrast, the NEC employs alphanumeric designations to classify educational programmes.
- MSIC coding would be used to classify transportation-related industries, such as air transport and land transport, in terms of transportation. The MASCO coding system would be used to classify transportation-related vocations such as drivers and pilots. The NEC would be used to classify transportation-related educational programmes, such as automotive engineering and aviation management.

Specific to the transportation sector, the NEC code for transport-related programs may vary depending on the specific program or course. Under NEC 2020, it belongs under Code 10: Service, 104: Transport Services. However, the transport service is generalised for all types of transport, either land, air or water transport. On the other hand, MASCO code for transport-related occupations may vary depending on the specific occupation, such as code 8331: Bus and Tram Drivers, 8332: Heavy Truck and Lorry Drivers and 2173: Aircraft Pilots and Related Professionals. Next section provides information related to code based on MSIC 2008.

### **2.3.2 Scope of Occupational Framework for Land Transport and Transport via Pipelines based on MSIC 2008**

This document only explores Land Transport and Transport via Pipelines service sectors. The



subject field shall be defined in accordance with MSIC 2008. The definition and area of coverage for the OF are listed in Table 2.4 below and are based on MSIC 2008.

Table 2.4: Summary of Scope Based on MSIC Section, Division and Group (*Source: MSIC 2008*)

Category	Code	Description
Section	H	Transportation and Storage
Division	49	Land Transport and Transport via Pipelines
Group	491	Transport via Railways
	492	Other Land Transport
	493	Transport via Pipeline

Meanwhile, Table 2.5 describes the scope further based on the respective section, division, group, class, and item.

Table 2.5: Description of Scope Based on MSIC Section, Division, Group, Class and Item (*Source: MSIC 2008*)

Category	Code	Description
<b>SECTION</b>	<b>H</b>	<b>Transportation and Storage</b>
<b>DIVISION</b>	<b>49</b>	<b>Land Transport and Transport via Pipelines</b>
<b>GROUP</b>	<b>491</b>	<b>Transport via Railways</b>
<i>Class</i>	4911	<b>Passenger rail transport, interurban</b>
<i>Item</i>	49110	<p><b>Includes:</b></p> <p>passenger transport by inter-urban railways operation of sleeping cars or dining cars as an integrated operation of railway companies</p> <p><b>Excludes:</b></p> <ul style="list-style-type: none"> <li>a. passenger transport by urban and sub urban transit systems, see 4921</li> <li>b. passenger terminal activities, see 52211</li> <li>c. operation of sleeping cars, see 55900 or dining cars when operated by separate units, see 5610</li> </ul>
<i>Class</i>	4912	<b>Freight rail transport</b>

Category	Code	Description
<i>Item</i>	49120	<b>Includes:</b> Freight transport by inter-urban, suburban and urban railways  <b>Excludes:</b> a. storage and warehousing, see 52100 b. freight terminal activities, see 52211 c. cargo handling, see 5224
<b>GROUP</b>	<b>492</b>	<b>Other Land Transport</b>
<i>Class</i>	4921	<b>Urban and suburban passenger land transport</b>
<i>Item</i>	49211	<b>Includes:</b> City bus services
	49212	<b>Includes:</b> Urban and suburban railway passenger transport service, Light Rail Transit (LRT), Express Rail Link (ERL), Monorail  <b>Excludes:</b> passenger transport by inter-urban railways, see 49110
<i>Class</i>	<b>4922</b>	<b>Other passenger land transport</b>
<i>Item</i>	49221 49222 49223 49224 49225 49229	Express bus services Employees bus services School bus services Taxi operation and limousine services Rental of cars with driver Other passenger land transport  <b>Includes:</b> a. express inter-urban bus, etc. b. charters, excursion and other occasional coach services c. hill tramway services d. passenger transport by man-or animal-drawn vehicles (trishaw) e. airport shuttles f. cable cars services  <b>Excludes:</b>

Category	Code	Description
		ambulance transport, see 86906
<b>GROUP</b>	<b>493</b>	<b>Transport via Pipeline</b>
<i>Class</i>	4923	<b>Freight transport by road</b>
<i>Item</i>	49230	<p><b>Includes:</b></p> <ul style="list-style-type: none"> <li>a. logging haulage</li> <li>b. stock haulage</li> <li>c. refrigerated haulage</li> <li>d. heavy haulage</li> <li>e. bulk haulage including haulage in tanker trucks (e.g. palm oil tanker)</li> <li>f. haulage of automobiles</li> <li>g. transport of waste and waste materials, without collection or disposal</li> <li>h. furniture removal</li> <li>i. renting of trucks with driver</li> <li>j. freight transport by man or animal-drawn vehicles</li> <li>k. transport of water, liquids, etc. by trucks</li> </ul> <p><b>Excludes:</b></p> <ul style="list-style-type: none"> <li>a. log hauling within the forest, as part of logging operations, see 02401</li> <li>b. distribution of water by trucks, see 36001</li> <li>c. operation of terminal facilities for handling freight, see 52211</li> <li>d. crating and packing services for transport, see 52299</li> <li>e. post see 53100 and courier activities, see 53200</li> <li>f. waste transport as integrated part of waste collection activities, see 3811, 3812</li> </ul>
<i>Class</i>	4930	<b>Transport via pipeline</b>
<i>Item</i>	49300	<p><b>Includes:</b></p> <ul style="list-style-type: none"> <li>a. transport of gases, liquids, water, slurry and other commodities via pipelines</li> <li>b. operation of pump stations</li> <li>c. operation of pipelines</li> </ul> <p><b>Excludes:</b></p> <ul style="list-style-type: none"> <li>a. distribution of natural or manufactured gas,</li> </ul>

Category	Code	Description
		water or stream, see 35202, 35301, 35302, 36001 b. transport of water, liquids, etc. by trucks, see 49230

In general, it also includes operation of pipelines (not cover by Section B Division 06), long distance transport of gas (not cover by Section D Division 35), long distance transport of water via pipelines (not cover by Section E, Division 36). It is not including construction of pipelines (Section F, Division 42), short-distance transport of gas through pipelines or transportation, distribution and supply of gaseous fuels of all kinds through a system of main (Section D, Division 35), repair and maintenance of locomotives and railroads cars (Section C, Division 33), water collection, treatment and distribution activities for domestic and industrial needs including distribution of water by trucks (Section E, Division 36). Ambulance transport also not included in this division.

Also not included cleaning services of trains, buses and so on (Section N, Division 81), office administrative and support activities such as provision of a range of day-to-day office administrative services, such as financial planning, billing and record keeping, personnel and physical distribution and logistics for others on a contract or fee basis (Section N, Division 82), activities of call centres (Section N, Division 82). For land transport, operation of terminal facilities such as railway stations, bus stations, stations for the handling of goods, freight terminal activities are not covered in Section H Division 49 (under Section H Division 52).

## 2.4 Malaysian Occupational Skills Qualification Framework (MOSQF)

An Occupational Skill is broken down into eight competency levels by MOSQF. As shown in Table 2.6 below, each competency level correlates to a distinct amount of complexity, expertise, and autonomy needed to demonstrate the competence in line with that level's knowledge, experience, and adaptability in application.

Table 2.6: Malaysia Occupational Skills Qualification Framework (MOSQF) Chart

Level	Level Descriptors
8	Achievement at this level reflects the ability to develop original understanding and extend a sub-area of knowledge or professional practice. It reflects the ability to address problematic situations that involve many complexes, interacting factors through initiating, designing and undertaking research, development or strategic activities. It involves the exercise of broad autonomy, judgement and leadership in sharing responsibility for the development of a field of work or knowledge, or for creating substantial professional or organisational change. It also reflects a critical understanding of relevant theoretical and methodological perspectives and how they affect the field of knowledge or work.
7	Achievement at this level reflects the ability to reformulate and use relevant understanding, methodologies and approaches to address problematic situations that involve many interacting factors. It includes taking responsibility for planning and developing courses of action that initiate or underpin substantial change or development, as well as exercising broad autonomy and judgment. It also reflects an understanding of theoretical and relevant methodological perspectives, and how they affect their sub-area of study or work.
6	Achievement at this level reflects the ability to refine and use relevant understanding, methods and skills to address complex problems that have limited definition. It includes taking responsibility for planning and developing courses of action that are able to underpin substantial change or development, as well as exercising broad autonomy and judgment. It also reflects an understanding of different perspectives, approaches or schools of thought and the theories that underpin them.
5	Achievement at this level reflects the ability to identify and use relevant understanding, methods and skills to address broadly-defined, complex problems. It includes taking responsibility for planning and developing courses of action as well as exercising autonomy and judgment within broad

Level	Level Descriptors
	parameters. It also reflects the understanding of different perspectives, approaches or schools of thought and the reasoning behind them.
4	Achievement at this level reflects the ability to identify and use relevant understanding, methods and skills to address problems that are well defined but complex and non-routine. It includes taking responsibility for overall courses of action as well as exercising autonomy and judgment within fairly broad parameters. It also reflects the understanding of different perspectives or approaches within a sub-area of study or work.
3	Achievement at this level reflects the ability to identify and use relevant understanding, methods and skills to complete tasks and address problems that are well defined with a measure of complexity. It includes taking responsibility for initiating and completing tasks and procedures as well as exercising autonomy and judgments within limited parameters. It also reflects awareness of different perspectives or approaches within a sub-area of study or work.
2	Achievement at this level reflects the ability to select and use relevant knowledge, ideas, skills and procedures to complete well-defined tasks and address straightforward problems. It includes taking responsibility for completing tasks and procedures and exercising autonomy and judgment subject to overall direction or guidance.
1	Achievement at this level reflects the ability to use relevant knowledge, skills and procedures to complete routine and predictable tasks that include responsibility for completing tasks and procedures subject to direction or guidance.

## 2.5 Industry and Market Analysis

Industry and market analysis is the gathering and analysis of data from a variety of sources for the industry to use in developing its human resources and determining its training needs. For creating strategies in the development of the industry, areas of personnel development, and the impact of those advancements, industry intelligence is essential. Based on industry growth and

employment figures, this section will present information about the economic sector for this document.

### 2.5.1 Growth of Land Transport and Transport via Pipelines

Based on National Account Gross Domestic Product 2022, Malaysia's gross domestic product (GDP) grew 7% from the previous year. Malaysia's transport and logistics value of gross output increased to RM102 billion, growing 2.2% as compared to the year 2021. According to Figure 2.3, the largest contribution was warehousing and support operations, with a gross output of RM41.8 billion (40.9%), followed by land transport at RM26.8 billion (26.3%), and water transport at RM19.5 billion (19.1%). 86.3 percent of the entire value of gross output for transportation and storage services came from these three activities (DOSM 2023). Highlighting the service sector, Malaysia's transport sector represents a critical enabler for its socioeconomic development.



Figure 2.3: Value of Gross Output for Transportation and Storage Services by Activities  
 (Source: Department of Statistics Malaysia 2023)

The services sector is anticipated to expand by 5% in 2023, benefitting from the sustained domestic demand in spite of a moderate global economic growth. The growth will continue to be mainly driven by wholesale and retail trade; real estate and business services; information and communication; transportation and storage; and food & beverages and accommodation subsectors. The transportation and storage subsector is anticipated to grow by 7%, supported by all segments due to the expansion in rail, highway, port and airport activities

as well as sustained external demand. The land transport segment is projected to increase attributed to full operations of Mass Rapid Transit (MRT) Putrajaya Line and Sungai Besi-Ulu Kelang Elevated Expressway (Ministry of Finance 2020). In addition, as mentioned in Chapter 1, there are a few recent and future planning for rail projects in Malaysia. In addition, for road or highway facilities, there are various new highways have been opened and under construction for public use. This situation indicates that the economic growth of this sector is excellent, which is supported by various government policies and initiatives. Figure 2.4 shows the main findings from Annual Economic Statistics, 2022 for Transportation and Storage Services (Department of Statistics Malaysia 2023).

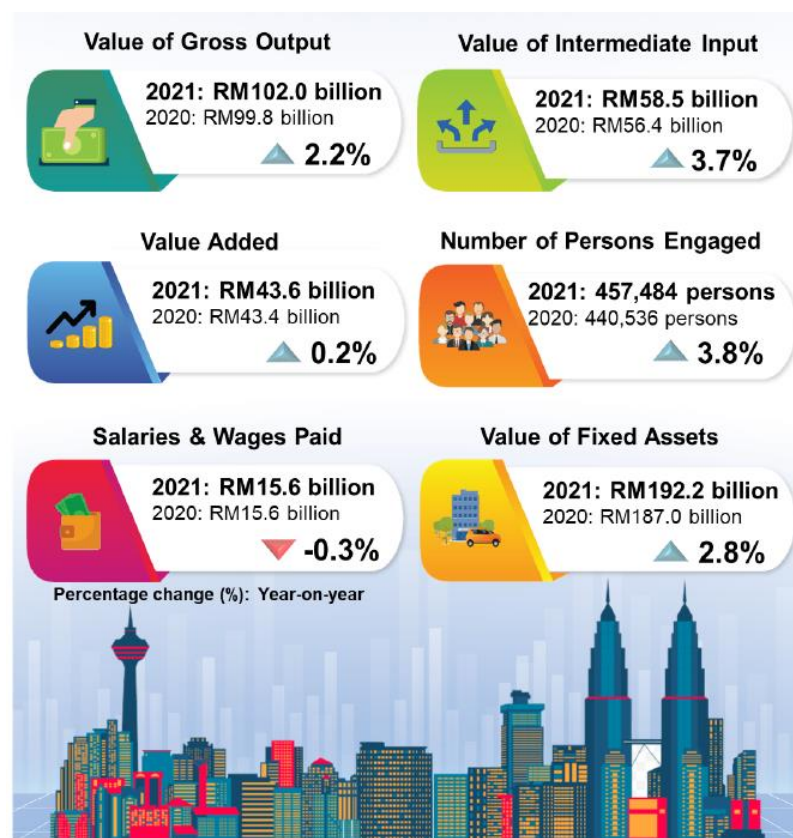


Figure 2.4: Main Findings from Annual Economic Statistics 2022 for Transportation and Storage Services (*Source:* Department of Statistics Malaysia 2023)

### 2.5.2 Employment Statistics

A total of 457,484 people were employed in transportation and storage services in 2021, an increase of 3.8% from the previous year (2020: 440,536). With 217,833 people, or 47.6%, the most people were employed in land transportation. Figure 2.5 shows that this was followed



by post and courier with 36,602 people or 8.0 percent and warehousing and support activities with 142,535 people or 31.2 percent. In 2021, 86.8% of the people working in the transportation and storage industry were involved in these three activities.

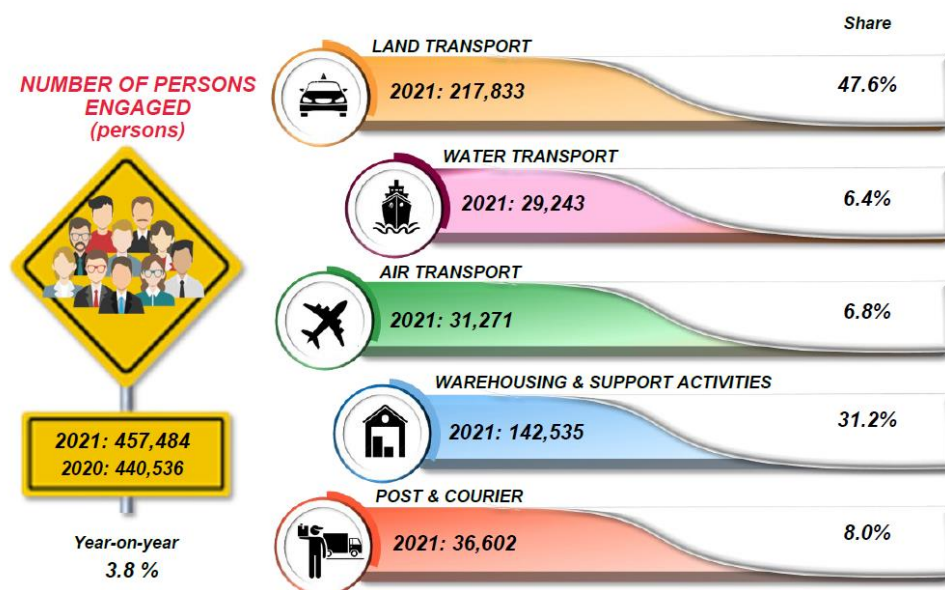


Figure 2.5: Number of Persons Engaged for Transportation and Storage Services by Activity, 2021 (*Source: Department of Statistics Malaysia 2023*)

According to employment figures, the number of people working in the transportation and storage sector climbed to 457,484 in 2021 from 440,536 in 2020. The expansion of this sector demonstrates unequivocally that transportation and storage is one of the sectors with the potential to improve national development in the future. In addition, the GDP of the service sector declined due to the COVID-19 pandemic between 2020 to 2021. However, in the third quarter of 2021, the service sector started to rise 3.2% due to resume some of the related economic activities and one of it is transportation and storage sector.

### 2.5.3 Value Chain Analysis on Land Transport and Transport via Pipelines Services

Value chain analysis is a collection of activities that an organization carries out to create value for its customers. The concept of value chain analysis as a generic business management tool was introduced by Porter (1985). Figure 2.6 shows a part of related logistics chain under Division H49. It shows the interconnection between various types of transportation including water, rail, and road transport to provide the service for the end user. The end user can be the retailer or customer.

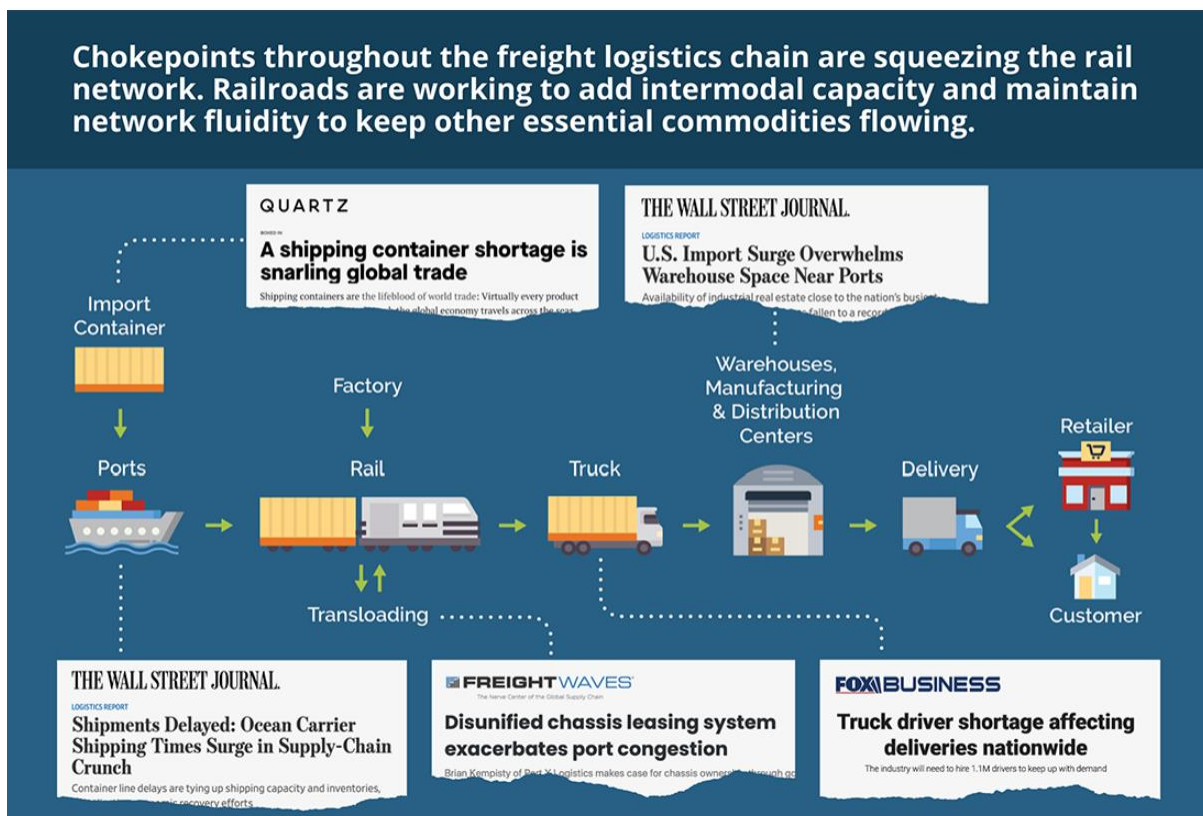


Figure 2.6: Related Logistics Chain Under Division H49 (Source: GoRail 2022)

Logistics refers to the receipt, production, and distribution of goods and materials in the customer-requested amounts to its final destination. It is also the strategy that determines how the company stores products in its warehouse, tracks orders, and delivers products to its customers. As stated by OECD (2021), there are five main subsectors of the logistics market: freight transportation, including transport by road, inland waterway and maritime; freight forwarding; warehousing; small-package delivery services; and value-added services. Figure 2.7 shows transport service value chain (Nooteboom 2007). In transportation the basic process is that objects or people undergo a shift of place, at a certain speed, yielding a utility of place and time. Further value is added in safety of travel, range and reliability of travel schedules,

and connections with ongoing travel.



Figure 2.7: Transport Service Value Chain (*Source: Nooteboom 2007*)

Transportation is an ‘experience product’, whose quality is mostly judged during consumption (Nooteboom 2007). Value is added in different stages of the process:

- Pre-departure: parking, reception, check-in, luggage, security checks, and waiting for departure.
- Transport: seating, catering, entertainment (music, films) and safety procedures.
- Post-arrival: docking, check-out, luggage retrieval, connecting transportation, accommodation, lost luggage, customs, complaint procedures.
- There is added value in the informational ‘tracking and tracing’ of goods in transport.

However, for Section H49, it covers on transport stage only, which is focus on operation. Next section explains specific primary and support activities for each group under Section H49: Land Transport and Transport via Pipelines.

#### a) **Primary and Support Activities for Land Transport and Transport via Pipelines**

Figure 2.8 shows the Value Chain for Rail Industry based on Porter’s Value Chain Model. This value chain is commonly modified from combination of studies and findings from the previous OF for Rail Industry (2016) and also from the Malaysian Rail Supporting Industry Roadmap 2030 (Department of Skills Development 2016; MIDA 2020). Basically, there are 10 components of rail-related activities with four components categorise as primary activities, while six components categorise as support activities. Based on the MSIC 2008 as described in Section 2.3, Section H49 for Group 491 (interurban train) and Group 492 (only for urban and suburban train, cable car, hill tram and airport shuttle) covers Rail Operation only.

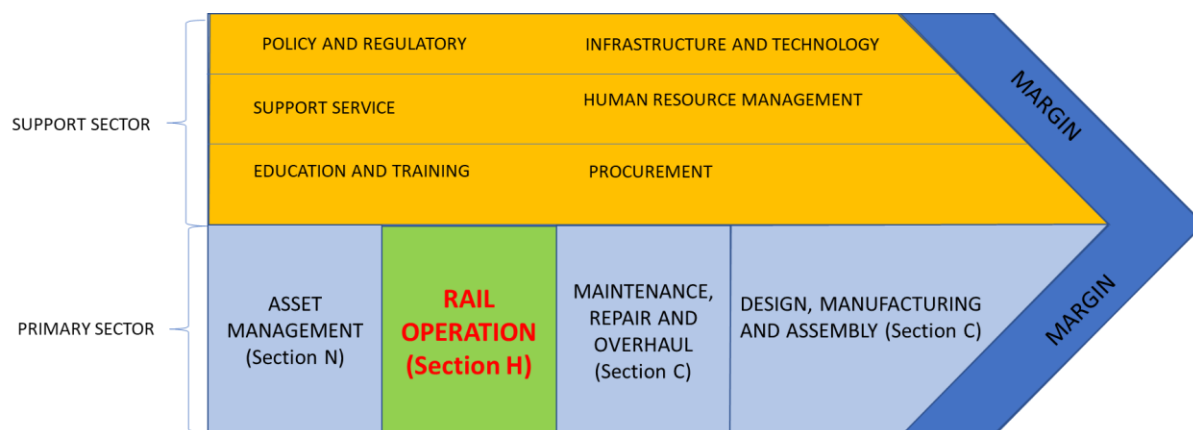


Figure 2.8: Value Chain for Rail Industry

(Source: Adapted from Department of Skills Development (2016) and MIDA (2020))

Table 2.7 shows the Value Chain for Group 492 (other than rail or train-related transport) as mentioned in the above paragraph. This value chain is commonly modified from combination of studies and findings from previous research related to land transport (Nooteboom 2007; Lowe et al. 2009; Logmore 2019; Lusikka et al. 2020). However, under Group 492, it covers Operation only.

Table 2.7: Value Chain for Other Land Transport

Area	Description
Incoming logistics	Activities involved in receiving, storing, and distributing the inputs needed to operate the bus and other type of land transport. The inputs can be fuel and spare parts.
Operations	Activities involved in running the bus or other land transport service, including maintenance of the transport, hiring and training drivers, and managing the routes and schedules.
Outbound Logistics	Activities involved in delivering the bus or other land transport service to customers.
Marketing and Sales	Activities involved in promoting the bus or other land transport service and attracting customers.
Service	Activities related to response for customer complaints, provide information and assistance to passengers.

Figure 2.9 shows the specific Value Chain for Water Industry. This value chain is commonly modified from combination of studies and findings from the previous OF for Water Service Industry (2016) and also from a few past research related to water industry (Spiller et al. 2009; Chofreh et al. 2019). However, under Group 493 which is related to pipeline transport, it only covers on transport services from the long-distance water distribution pipeline to the end user.

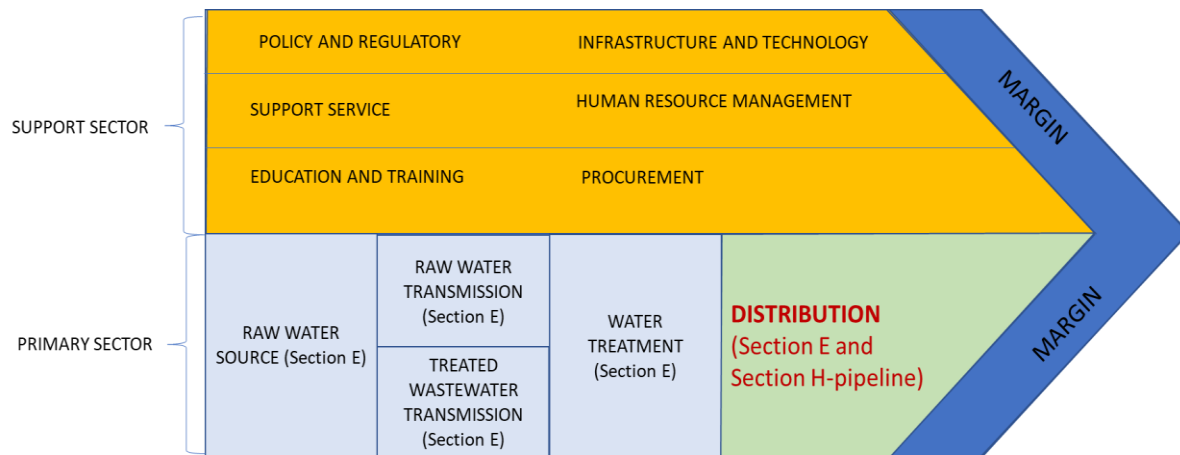


Figure 2.9: Value Chain for Water Industry

(Source: Adapted from Spiller et al. 2009 and Chofreh et al. 2019)

Figure 2.10 shows the overall Value Chain for Oil and Gas Industry, starting from upstream to downstream. The assets of each of the three principal business segments are held by E&P companies (Upstream), gas transmission providers (Midstream) and Local Distribution Companies (Downstream), the latter often owned by utility providers (Weijemars 2010). However, under Group 493 which is related to pipeline transport, it is only covers on downstream activities which is focusing on distribution from the distribution pipeline to the end user as demonstrated in Figure 2.11.

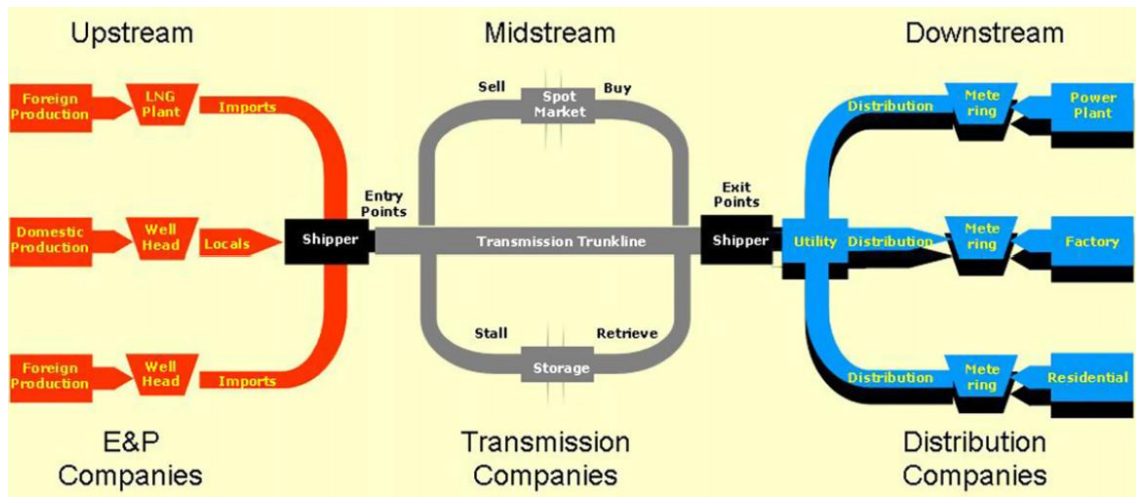


Figure 2.10: Physical Value Chain for Gas Trade

(Source: Weijemars 2010)

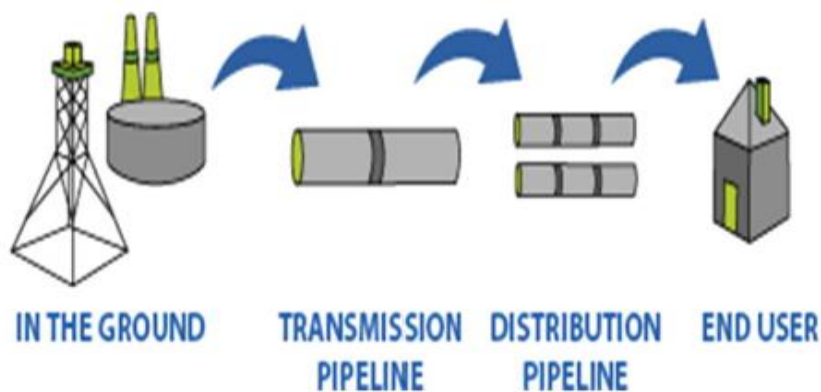


Figure 2.11: Typical Workflow For Value Chain Of Pipeline Transport

(Source: Weijemars 2010)

For the technology department as the support activity for the transportation sector, most businesses make use of a highly diverse range of technological solutions. The actions that go into developing new technologies can be categorized as either attempts to improve the product or efforts to improve the process. Technology such as telecommunications, automation software for transportation and customer service operations, as well as efficient supervisory control and data acquisition (SCADA) are a few examples that fall under this section.

For Human Resource Management as the support activity for transportation sector, the tasks of recruiting, hiring (and firing), training, developing, and compensating all different kinds of employees are included in the realm of human resource management. The role that Human Resource Management plays in evaluating the talents and motivation of employees, as



well as the cost of hiring and training them, can have a significant impact on the competitive edge of any company. This criterion (i.e., a person who is talented and skilled) is highly vital for the transportation industry, particularly for the freight and pipelines sector, since some of the commodities that have been transported are referred to be dangerous goods. In addition, this transportation sector also delivers the passengers via train, bus and other related land transport. Hence, it is very critical to select the right person to operate the transport.

#### **b) Other Matters related to Value Chain**

Safety is becoming an issue of major concern for the transportation sector. Regulations and preventive measures present powerful tool for increasing the safety and efficiency of dangerous transport. Galieriková et al. (2018) highlighted the risk identification process includes the main factors that may affect the occurrence of an emergency or accident in rail transport. There are identification of the state of the track, line characteristics, traffic system, railway operation, wagon characteristics and probability of hazardous material release.

In order to guarantee the efficacy, reliability and safety of rail travel and land transportation in general, it is essential to identify any and all potential hazards and reduce them to an acceptable level. Holeczek (2019) structured overview of the literature on the hazardous material (HAZMAT) transportation problem of the last 45 years. In general, dangerous code is classified into nine classifications, as tabulated in Table 2.8. Each substance has its own handling process.

Table 2.8: Nine Classification of Dangerous Goods (*Source: Lembaga Pelabuhan Johor 2022*)

<b>Class</b>	<b>Substance</b>
1	Explosives
2	Gases
3	Flammable Liquids
4	Flammable solids; substances liable to spontaneous combustion; substances which, in contact with water, emit flammable gases
5	Oxidizing substances and organic peroxides
6	Toxic and infectious substances
7	Radioactive material
8	Corrosive substances
9	Miscellaneous dangerous substances and articles

The value chains under Division H49 are governed and interconnected by a regulatory decision-making framework. To become competitive, the technology for connectivity to all locations should be good. In addition, a person with the necessary skills and training should be hired in order to guarantee the reliability of the transportation services that have been provided for the customers or users (European Bank for Reconstruction and Development 2019).

All in all, transportation is considered to be a sub-unit of logistics. Numerous companies deliver passengers, goods, and items (eg: liquid, water, etc) by the land, air and sea. A transportation network should improve customer or client service with zero downtime and disruption of the service process. Transportation need to integrate in order to fulfil client orders in accordance with their expectations at the most economical cost. It is one of the reasons why automation technology and data tracking is becoming increasingly popular among transportation and logistics organisations. It is possible for managers and executives to systematise tasks that are predictable and redundant across the supply chain network for a fraction of the cost and with no room for error.

As mentioned in Chapter 1, drivers have a significant impact on the economy of the entire world because of the important role they play in the logistics and transportation industries. On the other hand, the heavy demands of their professions can frequently cause them to ignore their health and well-being, which can have a severe influence not just on drivers but also on their companies and supply chains. This is an extremely important topic that, for the most part, has been glossed over in the literature on logistics and transportation. With a lack of drivers and a capacity crisis on the horizon in many important parts of the global economy, it is important that the drivers who are already working are able to do the best job they can. While driver wellbeing in terms of physical and mental health is a major issue, little support is provided for training and education (Ji-Hyland & Allen 2022). Hence, the human resource management aspect in providing the best support and welfare as well as sufficient training is necessary to minimise the risk of driver's shortage.

In accordance with Sustainable Development Goals 2030, particularly Goals 9 (Industry, Innovation, and Infrastructure) and 11 (Sustainable Cities and Communities), which emphasised a sustainable transport system for all and resilient infrastructure to support socio-economic development, this initiative will ensure that the transport system is efficient, clean, and resilient with minimal impact on the environment and natural resources, while serving the purpose of providing efficient and effective transport services (NTP 2018). According to the



National Transport Policy 2019-2030, there are three SDG-related success measures:

- Achievement of 45% reduction of greenhouse gas emission intensity of GDP by 2030 across all its key emitting sectors;
- Adoption of cleaner fuel – such as biodiesel and electric vehicles; and
- Increase in public transport modal share.

## 2.6 Business Comparison with Selected Countries

This section provides an overview regarding developed countries in land transport and transport via pipelines. The World Bank collects data on the quality of trade and transport-related infrastructure and provides an aggregate indicator over 100 countries. This indicator captures logistics professionals' perception of the quality of a country's trade and transport-related infrastructure, including ports, railways, roads and information technology, on a scale that ranges from one (very low quality) to five (very high quality). Based on Global Competitiveness Index 2019, there are significant differences across ASEAN countries concerning the quality of their infrastructure. As shown in Table 2.9, Malaysia fares better than many other ASEAN countries. Overall, it ranks 29 out of 141 countries for 'transport infrastructure' (World Economic Forum 2019; OECD 2021).

Table 2.9: Global Competitiveness Index Ranking by Transport Infrastructure Type of Selected ASEAN Countries, 2018-2019 (*Source:* World Economic Forum 2019; OECD 2021)

	Malaysia	Thailand	Philippines	Indonesia	Singapore	Cambodia
<b>Overall ranking for transport infrastructure</b>	29	53	102	55	1	96
<b>Road connectivity</b>	133	54	125	109	-	107
<b>Quality of road infrastructure</b>	19	55	88	60	1	97
<b>Railroad density</b>	63	55	91	85	1	-
<b>Efficiency of train services</b>	13	75	88	19	5	-
<b>Liner shipping connectivity</b>	5	35	59	36	2	93
<b>Efficiency of seaport services</b>	19	73	88	61	1	91

For rail, land and pipeline transports, Germany, Sweden, Japan and Singapore are four countries that were discussed due to their performance on the industry. Based on Logistic Performance Index (LPI) 2018, Germany ranked 1<sup>st</sup> in world ranking with 4.19 score followed by Sweden in the 2<sup>nd</sup> rank and Japan in 5<sup>th</sup> rank, while Singapore ranked 7<sup>th</sup> in world ranking and 1<sup>st</sup> in ASEAN ranking with 4.05 score. Whereas Malaysia is ranked 41<sup>st</sup> and 5<sup>th</sup> in ASEAN ranking with 3.34 score (The World Bank 2018; OECD 2021). Whereas Malaysia is ranked 41<sup>st</sup> in world ranking and 5<sup>th</sup> in ASEAN ranking with 3.34 score (The World Bank 2018; OECD 2021). According to the most recent LPI 2023 in world ranking, Singapore is climbing to the 1<sup>st</sup> rank. Germany, Sweden, and Japan have dropped to positions 3<sup>rd</sup>, 7<sup>th</sup>, and 13<sup>th</sup> respectively. Malaysia climbed from rank 41<sup>st</sup> based on previous LPI to 26<sup>th</sup> (The World Bank 2023).

The World Bank LPI benchmarks countries' performances in the logistics sector from 1 – lowest – to 5 – highest – to create an overall LPI index that allows for worldwide, regional and income-group country comparison. The LPI uses the weighted average of a country's scores meeting six key criteria (World Bank 2018; OECD 2021):

- i. Efficiency – speed, simplicity and predictability – of clearance processes by border-control agencies, including customs.
- ii. Quality of trade- and transport-related infrastructure.
- iii. Ease of arranging competitively priced shipments.
- iv. Competence and quality of logistics services, such as transport operators and customs brokers.
- v. Ability to track and trace consignments.
- vi. Timeliness of shipments arriving within the scheduled or expected delivery time.

Japan, Germany, and Sweden all have highly developed transportation systems that are regarded as among the best in the world and cover wide area of services. Singapore possibly known as among the smallest countries in the world, however, the transportation services is efficient. In terms of transportation services, each country has its own strengths and shortcomings. In addition, the different transport policies, and characteristics between Asian (Japan and Singapore) and Europe (i.e: Germany and Sweden) have led to the development of different passenger railway operations (Kurosaki 2014; Kurosaki 2017; Narita et al. 2018). Comparing the transportation services between Germany, Japan and Sweden can be done based on several factors as shown in Table 2.10 (The Korea Transport Institute 2014; Channel News

Asia 2022; Statista 2023):

Table 2.10: Comparison of Transportation Services in Japan, Singapore, Germany and Sweden

Factor	Comparison
Public transportation	Germany's public transportation system is considered one of the best in Europe, while Sweden's is also highly efficient and well-regarded. Japan's public transportation system is considered one of the most efficient and punctual in the world, while Germany's is also highly regarded. Singapore's public transportation system is known for its efficiency and cleanliness, with a network of buses and subways covering most areas of the city-state.
Coverage	Japan's, Germany and Sweden transportation system cover most areas of the country, with a particular emphasis on the urban areas. However, some rural areas may be underserved. Singapore's transportation system covers most areas of the city-state due to smallest coverage.
Infrastructure	Japan, Germany and Sweden have a modern and well-maintained transportation infrastructure, including high-speed trains and subways. Singapore known as a very clean due to there are fines for littering, which helps to keep the public transportation system in good condition.
Technology	Japan, Germany and Sweden are known for its advanced transportation technology, including high-speed trains and automated subways. Singapore has invested heavily in technology and innovation, which includes a contactless payment system for public transportation.

## 2.7 Industrial Revolution and Technology Related to Land Transport and Transport via Pipelines

Out of eleven mainpillars on Industry Revolution identified by The Ministry of International Trade and Industry (MITI), only nine pillars related to this sector as tabulated in Figure 2.12 below. Addictive Manufacturing and Advanced Materials are not included in this sector. Examples of application for each pillar based on FGD, interview and survey findings are presented in Chapter 4.

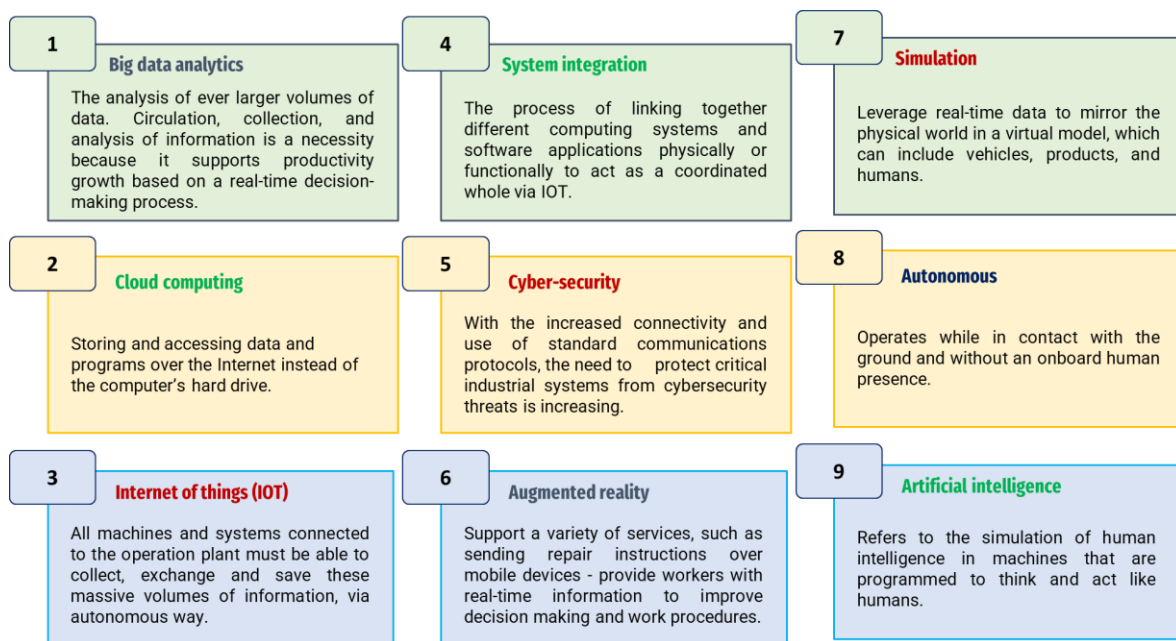


Figure 2.12: The Pillars of Industry Revolution related to Rail, Road and Pipeline Transport (Source: MITI, 2018)

Based on literature, following are among several features that elaborates the relevancy of industrial revolution to the industries under the Land Transport and Transport via Pipelines (Mbowa et al. 2021; Lusikka et al. 2020; Adeniran 2016; Adeniran 2017):

- **Intelligent maintenance:** Industrial revolution technologies enable railway, other land transport and pipeline companies to implement predictive maintenance practises, in which machine learning algorithms analyse data from sensors and other sources to predict impending equipment failures. This can help to reduce downtime and enhance the railway, land transport and pipeline infrastructure's dependability.
- **Predictive analytics:** Industrial revolution technologies enable railway, other land

transport and pipeline companies to analyse enormous quantities of data from trains, bus and related land transport as well as infrastructure to optimise operations, increase efficiency, and improve the customer experience. Using data, for instance, they can predict passenger demand, optimise train or bus schedules, and enhance the overall efficacy of the railway, road or pipeline system.

- **Augmented reality (AR):** AR technologies can be used to provide passengers, train and other land transport operators with real-time information, such as route details, delays, and other updates. This can aid in enhancing the consumer experience and increasing the efficiency of railway operations.
- **Cybersecurity:** Using blockchain technology, railway operations such as ticketing and cargo administration can be made more secure and transparent. This can help to reduce fraud and enhance system trust.
- **Autonomous trains:** For the time being, in Malaysia, Group H491 covers services related to interurban passenger train and freight cargo operation. The interurban train operation is not conducted without a driver. However, for urban and suburban train operation particularly under Group H492, this industry applies autonomous trains. With industrial revolution technologies such as artificial intelligence and advanced sensors, it is possible to develop fully autonomous trains. These trains can operate more efficiently and reliably without human operators, resulting in lower labour costs and enhanced dependability.

Overall, the implementation of industrial revolution technologies to the industry related to Land Transport and Transport via Pipelines has the potential to transform the industry, making it more efficient, dependable, and customer centric. By utilising cutting-edge technologies, railways, land transport and pipeline providers can optimise their operations, reduce expenses, and provide superior customer service.

Besides this industrial revolution related to the Land Transport and Transport via Pipelines, this sector also influences green energy technology to support Sustainable Development Goals. The largest energy consumers in Malaysia are the transportation and industrial sectors, which account for 36.8% and 29.8% of the total usage, respectively (Sazali 2020; Foo 2015). Currently, Sarawak Metro is promoting the use of zero-emission vehicles known as Green Hydrogen Agenda to decarbonise the public transport sector in Sarawak by using hydrogen fuel cell technology. The Autonomous Rapid Transit (ART) rolling stock will

be powered exclusively by hydrogen fuel cells (Sarawak Metro 2023).

## **2.8 Key Stakeholders**

The term "key stakeholders" refers to the subgroup of project backers whose withdrawal of support would spell disaster for the initiative. It is safe to assume that the people or organisations that make up this subset hold significant sway, whether as key managers or in the form of regulatory bodies. Table 2.12 and Table 2.15 list the government agencies, regulatory authorities, industry associations, professional organisations, and industry players that are most important to Malaysia's Land Transport and Transport via Pipelines service industries, respectively.

### **2.8.1 Government Agencies and Regulatory Bodies**

Table 2.11 to Table 2.14 shows government agencies and regulatory bodies related to this sector. Table 2.11 covers all government agencies and regulatory bodies for all group in the H49. Table 2.12 covers all government agencies and regulatory bodies for group related to rail transport. Table 2.13 covers all government agencies and regulatory bodies for land transport group, excluding rail transport. Table 2.14 covers all government agencies and regulatory bodies for Group H493.

Table 2.11: Government Agencies and Regulatory Bodies (For All Group)

No	Organizations	Overview, Roles, Functions and Responsibilities
1	Ministry of Transport Malaysia	<p>Ministry of Transport (MOT) main responsibilities include:</p> <ul style="list-style-type: none"> <li>i. To formulate and implement land transport, logistics, maritime and aviation policies.</li> <li>ii. To plan and execute land transport, logistics, maritime and aviation infrastructure projects.</li> <li>iii. To spearhead the integration of a holistic national transportation system.</li> <li>iv. To make available transport services delivery system for land transport, logistics, maritime and aviation.</li> <li>v. To enforce laws related to land transport, logistics, maritime and aviation.</li> <li>vi. To determine fees and charges for services provided by the Ministry</li> <li>vii. To regulate compliance to legislation, service and safety standards.</li> <li>viii. To facilitate businesses related to land transport, logistics, maritime and aviation industries.</li> <li>ix. To spearhead regional and international cooperation programmes in the field of transport.</li> </ul>
2	Ministry of International Trade and Industry (MITI)	<p>Ministry of International Trade and Industry (MITI) main responsibilities include:</p> <ul style="list-style-type: none"> <li>i. To develop and implement policies on industrial development, international trade and investment</li> <li>ii. To attract quality foreign and domestic investments</li> <li>iii. To promote and increase Malaysia's exports of high value-added goods and services by strengthening bilateral, regional and multilateral trade relations and cooperation</li> <li>iv. To enhance national productivity and competitiveness, particularly in manufacturing and services sectors</li> <li>v. To ensure a conducive business ecosystem to</li> </ul>

No	Organizations	Overview, Roles, Functions and Responsibilities
		<p>facilitate trade and investment</p> <p>vi. To provide credible standardisation, accreditation and conformity assessment services to enhance societal and environmental well-being as well as facilitate trade and economic growth</p> <p>vii. To promote and accelerate adoption of digitalisation and innovative technologies, including data-driven policies, towards growing globally competitive industries</p> <p>viii. To facilitate the development of small and medium enterprises, including homegrown industries, and the Bumiputera community to become globally competitive and integrate into the global value chain</p>
3	Ministry of Natural Resources, Environment and Climate Change	Administer, design, coordinate and implement programs in the Water Division to meet the requirements of the Environmental Quality Act 1974 and the Regulations and responsibilities of the country to International Agreements/ Treaties/ Conventions related to water and marine management.
4	Ministry of Human Resource	The Ministry of Human Resources (MOHR) is a ministry of the Government of Malaysia that is responsible for skills development, labour, occupational safety and health, trade unions, industrial relations, industrial court, labour market information and analysis, social security.
5	Department of Labour	<p>Department of Labour main responsibilities:</p> <p>i. Enforcing labor laws and international agreements covers the laws.</p> <p>ii. Study, review and enact amendments to labor laws, regulations and orders enforced from time to time.</p> <p>iii. Plan and implement labor education programs and promotional activities regarding national labor legislation and enforcement that focus on the acts enforced by the department in bipartite, tripartite, multitier organizations</p>



No	Organizations	Overview, Roles, Functions and Responsibilities
		<p>and relevant government agencies.</p> <ul style="list-style-type: none"> <li>iv. Manage, handle and resolve labor complaints.</li> <li>v. Manage, handle and resolve employee and employer claim disputes in the Labor Court.</li> <li>vi. Handle and deal with complaints of sexual harassment in the workplace.</li> <li>vii. Manage human resources, finance, procurement, assets, development as well as administration and logistics of the Department.</li> <li>viii. Manage employee termination activities.</li> <li>ix. Process and conduct investigations of applications for accommodation certificates under Act 446.</li> <li>x. Process and conduct investigations of foreign worker employment applications.</li> <li>xi. Process applications for labor permits.</li> <li>xii. Process private employment agency license applications.</li> </ul>
6	Malaysian Investment Development Authority (MIDA)	Government principal investment promotion agency for the development of the manufacturing and service sector in Malaysia.
7	Construction Industry Development Board (CIDB)	<p>Construction Industry Development Board (CIDB) main responsibilities include:</p> <ul style="list-style-type: none"> <li>i. Developing construction standards and specifications for transportation infrastructure projects.</li> <li>ii. Conducting research and development activities to improve construction techniques and technologies for transportation infrastructure.</li> <li>iii. Providing training and certification programs for construction professionals and workers to improve their skills and knowledge.</li> <li>iv. Promoting the adoption of sustainable construction practices and technologies to improve the efficiency and reduce the environmental impact of transportation</li> </ul>

No	Organizations	Overview, Roles, Functions and Responsibilities
		<p>infrastructure projects.</p> <p>v. Monitoring and enforcing construction standards and regulations to ensure that transportation infrastructure projects are built to the required quality and safety standards.</p> <p>vi. Providing financial assistance and incentives to support the development of transportation infrastructure projects.</p>
8	Department of Occupational Safety and Health (DOSH)	<p>Department of Occupational Safety and Health (DOSH) main responsibilities include:</p> <p>i. To study and review the policies and legislations of occupational safety and health;</p> <p>ii. To enforce the following legislations:</p> <ul style="list-style-type: none"> <li>• Occupational Safety and Health Act 1994 and its regulations.</li> <li>• Factories and Machinery Act 1967 and its regulations.</li> <li>• Part of Petroleum Act 1984 (Safety Measures) and its regulations.</li> </ul> <p>iii. To conduct research and technical analysis on issues related to occupational safety and health at the workplace;</p> <p>iv. To carry out promotional and publicity programs to employers, workers and the general public to foster and increase the awareness of occupational safety and health; and</p> <p>v. To become a secretariat for the National Council regarding occupational safety and health.</p>
9	Malaysian Industry-Government Group for High Technology (MIGHT) Malaysia	<p>The Malaysian Industry-Government Group for High Technology (MIGHT) was established on 22nd of February 1993 as the technology think-tank under the purview of the Prime Minister's Department. It is governed by a Board of Directors, helmed through the joint-chairmanship of prominent</p>

No	Organizations	Overview, Roles, Functions and Responsibilities
		private sector personality and the Science Advisor to the Prime Minister. MIGHT emphasis on market intelligence initiatives using the foresight practices and methodology to identify technology and business opportunities. MIGHT is built on the strength of public-private partnership with members representing both local and international organizations.
10	Land Public Transport Agency (APAD)	The Land Public Transport Commission ( <i>Suruhanjaya Pengangkutan Awam Darat</i> , SPAD), was a Malaysian statutory body set up to plan for, regulate and enforce rules concerning land-based public and freight transport in Malaysia from 2010 to 2018. In 2018, the SPAD was dissolved and rebranded as the Land Public Transport Agency ( <i>Agensi Pengangkutan Awam Darat</i> , APAD) which was absorbed into Ministry of Transport. APAD covers all matters relating to land public transport and has jurisdiction over Peninsular Malaysia.
11	Commercial Vehicle Licensing Board (CVLP) Sabah and Sarawak	<p>The functions and authorities of CVLB Sabah and Sarawak as provided under the CVLB Act 1987 (Amendment 1998) are as follows:</p> <ul style="list-style-type: none"> <li>i. Consider and approve applications for new licenses, renewals and modifications for all classes of commercial vehicle licenses throughout Sabah and Sarawak respectively;</li> <li>ii. Impose conditions on all classes of commercial vehicle licenses covering fare fixing, fares determination, itinerary, number of passengers, operating area, weight and type of goods, handling matters and other special conditions;</li> <li>iii. Suspending, canceling or imposing any appropriate penalties on any class of commercial vehicle license convicted of an offense in violation of license conditions or fails to comply with any provisions of the CVLB Act 1987 (Amendment 1998) and the rules made thereunder and the law other in force;</li> <li>iv. Determine the duration of license for all</li> </ul>

No	Organizations	Overview, Roles, Functions and Responsibilities
		<p>commercial vehicle license classes;</p> <ul style="list-style-type: none"> <li>v. CVLB Sabah: issuing all commercial and public transport licenses for Sabah and temporary licenses on commercial vehicles from Sarawak, Brunei and Kalimantan (Indonesia) entering Sabah;</li> <li>vi. CVLB Sarawak: Licensing commercial vehicles from Sabah, Brunei, and West Kalimantan Indonesia or other countries authorized to operate in Sarawak;</li> <li>vii. Conduct a new route study before giving consideration to the application for a bus license for the requested routes;</li> <li>viii. Collecting records, financial statements, statistics or other documents pertaining to the business of a commercial vehicle license holder;</li> <li>ix. Determine the procedure of the application, process and consider the application for license, charging, fixing penalties and determining identification marks to commercial vehicles;</li> <li>x. To perform the duties in relation to the enforcement of the terms of the commercial vehicle license.</li> </ul>

Table 2.12: Government Agencies and Regulatory Bodies (for Group 491 and 492 (Rail Industry))

No	Organizations	Overview, Roles, Functions and Responsibilities
1	Railway Asset Corporation (RAC)	<p>The Railway Assets Corporation (RAC) is a federal statutory body under the Ministry of Transport. It was established under the Railways Act 1991 (Act 463) through the Government Gazette No.16 Volume 36 on July 30, 1992. It became fully operational as an organisation on Aug 1, 1992, the same time the Malayan Railway Administration (KTM) was corporatised and known as Keretapi</p>

No	Organizations	Overview, Roles, Functions and Responsibilities
		<p>Tanah Melayu Berhad (KTMB). In other words, the RAC was established as a Government agency to help develop the railway industry in Malaysia to be at par with the railway industry in fully developed countries. This aspiration was realised with the formulation of the Railways Act 1991 and the revocation of the Railways Ordinance 1948.</p> <p>Through the enforcement of the Act, the KTM was dissolved, and all its property and assets, as well as railway land under the Federal Land Commissioner were vested in the RAC, while the railway service operations were taken over by the successor company, KTMB.</p> <p>Apart from being the manager and administrator of railway assets, the RAC also took over all KTM's assets and liabilities to enable the KTMB to operate without having to carry the burden of past debts. This means that the RAC now functions as the caretaker and business planner to govern and interpret railway assets into valuable property capable of generating continuous income for the Government. The decision to corporatise the KTM as KTMB was made with the aim to reduce the national railway industry's dependency on the Government.</p> <p>In 2015, the rebranding of RAC's image was implemented under the RAC Transformation Month Programme 2015. The effort was aimed at highlighting the corporate image and global nature of the RAC to suit its functions and ever-challenging roles, particularly in terms of empowering the railway sector in the country.</p> <p>In addition, RAC works closely with other stakeholders in the railway industry, including the Malaysian Railway Industry Corporation (MARIC), the Department of Railways, and other government agencies, to ensure the effective coordination and delivery of railway services in the country.</p>

Table 2.13: Government Agencies and Regulatory Bodies (For Group 492 Other Than Rail Transport)

No	Organizations	Overview, Roles, Functions and Responsibilities
1	Road Transport Department (RTD)	<p>Road Transport Department (RTD) main responsibilities include:</p> <ul style="list-style-type: none"> <li>i. To establish and regulate the registration and licensing of motor vehicles in a systematic, reliable and innovative manner.</li> <li>ii. Establish and administer the road transport law with the commitment to produce competent, law abiding and prudent drivers of motor vehicles.</li> <li>iii. To enforce and administer the road transport law with integrity and commitment to create a society that has a culture of adherence to the rules of the road.</li> <li>iv. To monitor and administer motor vehicle safety standards with efficiency and integrity to meet the needs of the environment and the country's automotive industry.</li> </ul>
2	<i>Pusat Pemeriksaan Kenderaan Berkomputer</i> (PUSPAKOM)	As a sole authorised vehicle inspection service provider appointed by the Ministry of Transport of Malaysia, PUSPAKOM hereby pledges to promote the culture of transparency, fairness, and accountability at the workplace by conducting the inspection activities according to the relevant laws, procedures and policies.

Table 2.14: Government Agencies and Regulatory Bodies (For Group 493)

No	Organizations	Overview, Roles, Functions and Responsibilities
1	Ministry of Natural Resources, Environment and Climate Change (NRECC)	<p>Ministry of Natural Resources, Environment and Climate Change (NRECC) main responsibilities include:</p> <ul style="list-style-type: none"> <li>i. Perform administrative and financial services,</li> </ul>

No	Organizations	Overview, Roles, Functions and Responsibilities
		<p>human resource management, information technology and development project monitoring.</p> <ul style="list-style-type: none"> <li>ii. Prepare and implement policy planning, regulations and programs of the Ministry.</li> <li>iii. Determine environmental protection policies, strategies and programs as well as climate change adaptation and mitigation actions at the national, regional and international levels.</li> <li>iv. Formulate the overall policy direction and strategy of the water service industry (including water supply and sewerage).</li> <li>v. Establish and review the regulatory framework for the water services industry.</li> </ul>
2	National Water Service Commission (SPAN)	<p>National Water Service Commission (SPAN) main responsibilities include:</p> <ul style="list-style-type: none"> <li>i. Advise the Minister on all matters in relation to the national policy objectives of water supply and sewerage services laws and to implement and promote the national policy objectives.</li> <li>ii. Implement and enforce the water supply and sewerage services laws and to consider and recommend reforms to the water supply and sewerage services laws.</li> <li>iii. Ensure the productivity of the water supply and sewerage services industry and the monitoring of operator compliance with stipulated standards, contractual obligations and relevant laws and guidelines.</li> <li>iv. Increase concerted efforts towards improving the operational efficiency of the industry in particular the reduction of non-revenue water through short-term, medium-term and long-term programmes.</li> <li>v. Ensure the national development goals pertaining to coverage, supply and access to water supply and sewerage services are achieved.</li> <li>vi. Ensure long-term sustainability of quality of</li> </ul>

No	Organizations	Overview, Roles, Functions and Responsibilities
		<p>water and sewerage services through continued capital works development.</p> <p>vii. Formulate and implement a plan to ensure all reasonable demands for sewerage services are satisfied and in consultation with the relevant authorities, prepare a sewerage catchment plan formulating the policy and general proposals in respect of the development of any new sewerage system and measures for improvement of any existing sewerage system.</p> <p>viii. Carry out any function conferred upon it under any other law.</p> <p>ix. Advise Minister generally on matters relating to water supply and sewerage services.</p>
3	Department of Irrigation and Drainage	<p>Department of Irrigation and Drainage main responsibilities include:</p> <p>i. Implementation of development and management of flood and drought forecast system, management of hydrological data and information and assessment and management of National Water Resources.</p> <p>ii. Development of planning and management of river basins.</p> <p>iii. Managing and regulating the implementation of Stormwater in Town Areas Management Programs.</p>
4	Malaysia Petroleum Resources Corporation (MPRC)	<p>Malaysia Petroleum Resources Corporation was established to advance the local oil and gas services and equipment (OGSE) industry and develop a thriving regional hub for the sector in Malaysia.</p>
5	<i>Pengurusan Aset Air Berhad (PAAB)</i>	<p><i>Pengurusan Aset Air Berhad (PAAB)</i> main responsibilities include:</p> <p>i. Work closely with the respective stakeholders in the planning of new water infrastructure.</p> <p>ii. Design and develop of new water infrastructure i.e., Water Treatment Plant, Reservoir, Pipelines.</p>



No	Organizations	Overview, Roles, Functions and Responsibilities
		iii. Pipe rehabilitation and replacement programme of aging pipes to arrest water leakage.
6	Water State Regulators	<p>Water State Regulators main responsibilities include:</p> <ul style="list-style-type: none"> <li>i. Supervise and regulate raw water supply services including determining raw water quality standards and enforcing related laws.</li> <li>ii. Ensure optimal raw water supply with reasonable charges and ensure the quality of water supplied is safe.</li> <li>iii. Serve as an advisory body to the State Authority on any matter related to the supply of raw water.</li> <li>iv. As a booster and intensify the supply of raw water for the purpose of advancing the economic development of the State of Melaka.</li> <li>v. Monitor the licensee to carry out the obligations imposed on him under the Enactment as well as other regulations made and also ensure that the licensee can finance the activities allowed by his license.</li> <li>vi. Ensure the licensee pays the raw water abstraction charge according to the set charge.</li> <li>vii. Regulate and monitor pollution of water sources and raw water.</li> </ul>

Overall, knowledge of government agencies and regulatory bodies is beneficial to workers interested in pursuing a career in the relevant industry. At a higher level of competency, such as management, the need to equip themselves in knowledge of these relevant stakeholders is deemed important.

### 2.8.2 Industries Association and Professional Bodies

This section discusses the activities of various industry associations and professional bodies involved in Land Transport and Transport via Pipelines. The scope of the review covers professional services that are provided to the industry. Regulation of these professional services will add value to the industry and ultimately to the whole economy. Related industry associations and professional bodies for each group are listed in Table 2.15 to Table 2.18.

Table 2.15: List of Related Industry Associations and Professional Bodies (For All Group)

No	Organizations	Overview, Roles, Functions and Responsibilities
1	Master Builders Association Malaysia (MBAM)	The Master Builders Association Malaysia (MBAM) plays an important role in the development and advancement of the construction industry.
2	Chartered Institute of Logistics and Transport Malaysia (CILT(M))	The Chartered Institute of Logistics and Transport in Malaysia is the professional body representing the logistics and transportation industries.
3	Federation of Malaysian Manufacturers Transportation and Logistics (FMM TLC)	<p>FMM TLC's main responsibilities include:</p> <ul style="list-style-type: none"> <li>i. Advocating for policies and regulations that support the growth of the manufacturing and logistics industries in Malaysia.</li> <li>ii. Promoting collaboration and cooperation between manufacturers and logistics service providers to improve supply chain efficiency and effectiveness.</li> <li>iii. Providing industry-specific training and education programs to improve the skills and knowledge of workers in the manufacturing and logistics industries.</li> <li>iv. Facilitating networking opportunities and business matching services to help manufacturers and logistics service providers connect with potential partners and customers.</li> <li>v. Conducting research and analysis to identify trends and issues affecting the manufacturing and logistics industries, and to develop strategies and solutions to address these issues.</li> </ul>
4	Board of Engineers Malaysia (BEM)	The Board of Engineers Malaysia (BEM) is a statutory body constituted under the Registration of Engineers Act 1967 with perpetual succession and a common seal, which may sue and be sued. BEM falls within the ambit of responsibility of the Minister of Works. It was formed in 23rd August 1972. BEM primary role is to facilitate the registration of Engineers, Engineering Technologists, Inspectors of Works, Sole Proprietorships, Partnerships and Bodies Corporate providing professional engineering services and; to regulate the professional conduct and practice of registered person in order to safeguard the safety and

No	Organizations	Overview, Roles, Functions and Responsibilities
		interest of the public.
5	The Institution of Engineers Malaysia (IEM)	The Institution of Engineers, Malaysia (IEM) was established in 1959 and its primary function is to promote and advance the science and profession of engineering in any or all of its disciplines and to facilitate the exchange of information and ideas related to engineering.
6	Malaysia Board of Technologists (MBOT)	Malaysia Board of Technologists (MBOT) is a professional body that gives Professional Recognition to Technologists and Technicians in related technology and technical fields. Based on Act 768, MBOT expands its function vertically and horizontally whereby MBOT looks at technology-based profession that cuts across discipline based from conceptual design to a realized technology and covers from Technicians (with MQF Level 3 to Advanced Diploma Level 5) up to Technologists (Bachelor's Degree and above). As a whole, these professionals (Technologists and Technicians) have integrated roles from concept to reality.

Table 2.16: List of Association and Professional Bodies (For Group 491 and 492 (Rail Industry))

No	Organizations	Overview, Roles, Functions and Responsibilities
1	Malaysia Railway Development Corporation (MRDC)	<p>The Role of MRDC is to provide a centralized platform to:</p> <ul style="list-style-type: none"> <li>i. Implement the Human Capital Development (HCD), Rail Industry Development Program (RIDP), Testing and Certification (T&amp;C), and Research and Technology (R&amp;T) by remaining sustainable in general.</li> <li>ii. Become the facilitator for Rail Industry Development in Malaysia.</li> <li>iii. Become the Hub and the front-line interface for international and local industry players to</li> </ul>

No	Organizations	Overview, Roles, Functions and Responsibilities
		<p>interact and to provide professional advise on Rail Industry, leveraging on ICP.</p> <p>MRDC shall operate as an entity under auspices of Ministry of Transport to facilitate and implementing a strict governance between the government, agencies, academia and industry player.</p>
2	Permanent Way Institution Malaysia Section (PWI)	<p>PWI's main responsibilities include:</p> <ul style="list-style-type: none"> <li>i. Promoting the exchange of knowledge and best practices among railway professionals in Malaysia through technical seminars, conferences, and training programs.</li> <li>ii. Developing and promoting standards and specifications for railway infrastructure and equipment in Malaysia.</li> <li>iii. Providing a platform for railway professionals to collaborate and share ideas on how to improve the efficiency, safety, and sustainability of railway operations in Malaysia.</li> <li>iv. Conducting research and analysis to identify opportunities for innovation and improvement in the railway industry.</li> <li>v. Advocating for policies and regulations that support the growth and development of the railway industry in Malaysia.</li> </ul>
3	Institute of Railway Signal Engineers (IRSE)	<p>The IRSE is the professional institution for all those engaged in or associated with railway signalling and telecommunications, train control, traffic management and allied professions.</p>

Table 2.17: List of Association and Professional Bodies (For Group 492 Other Than Rail Industry)

No	Organizations	Overview, Roles, Functions and Responsibilities
1	Road Engineering Association of Malaysia (REAM)	The Road Engineering Association of Malaysia (REAM) is a national organisation representing the country's road engineering fraternity. For the road industry which shall be achieved through: Strategic positioning, research and development, training, data base management and road industry intelligence.
2	Malaysia Bus Association	The Malaysia Bus Association (MBA) is a professional organization representing the interests of bus operators in Malaysia. It plays a significant role in promoting the development of the bus industry in Malaysia and advocating for the rights and welfare of its members. Some of key roles and responsibilities are lobbying and advocacy, capacity building, networking, and industry promotion.
3	Pan-Malaysian Bus Operators Association (PMBOA)	The Pan-Malaysian Bus Operators Association (PMBOA) is a professional organization representing the interests of express bus operators in Malaysia. It plays a significant role in promoting the development of the bus industry in Malaysia and advocating for the rights and welfare of its members.
4	The Malaysian School Bus Association Alliance (GPBSM)	One of the primary functions of GPBSM is to establish and promote best practices for school bus safety. This includes ensuring that school buses are maintained to a high standard, drivers are properly trained and licensed, and safety protocols are in place for emergencies.
5	Malaysian Taxi Association (GTSM)	The Malaysian Taxi Association (GTSM) is a professional organization representing the interests of taxi operators in Malaysia.
6	Malaysia E-Hailing Drivers Association (MeHDA)	The association was originally registered as PERSATUAN PEMANDU UBER DAN GRAB (PPUG) with the Registrar of Societies (ROS) of Malaysia on the 10th of January 2017.

No	Organizations	Overview, Roles, Functions and Responsibilities
7	Malaysia Association of Tour and Travel Agents (MATTA)	Role of the Malaysian Association of Tour and Travel Agents (MATTA) to publicise, encourage, promote and extend the tourist and travel trade. To develop friendship and common purpose among the members of the tourist and travel industry. To make representations on behalf of members to Government and all organisations with which the Association has common interest.
8	Malay Peninsular Malaysia Express Bus Operators Association (Pembawa)	The Malay Peninsular Malaysia Express Bus Operators Association (Pembawa) is a professional organization representing the interests of express bus operators in Peninsular Malaysia.

Table 2.18: List of Association and Professional Bodies (For Group 493)

No	Organizations	Overview, Roles, Functions and Responsibilities
1	International Water Association (IWA)	<ul style="list-style-type: none"> <li>i. Catalyst for innovation, knowledge and best practice to the sector, external organisations and opinion leaders.</li> <li>ii. Provide experience and leadership in transitioning to sustainable water solutions that are robust and flexible in the face of global change pressures.</li> <li>iii. International reference and source of knowledge for sustainable water solutions that are robust and flexible in the face of global change pressures.</li> <li>iv. Support the global community to pursue their ambitions in relation to water related Sustainable Development Goals.</li> </ul>
2	Malaysian Water Association	The national association regarding networking and technological advancement for water professionals involved in the complete water cycle. Membership comprises of professionals from policy makers, water operators, consultants, contractors and suppliers.

No	Organizations	Overview, Roles, Functions and Responsibilities
3	Malaysian Oil, Gas and Energy Services Council (MOGSC)	The Malaysian Oil, Gas and Energy Services Council (MOGSC), the largest industry association representing the interests of the Oil, Gas and Energy Industry in Malaysia was established almost 20 years ago in 2003. MOGSC's main mission is to promote, create awareness, increase the profile and visibility of the members.
4	Malaysian Gas Association	A non-profit organisation to serve as an effective platform to bring together key industry players related to oil and gas industry to work towards a common vision.

### 2.8.3 Training Centers

This section discusses the activities of various training centres involved in Land Transport and Transport via Pipelines. The scope of the review covers services that are provided to the industry. Related training centers are listed in Table 2.19 to Table 2.22.

Table 2.19: List of Training Centers (All Group)

No	Organizations	Overview, Roles, Functions and Responsibilities
1	National Institute for Occupational Safety and Health (NIOSH)	<p>National Institute for Occupational Safety and Health (NIOSH) main responsibilities include:</p> <ul style="list-style-type: none"> <li>i. To promote a safe and healthy workplace and workforce in Malaysia;</li> <li>ii. To assist employers and employees to manage OSH in their organisation effectively;</li> <li>iii. To provide Quality Solutions related to OSH issues with a pragmatic approach which are reasonable and practicable; and</li> <li>iv. To conduct Evaluation exercises to ascertain the quality of the persons undergone training at NIOSH.</li> </ul>

No	Organizations	Overview, Roles, Functions and Responsibilities
2	Majlis Amanah Rakyat (MARA)	Spearheading the fields of entrepreneurship, education and investment to enhance equity holding of Bumiputera. Provide the funding for this sector.
3	SIRIM Berhad – SIRIM Industrial Research	<p>SIRIM is a premier industrial research and technology organisation in Malaysia, wholly-owned by the Minister of Finance Incorporated. With over forty years of experience and expertise, SIRIM is mandated as the machinery for research and technology development, and the national champion of quality.</p> <p>SIRIM has always played a major role in the development of the country's private sector. By tapping into our expertise and knowledge base, we focus on developing new technologies and improvements in the manufacturing, technology and services sectors. SIRIM nurture Small Medium Enterprises (SME) growth with solutions for technology penetration and upgrading, making it an ideal technology partner for SMEs.</p>
4	Centre for Instructor and Advanced Skill Training (CIAST)	<p>Centre for Instructor and Advanced Skill Training is situated in Shah Alam, Selangor. CIAST has started operations in the year 1983 with the financial help from Government of Japan under ASEAN Human Resource Development Project and supervised by management and technical experts from Japan through JICA until 1991.</p> <p>CIAST has been fully operational under Manpower Department, Ministry of Human Resources beginning in 1991 until May 2007 before CIAST management has been transferred to be under Department of Skills Development (DSD) in the same ministry in June 2007.</p>
5	<i>Institut Latihan Perindustrian (ILP)</i>	<p>The Institut Latihan Perindustrian (ILP) is a training institute for the production of skilled labour to meet the demands of the industrial sector in Malaysia. ILP is manage by the Department of Human Resources has been producing national talent from the training certificate level to the Advanced Diploma in various skill courses.</p> <p>Example for Rail Sector:</p> <ul style="list-style-type: none"> <li>▪ ILP Kuala Lumpur – Mechanical, Electrical &amp;</li> </ul>



No	Organizations	Overview, Roles, Functions and Responsibilities
		Welding Technology Course
6	<i>Institut Kemahiran Belia Negara (IKBN)</i>	<p>The Institut Kemahiran Belia Negara (IKBN) and the Institut Kemahiran Tinggi Belia Negara (IKTBN) are a skill-based institution housed under the Ministry of Youth and Sports Malaysia.</p> <p>Example for Rail Sector:</p> <ul style="list-style-type: none"> <li>i. IKBN Jitra, Kedah – Mechanical &amp; Electrical Engineering Technology</li> <li>ii. IKBN Wakaf Tapai, Kuala Berang, Marang Terengganu – Electrical &amp; Mechanical Technology</li> <li>iii. IKBN Pekan, Pahang – Maintenance of Sheet Metal &amp; Composite</li> </ul>
7	MARA Education Institutes	MARA Education Institution is an educational & training institution that offers skills-based studies to produce professional workforce capable of self-reliance to meet government and private employment opportunities.
8	Higher Education Institutes (Public and Private Higher Education Institution)	Higher education institutions (HEIs) are essential actors in the promotion of lifelong learning (LLL). They have a unique capacity to develop skills and foster knowledge, and the potential to mobilize educational resources and provide learning opportunities for diverse populations.

Table 2.20: List of Training Centers (For Group 491 and 492 (Rail Industry))

No	Organizations	Overview, Roles, Functions and Responsibilities
1	Malaysian Railway Academy (MyRA)	Managed by Keretapi Tanah Melayu Berhad (KTMB), MyRA offers programmes in Operational & Technical, Management, Development and Safety.
2	Prasarana Learning & Culture Unit (PACE) - Prasarana International Training Academy of Rail (PINTAR)	PACE operates as the centralised training arm of Prasarana. Prasarana International Training Academy of Rail (PINTAR) is one of the academies under this unit. For this group, PINTAR manages the technology transfer of knowledge and skills from the System Contractors to the Operations and Maintenance

No	Organizations	Overview, Roles, Functions and Responsibilities
		personnel.
3	Malaysia Rail Development Corporation (MRDC)	<p>The Role of MRDC is to provide a centralized platform to:</p> <ul style="list-style-type: none"> <li>i. Implement the Human Capital Development (HCD), Rail Industry Development Program (RIDP), Testing and Certification (T&amp;C), and Research and Technology (R&amp;T) by remaining sustainable in general.</li> <li>ii. Become the facilitator for Rail Industry Development in Malaysia.</li> <li>iii. Become the Hub and the front-line interface for international and local industry players to interact and to provide professional advice on Rail Industry, leveraging on ICP.</li> </ul> <p>MRDC shall operate as an entity under auspices of MOT to facilitate and implementing a strict governance between the government, agencies, academia and industry player.</p>
5	Higher Education Institutes (Public and Private Higher Education Institution)	Currently, there are two universities focus on rail field of study, namely: UTHM (Industrial Centre of Excellent for Railway and UNIKL (Asia Rail Centre).

Table 2.21: List of Training Centers (for Group 492 other than rail industry)

No	Organizations	Overview, Roles, Functions and Responsibilities
1	Malaysian Institute of Road Safety Research (MIROS)	<p>The Malaysian Institute of Road Safety Research (MIROS) is a government agency established in 2007 to conduct research and development on road safety issues in Malaysia. Its primary role is to promote and enhance road safety in the country through research, training, education, and public awareness programs.</p> <p>MIROS works closely with the Ministry of Transport and other relevant stakeholders to develop and implement road safety policies and initiatives. Its</p>

No	Organizations	Overview, Roles, Functions and Responsibilities
		<p>research covers a wide range of areas, including vehicle safety, road infrastructure, driver behavior, and road safety education.</p> <p>The Institute also provides training and education programs for road users, government officials, and other stakeholders, aimed at increasing awareness of road safety issues and improving knowledge and skills related to road safety.</p>
2	Malaysia Airports Academy (MAA)	Malaysia Airports Academy (MAA) is a training provider for Malaysia Airports Holdings Berhad (MAHB). The role is to provide a learning platform in ensuring all employees are competent, skilful, and knowledgeable to prevent non-conformities to the services rendered to customers.
3	Prasarana Learning & Culture Unit (PACE) - Prasarana Bus Academy (PBA)	Prasarana Bus Academy (PBA) is one of the academies under PACE. For this group, PBA initially established as a training department of Rapid Bus Sdn Bhd, has expanded its operations and functions to be a skills development centre for the overall Rapid Bus personnel.

Table 2.22: List of Training Centers (for Group 493)

No	Organizations	Overview, Roles, Functions and Responsibilities
1	National Water Research Institute of Malaysia (NAHRIM)	<ol style="list-style-type: none"> <li>i. Conducting basic and applied research within water sector such as river basin, water resources and climate change, coastal and oceanography, hydrogeology and water quality and environment;</li> <li>ii. Providing expert consultancy services pertaining to water and its environment for the public and private sector;</li> <li>iii. Providing advisory role in the water related fields;</li> <li>iv. As a referral centre for water and environment related research at the national level as well as participating actively in bilateral or multilateral research at international level.</li> </ol>

No	Organizations	Overview, Roles, Functions and Responsibilities
2	Malaysian Water Academy (MyWA)	Malaysian Water Academy Sdn Bhd (MyWA) is a wholly own training provider by The Malaysian Water Association (MWA) to fulfill the role of developing human capital for the water and wastewater industry.
3	Penang Water Services Academy (PWSA)	The Penang Water Services Academy (PWSA) was jointly founded by <i>Perbadanan Bekalan Air Resources Sdn Bhd</i> and the Penang Skills Development Centre in December 2007. The PWSA promotes and provides industry-relevant education and training programmes to build a knowledgeable and capable water supply workforce for today and tomorrow.
4	Ranhill SAJ Water Academy	Ranhill SAJ Water Academy is the training facility for SAJ Holdings.
5	PETRONAS Institute of Petroleum Technology (INSTEP)	PETRONAS Institute of Petroleum Technology (INSTEP) is a state-of-the-art technical training institution located by the shores of Malaysia's East Coast. Established in 1981, INSTEP accelerates human capital development in the oil & gas industry through experiential learning, and delivering customised niche programmes. Anchored on world class facilities and industry-experienced instructors, INSTEP further supports the exceptional growth of the oil & gas industry.

## 2.9 Government Legislations, Policies and Initiatives

It is imperative that, this research must refer to legislations, by-laws and policies that are directly related to Land Transport and Transport via Pipelines service sectors.

### 2.9.1 Government Legislations

Table 2.23 shows description for each government legislation according to related groups. Basically, each act serves different aspects in ensuring that all related sectors operate according

to the guidelines and acts.

Table 2.23: Government Legislation

No	Group	Act	Description
1	All Groups	Employment Act (Amendment) 2022	Amendments to Malaysia Employment Act 1955 came to effect on 1 January 2023, seeing the introduction of reduced working hours, rules around flexible work arrangements, extended maternity and paternity leave regulations, and more. The purpose of the amendment is to (1) increase and improve the protection and welfare of employees. (2) Ensuring that labour law provisions are in accordance with international labour standards.
2	All Groups	National Wages Consultative Council Act 2011 (Act 732) Amendment 2022	Provides an important framework for the determination of minimum wage rates in Malaysia and ensures that wages policies in the country are developed through a consultative and collaborative process involving all relevant stakeholders.
3	All Groups	Occupational Safety and Health Act 1994 (Act 514)	An Act to make further provisions for securing the safety, health and welfare of persons at work, for protecting others against risks to safety or health in connection with the activities of persons at work, to establish the National.
4	All Groups	Commercial Vehicles Licensing Board Act 1987 (Act 334)	An Act to provide for the licensing and regulating of commercial vehicles and for matters connected therewith. This Act shall apply to Sabah, Sarawak and the Federal Territory of Labuan.
5	All Groups	Environmental Quality Act 1974 (Act 127), (Amendment) Act 2012 (Act A1441)	An Act relating to the prevention, abatement, control of pollution and enhancement of the environment and for purpose connected herewith.
6	All Groups	Factory and Machinery Act 1967 Revised 1974 (Act 139)	This act is to provide for the control of factories on matters relating to the safety, health and welfare of persons, and the registration and inspection of machinery.
7	All Groups	Environmental Quality Act 1974	This Act is for the prevention, abatement, control, and enhancement of the environment, and for purposes connected therewith.

No	Group	Act	Description
8	Group 491 and 492	Land Public Transport Act 2010 (Act 715)	This act is to provide for and regulate land public transport and for matters incidental thereto.
9	Group 491 and 492 (rail industry)	Railway Act 1991 (Act 463)	Railway Act 1991 commenced after the revocation of Railway Ordinance 1948. This act cover railway matters in Sabah, Sarawak and Wilayah Persekutuan Labuan. Railway Act 1991 also became the body Act to the establishment of the Railway Asset Corporation.
10	Group 492 and 493	Road Transport Act 1987 (Act 333)	Malaysian laws which enacted to make provision for the regulation of motor vehicles and of traffic on roads and other matters with respect to roads and vehicles thereon; to make provision for the protection of third parties against risks arising out of the use of motor vehicles; to make provision for the co-ordination and control of means of and facilities for transport; to make provision for the co-ordination and control of means of and facilities for construction and adaptation of motor vehicles; and to make provision for connected purposes.
11	Group 492 and 493	Road Transport (Construction and Use) (Dangerous Goods Vehicles) Rules 2015	These rules specify the construction of dangerous goods vehicles except enforcement vehicles (army and police).
12	Group 492	Tourism Vehicle Licensing Act 1999 (Act 594)	An Act to provide for the licensing and regulation of tourism vehicles and for matters connected therewith.
13	Group 493 (water)	Water Services Industry Act 2006 (Act 655)	This Act aims at establishing a licensing and regulatory framework for regulatory intervention to promote the national policy objectives for the water supply services and sewerage services industry.
14	Group 493 (water)	Water Services Industry (Licensing) Regulations 2007	These Regulations prescribe all matters relating to the issuance of individual licences and registration of class licences granted under the Water Services Industry Act. The Regulations provide the form and manner in which applications for individual or class licences shall be made including the eligibility of persons applying for licences, licence fees for different types of licences and licensed activities, the

No	Group	Act	Description
			duration of the licences, the forms of licences, the standard conditions of the licences, renewal fees and other processing charges.
15	Group 493 (water)	Water Services Industry (Compounding of Offences) Regulations 2008	These Regulations prescribe the offences which may be compounded and the forms to be used and set out methods and procedures for compounding offences.
16	Group 493 (water)	Water Services Industry (Prohibited Effluent) Regulations 2021	These Regulations stipulate that no person shall discharge or permit discharging any prohibited effluent as specified in the Schedule of the Regulations to a public sewage system or public sewage treatment plant without the approval of the National Water Services Commission (SPAN). Applications for approval on discharge of wastewater must be made in a manner to be determined by SPAN. Prohibited effluent includes, amongst other things, any discharge and substance that affects the disposal of sewage sludge as organic compound and discharges having a toxic effect in the watercourse that constitute a hazard to humans or animals.
17	Group 493 (water)	Water Services Industry (Bulk Water Supply Agreement) Rules 2015	<p>These Rules, consisting of 4 Sections and 2 Schedules, prescribe all matters relating to the bulk water supply agreement. “bulk water supply agreement” means an agreement to supply water in bulk entered into by service licensees and includes a bulk water supply agreement which has been renewed and a supplemental agreement to a bulk water supply agreement.</p> <p>Bulk water supply agreement shall be in writing. A bulk water supply agreement— (a) shall contain the salient terms provided in the Schedules, (b) shall contain any conditions which may be imposed by the National Water Service Commission before the registration of the bulk water supply agreement; and (c) may contain the terms agreed by the purchaser and the supplier subject to the approval of the Commission.</p>
18	Group 493 (water)	Water Services Industry (Permit) Rules, 2007	These Rules prescribe all matters relating to the issuance of permits granted under the Water Services Industry Act, including the procedures for application, fees, forms, conditions and duration of the permits.

No	Group	Act	Description
19	Group 493 (water)	Water Services Industry (Licensing) (Exemption) Order 2007	This Order, consisting of 4 Sections, is enacted in accordance with Water Services Industry Act, 2006. It prescribes exemptions from holding a licence under the Act. The Federal Government shall be exempted from holding an individual license and a class licence under the Act. The State Government shall be exempted from holding a class licence under the Act. The extent of exemption is stipulated in Section 4.
20	Group 493 (oil and gas)	Petroleum Development Act 1974 (PDA 1974)	The Petroleum Development Act 1974 (PDA 1974) is the main legislation governing the Malaysian oil and gas industry. Regulates the exploration, development, and production of petroleum resources in Malaysia. This act establishes the regulatory framework for the upstream petroleum industry and sets out the licensing requirements and procedures for petroleum activities.
21	Group 493 (oil and gas)	Petroleum (Safety Measures) Act 1984 (Act302)	An Act to consolidate laws relating to safety in the transportation, storage and utilization of petroleum and to provide for matters relating thereto. Sets out safety standards and measures for the construction, installation, operation, and maintenance of petroleum facilities in Malaysia.
22	Group 493 (oil and gas)	Gas Supply (Amendment) Act 2016	Regulates the supply and distribution of natural gas in Malaysia. This act provides for the licensing of gas supply businesses and sets out the conditions for the supply and distribution of gas.

## 2.9.2 Government Policies and Initiatives

This section provides information on related government policies and initiatives for the service sector. Figure 2.14 shows related policies and initiatives for Section H49.



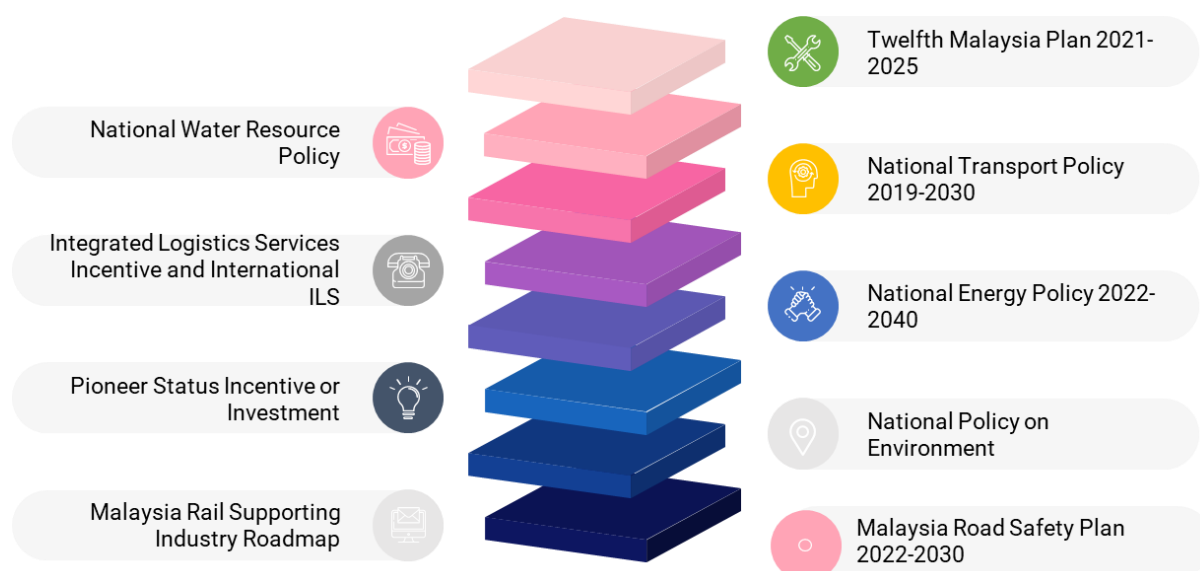


Figure 2.14: Related Government Policies and Initiatives

Table 2.24 shows description for each government policy and initiative. In addition, each government policies and initiatives have been categorized according to specific group as indicated by MSIC 2008.

Table 2.24: Description for Each Government Policies and Initiatives

No	Group	Policies and Initiatives	Descriptions
1	All Group	Twelfth Malaysia Plan 2021-2025	Under Policy Enabler 3: Enhancing Connectivity and Transport Infrastructure, Provision of efficient and inclusive transportation and logistics infrastructure will continue to be the focus by enhancing accessibility to public transport, improving trade facilitation as well as strengthening the institutional and regulatory framework. Measures will be taken to improve last-mile connectivity through the integration of rail and road networks between airports, ports, industrial areas and cities. The capacity of ports infrastructure and services will be increased while a multi modal cargo movement approach by the same service provider will be adopted. In addition, transforming the logistics ecosystem for greater efficiency has been identified as a game changer for the logistics sector. Initiatives will be taken to centralise planning and development of logistics hub, accelerate digital adoption, encourage

No	Group	Policies and Initiatives	Descriptions
			mergers and acquisitions among industry players, establish a single border agency and create a national regulatory framework for warehousing and maritime economy. These efforts will support and facilitate the expansion of economic activities and contribute to the socioeconomic growth of the country (Ministry of Economy 2023).
2	All Group	National Transport Policy 2019-2030	<p>The National Transport Policy (NTP) 2019-2030 is one of the main pillars to strengthen national transport infrastructure and provide a sustainable transport system as the Government of Malaysia strives to drive Malaysia's economic growth. The NTP is providing the strategic thrusts and policy directions in addressing the challenges to ensure they remain sustainable and competitive specifically in land transport sector. From five strategic thrusts, only four thrusts related closely to this sector (MOT 2023), namely:</p> <ul style="list-style-type: none"> <li>i. Policy Thrust 1: Strengthen governance to create a conducive environment for the transport sector</li> <li>ii. Policy Thrust 2: Optimise, build and maintain the use of transport infrastructure, services and networks to maximise efficiency</li> <li>iii. Policy Thrust 3: Enhance safety, integration, connectivity &amp; accessibility for seamless journey</li> <li>iv. Policy Thrust 5: Expand global footprint and promote internationalisation of transport services</li> </ul>
3	All Group	National Energy Policy 2022-2040	<p>The Malaysian Government had, on 19 September 2022, launched the National Energy Policy 2022-2040 (NEP) with the following objectives:</p> <ul style="list-style-type: none"> <li>i. Enhancing macroeconomic resilience and energy security</li> <li>ii. Achieving social equitability and affordability</li> <li>iii. Ensuring environmental sustainability</li> </ul> <p>In order to achieve these objectives, numerous action plans have been developed and laid out in the NEP and this client alert aims to provide an</p>

No	Group	Policies and Initiatives	Descriptions
			overview of the Low Carbon Aspiration 2040 initiative ("Aspiration") and highlight key action plans that would be of interest to all types of investors and companies intending to comply with environmental, social and governance (ESG) requirements.
4	All Group	National Policy on Environment	National Policy on Environment has been established to continue economic, social and cultural progress as well as improve the quality of life of Malaysians through environmental well-being and sustainable development. The purpose of DASN is to achieve; (1) A clean, safe, healthy and productive environment for present and future generations, (2) Conservation of a unique and diverse culture and natural heritage with the effective participation of all sectors of society, and (3) Lifestyle, consumption patterns and sustainable production.
5	All Group	Integrated Logistics Services (ILS) Incentive and International	MIDA supports the growth of companies undertaking integrated logistics services (ILS) by offering the ILS incentive and International ILS (IILS) status. As at 2021, MIDA had approved over 100 ILS projects where majority of the applicants were Malaysian-based companies. Integrated logistics services (ILS) refers to a company that performs a variety of end-to-end logistics-related service activities like air, ocean, road and rail transportation, warehousing and other value-added services that make up a total logistics services package (MIDA 2022b).
6	All Group	Malaysia Road Safety Plan 2022–2030	This plan is a continuity from Malaysia Road Safety Plan 2014-2020. This plan has targeted a 50% reduction in the number of deaths due to road accidents by the end of 2030. This target is in line with UN resolution 74/299 which also declared the period of 2021-2030 as The Second Global Decade of Action for Road Safety.
7	Group 491 and 492 (rail)	Malaysia Rail Supporting Industry Roadmap 2030	The Malaysia Rail Supporting Industry Roadmap 2030 has been prepare as a guideline for the development of this industry to complement the growing rail transportation industry. The plan identifies ke initiatives for the transformation of local rail industry into strong and sustainable business, capable of satisfying the demand of the

No	Group	Policies and Initiatives	Descriptions
			national rail transportation and turning Malaysia into the competitive global player that optimizes the use of indigenous resources and technologies by 2030 (MIDA 2020).
8	Group 493 (oil and gas)	Pioneer Status incentive or Investment Tax Allowance	Malaysian Investment Development Authority (MIDA) remains focused on the continued strategic integration in Malaysia's downstream operations to meet demands and capture value across the O&G supply chain. MIDA also encourage more joint ventures or collaborations between local and foreign players with expertise to enhance local capabilities via knowledge transfer. To assist and support companies in their business ventures, MIDA offers the Pioneer Status incentive or Investment Tax Allowance to eligible projects (MIDA 2022a).
9	Group 493 (water)	National Water Resources Policy	This policy aims to ensure the sustainable management of water resources in Malaysia. It sets out the government's strategies for managing water resources, protecting water quality, and ensuring adequate water supply for all sectors.

## 2.10 Conclusion

The outcomes of the literature review suggest that Land Transport and Transport via Pipelines are significant considerations in the country's economic success and in attracting foreign investment. Today, a variety of agencies within the government are tasked with developing and monitoring the industry to ensure it adheres by the applicable laws and regulations. It is necessary that the elements of Occupational Framework be redefined in order to enhance employment mobility for the workforce. This can be accomplished by redefining the occupational areas in the Occupational Structure based on MOSQF. This is done to make it possible to scale skills, as well as to make room for new skills that will be necessary throughout the current period of technology and industrial revolution. Up to this date, there are around 30 NOSS related to Section H49 as stated in Section 2.2.2. MSIC 2008 is also taken into consideration to be in sync with data on labour demographics provided by the DOSM. This was done so that economic activities within the industry could be classified within MSIC 2008.

Under the MSIC 2008 classification system, this sector in particular is classified as Transportation and Storage Section H, Division 49: Land Transport and Transport via Pipelines. There are three main groups for this OF document; i) Transport via railways, ii) Other land transport and iii) Transport via Pipeline. Section 2.3.2 provides information on the scope of these groups in greater detail. As a result of the expansion of rail and highway, the land transportation sector is anticipated to contribute 7% to economic expansion. In terms of the value chain, transportation operations are the sector's primary activities. Multiple industrial revolution-related technologies have been implemented in the transportation industry, particularly for fleet monitoring, pipeline monitoring, and data integration. Multiple organisations were involved in assuring the continued success of this sector, including MOT and MITI. In addition, a number of government policies and initiatives have been developed to support this sector in order to move forward.

## **CHAPTER III**

### **METHODOLOGY**

#### **3.1 Introduction**

This chapter provides an overview of the research design, process flow, strategy as well as data collection methods used to achieve the objectives of this document. In order to comprehend the existing state of the industry and the future capabilities needed for the Land Transport and Transport via Pipelines sector in Malaysia, this study adopted an Exploratory Sequential Mixed Method, beginning with document analysis and ending with the finalisation of the OF document. As a result of applying this methodology, the following outputs are created: Occupational Structure (OS), Occupational Responsibilities (OR), Occupation Description (OD), Critical Jobs (CJ), Jobs Relevant to the Industry and Technology Revolution (JRR), and Emerging Skills (ES).

#### **3.2 Research Approach and Design**

The research approach used for this study are shown in Figure 3.1. It employs an exploratory sequential mixed method, starting with a qualitative approach before moving on to a quantitative approach. This study utilizes two different qualitative methods: document review and focus group discussion as well as interview with Subject Matter Experts (SMEs). A survey is used to apply a quantitative method.

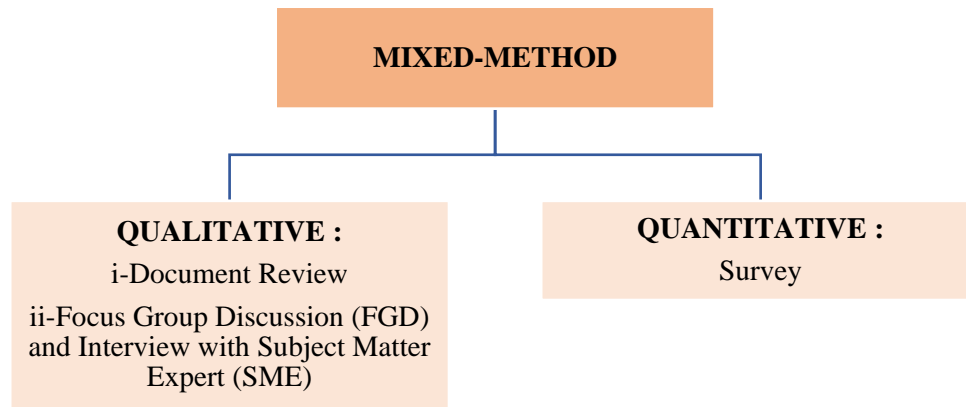


Figure 3.1: Research Approach

Overall research design is tabulated in Figure 3.2. The research approach, data collection methods, anticipated outcomes from each method and final findings are all illustrated in this table. The details of each data collection method are explained in Section 3.2.2. This study employs two main types of data analysis techniques, namely content analysis, and statistical analysis. It will be described in Section 3.3.

Research Approach	Data Collection Method Data Analysis Methods	Outcome
<ul style="list-style-type: none"> <li>•Qualitative</li> </ul>	<ul style="list-style-type: none"> <li>•<b>Data Collection Method - Document Review</b> <ul style="list-style-type: none"> <li>•Articles</li> <li>•Statistical Data</li> <li>•Employment Report</li> <li>•Economic Report</li> <li>•Industry report</li> <li>•Industry Association Report</li> </ul> </li> <li>•<b>Data Collection Method - Discussion with Expert</b> <ul style="list-style-type: none"> <li>•FGD 1</li> <li>•FGD 2</li> <li>•Interview</li> </ul> </li> <li>•<b>Data Analysis Method</b> <ul style="list-style-type: none"> <li>•Content Analysis</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>•Industry Overview</li> <li>•Industry Market</li> <li>•Industry Issues &amp; Challenges</li> <li>•Industry Policy, Legislative, Initiatives</li> <li>•Government Program Supporting Industry</li> <li>•Occupational Structure</li> <li>•Occupational Description</li> <li>•Occupational Responsibility</li> <li>•Critical Job Title</li> <li>•Job Relevant to Technology and Industrial Revolution and Application</li> <li>•Survey Questionnaire</li> </ul>

Figure 3.2: Overall Research Design

The overall study flow for the development of this document is depicted in Figure 3.3. Section 3.2.1 shows important activities related to the development of this document. The process begins with the definition of a precise problem statement and the research objective, that will be presented in Section 3.2.2. Review of the document is the next step in this process. MSIC 2008 is one of the documents that has been examined; it is crucial for identifying the industry or sector that relevant to Malaysian practice and to select the Subject Matter Expert (SME) who is knowledgeable and familiar with H49.

Based on economics activities under Section H49, the SME should include members from the rail industry, other related land transport, land transportation agency, water service industry as well as oil and industry for the purposes of the FGD. More information on the review document procedure is provided in Section 3.2.3. Meanwhile, Section 3.2.4 until Section 3.2.5 will provide additional information and analysis regarding this FGD technique. After getting input from SMEs, a survey is developed and administered via a series of procedures (refer to Section 3.2.6 and Section 3.2.7). Survey analysis technique will be discussed in Section 3.3.2. The results of the survey and recent data findings will be discussed, revisited and validated with the SMEs and panels before the OF document is finalised.



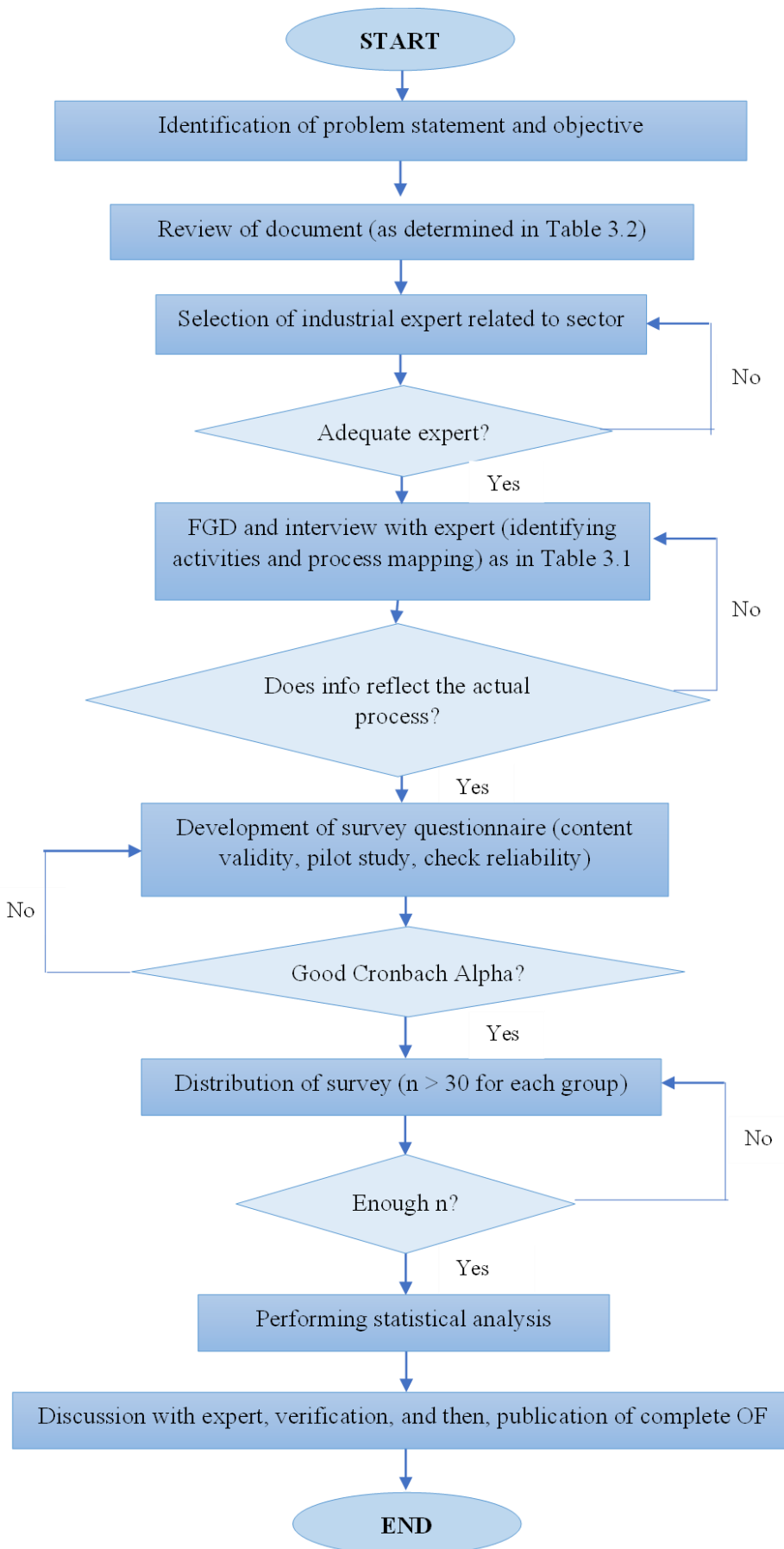


Figure 3.3: Overall Study flow

### 3.2.1 Research Activities

Information for the OF was collected with the help of SMEs in the field, who also checked and analysed the data collected in the form of a survey to ensure its accuracy. All meetings, FGD workshops and interviews with industries for the OF development until May 2023 are listed in Figure 3.4.

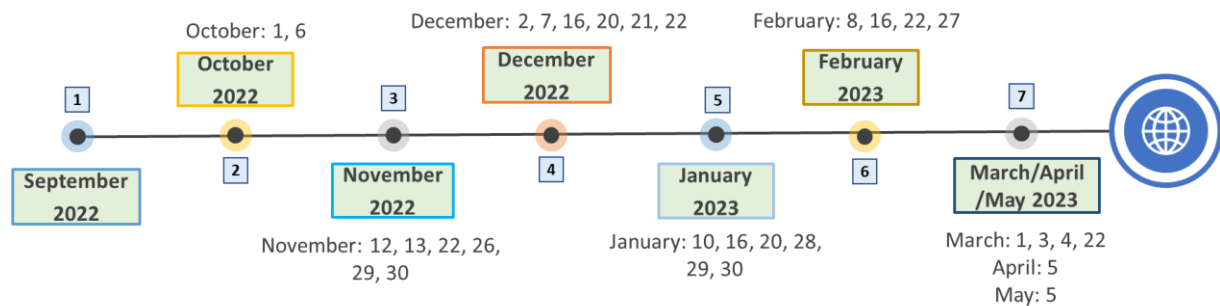


Figure 3.4: Research Activities from September 2022 until May 2023

Figure 3.5 depicts the three major phases of the research activities: i) Phase 1: Information Gathering, ii) Phase 2: Expert View, and iii) Phase 3: Verification and Usability. The details information of these information are described as follows:

#### i) Phase 1: Information Gathering

Phase 1 involves information gathering, which includes three main tasks. The first task is to conduct a document review to gather relevant information that will be used to develop Chapters 1, 2, and 3 of this research. This may include reviewing academic literature, reports, and other sources of information related to the research topic.

The second task is to develop a survey questionnaire construct. A well-designed questionnaire should meet the research objectives. From the FGD, a reliable instrument will be constructed and proposed to be used in the actual field survey. Based on the research objectives that were developed by the research team, a set of predefined questionnaire items will be created to collect data from study participants.

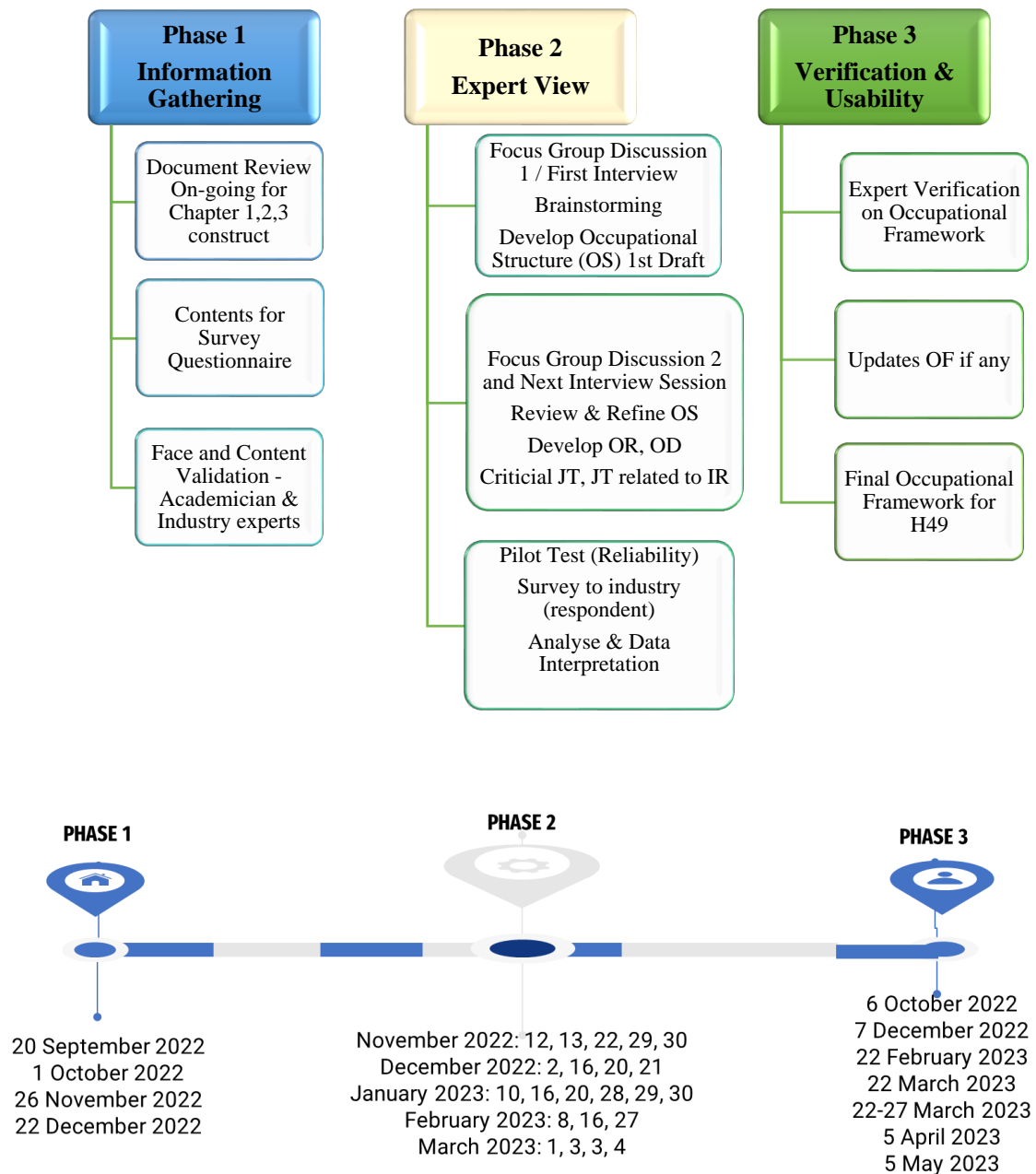


Figure 3.5: Research Activities According to Phase

The third task is to ensure the quality of the survey questionnaire by conducting face and content validation with academic and industry experts. This means that survey questionnaire was shared with experts related to H49 to obtain feedback on the clarity and relevance of the questionnaire items. The feedback received will be used to make any necessary revisions to the questionnaire to ensure that it accurately measures the constructs of this research.

Overall, Phase 1 is a crucial step in the research process as it lays the foundation for the rest of this study. By conducting a thorough document review, developing a well-constructed survey questionnaire, and ensuring its quality through validation, the researcher can ensure that the study is built on a solid base of relevant and accurate information.

## **ii) Phase 2: Expert View**

The main task in Phase 2 is to conduct FGD and interview with experts. Details information on FGD and interview session will be discussed in Section 3.2.4. In this phase, industry experts were selected from personnel related to H49 as determined in MSIC 2008 to participate in both FGD sessions and interview. Subject Matter Experts are listed in the list of development panel members in Annex 2: List of Contributors. There are five criteria that are taken into consideration when selecting SME:

- i. the selected industry panel was involved with or experienced the sector and activities being studied as described in MSIC 2008;
- ii. the panel was able to communicate with researchers;
- iii. the panel was prepared to provide information on the experiences they have had (Magilvy & Thomas, 2009);
- iv. the panels should have a combined total of at least five years of executive or management level experience in the discipline being explored; and
- v. representing stakeholders, authorities, statutory bodies (GLCs), multinational companies (MNCs) or other organizations that are relevant to the industry.

The second task in this phase is to conduct a pilot test to the prospective respondents once the reliable instrument was verified. Both self-administered and internet survey was carried out at nationwide for generalisation purposes. Sample from the establishment will be collected at random to be representative. Details information on the survey implementation will be elaborated in Section 3.2.5.

## **iii) Phase 3: Verification and Usability**

The third phase of this research project focuses on verification and usability. There are three main sessions for data verification and usability during Phase 3: i) Internal Technical Meeting (verification with DSD officers), ii) Occupational Framework Evaluation Technical Committee (verification with DSD officers and experts panel) and iii) industry engagement

(verification with representatives related to H49). This phase aims to verify and test the usability of the proposed occupational framework for Land Transport and Transport via Pipelines. Representatives from the industry were invited to participate in this phase of the research, including road transport agencies, railway industries, bus industry, cable car, airport shuttle, hill tram, water industry as well as oil and gas industry.

During the industry engagement phase, the researcher will seek feedback from industry representatives on the proposed framework, including its relevance, comprehensiveness, and applicability to their respective sectors. The researcher will gather insights on the strengths and weaknesses of the framework and identify areas for improvement. The feedback from industry representatives will be used to refine and finalize the occupational framework, ensuring that it accurately reflects the skills and competencies required for Land Transport and Transport via Pipelines. Table 3.1 shows details of workshop and meeting schedule with the related parties from September 2022 until May 2023.

Table 3.1: Occupational Framework Development Workshops and Meeting Schedule

<b>Date</b>	<b>Venue</b>	<b>Activity</b>	<b>Outcome</b>
20 September 2022	Park Inn by Radisson Putrajaya	Initial briefing regarding OF development	Target for OF development
1 October 2022	Syarikat Adimega Sdn. Bhd.	Preparation for Internal Technical Committee Meeting 1 (JTD 1)	Presentation draft including problem statement, objective, and method
6 October 2022	Park Inn by Radisson Putrajaya	Internal Technical Committee Meeting 1	Revision on problem statement, objective, and method
12 to 13 November 2022	Philea Mines Beach Resort Hotel	FGD1 with urban and suburban rail services, water industry and land transport agencies (Group 492 and 493)	Development of OS, critical job titles, job titles relevant to technology and IR, emerging skills, issues and challenges, draft for questionnaire

<b>Date</b>	<b>Venue</b>	<b>Activity</b>	<b>Outcome</b>
22 November 2022	Universiti Kebangsaan Malaysia	Interview with interurban rail service (Group 491)	Development of OS, critical job titles, job titles relevant to technology and IR, emerging skills, issues and challenges
26 November 2022	Syarikat Adimega Sdn. Bhd.	Preparation for Occupational Framework Evaluation Technical Committee Meeting 1 (JTPOF 1)	Presentation and report draft from Chapter 1 to Chapter 3, including current questionnaire draft and current OS draft
29 November 2022	Universiti Kebangsaan Malaysia	Interview with sewerage or waste industry (could be Group 493)	Identification of job areas under Group 493
30 November 2022	MIROS	Interview with bus industry (Group 492)	Development of OS, critical job titles, job titles relevant to technology and IR, emerging skills, issues and challenges
2 December 2022	Online	Interview with oil and gas industry (Group 493)	Related activities for oil and gas industry, emerging skills, issues, and challenges
7 December 2022	NIOSH Bangi	Occupational Framework Evaluation Technical Committee Meeting 1 (JTPOF 1)	Revision on Chapter 1 to Chapter 3, questionnaire contents, OS draft
16 December 2022	Online	Discussion with oil and gas industry (Group 493)	Development of OS, critical job titles, job titles relevant to technology and IR
20 December 2022	Online	Discussion with oil and gas industry (Group 493)	Revision on OS draft, critical job titles, job titles relevant to technology and IR
21 December 2022	Online	Discussion with Rail Specialist (Group 491 and Group 492)	Revision on OS draft for interurban/ urban/ suburban railways

Date	Venue	Activity	Outcome
22 December 2022	Online	Validation of survey questionnaire	Revision on questionnaire draft
10 January 2023	Indah Water Konsortium	Discussion with sewerage or waste industry (could be Group 493)	Verification whether this activity under Group 493
16 January 2023	KTMB Kuala Lumpur	Distribution of hardcopy survey and discussion with Interurban Rail Expert (Group 491)	Data gathering for Group 491
20 January 2023	Online	Interview with one of the land transport providers (Group 492)	Identification of job areas under Group 492
28 – 29 January 2023	Philea Mines Beach Resort Hotel	FGD2 with interurban, urban and suburban rail services, bus, water industry, oil and gas as well as land transport agencies (Group 491, 492, 493)	Verification on OS draft, critical job tile, job title related to technology and IR, establishment of OR, OD, review on current findings on survey
30 January 2023	Online	Discussion with oil and gas industry (Group 493)	Verification on OS draft, critical job tile, job title related to technology and IR, establishment of OR, OD, review on current findings on survey
8 February 2023	Online	Interview and discussion with other rail transport providers (cable car, airport shuttle and hill tram) (Group 492)	Revision and verification on OS draft related to industries under Group 492, critical job tile, job title related to technology and IR, establishment of OR, OD
16 February 2023	Online	Preparation for Internal Technical Committee Meeting 2 (JTD 2)	Report drafts from OF document draft, survey findings

<b>Date</b>	<b>Venue</b>	<b>Activity</b>	<b>Outcome</b>
22 February 2023	Department of Skill Development, Cyberjaya	Internal Technical Committee Meeting 2 (JTD 2)	Revision of contents in OF document
27 February 2023	Online	Discussion with cable car provider (Group 492)	Updated information related to this industry
1 March 2023	Online	Discussion with hill tram (Group 492)	Updated information related to this industry
3 March 2023	Online	Discussion with Rail Specialist (Group 491 and Group 492)	Updated information related to this industry
3-4 March 2023	Tenera Hotel, Bangi	Preparation for Final OF Document	Revision on OF document
22 March 2023	Online	Industrial Engagement (IE)	Verification on contents for OF H49 document
22-27 March 2023	Online	Discussion with SMEs (Rail, airport shuttle, oil and gas and water sector)	Updated information related to this sector based on feedback from IE and MSIC 2008
5 April 2023	Philea Mines Beach Resort Hotel	Occupational Framework Evaluation Technical Committee Meeting 2 (JTPOF 2)	Verification on OF H49 document
5 May 2023	Department of Skill Development, Cyberjaya	Final Occupational Framework Evaluation Technical Committee Meeting (JTPOF)	Final Verification on OF H49 document

### 3.2.2 Identification of Problem Statement and Objective

Through preliminary information gathering, which included secondary data collection and literature review, a general problem statement related to Land Transport and Transport via Pipelines has been identified. A secondary data collection and a literature review are conducted



to gain an understanding of H49-related sectors in the Malaysian environment. Then, the objective of this study is to ensure that the problem that had been brought up could be solved.

### 3.2.3 Review of Document

To provide foundational insight into the sector and evidence to support assumptions and arguments, preliminary data was acquired through systematic documentation analysis. This approach calls for a comprehensive analysis of secondary data obtained from a variety of sources, including scholarly works (published materials) and grey literature (unpublished materials) (Auger, 2017). In a systematic review, grey literature is useful since it is often more up to date than published materials and suffers from less publication bias. Grey literature encompasses a wide range of sources, including but not limited to: unpublished studies, reports, dissertations, conference papers and abstracts, blog posts, videos, white papers, and government research reports (Garousi, et. al., 2019).

This review gathers data to support the OF document through systematic searching, identifying, selecting, evaluating, and synthesizing. The goal of this method is to present a high-level and sector-level overview of the Land Transport and Transport via Pipelines environment and forecast, including industry and employment growth, trends, and opportunities. By taking this approach, this OF document can meet both the requirements of Industry Revolution and the needs of the sector in the context of Malaysia scenario. Table 3.2 displays the three primary types of informational resources or documents that were utilised during this process.

Table 3.2: Main Sources

Source	Descriptions
<b>Published materials</b>	<p>A review of relevant scientific publications in the industry was also carried out. Findings from publications are critical in discussing the outcomes of primary data collection.</p> <p>Information from these three main sources was elaborated in Chapter 2 Literature Review as well as supporting the findings from the analysis; such as the followings:</p> <ol style="list-style-type: none"> <li>The sector's economic performance as measured by several macroeconomic indicators such as industry growth and employment statistics;</li> </ol>

Source	Descriptions
	<ul style="list-style-type: none"> <li>ii. The industry outlook as compared to regional and global perspectives;</li> <li>iii. The start of technological development in the industry;</li> <li>iv. The identification of relevant legislations and stakeholders;</li> <li>v. The underlying background of the sector's issues; and</li> <li>vi. The support for the findings from data analysis.</li> </ul>
<b>Database from other agencies</b>	<p>Databases from both local and international agencies that contained relevant information on the Land Transport and Transport via Pipelines were referred. Among the databases applied were:</p> <ul style="list-style-type: none"> <li>i. Department of Skills Development, Ministry of Human Resource;</li> <li>ii. Ministry of Transport (MOT);</li> <li>iii. Department of Labour, Ministry of Human Resource;</li> <li>iv. Department of Statistics Malaysia;</li> <li>v. Social Security Organization (SOCSSO);</li> <li>vi. MySPIKE (Department of Skills Development, Ministry of Human Resources Malaysia);</li> <li>vii. Singapore Workforce Skills Qualifications (WSQ);</li> <li>viii. European Skills/Competences, Qualifications and Occupations (ESCO);</li> <li>ix. U.S Bureau of Labor Statistics (BLS);</li> <li>x. Eurostat (European Commission) and Statistics Department of other foreign countries.</li> </ul> <p>These databases were in the form of both online and offline sources. From the listed databases, specific documents and reports were retrieved and reviewed, including:</p> <ul style="list-style-type: none"> <li>i. Monitoring Occupational Shortages: Lessons from Malaysia's Critical Occupations List 2019 by World Bank Group;</li> <li>ii. Malaysia Standard Industrial Classification (MSIC) 2008;</li> <li>iii. International Standard Industrial Classification of All Economic Activities (ISIC);</li> <li>iv. Malaysia Standard Classification of Occupations (MASCO) 2020</li> </ul>

Source	Descriptions
<b>Economic database</b>	<p>Data on labour demand and organisational structures in the workplace would be useful for this investigation. Data is collected, analysed, and reported from several sources, including from the Department of Statistics Malaysia (DOSM) - MSIC 2008 and Occupation classifications by MASCO, the 12th Malaysia Plan, and the National Budget.</p> <p>In addition to providing a glimpse of the current state of the Land Transport and Transport via Pipelines industry, the database would also be used as a set of control figures and a baseline database against which the results of the online survey could be evaluated.</p>

### 3.2.4 Focus Group Discussion and Interview Session with Subject Matter Experts (SME)

Twenty-four industry players known as Subject Matter Experts (SMEs) through purposive sampling, are brought together to engage in discussion in the section of Land Transport and Transport via Pipelines service. Screening process was done to only selected managerial level personnel from the industry where homogeneity in terms of experience and occupation were considered. Subject Matter Experts are listed in the list of development panel members in Annex 1: List of Contributors.

There are two major FGD meetings held for every industry or area. Overall, as demonstrated in Figure 3.2 and Figure 3.3, there are eight main goals from these FGDs and interview activities, as follows:

- i. OS, OR, OD;
- ii. critical job title;
- iii. jobs relevant to technology and industrial revolution;
- iv. competency in demand;
- v. emerging skills;
- vi. industry issues and challenges;
- vii. contents for questionnaire draft; and

- viii. validation of data analysis from survey and previous meeting input for finalising the OF document

Table 3.3 shows the list of experts who are involved in the first FGD, the second FGD the list of experts who participated in the first and second FGDs, as well as interviews or full discussions outside of FGDs.

Table 3.3: List of Expert According to FGD and Interview Session

Activity	Name	Organisation	MSIC Group
FGD 1 & FGD 2	Muhammad Syafiq bin Abdullah	Rapid Rail Sdn. Bhd.	492
FGD 1 & FGD 2	Harpajan Singh A/L Jewant Singh	Rapid Rail Sdn. Bhd.	492
FGD 1 & FGD 2	Chairil Syarna bin Mazlan	Prasarana Sdn. Bhd.	492
FGD 1 & FGD 2	Syed Zulkefli bin Syed Mohd Yusof	Training Resource and Development Center Sdn. Bhd.	491 & 492
FGD 1 & FGD 2	Zulhazmi bin Elias	Malaysian Water Academy	493
FGD 1 & FGD 2	Mohamad Tharmizi bin Mohamad Ehsan	Syarikat Air Negeri Sembilan Sdn. Bhd.	493
FGD 1	Ir. Mohd Yusop bin Mohamad	Road Transport Department	492 & 493
FGD 1	Ts. Zulhaidi bin Mohd Jawi @ Said	MIROS	492 & 493
FGD 2	Mohd Nizar bin Mohd Amin	APAD	491, 492 & 493
FGD 2	Normala binti Abdul Malik	Maraliner Group	492
FGD 2	Adnan Faiz bin Abdul Rahim	NGC Energy Sdn Bhd	493
FGD 2	Ir. Mohd Kholel bin Manaf	Kereta Tanah Melayu Berhad (KTMB)	491 & 492
Interview	Zulkefli bin Ismail	Park May Berhad	492

Activity	Name	Organisation	MSIC Group
Interview	Fadzliey bin Jani	Park May Berhad	492
Interview	Ir. Mohd Zaid bin Yunos	NGC Energy Sdn Bhd	493
Interview	Zikrulamin bin Abd Wahab	Panaroma Langkawi Sdn. Bhd.	492
Interview	Amran bin Ayob	Panaroma Langkawi Sdn. Bhd.	492
Interview	Nasrol bin Md Noh	Panaroma Langkawi Sdn. Bhd.	492
Interview	Mohammad Hanif Hariz bin Ghazali	Panaroma Langkawi Sdn. Bhd.	492
Interview	Manivel a/l Munisamy	Perbadanan Bukit Bendera Pulau Pinang	492
Interview	Thangeswaran	Perbadanan Bukit Bendera Pulau Pinang	492
Interview	Marzlan bin Othman	Perbadanan Bukit Bendera Pulau Pinang	492
Interview	Rizan bin A Hamid	Malaysia Airports Berhad (MAHB)	492
Interview	Asmungi bin Sakimi	Malaysia Airports Academy, MAHB	492

The first part of the FGD discusses how the OS has evolved through time. For the first FGD, eight representatives from rail industry, road and land transport agencies, water industry were participated. The researchers begin the FGD with a brief presentation outlining the document's goals and describing whose populations (according to group H491, H492 and H493) are included and excluded in accordance with MSIC 2008. The rule of thumb is to disregard the general organisation chart because it contains activities unrelated to this area of the document.

A determining element is grouping based on similar skill sets in terms of technical ability as defined by MOSQF. The existing document related to OF related to the industry or sector and also in the NOSS Registry are also used as a point of reference. However, the SME must have a good knowledge about the boundary between each activity inside the organisation. A brainstorming session was conducted in which participants utilised both visual and group methods to generate the following major steps before presenting the entire set of OS:

- a) Identify main areas according to each service sector related to Land Transport and Transport via Pipelines based on MSIC 2008.
- b) List out possible professions and job titles that could subsequently be assessed based on competency levels.

For the first FGD, participants utilised the Card Clusters method, in which they recorded their job titles on index cards and clustered them together to establish their relative hierarchy. This method thrives in situations that call for the rapid collection of thoughts and data. By giving a visual representation that helps participants see connections between and among ideas, it facilitates the production of a wide range of fresh and new concepts. The researchers acted as guides, helping to direct participants' thoughts toward the exercise's intended outcome. Figure 3.6 shows the scenario during the first FGD.



(a) Brief presentation for FGD1



(b) Determination of the main job area according to the section



(c) List the job title for each job area

Figure 3.6: First Focus Group Discussion Activities

Aside from OS development, the first FGD also covered industry issues and challenges, critical job titles, job titles that are relevant to technology and the IR, emerging skills, and a few details for Chapters 1 and 2. Furthermore, a draft questionnaire has been produced based on the information gathered during the first part of the FGD. Basically, seven main semi-structured questions are constructed for constructing the first draft of OS and to be used for questionnaire draft. These questions are as follows:

- a) What are the challenges facing the transportation industry? Why do these occur and how it can be reduced?
- b) What are relevant job areas for this Section? What job title listed under this Job Area?
- c) What are the critical jobs in the Land Transport and Transport via Pipelines service sector or industry, and how to identify them?
- d) What are the relevant job titles that correspond with technological progress and the industrial revolution?
- e) What are jobs that normally acquire high demand in the industry?
- f) What are the emerging skills for the Land Transport and Transport via Pipelines service sector or industry, and what motivates their emergence?
- g) What are the competencies set relevant for this sector?

For the second FGD, the OS has been reviewed and referred to in the development of the Occupational Responsibilities (OR) and Occupational Description (OD). For the second FGD, ten representatives from rail industry, land transport agencies, water industry, oil and gas



industry participated in this session. The researchers facilitated the FGD to encourage dialogue among the panels while also steering the discussions in confirming critical job titles, job titles relevant to the technology and industrial revolution, and relevant industry challenges. In addition, preliminary survey findings were also discussed with the experts. Figure 3.7 shows the activities held in the second FGD.



(a) Brief presentation for FGD2 including review on previous and current OS as well as preliminary survey findings





(b) Discussion on OR and OD

Figure 3.7: Second Focus Group Discussion Activities

Basically, for the second FGD, following semi-structured questions were asked to the experts to encourage dialogue among all the experts and to refine the contents for the OS, OR and OD and the contents for the OF document:

- a) What are job responsibilities, job descriptions and competency set for each job title?
- b) What is the level of each of this job title for each of this job area?
- c) What are examples of technological or industrial revolution elements in industry related to job area?
- d) Do these job in demand, competencies sets, emerging skills, job area related to IR, emerging skills and challenge based on the current survey findings relevant to the industry? Elaborate it.

For the interview session outside of these FGD sessions, there were nine experts from cable car, hill tram and airport shuttle companies participated to assist in providing relevant information related to these sectors for this document. Basically, the structure of the interview session also similar with what have been held in FGD. As demonstrated in Table 3.2, there were multiple interview and discussion have been held with all these experts. Basically, for

final discussion, the outcomes of data analysis from the field study and online survey were presented with the SMEs and the panels. In these discussions, all SMEs and panels verified the findings of the survey's responses. The OF document can be finalised using this output and feedback before submitting to the DSD for final verification. Figure 3.8 and Figure 3.9 show the summary of main questions and flow chart for discussion with experts.

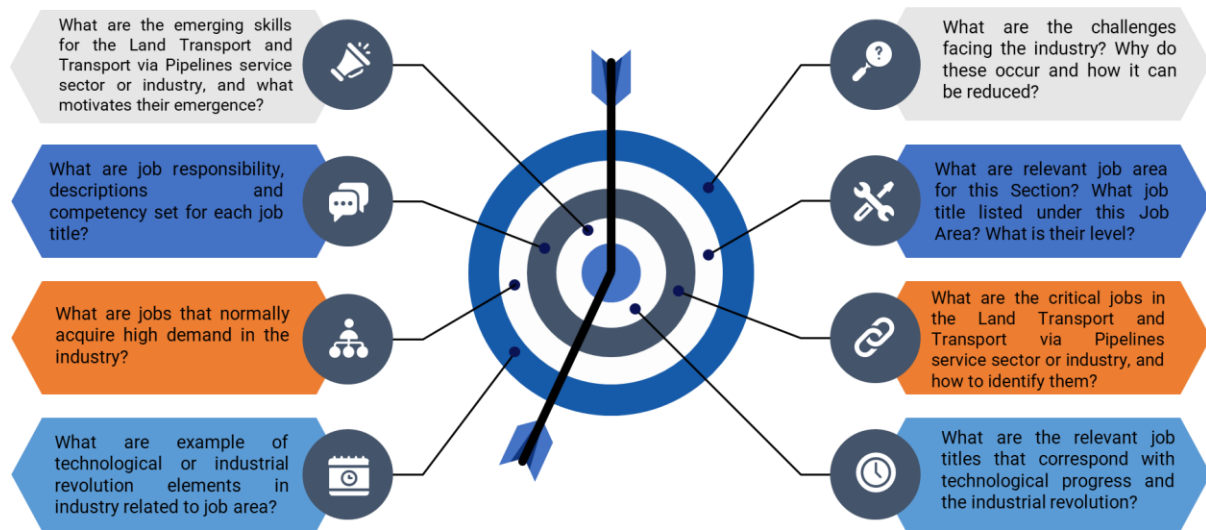


Figure 3.8: Semi-Structured Questions for Discussion with SME

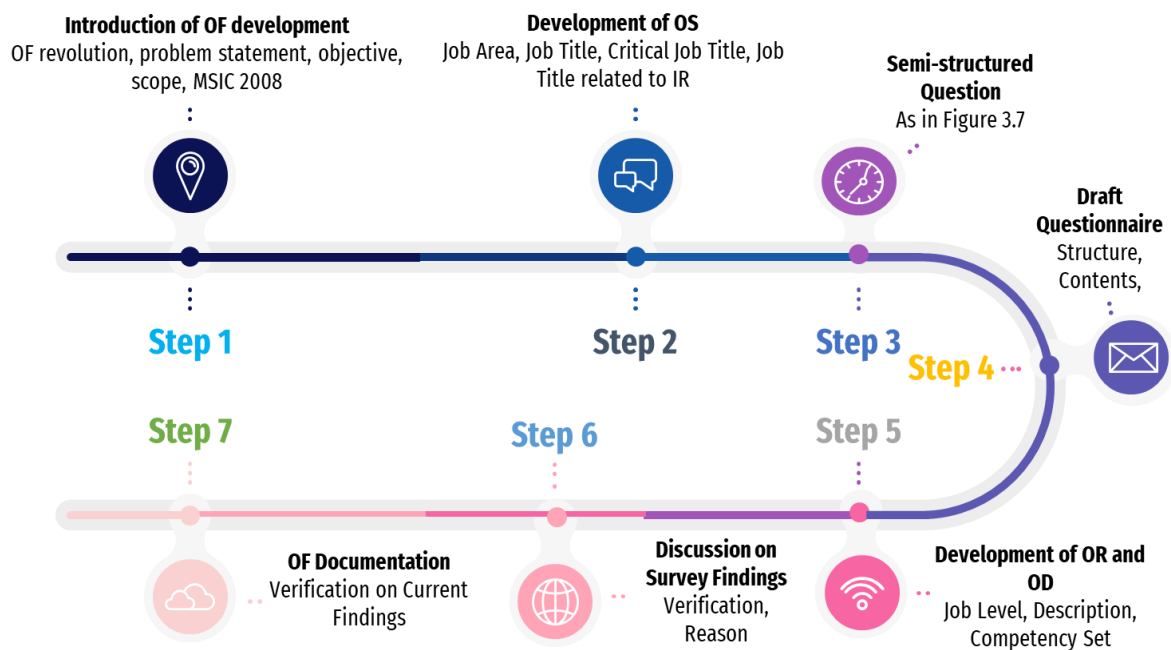


Figure 3.9: Summary on Flow Chart of FGD And Interview Session with SME

The following results are produced from the FGD and interview sessions:

- i. Definition for each Job Area;
- ii. Occupational Structure (OS) for the three groups under H49 that consist of job area, job titles and job levels;
- iii. Occupational Responsibilities (OR);
- iv. Occupational Description (OD) that consist of summary of responsibilities and competencies sets;
- v. Critical Job Titles for H49;
- vi. Job titles related to industrial revolution technology; and
- vii. Example of application related to industrial revolution technology and description for competency sets.

### **3.2.5 Survey Instrument**

To identify the job in demand, competency in demand, and job related to technology and Industrial Revolution, emerging skills as well as issues in this sector, a quantitative survey was conducted in addition to FGD and interview with industry experts and secondary materials. The survey also obtained information on issues concerning land transport and transport via pipelines.

To fulfil the study objectives, the questionnaire included closed-ended questions with Likert scales, and multiple choice, as well as open-ended questions to capture opinions. Before being deployed, the questionnaire underwent face and content validation by academician and industrial practitioner related to this sector before it was put into use. These panels validated the structure of the questions, grammar, and translation accuracy. Furthermore, they validated the suitability of the content, including any jargon or terms that were used. In addition, this questionnaire also has been checked in the Occupational Framework Evaluation Technical Committee Meeting 1 (JTPOF 1) with other panels from different organisations related to land transport and pipeline transport. Committees from Department of Skills Development in JTPOF 1 also participated in evaluating the contents and structure of this questionnaire draft. Before the recommendations are sent out to the respondents, every single one of them needs to be updated.

The completed survey was subsequently distributed to 12 participants for the pilot study phase. Twelve participants for pilot study phase are appropriate for checking the major flaws

in questionnaire (Zukerberg et al. 1995; Sheatsley 1983; Sudman 1983). The pilot study's goal was to determine respondents' comprehension and ease of answering survey questions. The data acquired during this pilot project was utilised to conduct an examination of the survey's reliability and relevance using Cronbach's Alpha. The Cronbach Alpha for this survey is 0.899. The survey's level of reliability can be accepted if the value of Cronbach's Alpha surpasses 0.7 (Bland & Altman 1997; George and Mallery 2003; Shahbazi et al. 2019). It demonstrates that these questions are simple to grasp and participants capable of answering the survey questions.

Annex 2 shows the survey questionnaire used for this study. The survey questionnaire consists of six sections:

a) Section 1: Demographics Profile

This section collects the demographic background of the respondents such as age, gender, overall number of years in industry, position in organization, and location of organisation.

b) Section 2: Competency in Demand

This section investigates the overall competency sets required for workers in the industry to perform their current and future job. Another goal of this section is to identify the factors contributing to the skills gap of the current graduates and current workers. Five-point Likert Scale was used to rate the Level of Importance for the competency in demand. This scale was used due to suitability of scale when rating importance in the questionnaire (Snapsurveys 2022).

c) Section 3: Job in Demand

This section describes the job in demands as well as elucidates the factors contributing to the shortage of workers. Following scale was used in this section: Low shortage, Moderate shortage, High shortage and Not relevant. Not relevant scale was used to indicate if the job title is not relevant with their organization. It is because, the structure of this survey was developed according to the group as defined in MSIC 2008. The respondent also required to state the reason for high shortage.

d) Section 4: Emerging Skills

This section identifies the emerging skills that are anticipated to be essential to the sector based on the reasons driving the need for such skills.

e) Section 5: Occupation Related to Technology and Industrial Revolution

This section assesses industry and labour readiness for the industrial revolution and technology advancement. Respondents must evaluate how relevant the industrial revolution's technology drivers are to their organization according to job titles.

f) Section 6: Related Issues

This section explores the industry's most common problems or challenges. four-point Likert Scale was used to rate the Level of Importance for the competency in demand.

### **3.2.6 Sampling Strategy and Data Collection**

The population that will serve as a representative sample for the development of this document consists of workforce at the managerial level from Land Transport and Pipeline Transport organisations in Malaysia. Sampling is the process of selecting items from a population in order to generalise the characteristics of the samples to the population as a whole. Despite the fact that the number of organisations in certain economic activities or sectors has been provided, the overall workforce, particularly at the managerial level, remains unclear. Miller (1997) proposed the Intercept Survey Method for the unidentified population because it can generate more accurate data than conventional population survey techniques.

In addition, convenience sampling has been used for this data collection. Convenience sampling is a non-probability form of sampling. In regards with unknown population, there is no set rule for the minimum number of observations that must be used for statistical analysis, but academic literature typically uses between 20 and 50 observations, with 30 being the most frequent (TalentCorp 2021). It is consistent with Roscoe's remark that most behavioral survey require a sample size of between 30 and 500. Roscoe also suggested that a minimum of 30 respondents should be considered for each subgroup if the data set must be separated into many subgroups for comparison analysis (e.g., male/female, rural/urban, local/international, etc.) (Roscoe 1975).

The Central Limit Theorem (CLT) also serves as the foundation for the reasoning behind the rule of 30. The CLT presupposes that as sample size grows, the distribution of sample means moves closer to (or tends to move closer to) a normal distribution. Gosset first came up with this concept in the early 1900s (Memon et al. 2020). Furthermore, 30 is regarded as a boundary between small and large samples for the purpose of drawing distributions (Hogg & Tanis 2006; Lehmann 2012). As stated previously, this document is structured around three primary groups.

Hence, it is determined to collect at least 30 samples or respondents by using stratified sampling technique (Miller 1997). Researchers employ stratified sampling to guarantee that their sample contains representation from all the relevant subgroups (Parsons 2014). In addition to this, it enables them to obtain accurate estimations of the qualities shared by each group. This approach is used in many surveys to gain a deeper understanding of the disparities that exist across different subpopulations. It provides useful input and accurately depict the situation in each group's industry.

There are two methods for distributing questionnaires: i) handed out in person or on-site visit and ii) through an online form. An Intercept Survey Method is another name for the on-site visit. An intercept survey can help swiftly collect relevant data in identified organisation (Henley & McCoy 2018). On the other hand, the online distribution method uses Google Forms to send the information to a wider audience. Google Form facilitates acquiring a sufficient number of participants without requiring them to visit the site (Vasanth Raju & Harinarayana 2016; Aboagye et al. 2021).

To increase the number of respondents for data collection, the following strategies are utilised:

- i. Targeting organisations include MIROS, APAD, and JPJ as well as the leading agencies for the transportation industry. These contributors can assist in providing each group information concerning organisations.
- ii. ii) Adopt a parallel methodology while administering the survey during an on-site visit and online approach.
- iii. Support from relevant government organisations in the form of institutional backing when contacting the chosen respondents.

### **3.3 Data Analysis**

Using the approaches research design depicted in Table 3.1, three types of data collection methods are used to obtain significant data and information. Document review, focus group discussions, interviews and survey data are analysed utilising different techniques as determined in Table 3.1.

#### **3.3.1 Content Analysis**

The participation of industry professionals ensured the relevance and currency of the Occupational Framework. In addition to collecting the job titles identified by brainstorming, FGD and interview sessions were utilised to further debate and examine further facets of OF. The researchers facilitated the sessions to obtain information from all participants. The entire discussion was recorded. The data was then analysed and interpreted to generate codes and emergent themes. The findings section was organised according to recurring concerns and major themes that summarised the responses of all participants. Subject matter experts then verified the findings to guarantee their reliability and precision. The following were the outcomes from these discussion sessions:

- i. Development of OS, OR, and OD;
- ii. Analysis of critical job titles;
- iii. Analysis of job title relevant with technology and industrial revolution;
- iv. Contents and structure for questionnaires;
- v. Example of emerging skill, technological and industrial revolution elements in industry
- vi. Description for competency attribute; and
- vii. Main industry issues and challenges.

#### **3.3.2 Statistical Analysis**

Using Microsoft Excel, the survey data was statistically analysed to generate descriptive results such as frequency and percentage. The following were the outcomes from survey data analysis:

- i. Analysis of competency in demand;
- ii. Analysis of job in demand;
- iii. Identification of emerging skills;
- iv. Determination of jobs relevant to the technology and industrial revolution; and
- v. Identification of industry-specific issues.

### **3.4 Conclusion**

This chapter provided additional information regarding the methodology that was utilised in the process of developing the OF document. The justification of the chosen research methodology and data collection method consisting of document review, focus group discussion, interview and survey questionnaires were discussed under Section 3.2. Research activities also have been listed in this chapter. Basically, this methodology has included following steps: the identification of a problem statement and objective; the review of relevant literature and documents; the selection of industry experts; focus group discussions; interviews; the process in developing the survey instrument; a sampling strategy; the data collection and the data analysis. The findings on the OS, OR, OD, competency in demand, job in demand, critical job, emerging skill, occupation or job area related to technology and industrial revolution as well as challenge in the industry as identified by the FGD, interview and industry surveys are presented in the next chapter.



## **CHAPTER IV**

### **FINDINGS**

#### **4.1 Introduction**

This chapter elaborates on the findings derived from the data collection. The findings focused on the objectives of this document, which were to develop Occupational Structure (OS), Occupational Responsibilities (OR), and Occupational Descriptions (OD) for each job title generated from the OS. Furthermore, the findings determine the job in demand and critical job titles in this sector, as well as the competency in demand, job titles related to technology and the industrial revolution and emerging skills. There are also findings on related issues in this sector and a mapping between OS and the National Occupational Skills Standard (NOSS).

#### **4.2 Findings Analysis**

This section presents the results generated from the analysis of the document review, the Focus Group Discussions (FGD) and interview with industry representatives, as well as the survey of employees in the Land Transport and Transport via Pipelines industries. All these techniques were utilised to develop the Occupational Framework (OF) for this sector. The discussion of the results focuses on the three (3) major groups outlined in Division H49 of the MSIC 2008, which are:

- Group 491: Transport via railways
- Group 492: Other land transport
- Group 493: Transport via pipeline

The identification of job areas and job titles to produce OS for the Land Transport and Transport via Pipeline sector was obtained through FGD and interview sessions with 25 industry representatives. In addition, the identification of competency in demand, job in demand, occupation related to technology and related issues were gathered through the online survey and verified with the expert. Finally, the development of OR and OD that described the job responsibilities and the required competency set were determined based on documents review and analysis with the experts.

#### **4.2.1 Document Review Findings**

According to the analysis in Chapter 2, the Occupational Framework (OF) for Land Transport and Pipeline Transport requires an urgent update, as it has not been published by the Department of Skills Division yet, despite the development of some National Occupational Skills Standards (NOSS) for specific groups in H49. Furthermore, the substantial capital investment, expertise, and skill required for Industrial Revolution (IR) technology adoption particularly for main operation as highlighted in value chain of each industry has left many industry players behind, demanding the need to empower workforce with new technology and IR tools to improve production processes and overall competitiveness.

Multiple stakeholders have been identified as relevant to the H49 industry, including industry players, government agencies, industry associations, professional bodies and training centres. All these stakeholders play an important role in supporting this sector. Transportation service sectors, for example, are important stakeholders in the H49 ecosystem. These industries drive innovation and competition in the sector, generating employment and revenue. These parties can work together to exchange expertise and resources, resulting in innovative product development, faster processes, and better service delivery.

Government agencies may support the H49 sector by establishing laws, regulations, and incentives that promote growth and development. Industry associations and professional bodies can also contribute to the improvement of the H49 industry sector by offering a forum for networking, information sharing, and advocacy. These organisations can represent the interests of the sector to the government and other stakeholders, give direction and support to industry participants, and promote best practises and standards. Training centres can bridge the skills gap in the H49 business by providing workers with training and education. Training institutes can collaborate with industry players to identify the skills required in the area and

create training programmes to fulfil those needs.

The H49 sector is also impacted by various legislations, policies, and regulatory frameworks, such as environmental regulations and safety standards, which can be expensive and time-consuming to comply with. In conclusion, based on the analysis of market analysis and business growth, the value chain, stakeholders, and acts for the H49 sector as indicated in Chapter 4, it is clear that this H49 sector plays a vital role in the economy. The sector has shown significant growth over the years, with several employment opportunities created, resulting in a positive impact on the country's Gross Domestic Product (GDP).

#### **4.2.2 Focus Group Discussion and Interview Sessions Findings**

There are two main FGDs and multiple interview and discussion sessions outside FGD with industry representatives, as laid out in Chapter 3. Annex 1 depicts list of contributors, including the expert panellists, documenting service persons, and technical committees. The outputs of these sessions have been listed in Section 3.2.5. Furthermore, as detailed in the following section for each finding, these sessions supported the survey findings.

#### **4.2.3 Demographic Profile from the Survey**

The survey received 131 responses. The link to the questionnaire survey was widely disseminated via email to agencies (300 email addresses) in this sector and was provided access from 3 January 2023 to 4 March 2023 (2 months). In addition, the hardcopy of the questionnaire survey also has been submitted to industries. Around 60 respondents answered via hardcopy form while 70 respondents answered through online form. As mentioned in Chapter 3, several researchers recommend a sample size of 30 for most survey research and statistical analysis (Roscoe 1975; TalentCorp 2021; Memon et al. 2020; Hogg & Tanis 2006; Lehmann 2012). This means that the number of respondents gathered is sufficient to represent the workforce in the Land Transport and Transport via Pipeline sector. Furthermore, the demographic profile reveals that the respondents were well represented by almost all the occupational groups under Division H49 and were from various Malaysian states as shown in Table 4.1. Table 4.1 also shows respondent demographic profile of the respondents based on MSIC group according to age, gender, years working, position and location. Meanwhile, Figure 4.1 shows percentage of respondent based on sector. There are 22.66% respondents represent Group 491 (Rail Industry (Interurban)), 53.44% respondents categorise as Group 492 (Other

Land Transport including Rail Industry (Urban and Suburban)) and 22.95% respondents correspond to Group 493 (Pipeline Transport).

Table 4.1: Respondents' Demographic Profile

Profile	Item	Frequency (Percentage, %)		
		Group		
		491	492	493
Age	Below 30	4 (12.9%)	23 (32.9%)	-
	31 - 40	19 (61.3%)	28 (40%)	22 (20%)
	41 - 50	1 (3.2%)	15 (21.4%)	6 (73.3%)
	Above 51	7 (22.6%)	4 (5.7%)	2 (6.7%)
Gender	Male	21 (67.7%)	57 (81.4%)	24 (80%)
	Female	10 (32.3%)	13 (18.6%)	6 (20%)
Overall Years Working in this Sector	Below 5 years	9 (29%)	24 (34.3%)	-
	6-10 years	8 (25.8%)	23 (32.9%)	-
	11-20 years	7 (22.6%)	19 (27.1%)	28 (93.3%)
	21-30 years	7 (22.6%)	4 (5.7%)	2 (6.7%)
Position in the organisation	Specialist/Managing Director/General Manager	2 (6.5%)	-	-
	Manager	13 (41.9%)	20 (28.6%)	7 (23.3%)
	Executive/Engineer	16 (51.6%)	29 (41.43%)	12 (40%)
	Assistant Manager	-	21 (30%)	5 (16.7%)
	Other	-	-	6 (20%)
Location	Kedah	-	1 (1.4%)	-
	Penang	-	1 (1.4%)	-
	Kuala Lumpur	28 (90.3%)	15 (21.4%)	18 (60%)
	Selangor	2 (6.5%)	53 (75.7%)	2 (6.7%)
	Negeri Sembilan	1 (3.2%)	-	9 (30%)
	Sabah	-	-	1 (3.3%)

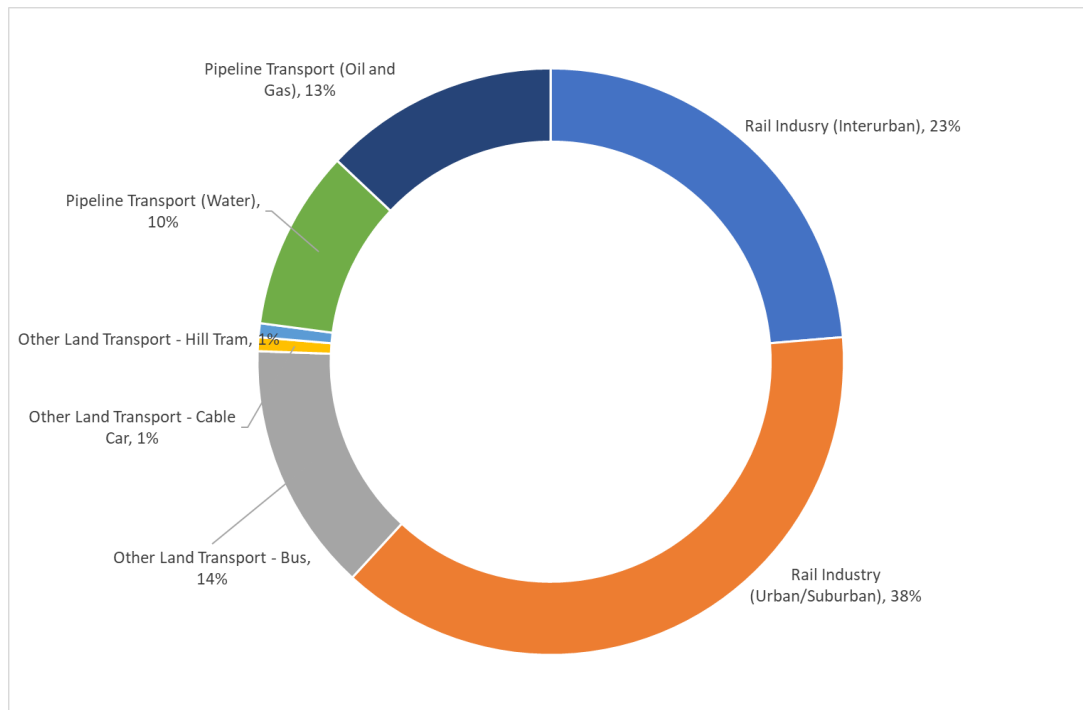


Figure 4.1: Percentage of Respondent based on Sector

Figure 4.2 shows the demographic profile of all respondents. According to the respondents' demographic data, majority of the respondent aged below 40 years with more than 75% respondents are male. Majority of respondents have been in the industry between 11 to 20 years. The responses were representing the high level of job position in the industry starting from executive level and above, with executive or engineer is the highest response for this survey with 41.22% and the lowest responses was among "others" with 1.53%.

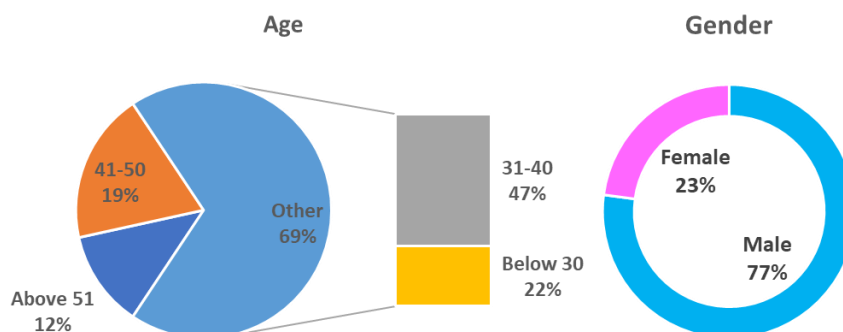


Figure 4.2: Respondents Demographic Profile based on Percentage

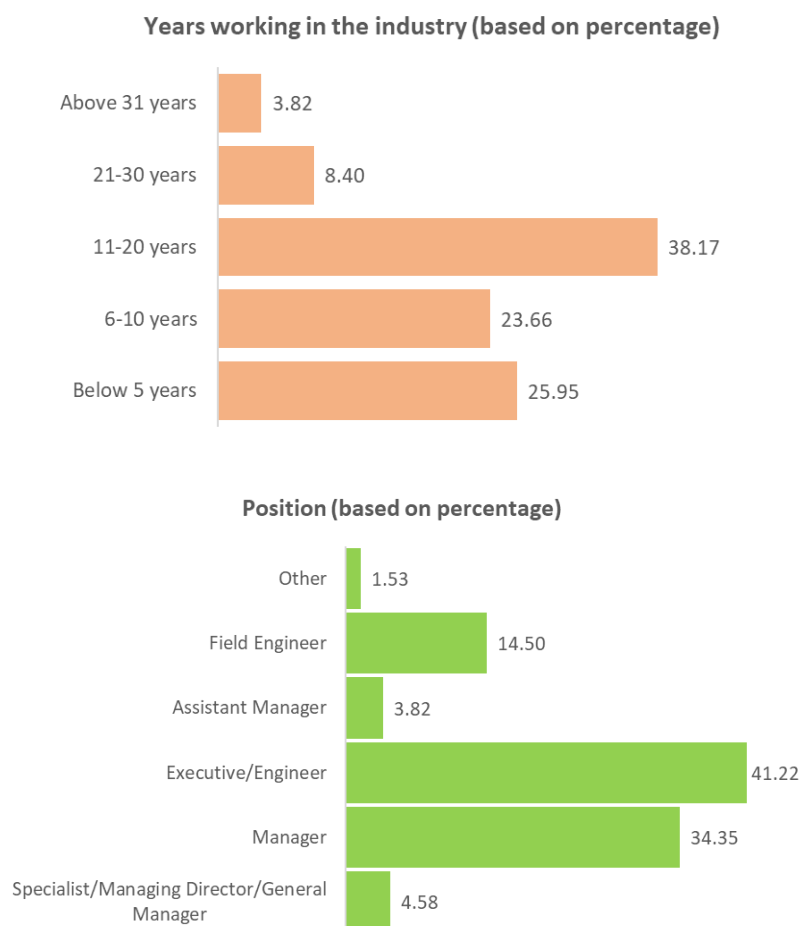


Figure 4.2: Respondents Demographic Profile based on Percentage.

### 4.3 Occupational Structure (OS)

Occupational Structure (OS) refers to the aggregate distribution of occupations in the organization; classified according to skill level, economic function, or social status. Based on the discussion with the industry representatives, there are altogether 18 job areas in this sector. These job areas are listed as follows: H491: (1) Interurban Passenger Rail Operation, (2) Interurban Passenger Electric Train Service (ETS) Operation, (3) Interurban Train Operation Control Centre, (4) Freight Cargo Train Operation, (5) Freight Cargo Train Coordination, (6) Freight Cargo Train Support Operation; H492: (7) Bus Operation, (8) Bus Operation Control Centre, (9) Urban and Suburban Passenger Rail Operation, (10) Urban and Suburban Train Operation Control Center, (11) Cable Car Operation, (12) Hill Tram Operation, (13) Automated People Mover Operation, (14) Automated People Mover Operation Control Centre (OCC) or known as Airport Shuttle OCC; H493: (15) Tanker/Haulage Operation, (16) Routine Operation – Liquid and Gaseous Pipeline, (17) Multi-Product Pipeline Control, and (18)

Pipeline Distribution Operation. A total of 77 job titles have been identified, in which 33 critical job titles and 30 industrial revolution-related job titles identified within this sector; all of which will be featured in the OS.

Based on the discussion with the industries and regulatory bodies in the second FGD, job areas such as taxi, airport limousine, rental car service and trishaw are based on individual. Based on discussion with experts, particularly land transport agencies, the industry mostly individual own business and do not have firm aggregate distribution of work structure. For airport limousine, even though their look-liked structure operation, the operation is only for hailing processes. In addition, e-hailing industry in Malaysia defined as partnership business between operators and the drivers. The e-hailing industry in Malaysia works through a platform-based business model, connecting passengers with drivers through a mobile application. Furthermore, according to findings from FGD with experts, operation of pump station also own by individual and do not have firm aggregate distribution of career path and work structure. Therefore, all these job areas did not have occupational structure and were excluded in this study.

Figure 4.3 depicts illustration of each group under H49 as described in MSIC 2008. Based on this figure, Group 492 shows the largest job areas with eight job areas. Meanwhile, for Group 491 and Group 493, there are six and four job areas, respectively.

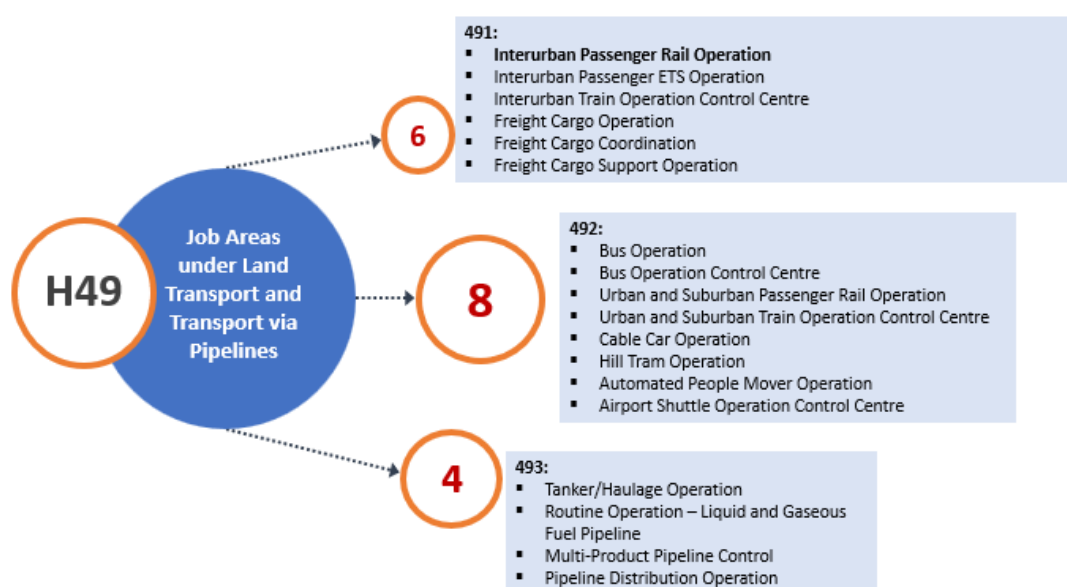


Figure 4.3: Job Area under H49

Table 4.2 shows the overall job title in H49. In this table, the job title is divided into three main criteria, with single asterisk, two asterisk and three asterisk. Within these 18 job areas, there are 77 job titles, 33 critical jobs (from single and three asterisk), 30 job related to technology and industrial revolution (from single and two asterisk), for H49. The OS is presented in Section 4.3, beginning with Table 4.4 and ending with Table 4.12. The tables also show critical job titles with a single asterisk (\*), jobs relevant to technology and the industrial revolution with two asterisks (\*\*), and critical job titles and jobs relevant to technology with a triple asterisk (\*\*\*).

Table 4.2: Overall of Job Title in H49: Land Transport and Transport via Pipelines

No.	Occupational Structure (OS)	Total of Job Titles	Total Critical Job Title (*)	Total Job Related to Technology and Industrial Revolution (**)	Total Job Related to Critical Jobs and Jobs Relevant to Technology And Industrial Revolution (***)
1.	H491: Transport via railways	28	7	7	2
2.	H492: Other land transport	32	12	10	4
3.	H493: Transport via pipeline	17	4	3	4
	<b>TOTAL</b>	<b>77</b>	<b>23</b>	<b>20</b>	<b>10</b>

A description of six job areas under Group 491 is presented in Table 4.3. This description is based on the current role occurred in the industry related to these job areas. In general, multiple organisations are involved directly in this land transport and pipeline transport sector.

Table 4.3: Description of Each Job Area for Group 491

Group	Job Area	Description
<b>491</b>	Interurban Passenger Rail Operation	Interurban train service is referred to train operation between cities. Normally, it is operated by Keretapi Tanah Melayu Berhad (KTMB) which is the national railway company.



Group	Job Area	Description
		In addition to the passenger coach, KTM Commuter and Ekspres Rakyat Timuran also has been provided to cover interurban segment in the Peninsular Malaysia area. For instance, Ekspres Rakyat Timuran cover East Coast from Johor Bahru Sentral to Tumpat, Kelantan. These trains are typically diesel-powered.
	Interurban Passenger Operation      ETS	The main intercity train service is known as the Electric Train Service (ETS), which operates West Coast Line between major cities Padang Besar, Kuala Lumpur and Gemas including the branch line between Bukit Mertajam and Butterworth. The ETS uses electric multiple unit (EMU) trains that are powered by overhead catenary cables.
	Interurban Train Operation Control Centre	This OCC in Malaysia involves the overall supervision of Main Line operational status and train movements, monitoring and controlling station, communicating with persons in charge and ensuring the safety and comfort of passenger. In addition, it also response to mitigate the effect of any incident, accident and service disruption and facilitate, respond, coordinate and manage emergency situations with relevant parties to ensure smooth train operations, responding to emergencies or disruptions. It includes also monitoring and controlling Non-Operational Hours Engineering Possession works.
	Freight Train Operation      Cargo	Provides rail freight services with integrated logistics solution to domestic and cross-border market such as Containerized cargo and bulk cargo with a network that is accessible from seaports and inland container depot for export and import.
	Freight      Cargo	The job at the Freight Cargo Coordination department

Group	Job Area	Description
	Train Coordination	involves managing and coordinating the movement of cargo shipments. The responsibilities include coordinating shipments, booking cargo space, preparing shipping documents, tracking and monitoring the movement of cargo, communicating with stakeholders, and resolving any problems or issues that may arise.
	Freight Cargo Train Support Operation	Freight Cargo Support Operation is a department that provides support to the Freight Cargo Coordination department. This department assists in ensuring the smooth and efficient operation of cargo shipments by providing administrative support, coordinating with carriers, tracking and monitoring cargo movement, communicating with stakeholders, and handling customer complaints.

Table 4.4 shows the OS for Group 491. There are six main job areas for Group 491; Interurban Passenger Rail Operation, Interurban Passenger Rail Operation ETS, Interurban Train Operation Control Centre, Freight Cargo Train Operation - Yard Operation, Freight Cargo Train Operation - Foremen Operation and Freight Cargo Train Operation - Shunting with the highest level is at Level 6, and the lowest level is at Level 1. Meanwhile, Table 4.5 shows the summary of job title for Group 491 with 28 job titles, nine critical job title and nine job title related to technology and industrial revolution.

Table 4.4: Occupational Structure Group H491

<b>MSIC SECTION</b>	<b>(H) TRANSPORTATION AND STORAGE</b>					
<b>MSIC DIVISION</b>	<b>(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES</b>					
<b>MSIC GROUP</b>	<b>(491) Transport via Railways</b>					
<b>AREA</b>  <b>LEVEL</b>	<b>Interurban Passenger Rail Operation</b>	<b>Interurban Passenger ETS Operation</b>	<b>Interurban Train Operation Control Centre</b>	<b>Freight Cargo Operation</b>	<b>Freight Cargo Coordination</b>	<b>Freight Cargo Support Operation</b>
<b>LEVEL 8</b>	NJT	NJT	NJT	NJT	NJT	NJT
<b>LEVEL 7</b>	NJT	NJT	NJT	NJT	NJT	NJT
<b>LEVEL 6</b>	Head of Interurban Passenger Rail Operation	Head of Interurban Passenger ETS Operation	Head of Operation Control Centre	Head of Freight Cargo Operation	Head of Freight Cargo Coordination	Head of Freight Cargo Support Operation
<b>LEVEL 5</b>	Assistant of Interurban Passenger Rail Operation **	Assistant of Interurban Passenger ETS Operation **	Assistant Head of Operation Control Centre **	Assistant Head of Freight Cargo Operation **	Assistant Head of Freight Cargo Coordination **	Assistant Head of Freight Cargo Support Operation **
<b>LEVEL 4</b>	Train Operation Executive ***	ETS Captain *	Chief Controller ***	Head of Terminal	Head of Terminal	Head of Terminal
<b>LEVEL 3</b>	Train Driver Supervisor *	NJT	Control Center Operation Controller *	Head of Yard**	Under Foreman	Head of Shunting

<b>MSIC SECTION</b>	<b>(H) TRANSPORTATION AND STORAGE</b>					
<b>MSIC DIVISION</b>	<b>(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES</b>					
<b>MSIC GROUP</b>	<b>(491) Transport via Railways</b>					
<b>AREA LEVEL</b>	<b>Interurban Passenger Rail Operation</b>	<b>Interurban Passenger ETS Operation</b>	<b>Interurban Train Operation Control Centre</b>	<b>Freight Cargo Operation</b>	<b>Freight Cargo Coordination</b>	<b>Freight Cargo Support Operation</b>
<b>LEVEL 2</b>	Train Driver *	NJT	NJT	Shunting Driver *	Shunting Driver *	Shunting Driver *
<b>LEVEL 1</b>	Assistant of Train Driver	NJT	NJT	NJT	NJT	NJT

NJT – No Job Title |\* Critical Job/ High Demands |\*\* Jobs relevant to technology and industrial revolution |\*\*\* Critical Jobs and jobs relevant to technology and industrial revolution



The description of job areas under Group 492 is presented in Table 4.6. In addition, OS for Group 492 is shown in Table 4.7 and Table 4.8. For Group 492, there are eight main industrial categories: bus-related service, urban and suburban rail-related service, cable car operation, hill tram operation, and airport shuttle operation related service, with Level 6 being the highest level and Level 1 being the lowest. The summary of job titles for Group 492 is shown in Table 4.9, which includes 32 job titles for the group, 16 critical job titles, and 14 jobs associated with the industrial revolution and technology.

Table 4.6: Description of Each Job Area for Group 492

Group	Job Area	Description
<b>492</b>	Bus Operation	Bus operation in Malaysia involves City Bus, Express Bus, Employee Bus, and School Bus. It involves driving the bus safely and efficiently, conducting vehicle inspections, providing customer service, enforcing rules and regulations, maintaining the bus, coordinating with dispatch, reporting incidents, and managing schedules. The focus is on ensuring safe, efficient, and effective transportation services. Job roles may vary depending on the specific responsibilities and requirements of the bus operator.
	Bus Operation Control Centre	A Bus Operation Control Centre (OCC) is a central location where transportation companies or authorities can monitor and control their bus fleet operations. The OCC monitors bus locations and performance, communicates with drivers and passengers, coordinates dispatch and scheduling, provides customer service, and ensures safety and security. The job in a BOCC requires strong communication and organizational skills, attention to detail, and the ability to work in a fast-paced environment. This OCC usually related to express bus and stage bus which has a numbers of fleet to be monitored.

Group	Job Area	Description
	Urban and Suburban Passenger Rail Operation	<p>Urban and Suburban Train Operation refer to operation in urban areas usually include the inner, or main city, whereas suburban areas are those that are just adjacent to the city or surround the city.</p> <p>This operation is operated by multiple organisations such as:</p> <ul style="list-style-type: none"> <li>i. Light Rail Train (LRT): Rapid KL's LRT operation is run by Rapid Rail Sdn Bhd, which is responsible for overseeing the urban rail lines of Ampang Line and Sri Petaling Line, and Kelana Jaya Line.</li> <li>ii. Monorail: The KL Monorail is an intra city public transit system that links many key destinations within Kuala Lumpur. Operated as part of the RapidKL system by Rapid Rail, a subsidiary of Prasarana Malaysia, it is one of the components of the Klang Valley Integrated Transit System.</li> <li>iii. Mass Rapid Transit (MRT): Currently, there are two main line in Malaysia (Kajang Line and Putrajaya Line).</li> <li>iv. Commuter: Operate by Keretapi Tanah Melayu Berhad (KTMB) and uses electric multiple unit (EMU) trains.</li> <li>v. Express Rail Link: operates the airport rail link of the same name that connects the Kuala Lumpur International Airport (KLIA) with the Kuala Lumpur Sentral (KL Sentral) transportation hub, 57 kilometres apart.</li> <li>vi. Train Sabah State Railway: Operate by Department of Railway Sabah</li> </ul>

Group	Job Area	Description
	Urban and Suburban Train Operation Control Centre	This OCC in Malaysia involves the overall supervision of line operational status and train movements, monitoring and controlling station, communicating with persons in charge and ensuring the safety and comfort of passenger. In addition, it also response to mitigate the effect of any incident, accident and service disruption and facilitate, respond, coordinate and manage emergency situations with relevant parties to ensure smooth train operations, responding to emergencies or disruptions.
	Cable Car Operation	<p>Cable car operation in Malaysia involves operating the cable car system safely and efficiently, monitoring safety systems, providing customer service, conducting inspections and maintenance, responding to emergencies, and reporting incidents.</p> <p>Currently there are two main providers for cable car, in Langkawi Island and Genting Highland.</p>
	Hill Tram Operation	The Penang Hill Railway in Penang is the only cable car rail system type (funicular) in Malaysia. The line is made up of two separate sections, with the total length at 1996 metres. Both sections are single lines with passing loops at midway.
	Automated People Mover (APM) Operation	This APM is one of airport shuttle used and mainly operated by Malaysia Airport to provide the transport service for passenger in the airport.



Group	Job Area	Description
	Airport Shuttle Operation Control Centre	This OCC located in Kuala Lumpur International Airport involves monitoring train movements, communicating with relevant parties to ensure smooth train operations, responding to emergencies or disruptions, overseeing maintenance and repairs of train infrastructure, compiling data and generating reports on train operations, and coordinating with other departments to ensure seamless train operations.

Table 4.7: Occupational Structure Group H492 (1/2)

<b>MSIC SECTION</b>	<b>(H) TRANSPORTATION AND STORAGE</b>			
<b>MSIC DIVISION</b>	<b>(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES</b>			
<b>MSIC GROUP</b>	<b>(492) Other Land Transport</b>			
<b>AREA LEVEL</b>	<b>Bus Operation</b>	<b>Bus Operation Control Centre</b>	<b>Urban and Suburban Passenger Rail Operation</b>	<b>Urban and Suburban Train Operation Control Centre</b>
<b>LEVEL 8</b>	NJT	NJT	NJT	NJT
<b>LEVEL 7</b>	NJT	NJT	NJT	NJT
<b>LEVEL 6</b>	NJT	NJT	Head of Passenger Rail Operation	Head of Train Operation Control Centre
<b>LEVEL 5</b>	Head of Bus Operation **	Head of Bus Control Centre Operation **	Assistant Head of Passenger Rail Operation **	Assistant Head of Train Operation Control Centre **
<b>LEVEL 4</b>	Assistant Head of Bus Operation	Assistant Head of Bus Control Centre Operation	Train Executive ***	Chief Controller ***
<b>LEVEL 3</b>	Supervisor	Traffic Controller *	Train Supervisor **	Train Controller Operator *
<b>LEVEL 2</b>	Bus Driver *	NJT	Train Driver *	NJT
<b>LEVEL 1</b>	NJT	NJT	NJT	NJT

NJT – No Job Title |\* Critical Job/ High Demands |\*\* Jobs relevant to technology and industrial revolution |\*\*\* Critical Jobs and jobs relevant to technology and industrial revolution

Table 4.8: Occupational Structure Group H492 (2/2)

<b>MSIC SECTION</b>	<b>(H) TRANSPORTATION AND STORAGE</b>			
<b>MSIC DIVISION</b>	<b>(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES</b>			
<b>MSIC GROUP</b>	<b>(492) Other Land Transport</b>			
<b>AREA</b>	<b>Cable Car Operation</b>	<b>Hill Tram Operation</b>	<b>Automated People Mover Operation</b>	<b>Automated People Mover Operation Control Centre</b>
<b>LEVEL</b>				
LEVEL 8	NJT	NJT	NJT	NJT
LEVEL 7	NJT	NJT	NJT	NJT
LEVEL 6	NJT	NJT	NJT	NJT
LEVEL 5	Head of Cable Car Operation **	Head of Hill Tram Operation **	Head of Automated People Mover Operation **	NJT
LEVEL 4	Technical Executive *	Executive **	Executive ***	Engineer ***
LEVEL 3	Technical Supervisor **	Operation Supervisor	Technical Officer *	Technical Officer *
LEVEL 2	Technician *	Technician (Control Room Staff) *	Technician *	Control Centre Operator *
LEVEL 1	NJT	Driver *	NJT	NJT

NJT – No Job Title |\* Critical Job/ High Demands |\*\* Jobs relevant to technology and industrial revolution |\*\*\* Critical Jobs and jobs relevant to technology and industrial revolution

Table 4.9: Summary of Job Titles Group H492

SUMMARY OF JOB TITLE FOR (492) OTHER LAND TRANSPORT									
NO.	JOB AREA	LEVEL							
		1	2	3	4	5	6	7	8
(492) OTHER LAND TRANSPORT									
1.	Bus Operation	NJT	1	1	1	1	NJT	NJT	NJT
2.	Bus Operation Control Centre	NJT	NJT	1	1	1	NJT	NJT	NJT
3.	Urban and Suburban Passenger Rail Operation	NJT	1	1	1	1	1	NJT	NJT
4.	Urban and Suburban Train Operation Control Centre	NJT	NJT	1	1	1	1	NJT	NJT
5.	Cable Car Operation	NJT	1	1	1	1	NJT	NJT	NJT
6.	Hill Tram Operation	1	1	1	1	1	NJT	NJT	NJT
7.	Automated People Mover Operation	NJT	1	1	1	1	NJT	NJT	NJT
8.	Airport Shuttle Operation Control Centre	NJT	1	1	1	NJT	NJT	NJT	NJT

NO.	ITEM	LEVEL							
		1	2	3	4	5	6	7	8
1.	Identified job title (per level)	1	6	8	8	7	2	0	0
2.	Total identified job title	32							
3.	Critical job title (per level)	1	6	4	5	0	0	0	0
4.	Total critical job titles	16							
5.	Job titles relevant to technology & industrial revolution (per level)	0	0	2	5	7	0	0	0
6.	Total job title relevant to technology & industrial revolution	14							

**NJT -NO JOB TITLE**

Description for each job area under Group 493 is tabulated in Table 4.10. The OS for Group 493 is shown in Table 4.11. There are two main industries for Group 493: water sector as well as oil and gas sector, with the highest level being at Level 5 and the lowest level being at Level 1. In the meantime, Table 4.12 lists the 17 job titles for Group 493, including eight critical job titles and seven job titles related to the industrial revolution and technology.

Table 4.10: Occupational Structure Group H493

Group	Job Area	Description
<b>493</b>	Tanker/Haulage Operation	Haulage operation in Malaysia involves managing logistics, drivers, safety, clients, finances, records, emergencies, and incidents. The focus is on ensuring the safe and efficient transportation of goods.
	Routine Operation – Liquid and Gaseous Fuel Pipeline	Gas and Liquid Fuel pipeline in Malaysia involves managing the integrity of the downstream pipeline system, flow and process control, emergency response, incident management, coordination with other teams and quality assurance. The focus is on ensuring the safe and efficient transportation of products through the pipeline system.
	Multi-Product Pipeline Operation	Multi-product pipeline control in Malaysia involves managing process flow, product management, quality assurance, emergency response, incident management, coordinating with other teams, and meeting customer specifications. The focus is on ensuring the safe, efficient and precise transportation of various products through the pipeline system.
	Pipeline	Distribution operation in Malaysia involves long distance

Group	Job Area	Description
	Distribution Operation	pipeline particularly focus on water, for operating and managing distribution systems, monitoring distribution networks, responding to emergencies, performing maintenance, conducting inspections, and coordinating with other teams.

Table 4.11: Occupational Structure Group H493

<b>MSIC SECTION</b>	<b>(H) TRANSPORTATION AND STORAGE</b>			
<b>MSIC DIVISION</b>	<b>(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES</b>			
<b>MSIC GROUP</b>	<b>(493) Transport via Pipeline</b>			
<b>AREA LEVEL</b>	<b>Tanker/Haulage Operation</b>	<b>Routine Operation- Liquid and Gaseous Fuel Pipeline</b>	<b>Multi-Product Pipeline Control</b>	<b>Pipeline Distribution Operation</b>
LEVEL 8	NJT	NJT	NJT	NJT
LEVEL 7	NJT	NJT	NJT	NJT
LEVEL 6	NJT	NJT	NJT	NJT
LEVEL 5	Head of Tanker/Haulage Operation **	Head of Routine Operation- Liquid and Gaseous Fuel Pipeline	Head of Multi-Product Pipeline Control	Head of Pipeline Distribution Operation **
LEVEL 4	Operation Executive ***	Operation Engineer ***	Planner ***	Executive ***
LEVEL 3	Driver Supervisor	Operation Executive **	Shift Supervisor	Supervisor
LEVEL 2	Driver *	Operation Technician *	Control Room Operator *	Operator *
LEVEL 1	NJT	NJT	NJT	General Worker

NJT – No Job Title | \* Critical Job/ High Demands | \*\* Jobs relevant to technology and industrial revolution | \*\*\* Critical Jobs and jobs relevant to technology and industrial revolution

Table 4.12: Summary of Job Titles Group H493

SUMMARY OF JOB TITLE FOR (493) TRANSPORT VIA PIPELINES									
NO.	JOB AREA	LEVEL							
		1	2	3	4	5	6	7	8
(493) TRANSPORT VIA PIPELINES									
1.	Tanker/Haulage Operation	NJT	1	1	1	1	NJT	NJT	NJT
2.	Routine Operation - Liquid and Gaseous Fuel Pipeline	NJT	1	1	1	1	NJT	NJT	NJT
3.	Multi-Product Pipeline Control	NJT	1	1	1	1	NJT	NJT	NJT
4.	Pipeline Distribution Operation	1	1	1	1	1	NJT	NJT	NJT

NO.	ITEM	LEVEL							
		1	2	3	4	5	6	7	8
1.	Identified job title (per level)	1	4	4	4	4	0	0	0
2.	Total identified job title	17							
3.	Critical job title (per level)	0	4	0	4	0	0	0	0
4.	Total critical job titles	8							
5.	Job titles relevant to technology & industrial revolution (per level)	0	0	1	4	2	0	0	0
6.	Total job title relevant to technology & industrial revolution	7							

**NJT -NO JOB TITLE**



#### **4.4 Occupational Responsibilities (OR)**

The Occupational Responsibilities (OR) describe the main duties of each of the job titles listed under the Occupational Structure (OS), which also corresponds with the particular job's respective area and level. The OR will serve as the future reference for the development of the National Occupational Skills Standard (NOSS) for the Land Transport and Transport via Pipelines occupation under the MSIC 2008, Division H49: Group: H491, H492 and H493. The OR are presented on the following pages, from Table 4.11 to Table 4.15.

Table 4.13: Occupational Responsibility (OR) Group H491 (1/2)

MSIC SECTION	(H) TRANSPORTATION AND STORAGE		
MSIC DIVISION	(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES		
MSIC GROUP	(491) Transport via Railways		
AREA LEVEL	Interurban Passenger Rail Operation	Interurban Passenger Operation ETS	Interurban Train Operation Control Centre
LEVEL 8	NJT	NJT	NJT
LEVEL 7	NJT	NJT	NJT
LEVEL 6	<b>Head of Interurban Passenger Rail Operation</b> <ul style="list-style-type: none"> <li>• Manage the overall interurban passenger rail operation, ensuring business are met and costs are controlled.</li> <li>• Plan, strategize and ensure all operation and maintenance activities are in line with the current Safety requirement, Operating plans and Maintenance plans.</li> <li>• Responsible for safe operations of Manual Trains as well as making sure Rules and Procedures are followed and reviewed accordingly.</li> <li>• Ensure all communications flow during Failure Management or Crisis are well disseminated especially to customer.</li> <li>• Prepare the annual budget for meeting</li> </ul>	<b>Head of Interurban Passenger ETS Operation</b> <ul style="list-style-type: none"> <li>• Manage the overall ETS services, ensuring business are met and costs are controlled.</li> <li>• Plan, strategize and ensure all operation and maintenance activities are in line with the current Safety requirement, Operating plans and Maintenance plans.</li> <li>• Responsible for safe operations of Automatic and manual as well as making sure Rules and Procedures are followed and reviewed accordingly.</li> <li>• Ensure all communications flow during Failure Management or Crisis are well disseminated especially to customer.</li> <li>• Prepare the annual budget for meeting the company's business goals by monitoring and control the expenditure for cost-effective operations.</li> <li>• Maintains long-term, collaborative relationship</li> </ul>	<b>Head of Operation Control Centre</b> <ul style="list-style-type: none"> <li>• Manage the overall Operations of Control Centre to ensure a smooth and efficient administrative of day-to-day activities.</li> <li>• Lead and control the safety of passengers, staffs and assets with regards to rolling stock and support actions,</li> <li>• Optimise the utilization of resources for a safe, reliable, efficient rail service at all time.</li> <li>• Lead and control the operation, alternate service and emergency response plans for the safe, reliable and efficient services.</li> <li>• Training need analysis (TNA) to operation staff.</li> </ul>

MSIC SECTION	(H) TRANSPORTATION AND STORAGE		
MSIC DIVISION	(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES		
MSIC GROUP	(491) Transport via Railways		
AREA LEVEL	Interurban Passenger Rail Operation	Interurban Passenger Operation ETS	Interurban Train Operation Control Centre
	<p>the company's business goals by monitoring and control the expenditure for cost-effective operations.</p> <ul style="list-style-type: none"> <li>• Maintains long-term, collaborative relationship with key stakeholders and with selected organizations to achieve mutual goals.</li> <li>• Participate in any assignment, project or activities initiated by the company, Non-Government Organisation (NGO) or government authority with regards to development of Public Transportations (system or personnel).</li> <li>• Responsible to enhance the Failure Management Strategies and Standard Operating Procedures.</li> </ul>	<p>with key stakeholders and with selected organizations to achieve mutual goals.</p> <ul style="list-style-type: none"> <li>• Participate in any assignment, project or activities initiated by the company, NGO or government authority with regards to development of Public Transportations (system or personnel).</li> <li>• Responsible to enhance the Failure Management Strategies and Standard Operating Procedures.</li> </ul>	
<b>LEVEL 5</b>	<p><b>Assistant of Interurban Passenger Rail Operation</b></p> <ul style="list-style-type: none"> <li>• Assist Head in managing the overall section of train drivers to ensure a smooth and efficient administration of day-to-day operations.</li> <li>• Assist head in lead and control the safety of train, staff, and passengers.</li> <li>• Assist head in lead and control the operation, alternate service and</li> </ul>	<p><b>Assistant of Head Interurban Passenger ETS Operation</b></p> <ul style="list-style-type: none"> <li>• Assist Head in managing the overall section of train drivers to ensure a smooth and efficient administration of day-to-day operations.</li> <li>• Assist head in lead and control the safety of train, staff, passengers and cargo.</li> <li>• Assist head in lead and control the operation, alternate service and emergency response plans for the safe, reliable and efficient services.</li> </ul>	<p><b>Assistant Head of Operation Control Centre</b></p> <ul style="list-style-type: none"> <li>• Assist Head to manage the overall Operations of Control Centre to ensure a smooth and efficient administrative of day-to-day activities.</li> <li>• Assist head in control the safety of passengers, staffs and assets with regards to rolling stock and support</li> </ul>

MSIC SECTION	(H) TRANSPORTATION AND STORAGE		
MSIC DIVISION	(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES		
MSIC GROUP	(491) Transport via Railways		
AREA LEVEL	Interurban Passenger Rail Operation	Interurban Passenger Operation ETS	Interurban Train Operation Control Centre
	<p>emergency response plans for the safe, reliable and efficient services.</p> <ul style="list-style-type: none"> <li>Assist head in training need analysis (TNA) to operation staff</li> </ul>	<ul style="list-style-type: none"> <li>Assist head in training need analysis (TNA) to operation staff.</li> </ul>	<p>actions,</p> <ul style="list-style-type: none"> <li>Assist head in optimizing the utilization of resources for a safe, reliable, efficient rail service at all time.</li> <li>Assist head in in lead and control the operation, alternate service and emergency response plans for the safe, reliable and efficient services.</li> <li>Assist head in training need analysis (TNA) to operation staff.</li> </ul>
<b>LEVEL 4</b>	<p><b>Train Operation Executive</b></p> <ul style="list-style-type: none"> <li>Coordination of train drivers to ensure a smooth and efficient administration of day-to-day business and activities.</li> <li>Monitor the safety of train, staff, and passengers.</li> <li>Coordinate the operation, alternate service and emergency response plans for the safe, reliable and efficient services.</li> </ul>	<p><b>ETS Captain</b></p> <ul style="list-style-type: none"> <li>Drive the train in accordance with the schedule and ensure train punctuality, safety, reliability.</li> <li>Communication is maintained with the station and control center all times.</li> <li>Shunting is the job of safely moving trains between yards and platforms/depot.</li> <li>Adhere to train operation rules and regulations.</li> <li>Facilitate the movement of passengers by providing information to the passengers.</li> <li>Ensure operation, alternate service and emergency response plans for safe, reliable and efficient services.</li> <li>Conduct pre and post inspection.</li> </ul>	<p><b>Chief Controller</b></p> <ul style="list-style-type: none"> <li>Supervising a group of Control executives on their daily task and responsibilities to meet the set service level standards.</li> <li>Prepare daily Event Log report, incident reports and any requested report inclusive of participation in any committee as instructed for the establishment of incident investigation team and improvement initiatives.</li> <li>Ensure the implementation of Alternate Service or Failure Management to secure maximum</li> </ul>

MSIC SECTION	(H) TRANSPORTATION AND STORAGE		
MSIC DIVISION	(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES		
MSIC GROUP	(491) Transport via Railways		
AREA LEVEL	Interurban Passenger Rail Operation	Interurban Passenger Operation ETS	Interurban Train Operation Control Centre
			<p>safety to staff, public and operations as well as to minimize service disruption.</p> <ul style="list-style-type: none"> <li>• Providing effective and well disseminated communications flow during Failure Management or Crisis especially to customer in order to give clear directions and alleviate pressure faced by staffs at stations, as to always give the effort in ensuring operation continuity.</li> <li>• Identify training needs.</li> <li>• Safe operations of Trains as well as making sure Rules and Procedures and Operations Plans are followed.</li> </ul>
<b>LEVEL 3</b>	<p><b>Train Driver Supervisor</b></p> <ul style="list-style-type: none"> <li>• Responsible prepare timetable for the train drivers to ensure a smooth and efficient administration of day-to-day train rostering.</li> <li>• Support the operation, alternate service and emergency response plans for the safe, reliable and efficient services</li> <li>• Identify training needs for train drivers</li> </ul>	NJT	<p><b>Control Center Operation Controller</b></p> <ul style="list-style-type: none"> <li>• Provide prompt, accurate, up to date and clear information to train drivers and passenger at station.</li> <li>• Assist Chief Controllers by monitor passenger movements at station and train.</li> <li>• Monitor station openings and closings.</li> <li>• Assist Chief Controller in external communications.</li> </ul>

MSIC SECTION	(H) TRANSPORTATION AND STORAGE		
MSIC DIVISION	(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES		
MSIC GROUP	(491) Transport via Railways		
AREA LEVEL	Interurban Passenger Rail Operation	Interurban Passenger Operation ETS	Interurban Train Operation Control Centre
			<ul style="list-style-type: none"> <li>• Report faults promptly.</li> <li>• Assist Chief Controller in calling up additional operating staff during Major Incident and disseminate incident and progress messages to all relevant parties during degraded and emergency mode of operation.</li> </ul>
LEVEL 2	<p><b>Train Driver</b></p> <ul style="list-style-type: none"> <li>• Operating and driving locomotives and trains safely and efficiently in accordance with regulations and procedures.</li> <li>• Checking the locomotive and train before departure to ensure that they are in proper working order and that all necessary equipment and supplies are on board.</li> <li>• Following instructions from dispatchers and signal operators to ensure safe movement of the train, including speed limits, signals, and track conditions.</li> <li>• Communicating with crew members, dispatchers, and other railroad personnel using radios and other</li> </ul>	NJT	NJT

MSIC SECTION	(H) TRANSPORTATION AND STORAGE		
MSIC DIVISION	(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES		
MSIC GROUP	(491) Transport via Railways		
AREA LEVEL	Interurban Passenger Rail Operation	Interurban Passenger Operation ETS	Interurban Train Operation Control Centre
	<p>communication devices.</p> <ul style="list-style-type: none"> <li>• Maintaining accurate records of train movements, including times, distances, and delays.</li> <li>• Adhering to schedules and adjusting speed and route as necessary to maintain on-time performance.</li> <li>• Monitoring gauges and instruments to ensure that the locomotive is operating at peak efficiency and that fuel and other supplies are not running low.</li> <li>• Responding to emergency situations, such as derailments or accidents, in a timely and safe manner.</li> <li>• Complying with all applicable regulations and safety procedures, including those related to hazardous materials and other special requirements.</li> <li>• adhere to train operation Rules and Regulations and conduct pre and post inspection.</li> </ul>		
LEVEL 1	<p><b>Assistant of Train Driver</b></p> <ul style="list-style-type: none"> <li>• Assist train driver in accordance to the schedule and ensure train punctuality, safety, reliability</li> </ul>	NJT	

<b>MSIC SECTION</b>	<b>(H) TRANSPORTATION AND STORAGE</b>		
<b>MSIC DIVISION</b>	<b>(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES</b>		
<b>MSIC GROUP</b>	<b>(491) Transport via Railways</b>		
<b>AREA LEVEL</b>	<b>Interurban Passenger Rail Operation</b>	<b>Interurban Passenger Operation ETS</b>	<b>Interurban Train Operation Control Centre</b>
	<ul style="list-style-type: none"> <li>• Prepare train coach and goods wagon to complete a train set for service.</li> <li>• Assist shunting is the job of safely moving trains between yards and platforms/depot.</li> <li>• Adhere to train operation Rules and Regulations.</li> <li>• Assist pre and post inspection</li> </ul>		NJT



Table 4.14: Occupational Responsibility (OR) Group H491 (2/2)

MSIC SECTION	(H) TRANSPORTATION AND STORAGE		
MSIC DIVISION	(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES		
MSIC GROUP	(491) Transport via railways		
AREA LEVEL	Freight Cargo Operation	Freight Cargo Coordination	Freight Cargo Support Operation
LEVEL 8	NJT	NJT	NJT
LEVEL 7	NJT	NJT	NJT
LEVEL 6	<b>Head of Freight Cargo Operation</b> <ul style="list-style-type: none"> <li>Plan, strategize and ensure all operation and maintenance activities are in line with the current Safety requirement, Operating plans and Maintenance plans.</li> <li>Responsible for safe operations of Manual Trains as well as making sure Rules and Procedures are followed and reviewed accordingly.</li> <li>Ensure all communications flow during Failure Management or Crisis are well disseminated especially to customer.</li> <li>Prepare the annual budget for meeting the company's business goals by monitoring and control the expenditure for cost-effective</li> </ul>	<b>Head of Freight Cargo Coordination</b> <ul style="list-style-type: none"> <li>Planning and organizing transportation routes and schedules for the delivery of cargo.</li> <li>Coordinating with shipping companies, freight carriers, and trucking companies to ensure that goods are transported efficiently and in a timely manner.</li> <li>Communicating with customers and clients to arrange pick-up and delivery schedules and to provide information on shipment status.</li> <li>Tracking shipments using specialized software and tools to monitor progress and ensure that deliveries are on schedule.</li> <li>Managing documentation related to shipping, including bills of lading, shipping manifests, and customs declarations.</li> </ul>	<b>Head of Freight Cargo Support Operation</b> <ul style="list-style-type: none"> <li>Assisting in the preparation of shipping documents such as bills of lading, packing lists, and customs declarations.</li> <li>Coordinating with shipping companies, freight carriers, and trucking companies to arrange pick-up and delivery schedules.</li> <li>Tracking shipments using specialized software and tools to monitor progress and ensure that deliveries are on schedule.</li> <li>Communicating with customers and clients to provide information on shipment status and to address any concerns or issues that arise.</li> </ul>

MSIC SECTION	(H) TRANSPORTATION AND STORAGE		
MSIC DIVISION	(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES		
MSIC GROUP	(491) Transport via railways		
AREA LEVEL	Freight Cargo Operation	Freight Cargo Coordination	Freight Cargo Support Operation
	<p>operations.</p> <ul style="list-style-type: none"> <li>Plan, strategize and implement all operations and maintenance activities to meet the regulatory service level license requirements.</li> <li>Develop new, review and append Operations Manual, Emergency response manual and related departmental SOP' to be in line with the latest operational requirements and needs.</li> <li>Oversee the day to day running of cargo operations and making vital operational decision that may obstruct, stop and jeopardize rail operations.</li> <li>Work with all levels of people and respective stakeholders in addressing operations, fare collection, commercial and maintenance activities comply to meet regulatory safety requirements.</li> <li>Manages a team of operational staffs to look into safety, benefits, training, performance management and administration for the smooth functioning of operations department.</li> </ul>	<ul style="list-style-type: none"> <li>Ensuring that all cargo is properly labeled, packaged, and handled to prevent damage or loss during transport.</li> <li>Monitoring freight rates and negotiating with carriers to secure competitive pricing.</li> <li>Resolving any issues or problems that arise during the shipping process, including delays, damages, and lost shipments.</li> <li>Responsible for ensuring that goods are transported safely and efficiently, and that all stakeholders involved in the shipping process are informed and satisfied with the service provided</li> <li>Responsible to enhance the Failure Management Strategies and Standard Operating Procedures.</li> </ul>	<ul style="list-style-type: none"> <li>Providing administrative support, such as filing and data entry, to ensure accurate and timely documentation.</li> <li>Liaising with warehouse and distribution personnel to coordinate the movement of cargo and to ensure that inventory levels are maintained.</li> <li>Ensuring that all cargo is properly labeled, packaged, and handled to prevent damage or loss during transport.</li> <li>Resolving any issues or problems that arise during the shipping process, including delays, damages, and lost shipments.</li> <li>Overall, a Freight Cargo Support Operator is responsible for supporting the efficient operation of the shipping process, from preparing documentation to tracking shipments and resolving any issues that arise.</li> <li>They play a crucial role in ensuring that goods are transported safely and on time, and that customers are satisfied with the service provided.</li> </ul>

MSIC SECTION	(H) TRANSPORTATION AND STORAGE		
MSIC DIVISION	(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES		
MSIC GROUP	(491) Transport via railways		
AREA LEVEL	Freight Cargo Operation	Freight Cargo Coordination	Freight Cargo Support Operation
LEVEL 5	<p><b>Assistant Head of Freight Cargo Operation</b></p> <ul style="list-style-type: none"> <li>Assist Head in leading and supervising a team of Freight Cargo Support Operators, providing direction, guidance, and support to ensure efficient and effective operation of the shipping process.</li> <li>Planning and organizing transportation routes and schedules for the delivery of cargo, ensuring that shipments are delivered safely and on time.</li> <li>Coordinating with shipping companies, freight carriers, and trucking companies to ensure that goods are transported efficiently and in a timely manner.</li> <li>Communicating with customers and clients to arrange pick-up and delivery schedules and to provide information on shipment status.</li> <li>Monitoring freight rates and negotiating with carriers to secure competitive pricing.</li> <li>Ensuring that all cargo is properly</li> </ul>	<p><b>Assistant Head of Freight Cargo Coordination</b></p> <ul style="list-style-type: none"> <li>Assisting the Head of Freight Cargo Coordination in planning and organizing transportation routes and schedules for the delivery of cargo.</li> <li>Coordinating with shipping companies, freight carriers, and trucking companies to ensure that goods are transported efficiently and in a timely manner.</li> <li>Communicating with customers and clients to arrange pick-up and delivery schedules and to provide information on shipment status.</li> <li>Tracking shipments using specialized software and tools to monitor progress and ensure that deliveries are on schedule.</li> <li>Managing documentation related to shipping, including bills of lading, shipping manifests, and customs declarations.</li> <li>Ensuring that all cargo is properly labeled, packaged, and handled to prevent damage or loss during transport.</li> <li>Monitoring freight rates and negotiating with carriers to secure competitive pricing.</li> <li>Resolving any issues or problems that arise</li> </ul>	<p><b>Assistant Freight Cargo Support Operation</b></p> <ul style="list-style-type: none"> <li>Assisting in the preparation of shipping documents such as bills of lading, packing lists, and customs declarations.</li> <li>Coordinating with shipping companies, freight carriers, and trucking companies to arrange pick-up and delivery schedules.</li> <li>Tracking shipments using specialized software and tools to monitor progress and ensure that deliveries are on schedule.</li> <li>Communicating with customers and clients to provide information on shipment status and to address any concerns or issues that arise.</li> <li>Providing administrative support, such as filing and data entry, to ensure accurate and timely documentation.</li> <li>Liaising with warehouse and distribution personnel to coordinate the movement of cargo and to ensure that inventory levels are maintained.</li> <li>Ensuring that all cargo is properly</li> </ul>

<b>MSIC SECTION</b>	<b>(H) TRANSPORTATION AND STORAGE</b>		
<b>MSIC DIVISION</b>	<b>(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES</b>		
<b>MSIC GROUP</b>	<b>(491) Transport via railways</b>		
<b>AREA LEVEL</b>	<b>Freight Cargo Operation</b>	<b>Freight Cargo Coordination</b>	<b>Freight Cargo Support Operation</b>
	<p>labeled, packaged, and handled to prevent damage or loss during transport.</p> <ul style="list-style-type: none"> <li>• Managing documentation related to shipping, including bills of lading, shipping manifests, and customs declarations.</li> <li>• Resolving any issues or problems that arise during the shipping process, including delays, damages, and lost shipments.</li> <li>• Implementing and enforcing policies and procedures related to the shipping process, ensuring compliance with all relevant regulations and standards.</li> </ul>	<p>during the shipping process, including delays, damages, and lost shipments.</p> <ul style="list-style-type: none"> <li>• Providing guidance and support to Freight Cargo Coordinators to ensure that they are performing their duties effectively and efficiently.</li> <li>• Implementing and enforcing policies and procedures related to the shipping process, ensuring compliance with all relevant regulations and standards.</li> </ul>	<p>labeled, packaged, and handled to prevent damage or loss during transport.</p> <ul style="list-style-type: none"> <li>• Resolving any issues or problems that arise during the shipping process, including delays, damages, and lost shipments.</li> <li>• Supporting the Freight Cargo Support Operations team to ensure efficient and effective operation of the shipping process.</li> </ul>

MSIC SECTION	(H) TRANSPORTATION AND STORAGE		
MSIC DIVISION	(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES		
MSIC GROUP	(491) Transport via railways		
AREA LEVEL	Freight Cargo Operation	Freight Cargo Coordination	Freight Cargo Support Operation
<b>LEVEL 4</b>	<p><b>Head of Terminal</b></p> <ul style="list-style-type: none"> <li>• Coordination and communicating with customers in term of loading/unloading and monitor customers' loading facilities with regard to track capacity and operational requirement.</li> <li>• Monitor the safety of staff, rolling stock and container.</li> <li>• Coordinate the operation, alternate service to ensure maximum utilization and wagon turnaround.</li> <li>• Coordinate the emergency response plans for the rescue.</li> </ul>	<p><b>Head of Terminal</b></p> <ul style="list-style-type: none"> <li>• Coordination and communicating with customers in term of loading/unloading and monitor customers' loading facilities with regard to track capacity and operational requirement.</li> <li>• Monitor the safety of staff, rolling stock and container.</li> <li>• Coordinate the operation, alternate service to ensure maximum utilization and wagon turnaround.</li> <li>• Coordinate the emergency response plans for the rescue.</li> </ul>	<p><b>Head of Terminal</b></p> <ul style="list-style-type: none"> <li>• Coordination and communicating with customers in term of loading/unloading and monitor customers' loading facilities with regard to track capacity and operational requirement.</li> <li>• Monitor the safety of staff, rolling stock and container.</li> <li>• Coordinate the operation, alternate service to ensure maximum utilization and wagon turnaround.</li> <li>• Coordinate the emergency response plans for the rescue.</li> </ul>
<b>LEVEL 3</b>	<p><b>Head of Yard</b></p> <ul style="list-style-type: none"> <li>• Responsible prepare the wagons' requirements at the terminal to ensure meet the operation day-to-day.</li> <li>• Support the operation and emergency response plans for safe, reliable, and efficient services.</li> <li>• Responsible and coordinate the wagon requirement day-to-day in good condition for service before loading activities at terminal.</li> </ul>	<p><b>Under Foreman</b></p> <ul style="list-style-type: none"> <li>• Responsible for work planning, operation and continues communication between head of shunter at the terminal to ensure correct implementation at terminal day-to-day.</li> <li>• Support the cargo operation for loading/unloading for the best practice during shunting activities at terminal/yard.</li> <li>• Coordinate with the shunter during shunting activities at the terminal.</li> </ul>	<p><b>Head of Shunting</b></p> <ul style="list-style-type: none"> <li>• Responsible prepare and manage the wagons safe for loading/unloading at the terminal during shunting activities day-to-day.</li> <li>• Support the operation and manage the signal during shunting movement at the terminal.</li> <li>• Coordinate and arrange the wagons requirement day-to-day to meet the customer's requirements.</li> </ul>

MSIC SECTION	(H) TRANSPORTATION AND STORAGE		
MSIC DIVISION	(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES		
MSIC GROUP	(491) Transport via railways		
AREA LEVEL	Freight Cargo Operation	Freight Cargo Coordination	Freight Cargo Support Operation
LEVEL 2	<p><b>Shunting Driver</b></p> <ul style="list-style-type: none"> <li>• Shunting is the job of safely moving trains between yards and platforms/depot.</li> <li>• Adhere to train operation Rules and Regulations.</li> <li>• Conduct pre and post inspection.</li> <li>• Shunting is the job of safely moving trains between yards and platforms/depot.</li> <li>• Adhere to train operation Rules and Regulations</li> <li>• Assist train driver in accordance to the schedule and ensure train punctuality, safety, reliability</li> <li>• Prepare train coach and goods wagon to complete a train set for service</li> <li>• Assist shunting is the job of safely moving trains between yards and platforms/depot.</li> <li>• Adhere to train operation Rules and Regulations.</li> <li>• Assist pre and post inspection.</li> </ul>	<p><b>Shunting Driver</b></p> <ul style="list-style-type: none"> <li>• Shunting is the job of safely moving trains between yards and platforms/depot.</li> <li>• Adhere to train operation Rules and Regulations.</li> <li>• Conduct pre and post inspection.</li> <li>• Shunting is the job of safely moving trains between yards and platforms/depot.</li> <li>• Adhere to train operation Rules and Regulations</li> <li>• Assist train driver in accordance to the schedule and ensure train punctuality, safety, reliability</li> <li>• Prepare train coach and goods wagon to complete a train set for service</li> <li>• Assist shunting is the job of safely moving trains between yards and platforms/depot.</li> <li>• Adhere to train operation Rules and Regulations.</li> <li>• Assist pre and post inspection.</li> </ul>	<p><b>Shunting Driver</b></p> <ul style="list-style-type: none"> <li>• Shunting is the job of safely moving trains between yards and platforms/depot.</li> <li>• Adhere to train operation Rules and Regulations.</li> <li>• Conduct pre and post inspection.</li> <li>• Shunting is the job of safely moving trains between yards and platforms/depot.</li> <li>• Adhere to train operation Rules and Regulations</li> <li>• Assist train driver in accordance to the schedule and ensure train punctuality, safety, reliability</li> <li>• Prepare train coach and goods wagon to complete a train set for service</li> <li>• Assist shunting is the job of safely moving trains between yards and platforms/depot.</li> <li>• Adhere to train operation Rules and Regulations.</li> <li>• Assist pre and post inspection.</li> </ul>
LEVEL 1	NJT	NJT	NJT

Table 4.15: Occupational Responsibility (OR) Group H492 (1/2)

<b>MSIC SECTION</b>	<b>(H) TRANSPORTATION AND STORAGE</b>			
<b>MSIC DIVISION</b>	<b>(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES</b>			
<b>MSIC GROUP</b>	<b>(492) Other Land Transport</b>			
<b>AREA LEVEL</b>	<b>Bus Operation</b>	<b>Bus Operation Control Centre</b>	<b>Urban and Suburban Passenger Rail Operation</b>	<b>Urban and Suburban Train Operation Control Centre</b>
<b>LEVEL 8</b>	NJT	NJT	NJT	NJT
<b>LEVEL 7</b>	NJT	NJT	NJT	NJT
<b>LEVEL 6</b>	NJT	NJT	<b>Head of Passenger Rail Operation</b> <ul style="list-style-type: none"> <li>• Manage all human resource related matter, duty roster and training need to maintain high level of staff competency.</li> <li>• Formulate, plan and prepare the required staffing numbers for operations during revenue hours to minimize the failure response time and prepare supporting manuals for ease of reference.</li> <li>• Ensure communication flow during degraded or emergency services are well disseminated.</li> <li>• Ensure rules and procedures are followed and reviewed accordingly as to maintain the timeless source of reference.</li> </ul>	<b>Head of Train Operation Control Centre</b> <ul style="list-style-type: none"> <li>• Manage all human resource related matter, duty roster and training need to maintain high level of staff competency.</li> <li>• Formulate, plan and prepare the required staffing numbers for operations during revenue hours to minimize the failure response time and prepare supporting manuals for ease of reference.</li> <li>• Ensure communication flow during degraded or emergency services are well disseminated.</li> </ul>

<b>MSIC SECTION</b>	<b>(H) TRANSPORTATION AND STORAGE</b>			
<b>MSIC DIVISION</b>	<b>(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES</b>			
<b>MSIC GROUP</b>	<b>(492) Other Land Transport</b>			
<b>AREA LEVEL</b>	<b>Bus Operation</b>	<b>Bus Operation Control Centre</b>	<b>Urban and Suburban Passenger Rail Operation</b>	<b>Urban and Suburban Train Operation Control Centre</b>
			<ul style="list-style-type: none"> <li>• Support and enhance the failure management strategies to cope with any fleet and line expansion for a standard response plan among all staff.</li> <li>• Support higher management in preparing departmental objectives, KPI, annual budget, reports and review policies &amp; procedures inclusive of incident report &amp; investigations for establishment of performance results as well as for learning and improvement.</li> <li>• Maintain and enhance staff performance by monitoring day to day reports and provide feedback for a continuous learning and improvement.</li> <li>• Support the implementation of Alternate Service plan or failure management plan to minimize disruption to customers.</li> <li>• Ensure sales and reconciliation problems are addressed to</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure rules and procedures are followed and reviewed accordingly as to maintain the timeless source of reference.</li> <li>• Support and enhance the failure management strategies to cope with any fleet and line expansion for a standard response plan among all staff.</li> <li>• Support higher management in preparing departmental objectives, KPI, annual budget, reports and review policies &amp; procedures inclusive of incident report &amp; investigations for establishment of performance results as well as for learning and improvement.</li> <li>• Maintain and enhance staff performance by monitoring day to day reports and</li> </ul>



MSIC SECTION	(H) TRANSPORTATION AND STORAGE			
MSIC DIVISION	(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES			
MSIC GROUP	(492) Other Land Transport			
AREA LEVEL	Bus Operation	Bus Operation Control Centre	Urban and Suburban Passenger Rail Operation	Urban and Suburban Train Operation Control Centre
			determine the root cause and improve where necessary.	<p>provide feedback for a continuous learning and improvement.</p> <ul style="list-style-type: none"> <li>• Support the implementation of Alternate Service plan or failure management plan to minimize disruption to customers.</li> <li>• Ensure sales and reconciliation problems are addressed to determine the root cause and improve where necessary.</li> </ul>
LEVEL 5	<p><b>Head of Bus Operation</b></p> <ul style="list-style-type: none"> <li>• Manage to plan, execute and monitor overall bus operational performance operation team to achieve target</li> <li>• Responsible to ensure the compliance and execution of Safety, Health and Environment (SHE) organization and SHE</li> </ul>	<p><b>Head of Bus Operation Control Centre (BOCC)</b></p> <ul style="list-style-type: none"> <li>• Develop and implement policies, procedures, and strategies for the BOCC to ensure smooth operation of the bus fleet.</li> <li>• Manage a team of BOCC staff, including setting goals, providing guidance, and conducting performance</li> </ul>	<p><b>Assistant Head of Passenger Rail Operation</b></p> <ul style="list-style-type: none"> <li>• Assist Head in managing the overall section of train drivers to ensure a smooth and efficient administration of day-to-day operations.</li> <li>• Monitor the safety of train, staff, passengers and cargo.</li> <li>• Monitor the operation, alternate service, and emergency</li> </ul>	<p><b>Assistant Head of Train Operation Control Centre</b></p> <ul style="list-style-type: none"> <li>• Assist Head in managing the overall train station</li> <li>• Responsible safety of customers, staff and assets</li> </ul>

MSIC SECTION	(H) TRANSPORTATION AND STORAGE			
MSIC DIVISION	(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES			
MSIC GROUP	(492) Other Land Transport			
AREA LEVEL	Bus Operation	Bus Operation Control Centre	Urban and Suburban Passenger Rail Operation	Urban and Suburban Train Operation Control Centre
	management <ul style="list-style-type: none"> <li>• Manage on strategic planning and scheduling Performances monitoring</li> <li>• Direction and planning (to minimise the fleet cost to maximise the revenue)</li> </ul>	evaluations. <ul style="list-style-type: none"> <li>• Ensure that the BOCC is adequately staffed, trained, and equipped to handle the day-to-day operation of the bus fleet.</li> <li>• Monitor the performance of the bus fleet to ensure that buses operate according to schedule and that any issues are promptly addressed.</li> <li>• Coordinate with other departments, such as maintenance and customer service, to ensure the overall smooth operation of the bus fleet.</li> <li>• Develop and implementing plans to improve the efficiency and effectiveness of the BOCC and the bus fleet operation.</li> </ul>	response plans for the safe, reliable and efficient services. <ul style="list-style-type: none"> <li>• Plan Training need analysis (TNA) to operation staff.</li> <li>• Ensure the safety of staffs.</li> </ul>	
LEVEL 4	<b>Assistant Head of Bus Operation</b> <ul style="list-style-type: none"> <li>• Support Fleet leadership in</li> </ul>	<b>Assistant Head of BOCC</b> <ul style="list-style-type: none"> <li>• Support Fleet leadership in analytically optimizing</li> </ul>	<b>Train Executive</b> <ul style="list-style-type: none"> <li>• Coordinate the drivers of the train in order to ensure the</li> </ul>	<b>Chief Controller</b> <ul style="list-style-type: none"> <li>• Analyse daily Event Log report, incident reports and</li> </ul>

MSIC SECTION	(H) TRANSPORTATION AND STORAGE			
MSIC DIVISION	(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES			
MSIC GROUP	(492) Other Land Transport			
AREA LEVEL	Bus Operation	Bus Operation Control Centre	Urban and Suburban Passenger Rail Operation	Urban and Suburban Train Operation Control Centre
	<p>analytically optimizing strategy and tactics deployment</p> <ul style="list-style-type: none"> <li>Forecasting current operation trends.</li> <li>Responsible to the operational staff recruitment process</li> <li>Manage all fleet operation and cost</li> <li>Ensure the compliance with rules and regulations</li> <li>Analysing ridership data for business operational efficiency.</li> <li>Streamline and monitor fuel purchase system with assistance of Fuel Cards for all vehicles and drivers.</li> <li>Develop and implement standard operating procedure (SOP) to maintain vehicles by advocating best practices in the industry.</li> <li>Plan and prepare Employer Requirement (ER) for new</li> </ul>	<p>strategy and tactics deployment</p> <ul style="list-style-type: none"> <li>Forecasting current operation trends.</li> <li>Responsible to the operational staff recruitment process</li> <li>Manage all fleet operation and cost</li> <li>Ensure the compliance with rules and regulations</li> <li>Analysing ridership data for business operational efficiency.</li> <li>Streamline and monitor fuel purchase system with assistance of Fuel Cards for all vehicles and drivers.</li> <li>Develop and implement standard operating procedure (SOP) to maintain vehicles by advocating best practices in the industry.</li> <li>Plan and prepare Employer Requirement (ER) for new vehicle purchase and vehicle</li> </ul>	<p>smooth and effective administration of daily operations</p> <ul style="list-style-type: none"> <li>Monitor the safety of the train, its crew and passengers</li> <li>Coordinate the operation of backup services and emergency response plans for the provision of safe, dependable, and efficient services.</li> <li>Monitor the operation of trains on the rail network, scheduling and maintaining trains, ensuring compliance with safety regulations and protocols, managing staff and resources, and coordinating with other departments or stakeholders to ensure efficient operations.</li> </ul>	<p>any requested report inclusive of participation in any committee as instructed for the establishment of incident investigation team and improvement initiatives.</p> <ul style="list-style-type: none"> <li>Plan the implementation of Alternate Service or Failure Management to secure maximum safety to staff, public and operations as well as to minimize service disruption.</li> <li>Ensure effective and well disseminated communications flow during Failure Management or Crisis especially to customer in order to give clear directions and alleviate pressure faced by staffs at stations, as to always give the effort in ensuring business continuity.</li> </ul>

MSIC SECTION	(H) TRANSPORTATION AND STORAGE			
MSIC DIVISION	(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES			
MSIC GROUP	(492) Other Land Transport			
AREA LEVEL	Bus Operation	Bus Operation Control Centre	Urban and Suburban Passenger Rail Operation	Urban and Suburban Train Operation Control Centre
	vehicle purchase and vehicle replacement through efficient settlement.	replacement through efficient settlement.		<ul style="list-style-type: none"> <li>• Monitor the operations of Control Room (shift) mainly on Signalling and Train Control (S&amp;TC), SCADA, Management System (BMS) and communication.</li> <li>• Plan training needs as to maintain high level of staff competencies.</li> <li>• Ensure safe operations of trains as well as making sure Rules and Procedures, Operations Plans and Failure Management Strategies are followed through and highlight the area that can be improved.</li> </ul>
LEVEL 3	<b>Supervisor</b> <ul style="list-style-type: none"> <li>• Supervise and coordinate drivers' schedule.</li> <li>• Monitoring driver's compliance to the regulatory requirements.</li> <li>• Monitor driver behaviour</li> </ul>	<b>Traffic Controller</b> <ul style="list-style-type: none"> <li>• Coordinate drivers schedule</li> <li>• Monitoring driver's compliance to the regulatory requirements.</li> <li>• Monitor driver behaviour ensuring high level of</li> </ul>	<b>Train Supervisor</b> <ul style="list-style-type: none"> <li>• Responsible prepare timetable for the train operation to ensure a smooth and efficient administration of day-to-day train rostering.</li> <li>• Support the operation plans,</li> </ul>	<b>Train Controller Operator</b> <ul style="list-style-type: none"> <li>• Operate train.</li> <li>• Check the power distribution system and all associated system and ensure current implementation of operation</li> </ul>

MSIC SECTION	(H) TRANSPORTATION AND STORAGE			
MSIC DIVISION	(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES			
MSIC GROUP	(492) Other Land Transport			
AREA LEVEL	Bus Operation	Bus Operation Control Centre	Urban and Suburban Passenger Rail Operation	Urban and Suburban Train Operation Control Centre
	<p>ensuring high level of customer service.</p> <ul style="list-style-type: none"> <li>Utilizing GPS systems to monitor drivers and vehicles movement.</li> <li>Ensure accurate records of fuel usage.</li> <li>Maintain a fleet of available vehicles that are safe and fit for service to support day-to-day operation.</li> <li>Ensure that all drivers are competent.</li> <li>Asses driver's performance</li> <li>Coordinate third-party activity.</li> <li>Handling customer complaint</li> <li>Liaise with the personnel in Control Centre Operations on irregularities encountered during bus service route operations.</li> <li>Monitor driver's log book.</li> </ul>	<p>customer service.</p> <ul style="list-style-type: none"> <li>Utilizing GPS systems to monitor drivers and vehicles movement</li> <li>Maintain a fleet of available vehicles that are safe and fit for service to support day-to-day operation</li> <li>Coordinate third-party activity</li> <li>Liaise with the management of Control Centre Operations on irregularities encountered during bus service route operations.</li> <li>Monitor driver's log book.</li> </ul>	<p>alternate service plans and emergency response plans at all time for the safe, reliable and efficient services.</p>	<p>and failure management.</p>

<b>MSIC SECTION</b>	<b>(H) TRANSPORTATION AND STORAGE</b>			
<b>MSIC DIVISION</b>	<b>(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES</b>			
<b>MSIC GROUP</b>	<b>(492) Other Land Transport</b>			
<b>AREA LEVEL</b>	<b>Bus Operation</b>	<b>Bus Operation Control Centre</b>	<b>Urban and Suburban Passenger Rail Operation</b>	<b>Urban and Suburban Train Operation Control Centre</b>
<b>LEVEL 2</b>	<b>Bus Driver</b> <ul style="list-style-type: none"> <li>• Comply with rules and regulatory requirements</li> <li>• Respond and report the occurrence of incidents, accidents and hazard identification</li> <li>• Operate buses by the assigned bus service routes and timetables.</li> <li>• Conduct pre and post visual inspection on bus conditions</li> <li>• Record log driver's log book</li> </ul>	NJT	<b>Train Driver</b> <ul style="list-style-type: none"> <li>• Drive the train in accordance to the schedule and ensure train punctuality, safety, reliability and communication is maintained with the station at all times.</li> <li>• Provide excellent customer service/support to public and staff on board the train with regards to service information, safety and health, cleanliness, emergency response, first aider assistance and support the implementation of alternate service plan for safe and efficient service.</li> </ul>	NJT
<b>LEVEL 1</b>	NJT	NJT	NJT	NJT

Table 4.16: Occupational Responsibility (OR) Group H492 (2/2)

<b>MSIC SECTION</b>	<b>(H) TRANSPORTATION AND STORAGE</b>			
<b>MSIC DIVISION</b>	<b>(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES</b>			
<b>MSIC GROUP</b>	<b>(492) Other Land Transport</b>			
	<b>Cable Car Operation</b>	<b>Hill Tramway Operation</b>	<b>Airport Shuttle Operation</b>	
<b>AREA</b>				
<b>LEVEL</b>	<b>Cable Car Operation</b>	<b>Hill Tram Operation</b>	<b>Automated People Mover (APM) Operation</b>	<b>Airport Shuttle Operation Control Centre</b>
<b>LEVEL 8</b>	NJT	NJT	NJT	NJT
<b>LEVEL 7</b>	NJT	NJT	NJT	NJT
<b>LEVEL 6</b>	NJT	NJT	NJT	NJT
<b>LEVEL 5</b>	<b>Head of Cable Car Operation</b> <ul style="list-style-type: none"> <li>Strategies, lead, organize, control and align the Cable Car Engineering Section in order to fulfil operation/maintenance requirements and to provide safe/reliable operation to customers.</li> <li>Managing technical stoppages against total operating hours for every year.</li> <li>Ensure full completion of the preventive maintenance as recommended by the manufacturer.</li> </ul>	<b>Head of Hill Tram Operation</b> <ul style="list-style-type: none"> <li>Lead and control the design and construction.</li> <li>the hill tramway system, including the cables, towers, cars, and control systems.</li> <li>Lead and control the maintenance and repair of the cable car system, including regular inspections of the cables, cars, and other components to identify any issues that need to be addressed.</li> <li>Ensure that the tramway system is safe for passengers and employees.</li> <li>Ensure that the hill tramway operation follows all relevant</li> </ul>	<b>Head of Automated People Mover Operation</b> <ul style="list-style-type: none"> <li>Manage the functions and activities in-line with the approved strategies, policies and procedures in providing support to other engineering units.</li> <li>Lead and manage the Quality Management System for engineering division and ensure certifications by relevant governing bodies are sustained.</li> <li>Plan, manage and</li> </ul>	NJT

MSIC SECTION	(H) TRANSPORTATION AND STORAGE			
MSIC DIVISION	(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES			
MSIC GROUP	(492) Other Land Transport			
	Cable Car Operation	Hill Tramway Operation	Airport Shuttle Operation	
AREA LEVEL	Cable Car Operation	Hill Tram Operation	Automated People Mover (APM) Operation	Airport Shuttle Operation Control Centre
	<ul style="list-style-type: none"> <li>Monitor and control the operational critical parameters are achieved on hourly basis, weekly, monthly and yearly requirements.</li> <li>Strategize the operational manpower strength between the experienced-technical experts and apprentice during the operation.</li> <li>Plan, monitor and control the daily manpower availability and station posting for the operation of the Cable Car.</li> <li>Engage competent service providers for specialist-required works for the installations and maintenance projects.</li> </ul>	<p>regulations and standards, including those related to safety, maintenance, and operation.</p> <ul style="list-style-type: none"> <li>Manage the budget for the engineering department, including allocating resources for maintenance, repairs, and upgrades to the hill tramway system.</li> <li>Communicate with a variety of stakeholders, including employees, passengers, regulatory agencies, and the public, to ensure that everyone is informed about the operation of the cable car system and any changes or updates that may be necessary.</li> </ul>	<p>coordinate the Engineering Control Center roles in ensuring engineering systems and facilities are reliable and safe to be used at all times.</p> <ul style="list-style-type: none"> <li>Plan, manage and control the engineering Document Management Center systematically for quick and easy reference.</li> <li>Manage and coordinate with other engineering units on operation and maintenance.</li> <li>procurement and contract matters</li> <li>Ensure compliance to Company's policies, procedures, guidelines, local/international regulations and legislations, Earth Check, Green Building Index and</li> </ul>	



<b>MSIC SECTION</b>	<b>(H) TRANSPORTATION AND STORAGE</b>			
<b>MSIC DIVISION</b>	<b>(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES</b>			
<b>MSIC GROUP</b>	<b>(492) Other Land Transport</b>			
	<b>Cable Car Operation</b>	<b>Hill Tramway Operation</b>	<b>Airport Shuttle Operation</b>	
<b>AREA LEVEL</b>	<b>Cable Car Operation</b>	<b>Hill Tram Operation</b>	<b>Automated People Mover (APM) Operation</b>	<b>Airport Shuttle Operation Control Centre</b>
			any other certifications. <ul style="list-style-type: none"> <li>• Plan, manage and control yearly budget for Operational Expenditures and Capital Expenditures.</li> <li>• Plan, organize, review and evaluate staff competency and skill for providing effective and efficient support and service.</li> <li>• Manage and participate in the development and standardization of goals, objectives, policies and priorities of the engineering division.</li> <li>• Conduct a variety of divisional studies against industry best practices and recommend improvement to programs and procedures as appropriate.</li> <li>• Manage effectively and</li> </ul>	

MSIC SECTION	(H) TRANSPORTATION AND STORAGE			
MSIC DIVISION	(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES			
MSIC GROUP	(492) Other Land Transport			
	Cable Car Operation	Hill Tramway Operation	Airport Shuttle Operation	
AREA LEVEL	Cable Car Operation	Hill Tram Operation	Automated People Mover (APM) Operation	Airport Shuttle Operation Control Centre
			timely during any system crisis and emergency situation.	
<b>LEVEL 4</b>	<b>Technical Executive</b> <ul style="list-style-type: none"> <li>Coordinate critical requirements of operation and maintenance activities for Cable Car.</li> <li>Assist Head of Section to plan and strategize in order to achieve departmental Key Performance Index (KPI) and targets every year.</li> <li>Plan the manpower scheduling and update the schedule as and when needed.</li> <li>Ensure the operation and maintenance are carried out as per ISO 9001:2015 requirements.</li> </ul>	<b>Executive</b> <ul style="list-style-type: none"> <li>Coordination of hill tramway to ensure a smooth and efficient administration of day-to-day business and activities.</li> <li>Monitor the safety of tramway, staff, and passengers.</li> <li>Coordinate the operation, alternate service and emergency response plans for the safe, reliable and efficient services.</li> </ul>	<b>Executive</b> <ul style="list-style-type: none"> <li>Plan and supervise the daily works and preventive maintenance carried out by technicians to ensure the works done are according to the specified maintenance standards and quality.</li> <li>Plan, manage, assess, review the planned preventive maintenance and repairs works according to the specified maintenance standards.</li> <li>Coordinate career development program as well as developing technically competent personnel.</li> </ul>	<b>Engineer</b> <ul style="list-style-type: none"> <li>Plan and execute the daily operation and work carried out according to the specified quality standards.</li> <li>Prepare and update a timely and accurate reporting for the assigned APM systems and facilities as per standard operating procedure.</li> <li>Adhere with policies, procedures; guidelines; local/international regulations, legislation and quality management system.</li> <li>Coordinate effectively and timely during any system</li> </ul>

<b>MSIC SECTION</b>	<b>(H) TRANSPORTATION AND STORAGE</b>			
<b>MSIC DIVISION</b>	<b>(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES</b>			
<b>MSIC GROUP</b>	<b>(492) Other Land Transport</b>			
	<b>Cable Car Operation</b>	<b>Hill Tramway Operation</b>	<b>Airport Shuttle Operation</b>	
<b>AREA LEVEL</b>	<b>Cable Car Operation</b>	<b>Hill Tram Operation</b>	<b>Automated People Mover (APM) Operation</b>	<b>Airport Shuttle Operation Control Centre</b>
			<ul style="list-style-type: none"> <li>Inspect, monitor and provide technical advice on the operation and maintenance of the APM system.</li> <li>Execute the planned preventive maintenance of the APM System.</li> <li>Consolidate and analyse system failures and suggest actions to improve the APM system performance.</li> <li>Inspect, verify of all works, repairs, operational and planned preventive maintenance.</li> <li>carried out by technician under supervision.</li> <li>Implementation and review of the documentation for International Standard Certification, Standard Operating Procedure,</li> </ul>	<p>crisis and emergency and ensure Operational Control Center is well manned.</p> <ul style="list-style-type: none"> <li>To coordinate and communicate with shift executives on the planning, managing and supervising outstanding issues related to APM daily operation for completion.</li> <li>Assess and provide technical advice on the operation and maintenance of the APM System for continuous improvement action.</li> <li>Develop staff competency and skill in order to improve the effectiveness of operation and maintenance activities.</li> <li>Verified the standards documentation checklists</li> </ul>

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MSIC GROUP	(492) Other Land Transport			
	Cable Car Operation	Hill Tramway Operation	Airport Shuttle Operation	
AREA LEVEL	Cable Car Operation	Hill Tram Operation	Automated People Mover (APM) Operation	Airport Shuttle Operation Control Centre
			checklists and forms are being compiled and kept up to date.	and forms are being compiled and keep the records up to date.
LEVEL 3	<b>Technical Supervisor</b> <ul style="list-style-type: none"> <li>Responsible to supervises, lead and executes all instructions/plannings involving operation and maintenance activities for Cable Car.</li> <li>Assist Technical Executive to keep monitoring and communicate with technicians regarding operation and maintenance of cable car system.</li> <li>Prepare the manpower scheduling, and update the schedule as and when needed.</li> <li>Supervise and execute the workshop job and night work</li> </ul>	<b>Operation Supervisor</b> <ul style="list-style-type: none"> <li>Prepare timetable for the tramway to ensure a smooth and efficient administration of day-to-day train rostering.</li> <li>Support the operation, alternate service and emergency response plans for the safe, reliable and efficient services</li> <li>Communication is maintained at all times.</li> <li>Facilitate the movement of passengers by providing information to the passengers.</li> <li>Ensure operation, alternate service and emergency response plans for the safe, reliable and efficient services.</li> </ul>	<b>Technical Officer</b> <ul style="list-style-type: none"> <li>Liaise with APM Executive on any emergency and proposed works to be carried out to minimize disruption to airport operation.</li> <li>Manage and supervise the daily works and preventive maintenance carried out by technicians to ensure the works done are according to the specified maintenance standards and quality.</li> <li>Execute the plan preventive maintenance and repairs works according to the specified maintenance</li> </ul>	<b>Technical Officer</b> <ul style="list-style-type: none"> <li>Liaise with APM Operation and Maintenance (O&amp;M) Executive on any emergency and proposed works to be carried out to minimize disruption to airport operation.</li> <li>Manage and supervise the daily works and preventive maintenance carried out by technicians to ensure the works done are according to the specified maintenance standards and quality.</li> <li>Execute the plan preventive maintenance and repairs</li> </ul>

MSIC SECTION	(H) TRANSPORTATION AND STORAGE			
MSIC DIVISION	(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES			
MSIC GROUP	(492) Other Land Transport			
	Cable Car Operation	Hill Tramway Operation	Airport Shuttle Operation	
AREA LEVEL	Cable Car Operation	Hill Tram Operation	Automated People Mover (APM) Operation	Airport Shuttle Operation Control Centre
	<p>activities.</p> <ul style="list-style-type: none"> <li>Assist Technical Executive analyse and recommend solutions to any abnormal situation for improvement.</li> <li>Assist to upkeep and improvise the document management system of the maintenance reports.</li> <li>Supervise and ensure the technician follow station posting and working schedule.</li> </ul>	<ul style="list-style-type: none"> <li>Conduct pre and post inspection.</li> </ul>	<p>standards.</p> <ul style="list-style-type: none"> <li>Assist the O&amp;M Executive on the planning, managing and supervising of the career development program as well as developing technically competent personnel.</li> <li>Inspect, monitor and provide technical advice on the operating and maintenance of the APM System unit as well as developing technically competent personnel.</li> <li>Troubleshooting problems and executing necessary repair in the event system breakdown.</li> <li>Inspect, verify all works, repairs, operational and plan preventive maintenance carried out by technician</li> </ul>	<p>works according to the specified maintenance standards.</p> <ul style="list-style-type: none"> <li>Assist the O&amp;M Executive on the planning, managing and supervising of the career development program as well as developing technically competent personnel.</li> <li>Inspect, monitor and provide technical advice on the operating and maintenance of the APM System unit as well as developing technically competent personnel.</li> <li>Troubleshooting problems and executing necessary repair in the event system breakdown.</li> <li>Inspect, verify all works, repairs, operational and</li> </ul>

MSIC SECTION	(H) TRANSPORTATION AND STORAGE			
MSIC DIVISION	(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES			
MSIC GROUP	(492) Other Land Transport			
	Cable Car Operation	Hill Tramway Operation	Airport Shuttle Operation	
AREA LEVEL	Cable Car Operation	Hill Tram Operation	Automated People Mover (APM) Operation	Airport Shuttle Operation Control Centre
			under supervision. • Implement and ensure checklists and forms are being compiled and keep up to date according to specified International Standard Certification and Standard Operating Procedure.	plan preventive maintenance carried out by technician under supervision. • Implement and ensure checklists and forms are being compiled and keep up to date according to specified International Standard Certification and Standard Operating Procedure.
<b>LEVEL 2</b>	<b>Technician</b> • Conduct, measure and test the daily critical operational requirements of the Cable Car	<b>Technician (Control Room Staff)</b> • Conduct routine maintenance and repairs on the tramway system to ensure that it is functioning safely	<b>Technician</b> • Liaise with the Technical Officer on any emergency and proposed works to be	<b>Control Center Operator</b> • Provide prompt and accurate daily tasks and responsibilities to meet the

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AREA LEVEL	Cable Car Operation	Hill Tram Operation	Automated People Mover (APM) Operation	Airport Shuttle Operation Control Centre
	<p>&amp; Outdoor Lift Operation in order to enhance quality of operation services thus increase customer's satisfaction toward provided services.</p> <ul style="list-style-type: none"> <li>• Compile records of all required documents and checklist as per SOP (Operation &amp; Maintenance).</li> <li>• Obey to the Manufacturer Operation Manual at all time.</li> <li>• Strictly follow station posting and working schedule.</li> <li>• Strictly follow the Bad Weather &amp; Technical Issue Guideline that covers bad weathers including strong wind and lightning condition.</li> <li>• Operate according to the Operation Execution Procedure when in operation regarding customer's safety.</li> </ul>	<p>and efficiently. This would involve inspecting cables, cars, and other components, lubricating moving parts, replacing worn or damaged parts, and performing any necessary repairs.</p> <ul style="list-style-type: none"> <li>• Responsible for diagnosing the issue and implementing a solution.</li> <li>• Following safety protocols, identifying potential hazards, and reporting any safety concerns to your supervisor.</li> <li>• Compile all maintenance and repair work that you perform on the tramway system. This would involve maintaining accurate records of maintenance schedules, repairs, and inspections, and ensuring that all documentation is up-to-date and in compliance with relevant regulations and standards.</li> <li>• Communicate effectively with other members of the tramway</li> </ul>	<p>carried out to minimize disruption to airport operation.</p> <ul style="list-style-type: none"> <li>• Execute the daily works and preventive maintenance to ensure the works done are according to the specified maintenance standards and quality.</li> <li>• Assist the Technical Officer on a competency development program.</li> <li>• Troubleshooting problems and executing necessary repair in the event system breakdown.</li> <li>• Inspect of all carried out works, repairs, operational and plan preventive maintenance.</li> <li>• Ensure checklists and forms are being filed up and kept up according to specified</li> </ul>	<p>APM system service level standards.</p> <ul style="list-style-type: none"> <li>• Assist Engineer by monitoring daily APM systems monitoring and operational.</li> <li>• Monitor Power Distribution System SCADA and station status.</li> <li>• Assist Engineer for internal and external communications as per Standard Operating Procedure.</li> <li>• Promptly report faults as per specified Standard Operating Procedure.</li> <li>• Disseminate incident and progress messages to all relevant parties during any system crisis and emergency as per Standard Operating Procedure.</li> </ul>

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MSIC DIVISION	(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES			
MSIC GROUP	(492) Other Land Transport			
	Cable Car Operation	Hill Tramway Operation	Airport Shuttle Operation	
AREA LEVEL	Cable Car Operation	Hill Tram Operation	Automated People Mover (APM) Operation	Airport Shuttle Operation Control Centre
	<ul style="list-style-type: none"> <li>• Liaise with Customer Relation Management (CRM) Department on any concerned matters with regards to the operation of the cable car as and when needed.</li> <li>• Ensure required records and checklist are done accordingly.</li> <li>• Identify, closely monitor and ensure critical parameters/ parts / equipment's of the cable car are at optimum level and to trigger the needs for maintenance projects.</li> </ul>	operation team, including other technicians, engineers, and supervisors. This would involve providing updates on maintenance and repair work, reporting any issues or concerns, and collaborating with other team members to ensure that the tramway system is functioning safely and efficiently.	International Standard Certification and Standard Operating Procedure.	<ul style="list-style-type: none"> <li>• Properly log data and alarm triggered in Operation Control Centre via standard form in the event of Data Log system failure.</li> </ul>
LEVEL 1	NJT	<b>Driver</b> <ul style="list-style-type: none"> <li>• Perform daily safe driving practices and following standard driving procedures.</li> <li>• Communicating with dispatch staff via radio or phone to notify them of any delays or other issues.</li> </ul>	NJT	NJT



<b>MSIC SECTION</b>	<b>(H) TRANSPORTATION AND STORAGE</b>			
<b>MSIC DIVISION</b>	<b>(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES</b>			
<b>MSIC GROUP</b>	<b>(492) Other Land Transport</b>			
	<b>Cable Car Operation</b>	<b>Hill Tramway Operation</b>	<b>Airport Shuttle Operation</b>	
<b>AREA LEVEL</b>	<b>Cable Car Operation</b>	<b>Hill Tram Operation</b>	<b>Automated People Mover (APM) Operation</b>	<b>Airport Shuttle Operation Control Centre</b>
		<ul style="list-style-type: none"> <li>• Perform safe working environment by following all Occupational Safety and Health Administration (OSHA) regulations, as well as company policies and procedures.</li> <li>• Stay alert for any hazardous conditions that may cause accidents or injuries to passengers.</li> <li>• Report any mechanical issues with the vehicle to maintenance staff.</li> <li>• Stay aware of current events that may impact traffic flow or safety concerns such as road construction or severe weather events.</li> <li>• Report unsafe driving conditions to supervisors or dispatchers.</li> </ul>		

Table 4.17: Occupational Responsibility (OR) Group H493 (1/1)

MSIC SECTION	(H) TRANSPORTATION AND STORAGE			
MSIC DIVISION	(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES			
MSIC GROUP	(493) Other Land Transport			
	Tanker/Haulage Operation	Transport via Pipeline Operation		
AREA LEVEL	Tanker/Haulage Operation	Routine Operation- Liquid and Gaseous Pipeline	Multi-Product Pipeline Control	Pipeline Distribution Operation
LEVEL 8	NJT	NJT	NJT	NJT
LEVEL 7	NJT	NJT	NJT	NJT
LEVEL 6	NJT	NJT	NJT	NJT
LEVEL 5	<b>Head of Tanker/Haulage Operation</b> <ul style="list-style-type: none"> <li>Implement road transport strategy to meet company objectives.</li> <li>Manage transport operation cost within allocated yearly budget.</li> <li>Manage overall Road Transport (RT) daily operation.</li> <li>Lead structural cost reduction and business optimization initiatives.</li> <li>Lead Customer Value Proposition and haulier scheduling system.</li> <li>Lead investigation on road accidents and key liaison person on incident</li> </ul>	<b>Head of Routine Operation- Liquid and Gaseous Fuel Pipeline</b> <ul style="list-style-type: none"> <li>Manage safe and efficient pipeline operation system within allocated yearly budget.</li> <li>Lead and control regulatory and compliance matters regarding pipeline operation</li> <li>Assist other business unit in intercompany purchase discussion. <ul style="list-style-type: none"> <li>Provide input on strategic</li> </ul> </li> </ul>	<b>Head of Multi-Product Pipeline Control</b> <ul style="list-style-type: none"> <li>Manage safe and efficient operation system within allocated yearly budget.</li> <li>Lead and control regulatory and compliance matters regarding pipeline operation</li> <li>Provide input on strategic decisions that affect functional area of</li> </ul>	<b>Head of Pipeline Distribution Operation</b> <ul style="list-style-type: none"> <li>Responsible to plan, direct and overall monitoring of water distribution</li> <li>Responsible for minor and major maintenances in pipe</li> <li>Plan the budget requirement &amp; expenses.</li> <li>Analyses water demand requirement and planning</li> </ul>

MSIC SECTION	(H) TRANSPORTATION AND STORAGE			
MSIC DIVISION	(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES			
MSIC GROUP	(493) Other Land Transport			
	Tanker/Haulage Operation	Transport via Pipeline Operation		
AREA LEVEL	Tanker/Haulage Operation	Routine Operation- Liquid and Gaseous Pipeline	Multi-Product Pipeline Control	Pipeline Distribution Operation
	management <ul style="list-style-type: none"> <li>Carry out audit and yearly appraisal on contractors.</li> <li>Custodian of standards and procedures on road transport operations based on type of goods.</li> <li>Plan Training Need Analysis (TNA) for all staff</li> </ul>	decisions that affect functional area of responsibility. <ul style="list-style-type: none"> <li>Lead investigation on pipeline related incidents</li> <li>Ensure proper control and management of document are maintained in accordance to laid out procedures.</li> <li>Custodian of standards and procedures related to pipeline operations.</li> <li>Resolve issues related to operations.</li> <li>Manage multi-department coordination.</li> </ul>	responsibility. <ul style="list-style-type: none"> <li>Ensure proper control and management of documents are maintained in accordance to laid out procedures.</li> <li>Custodian of standards and procedures related to fuel control operations.</li> <li>Resolve issues related to operations.</li> <li>Manage multi-department coordination.</li> <li>Manage output deliverables based on product information.</li> </ul>	the technical resources, <ul style="list-style-type: none"> <li>Adhere to legal and regulatory related to water industry.</li> <li>Carry out internal audit compliances including risk &amp; crisis management plan.</li> <li>Monitor and plan Non-Revenue Water issues.</li> <li>Implement policies and directions of office administration and management.</li> <li>Ensure safety, health and environmental are adhere all the time.</li> </ul>
LEVEL 4	<b>Operation Executive</b> <ul style="list-style-type: none"> <li>Monitor daily delivery operations as</li> </ul>	<b>Operation Engineer</b> <ul style="list-style-type: none"> <li>Manage pipeline integrity</li> </ul>	<b>Planner</b> <ul style="list-style-type: none"> <li>Coordinate production</li> </ul>	<b>Executive</b> <ul style="list-style-type: none"> <li>Analyses, prepares and</li> </ul>

MSIC SECTION	(H) TRANSPORTATION AND STORAGE			
MSIC DIVISION	(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES			
MSIC GROUP	(493) Other Land Transport			
	Tanker/Haulage Operation	Transport via Pipeline Operation		
AREA LEVEL	Tanker/Haulage Operation	Routine Operation- Liquid and Gaseous Pipeline	Multi-Product Pipeline Control	Pipeline Distribution Operation
	<p>per schedule prepared.</p> <ul style="list-style-type: none"> <li>• Communication with client on delivery issues</li> <li>• Escalate incident to Operation manager and execute ERP.</li> <li>• Prepare weekly and monthly performance report.</li> <li>• Coordinate fleet availability with maintenance team</li> <li>• Strategize transport operation within allocated yearly budget.</li> <li>• Execute improvement projects on transport operations.</li> <li>• Prepare Training Need Analysis (TNA) for all staff.</li> </ul>	<p>projects.</p> <ul style="list-style-type: none"> <li>• Implementation of the facility integrity program,</li> <li>• Review and continual improvement of work manual and procedures</li> <li>• Execute pipeline repair/mitigation plans and recommendations for Preventative &amp; Mitigative measures, based on results of pipeline integrity assessments.</li> <li>• Communicate with regulatory agencies regarding integrity work plans.</li> <li>• Work with the pipeline integrity team coordinating budgetary planning of integrity assessments.</li> <li>• Act as lead project manager for field execution of integrity assessment.</li> </ul>	<p>capacity and available stock against customer demands</p> <ul style="list-style-type: none"> <li>• Monitor operation activity within budget.</li> <li>• Obtain output goods information (available stock, percentage of defectives etc.) through collaboration with quality control and warehouse/ plant.</li> <li>• Plan goods transportation timeline and switching between different goods, including cooldown/ purging period.</li> <li>• Plan output quantity to each customer and liaise with control room operator on the operation plan for each transport</li> </ul>	<p>monitor corrective &amp; preventive maintenance program.</p> <ul style="list-style-type: none"> <li>• Plan and execute for future upgrading of pump house and water network system.</li> <li>• Assist in budget preparation &amp; related resources requirements.</li> <li>• Approval of pumping &amp; water distribution operation.</li> <li>• Analyse data on any issues related to water distribution for future upgrading or improvement.</li> <li>• Implement and adhere to the safety, health and environment.</li> <li>• Plan, monitor and execute</li> </ul>

<b>MSIC SECTION</b>	<b>(H) TRANSPORTATION AND STORAGE</b>			
<b>MSIC DIVISION</b>	<b>(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES</b>			
<b>MSIC GROUP</b>	<b>(493) Other Land Transport</b>			
	<b>Tanker/Haulage Operation</b>	<b>Transport via Pipeline Operation</b>		
<b>AREA LEVEL</b>	<b>Tanker/Haulage Operation</b>	<b>Routine Operation- Liquid and Gaseous Pipeline</b>	<b>Multi-Product Pipeline Control</b>	<b>Pipeline Distribution Operation</b>
		<ul style="list-style-type: none"> <li>• Actively monitor costs relative to approved PO and budget allocation</li> <li>• Plot repair locations using in-line inspection data and GPS</li> <li>• Review technical report prepared by technicians on routine inspection.</li> </ul>	<ul style="list-style-type: none"> <li>• Synchronize multiple supply points stock availability.</li> <li>• Communicate finalized transportation plan to customers</li> <li>• Liaise with maintenance and facilities team on downtime required for pipeline cleaning, corrosion inhibitor injection etc.</li> </ul>	<p>the maintenance works related to water distribution.</p> <ul style="list-style-type: none"> <li>• Handling customers complaint</li> <li>• Coordinate and monitor all the supervisor within zone.</li> <li>• Handling and manage all panel contractors related to maintenances</li> <li>• Implement policies and directions of office administration and management.</li> <li>• Plan and monitor Non Revenue Water practices</li> <li>• Plan for application of green technology and sustainability.</li> </ul>

MSIC SECTION	(H) TRANSPORTATION AND STORAGE			
MSIC DIVISION	(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES			
MSIC GROUP	(493) Other Land Transport			
	Tanker/Haulage Operation	Transport via Pipeline Operation		
AREA LEVEL	Tanker/Haulage Operation	Routine Operation- Liquid and Gaseous Pipeline	Multi-Product Pipeline Control	Pipeline Distribution Operation
LEVEL 3	<p><b>Driver Supervisor</b></p> <ul style="list-style-type: none"> <li>• Ensure sufficient drivers for all core trucks and standby replacement drivers.</li> <li>• Responsible in conducting daily safety briefing to driver.</li> <li>• Verify all Pre departure check (PDC) and Post Journey Check (PJC) and submit report to organization for rectification on daily basis.</li> <li>• Conduct random and scheduled drug and alcohol testing on drivers using company supplied equipment.</li> <li>• Check and monitor driver violations and counsel the driver as per organization disciplinary matrix.</li> <li>• Compile and monitor HSE audit closure raised by drivers.</li> <li>• Assist driver trainer to assess new drivers on driving, loading, unloading</li> </ul>	<p><b>Operation Executive</b></p> <ul style="list-style-type: none"> <li>• Prepare overall performance report, including production data, equipment downtime and maintenance activities.</li> <li>• Verify of transported goods volume against meter report and prepare billing based on meter reading.</li> <li>• Prepare technician schedule and scope of work.</li> </ul>	<p><b>Shift Supervisor</b></p> <ul style="list-style-type: none"> <li>• Assign workers into shifts for continuous operation.</li> <li>• Determine manpower and equipment needed to cover production demand</li> <li>• Prepare performance reports.</li> <li>• Responsible to ensure crew activities reach daily target and planning at the end of the shift.</li> </ul>	<p><b>Supervisor</b></p> <ul style="list-style-type: none"> <li>• Monitor all maintenances works related to water distributions.</li> <li>• Endorse testing for new/old pipeline before and after installations.</li> <li>• Coordinate pipe connection and tapping pipe repair.</li> <li>• Monitor valves operation, water pressure including preparation of reports.</li> <li>• Validate pipe connection, testing and maintenance work.</li> <li>• Handling customers complaint</li> <li>• Liase with superior for daily task</li> </ul>

MSIC SECTION	(H) TRANSPORTATION AND STORAGE			
MSIC DIVISION	(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES			
MSIC GROUP	(493) Other Land Transport			
	Tanker/Haulage Operation	Transport via Pipeline Operation		
AREA LEVEL	Tanker/Haulage Operation	Routine Operation- Liquid and Gaseous Pipeline	Multi-Product Pipeline Control	Pipeline Distribution Operation
	<p>prior to work commencement.</p> <ul style="list-style-type: none"> <li>• Ensure fleet availability with maintenance team.</li> <li>• Identify Training Need Analysis (TNA) for all staff.</li> <li>• Monitor driver work hours, driving time and rest hours</li> </ul>			<ul style="list-style-type: none"> <li>• Supervise Non Revenue Water practices.</li> </ul>
LEVEL 2	<p><b>Driver</b></p> <ul style="list-style-type: none"> <li>• Comply with rules and regulatory requirements.</li> <li>• Ensure the road tankers in a good condition before and after deliver the product by conduct inspection Pre Departure Checklist (PDC) and Post Journey Checklist (PJC).</li> <li>• Communicate with workshop on any defect on truck.</li> <li>• Operate truck equipment safely as per</li> </ul>	<p><b>Operation Technician</b></p> <ul style="list-style-type: none"> <li>• Ensure correct operation of pipeline as per standard operating procedure.</li> <li>• Perform periodic inspection and routine maintenance on pipeline system.</li> <li>• Pipeline monitoring – ensure no leakage and verification against control room.</li> <li>• Perform routine test, maintain</li> </ul>	<p><b>Control Room Operator</b></p> <ul style="list-style-type: none"> <li>• Operate Distributed Control System (DCS)/ SCADA.</li> <li>• Interface with contractor on any changes from subsystem to DCS/ SCADA</li> <li>• Monitor process flow condition to achieve targeted quality and</li> </ul>	<p><b>Operator</b></p> <ul style="list-style-type: none"> <li>• Record pump operation, reservoir or service tank level, flowmeter and any data related to water distribution within job scope.</li> <li>• Implement maintenance follow schedules for valve systems in pump house or reservoir.</li> </ul>

MSIC SECTION	(H) TRANSPORTATION AND STORAGE			
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MSIC GROUP	(493) Other Land Transport			
	Tanker/Haulage Operation	Transport via Pipeline Operation		
AREA LEVEL	Tanker/Haulage Operation	Routine Operation- Liquid and Gaseous Pipeline	Multi-Product Pipeline Control	Pipeline Distribution Operation
	<p>standard operating procedure.</p> <ul style="list-style-type: none"> <li>Follow loading and unloading procedure as detailed by loading plant and customer requirements.</li> <li>Record own work hours, driving time and rest hours.</li> <li>Report to management of all non-conformance/infringement i.e near miss, incident/accident etc.</li> <li>Perform delivery as per Journey Management Plan (JMP)</li> <li>Execute Emergency Response plan in case of incident.</li> </ul>	<p>and repair pipeline equipment including valve, flange and filtration system.</p> <ul style="list-style-type: none"> <li>Fill up maintenance checklist, service report and other required documents.</li> </ul>	<p>quantity.</p> <ul style="list-style-type: none"> <li>Coordinate crew formation based on operation process requirement.</li> <li>Pre-operation preparation activities</li> <li>Provide input to technicians to carry out equipment functioning test activities (field site) in effective and safe manner.</li> <li>Log instrument and equipment status and communicate with maintenance team for repair required.</li> </ul>	<ul style="list-style-type: none"> <li>Cleaning and maintenance work inside or outside pump house.</li> <li>Minor repairs for all equipment at reservoir or pump house.</li> <li>Report all administrative data, faulty and any works related to job scope to superior.</li> </ul>
LEVEL 1	NJT	NJT	NJT	<p><b>General Worker</b></p> <ul style="list-style-type: none"> <li>Identify pipe sizes and</li> </ul>



<b>MSIC SECTION</b>	<b>(H) TRANSPORTATION AND STORAGE</b>			
<b>MSIC DIVISION</b>	<b>(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES</b>			
<b>MSIC GROUP</b>	<b>(493) Other Land Transport</b>			
	<b>Tanker/Haulage Operation</b>	<b>Transport via Pipeline Operation</b>		
<b>AREA LEVEL</b>	<b>Tanker/Haulage Operation</b>	<b>Routine Operation- Liquid and Gaseous Pipeline</b>	<b>Multi-Product Pipeline Control</b>	<b>Pipeline Distribution Operation</b>
				<p>pipe specification.</p> <ul style="list-style-type: none"> <li>• Identify pipe threaders, benders and related equipment.</li> <li>• Identify other utilities location.</li> <li>• Assist in taking the measurement of pipes for cutting and threading.</li> <li>• Assist in excavation process</li> <li>• Assist in testing installed systems and pipe lines, using pressure gauge, hydrostatic testing, observation, or other methods.</li> </ul>

#### 4.5 Occupational Description (OD)

Occupational Descriptions (OD) describe a structured and factual statement of a specific job function. The OD within this context refers to the job titles in demand that have been identified as important for the operations of the sector. The OD describes the summary of responsibilities, job level, and competency set such as knowledge, skills and attributes particular to the job. In total, there are H491- 9 job titles (including similar job title (i.e: shunting driver) under three different job areas in the freight cargo operation), H492 - 16 job titles and H493 - 8 job titles listed under this section. Occupational Descriptions developed in this OF is as presented in Annex 3.

#### 4.6 Jobs in Demand and Critical Job Title

This section provides information on the jobs in demand and the critical jobs in the Land Transport and Transport via Pipelines sector. Jobs in demand are jobs that are required and important in the smooth running of the main operations of the company. Job in demand by industry definition are the job that required more worker in certain area, however there is a shortage of workforce supply. Jobs in demand are important to determine what job titles are demanded by the industry. Meanwhile, the critical jobs are jobs in demand but hard to fill and are always short of supply due to the nature of the jobs which require certain skills set. It is also considered as the strategic occupation of the industry that is critical to the success of the operation implementation. Job in demand and critical jobs are gathered based on findings from the FGD and interview sessions as well supported by survey findings. Table 4.16 shows job in demand and critical jobs findings.

Table 4.18: Job in Demand and Critical Jobs

Group	Job in Demand	Critical Job
<b>491</b>	Interurban Passenger Rail Operation: i. Train Operation Executive ii. Train Driver Supervisor iii. Train Driver  Interurban Passenger ETS Operation:	Interurban Passenger Rail Operation: i. Train Operation Executive ii. Train Driver Supervisor iii. Train Driver  Interurban Passenger ETS Operation: i. ETS Captain  Interurban Train Operation Control Centre: i. Chief Controller

Group	Job in Demand	Critical Job
	<p>i. ETS Captain</p> <p>Interurban Train Operation Control Centre:</p> <p>i. Chief Controller</p> <p>ii. Control Center Operation Controller</p> <p>Freight Cargo Operation, Coordination and Support Operation:</p> <p>i. Shunting Driver</p> <p><b>Total Job in Demand = 9 (including from three different job areas in cargo operation)</b></p> <p><i>Survey findings: More than 67% stated shortage for these Job Titles</i></p>	<p>ii. Control Center Operation Controller</p> <p>Freight Cargo Operation, Coordination and Support Operation:</p> <p>i. Shunting Driver</p> <p><b>Total Critical Job = 9 (including from three different job areas in cargo operation)</b></p>
492	<p>Bus Operation:</p> <p>i. Bus Supervisor</p> <p>ii. Bus Driver</p> <p>Bus Operation Control Centre:</p> <p>i. Controller</p> <p>Urban and Suburban Passenger Rail Operation:</p> <p>i. Train Executive</p> <p>ii. Train Supervisor</p> <p>iii. Train Driver</p> <p>Urban and Suburban Train Operation Control Centre:</p> <p>i. Chief Controller</p> <p>ii. Train Controller Operator</p> <p>Cable Car Operation:</p> <p>i. Technical Executive</p> <p>ii. Technical Supervisor</p> <p>iii. Technician</p> <p>Hill Tram Operation:</p> <p>i. Executive</p> <p>ii. Technician</p> <p>iii. Hill Tram Driver</p>	<p>Bus Operation:</p> <p>i. Bus Driver</p> <p>Bus Operation Control Centre:</p> <p>i. Controller</p> <p>Urban and Suburban Passenger Rail Operation:</p> <p>i. Train Executive</p> <p>ii. Train Driver</p> <p>Urban and Suburban Train OCC:</p> <p>i. Chief Controller</p> <p>ii. Train Controller Operator</p> <p>Cable Car Operation:</p> <p>i. Technical Executive</p> <p>ii. Technician</p> <p>Hill Tram Operation:</p> <p>i. Technician</p> <p>ii. Driver</p> <p>Automated People Mover Operation:</p> <p>i. Executive</p> <p>ii. Technical Officer</p> <p>iii. Technician</p> <p>Automated People Mover Operation Control Centre:</p> <p>i. Engineer</p> <p>ii. Technical Officer</p> <p>iii. Control Centre Operator</p>

Group	Job in Demand	Critical Job
	<p>Automated People Mover Operation:</p> <ul style="list-style-type: none"> <li>i. Executive</li> <li>ii. Technical Officer</li> </ul> <p>Automated People Mover Operation Control Centre:</p> <ul style="list-style-type: none"> <li>i. Engineer</li> <li>ii. Technical Officer</li> <li>iii. Control Center Operator</li> </ul> <p><b>Total Job in Demand = 19</b></p> <p><i>Survey findings: More than 55% stated shortage for these Job Titles.</i></p>	<p><b>Total Critical Job = 16</b></p>
<b>493</b>	<p>Tanker/Haulage Operation:</p> <ul style="list-style-type: none"> <li>i. Operation Executive</li> <li>ii. Driver Supervisor</li> <li>iii. Driver</li> </ul> <p>Routine Operation – Liquid and Gaseous Fuel Pipeline:</p> <ul style="list-style-type: none"> <li>i. Operation Engineer</li> <li>ii. Operation Executive</li> <li>iii. Operation Technician</li> </ul> <p>Multi-Product Pipeline Control:</p> <ul style="list-style-type: none"> <li>i. Planner</li> <li>ii. Control Room Operator</li> </ul> <p>Pipeline Distribution Operation:</p> <ul style="list-style-type: none"> <li>i. Executive</li> <li>ii. Operator</li> </ul> <p><b>Total Job in Demand = 10</b></p> <p><i>Survey findings: More than 55% stated shortage for these Job Titles.</i></p>	<p>Tanker/Haulage Operation:</p> <ul style="list-style-type: none"> <li>i. Operation Executive</li> <li>ii. Driver</li> </ul> <p>Routine Operation – Liquid and Gaseous Pipeline:</p> <ul style="list-style-type: none"> <li>i. Operation Engineer</li> <li>ii. Operation Technician</li> </ul> <p>Multi-Product Pipeline Control:</p> <ul style="list-style-type: none"> <li>i. Planner</li> <li>ii. Control Room Operator</li> </ul> <p>Pipeline Distribution Operation:</p> <ul style="list-style-type: none"> <li>i. Executive</li> <li>ii. Operator</li> </ul> <p><b>Total Critical Job = 8</b></p>

Based on Table 4.16, there are nine jobs in demand in the main operations of Group 491, with seven identified as critical by experts. Across the board, jobs are relatively easy to be filled in although requiring specific skill sets. For Group 492, there are 19 jobs in demand, with 16 job titles classified as critical. For Group 493, there are 10 jobs in demand, with eight job titles determined as critical. The discussion with the SMEs with the input from survey findings also identified the following factors as illustrated in Figure 4.4 as the reasons for the shortage of jobs in demand. It shows that eight reasons to the shortage of jobs in demand which less salary and lack of promotion in job is the top reasons.

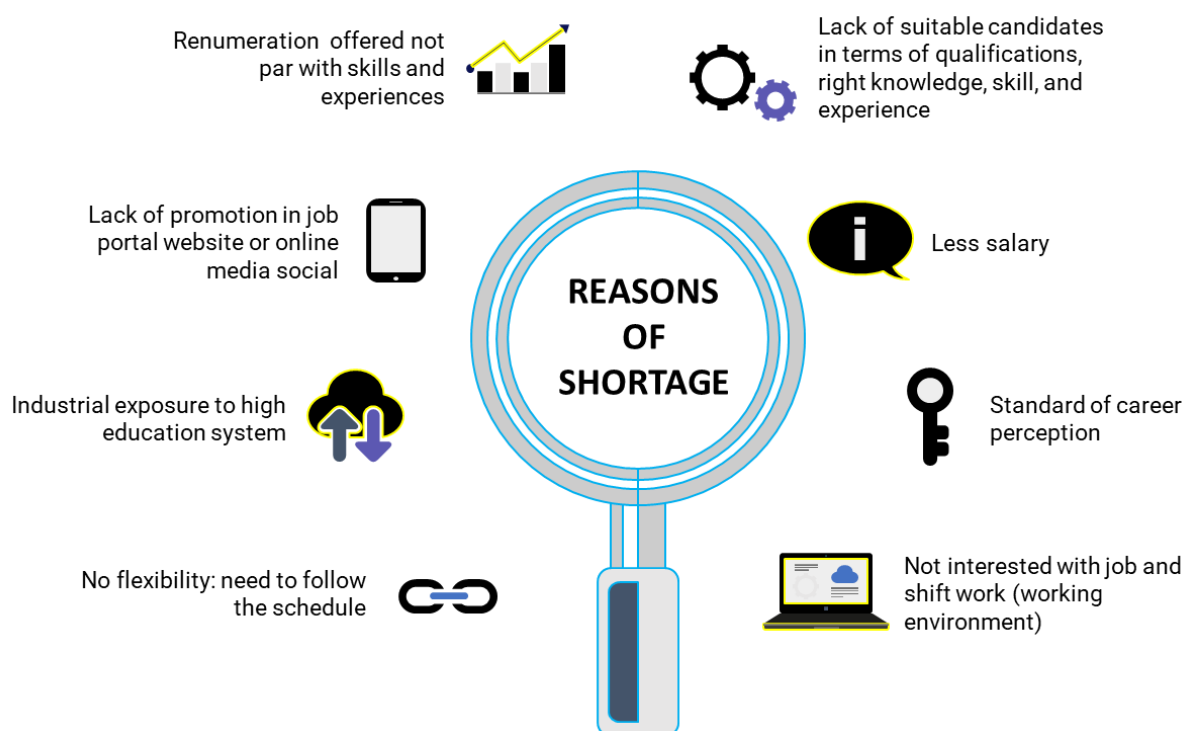


Figure 4.4: Reasons of Shortage

## 4.7 Competencies in Demand

This section covers competencies in demand for the Land Transport and Transport via Pipelines sector. Elicited through the FGD and supported by the data analysis from the survey, the competency and its descriptions that are highly important to the Land Transport and Transport via Pipelines sector are illustrated in Table 4.17.

Table 4.19: Competency Description

No.	Competency	Description
<b>KNOWLEDGE</b>		
1.	Policy	<p>Understanding and information about the policies, regulations, and laws that govern the transportation industry.</p> <p>This includes policies related to various modes of transportation, as well as policies related to safety, environmental protection, and accessibility.</p>
2.	Standard Operating Procedure	<p>Follow and abide by rules that govern the operation of the organization and those who work for it under land transport and transport via pipelines.</p> <p>This is a procedure specific to the operations of the organisation that describes the activities necessary to complete tasks in accordance with industry regulation, provincial laws and the organisations own standards of running the business.</p> <p>It also includes quality management and maintenance planning.</p>
3.	Rules and Legislation of the industry	<p>Follow and abide by rules and legislation set by the governing bodies and legislators.</p> <p>These laws and regulations are designed to ensure the safety and security of passengers and goods, protect the environment, and promote efficient and accessible transportation systems. Can refer to Chapter 2 to see example of rules and legislation.</p>
4.	Safety and Security	<p>Refers to the understanding and information about the measures and practices designed to ensure the safety and security of passengers, cargo, and the public during transportation.</p> <p>This includes measures aimed at preventing accidents and incidents, and ensuring the overall security of the transportation system.</p> <p>Examples of safety and security measures in the transport sector include:</p> <ol style="list-style-type: none"> <li>Emergency Response Plan (ERP),</li> <li>knowledge on safety and security level of the vehicle or service that has been handled,</li> <li>knowledge on safety action i.e defensive driving,</li> <li>safety regulations for vehicle, operation, and maintenance,</li> <li>security screenings at the transportation hubs,</li> <li>emergency response and evacuation procedures for</li> </ol>

No.	Competency	Description
		<p>accidents and incidents,</p> <p>vii. criminal background checks for transportation workers, including drivers, and personnel</p> <p>viii. security technology, such as surveillance cameras, GPS tracking systems, and biometric identification systems.</p>
5.	Product knowledge	<p>Understanding and information about the products, services, and technologies offered in the transportation industry.</p> <p>Examples of product knowledge in the transport sector include:</p> <ul style="list-style-type: none"> <li>i. knowledge on product handling,</li> <li>ii. knowledge on SCADA,</li> <li>iii. knowledge on train signalling and electrification system,</li> <li>iv. knowledge on train control,</li> <li>v. knowledge on operation of control centre,</li> <li>vi. knowledge on wagon specification,</li> <li>vii. knowledge on fleet operation management,</li> <li>viii. knowledge on routes,</li> <li>ix. knowledge on mechanical, electrical, hydraulic and control system,</li> <li>x. knowledge of the different types of vehicles available and their respective capabilities and limitations,</li> <li>xi. knowledge of the different services offered by transportation companies, such as delivery, intermodal transportation, and specialized services for dangerous goods,</li> <li>xii. knowledge of the latest technologies used in the transportation sector, such as autonomous vehicles, electric vehicles, and advanced navigation systems.</li> </ul>
<b>SKILLS</b>		
1.	Technical	Specialized knowledge and expertise required to perform various technical functions within the transportation industry. This includes skills related to operating and maintaining vehicles, using specialized equipment and technologies, and implementing safety and security measures.
2.	Communication	Ability to plan and deliver oral and written communication and ensure that information is passed on to others in a way

No.	Competency	Description
		that can be understood and related to.
3.	Diagnostic	Ability to identify and analyze problems and issues in the transportation industry, and to develop and implement effective solutions. This includes skills related to troubleshooting and problem-solving, as well as the ability to gather and analyze information, and to make informed decisions.
4.	Trouble/Problem solving	Ability to use cognition, actions, and attitudes, motives and emotions to cope with situations and problems where there are no available common procedures and solutions
5.	Administration	Perform administrative and support functions within the transportation industry. This includes skills related to managing documents and records, communicating with stakeholders, and organizing and coordinating activities and events.
6.	Leadership	Ability to influence and motivate others in organisation to achieve common goals by setting a direction, inspiring and motivating others to follow, and creating an environment that supports and encourages success.
7.	Data collection and sorting	Ability to gather, organize, and analyze data within the transportation industry. This includes skills related to data collection, data entry, and data analysis, as well as the ability to use data to inform decision-making and improve processes and procedures.
8.	Planning and forecasting	Ability to develop and implement plans and strategies, and to accurately predict future trends and developments within the transportation industry. This includes skills related to project management, risk assessment, and resource allocation, as well as the ability to use data and other information to inform decision-making.
9.	Analytical	Ability to analyze data, identify patterns and relationships, and make informed decisions within the transportation industry. This includes skills related to data analysis, problem-solving, and critical thinking, as well as the ability to use data and other information to inform decision-making and improve processes and procedures.
10.	Competent in using computer or laptop	Ability to effectively use office productivity software, computer systems, software, and tools within the transportation industry. This includes using computer systems to manage logistics, track vehicles, and communicate with customers, as well as using software and tools to analyze data and make informed decisions.



No.	Competency	Description
11.	Competent in using other mechanical devices	Ability to effectively use and maintain mechanical devices and equipment within the transportation industry. This includes skills related to using and maintaining vehicles, machinery, and other equipment, as well as the ability to troubleshoot and repair problems.
12.	Information Technology	Ability to effectively use and implement technology within the transportation industry. This includes skills related to information systems, data management, and digital communication
13.	Training and coaching	Ability to share information to individuals within the transportation industry. This includes skills related to skill in dealing with task in transportation operation job areas, as well as the ability to assess and improve performance.
14.	English language competency	Ability to effectively communicate in English within the transportation industry. This includes skills related to speaking, writing, reading, and listening in English, as well as the ability to understand and use technical vocabulary related to transportation.
15.	Interpersonal	Ability to effectively communicate and interact with others within the transportation industry. This includes skills related to interpersonal communication, teamwork, conflict resolution, and customer service.
<b>ATTRIBUTE/ATTITUDE</b>		
1.	Negotiation	Approach and mindset that individuals and organizations adopt when engaging in negotiations related to the transportation industry. Negotiations in the transport sector can involve a wide range of stakeholders, including government agencies, transportation companies, labor unions, and other organizations.
2.	Teamwork	Ability to and willingness to work cooperatively with others on a team.
3.	Multi-tasking	Being able to execute or fulfil multiple roles or perform more than one task simultaneously, while completing each task assigned.
4.	Flexibility	Willingness of individuals and organizations in the transportation industry to adapt and respond to changing circumstances and requirements. This includes being open to new ideas, technologies, and approaches, and being able to quickly adapt to changing market conditions, customer

No.	Competency	Description
		needs, and regulatory requirements. Examples of a flexible attitude in the transport sector include: willingness to adopt new technologies, ability to adjust routes, schedules, and services in response to changing demand and market conditions and adaptability to changing regulations, environmental concerns, and customer needs
5.	Professionalism	Competence in conducting tasks expected of a professional.
6.	Attention to Detail	Ability to efficiently allocate cognitive resources to achieve thoroughness and accuracy when accomplishing tasks, no matter how small or large.
7.	Resilience	Ability to keep functioning effectively when under pressure and/ or experiencing rapidly changing or uncertain conditions
8.	Agility	Ability to move, think, understand and act quickly from one task to another as the situation may arise.
9.	Dependability	Commitment and reliability of individuals and organizations in the transportation industry to deliver products and services that meet customer needs and expectations.
10.	Work ethic	Values and principles that guide the behavior and performance of individuals and organizations in the transportation industry.
11.	Career management	Focus on continuous learning and development, an understanding of career goals and aspirations, and a proactive approach to securing opportunities for growth and advancement and succession planning.
12.	Self-esteem	Level of confidence and self-worth that individuals in the transportation industry have in their abilities and contributions to their work and the industry as a whole.

The list of competencies was then asked in the survey to determine which competencies are important to respective industries under Land Transport and Transport via Pipelines. The result from the survey was analysed and shown as in Figure 4.5 until Figure 4.7. All the competencies presented in the figures were selected as “very important” by the respondents to their respective industry. From the figures, it shows that different industries

have different requirement on competencies. Nevertheless, there are quite similarities in which are very important based on the dominant competency in this sector such as knowledge on standard operating procedure (SOP) as well as safety and security, communication, and teamwork.

Figure 4.5 shows the competency in demand result based on the survey for Group 491. Based on Figure 4.5, majority of the respondent agree that in term of knowledge, safety and security (around 87%) shows the highest important (referring to scale of 5, very important). Meanwhile, technical (54.84%) shows the highest skill for skill attribute. Professionalism (54.84%) is the highest important for attitude attribute.

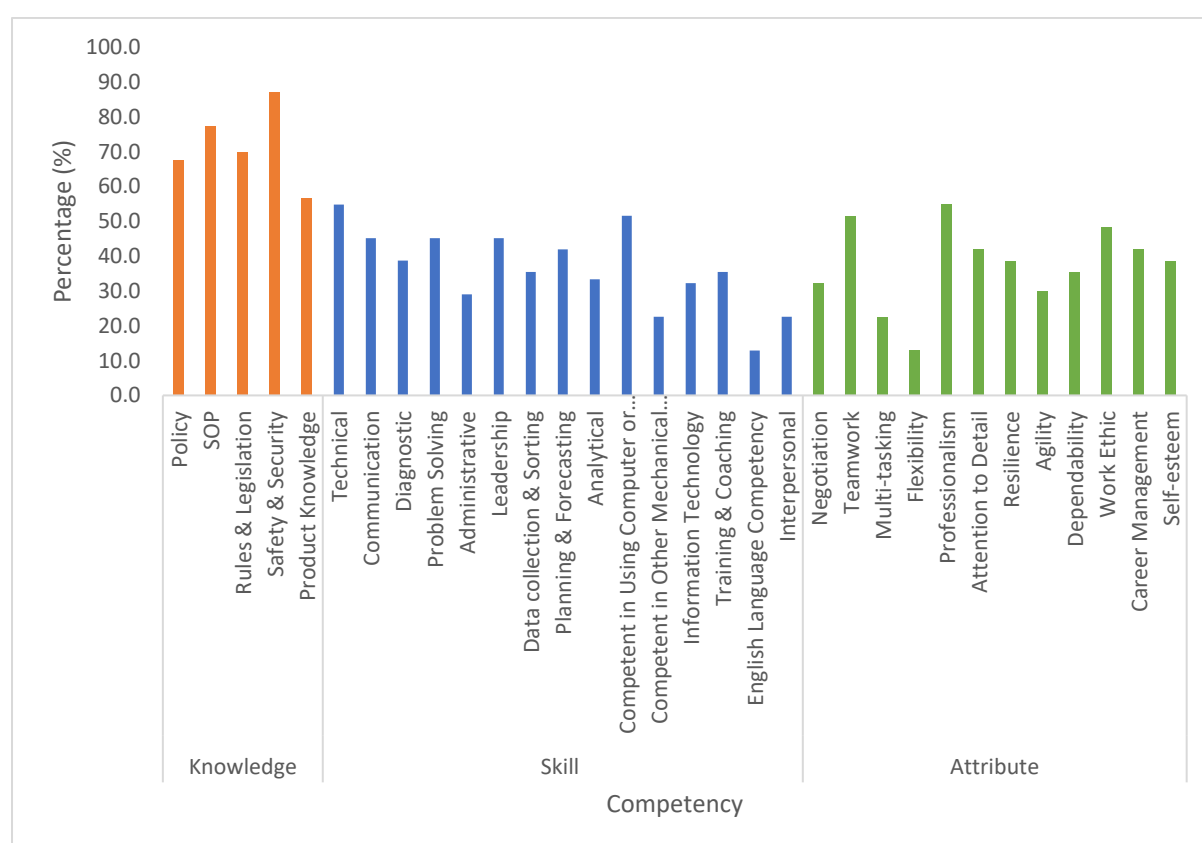


Figure 4.5: Very Important Competency in Demand for Group 491

Figure 4.6 shows the competency in demand result based on the survey for Group 492. Based on Figure 4.6, majority of the respondent agree that in term of knowledge, standard of operating procedure (around 65%) shows the highest important (referring to scale of 5, very important). Meanwhile, communication (51.43%) shows the highest skill for skill attribute. Teamwork (60%) is the highest important for attitude or attribute.

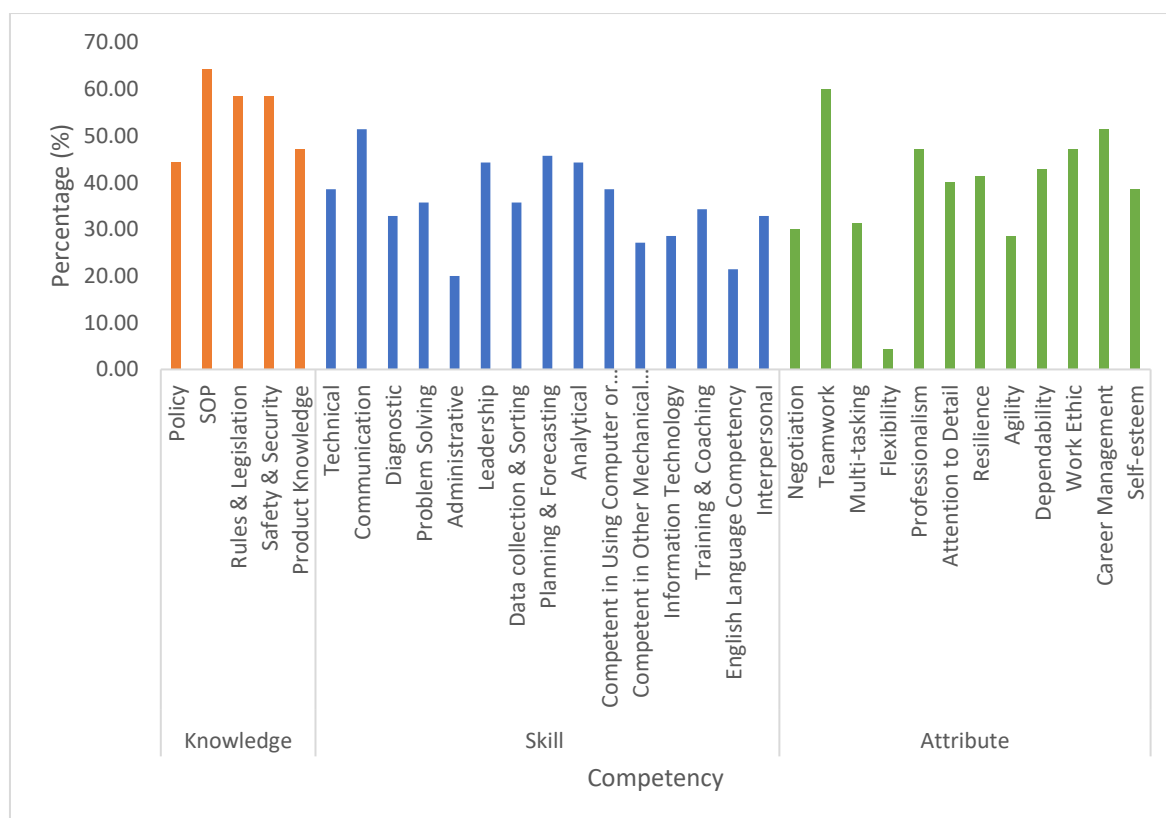


Figure 4.6: Very Important Competency in Demand for Group 492

Figure 4.7 shows the competency in demand result based on the survey for Group 493. Based on Figure 4.6, majority of the respondent agree that in term of knowledge, safety and security (86.67%) shows the highest important (referring to scale of 5, very important). Meanwhile, technical, problem solving and leadership (60%) show the highest skill for skill attribute. Teamwork (66.67%) is the highest important for attitude or attribute.

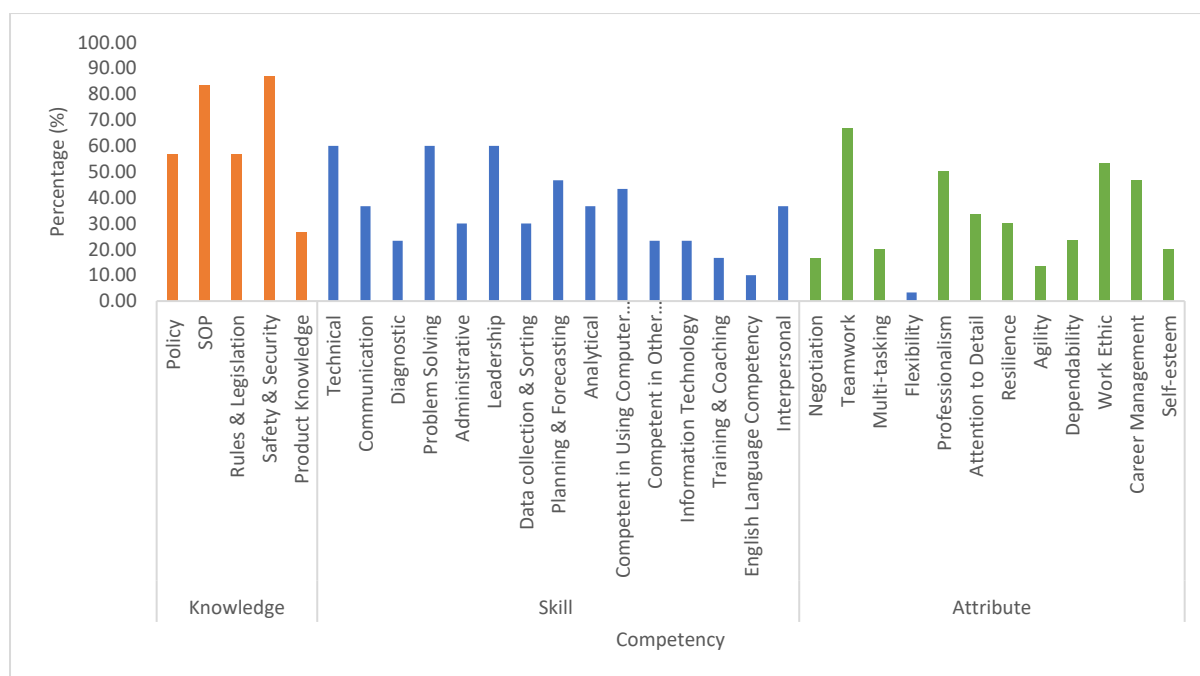


Figure 4.7: Very Important Competency in Demand for Group 493

All in all, the competencies listed in the table above are very important to all job in the Land Transport and Transport via Pipelines regardless of the level and job titles. However, the level of importance may differ following the specific functional job responsibilities. Besides the competency in demand, data related to the agreement statement of the current graduates, trainees, apprentices, and current workers possess the skills required by the industry was also captured through the survey as illustrated in Figure 4.8. Based on Figure 4.8, 86% of them agreed that current graduate or workers does possess the skills required by the industries to perform their tasks while the remaining 14% disagreed.

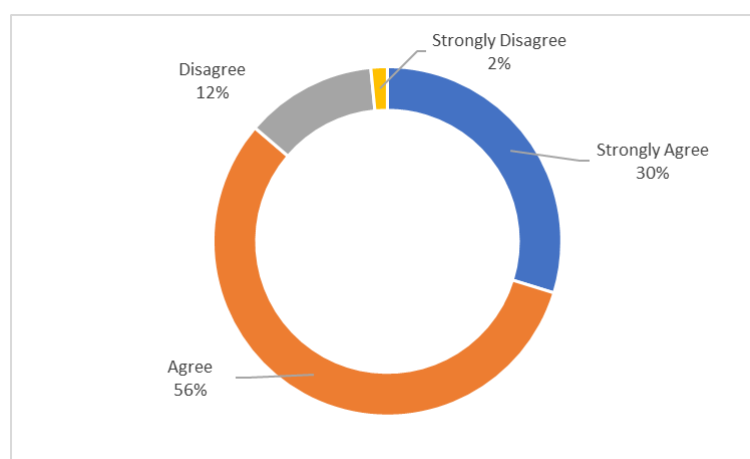


Figure 4.8: Agreement on the current graduates, trainees, apprentices, and current workers possess the skills required by the industry.

The skills gap among graduates and workers can be attributed to several factors. Figure 4.9 shows the reason for skill gaps. If there is a skill gap, the most common cause is a lack of attitude as depicted in Figure 4.9, followed by an education (Group 492) or training (Group 491 and Group 493) mismatch. Aside from education or training mismatch, employers do not clarify the skills they require for the job specifications appears to contribute to the gap between workforce abilities and sector competencies. However, experts during focus group discussions have suggested that these gaps can be reduced through on-the-job training and experience.

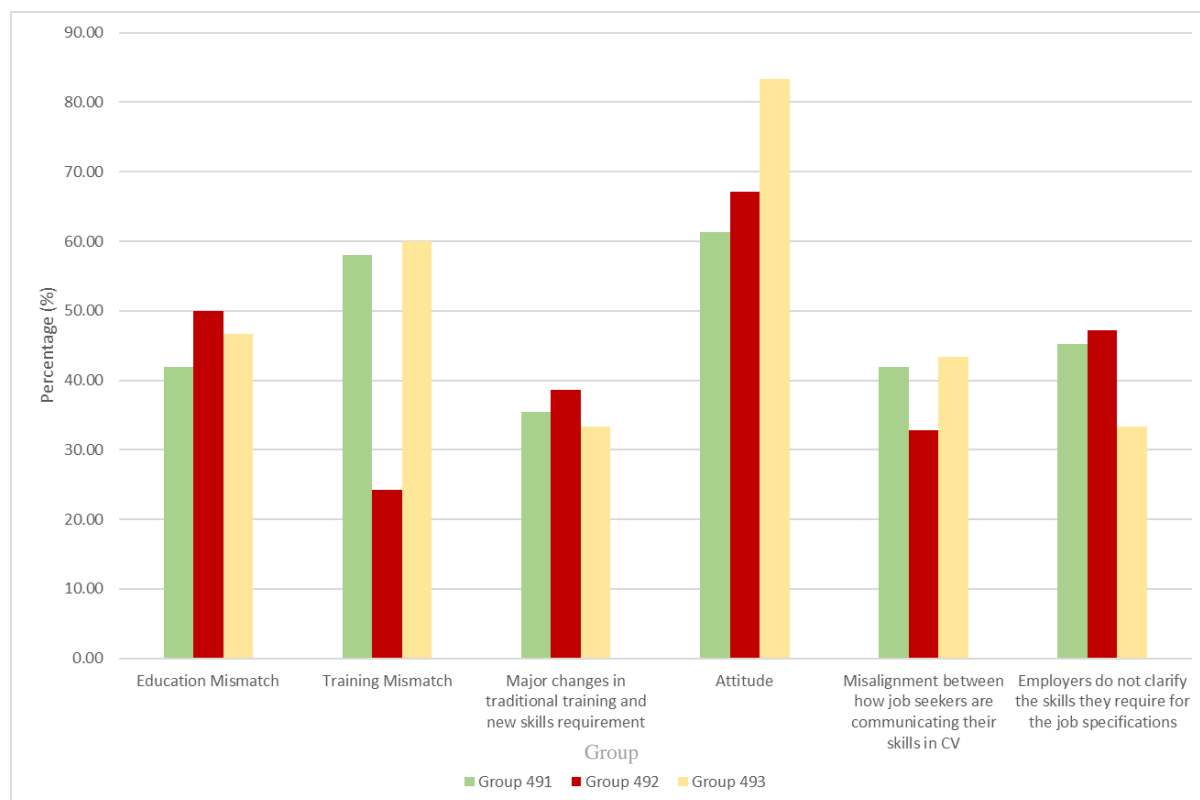


Figure 4.9: Reasons for Skill Gap for All Groups

#### 4.8 Job Relevant to Technology and Industrial Revolution

This section assesses the possibility that the entire occupation will be automated, based on current technology and the industrial revolution. Technologies that improve consumer engagement and corporate efficiency are relevant to the fourth industrial revolution. According to the survey findings, the technological revolution will have an impact on the economic operations of the Land Transport and Pipeline Transport sectors. The sector will be affected in two ways, either positively or negatively, by this technology. Based on the survey findings, out of 131 respondents, 11% strongly agreed that technology would have an influence on the industry landscape, 58% agreed that technology would have an impact on the industry

landscape, and just 2% disagreed that technology would have an impact on Land Transport and Transport via Pipelines. The reason of this agreement is due to the fact that these technologies provide more accurate journey plan, proper emergency plan i.e, accident, contingency plan for breakdowns. It demonstrates that this technology has a greater positive impact on this sector. The distribution of the findings based on each group is depicted in Figure 4.10.

Referring to Figure 4.10, the highest agreement is on Group 493 that involved pipeline operation. Based on discussions with the pipeline experts, technology and industrial revolution provides greater positive impact in term of connectivity and communication enhancement between pipeline system, which is allowing for more efficient coordination and optimisation of transport operations. This can assist to reduce waste, lower costs, and enhance system performance overall. In addition, new monitoring and control systems, such as sensors and remote monitoring technologies, are being implemented to enable real-time monitoring of pipeline conditions, flow rates, and other important parameters. This can help detect leaks or other issues promptly and precisely, reducing the risk of environmental damage or service interruptions.

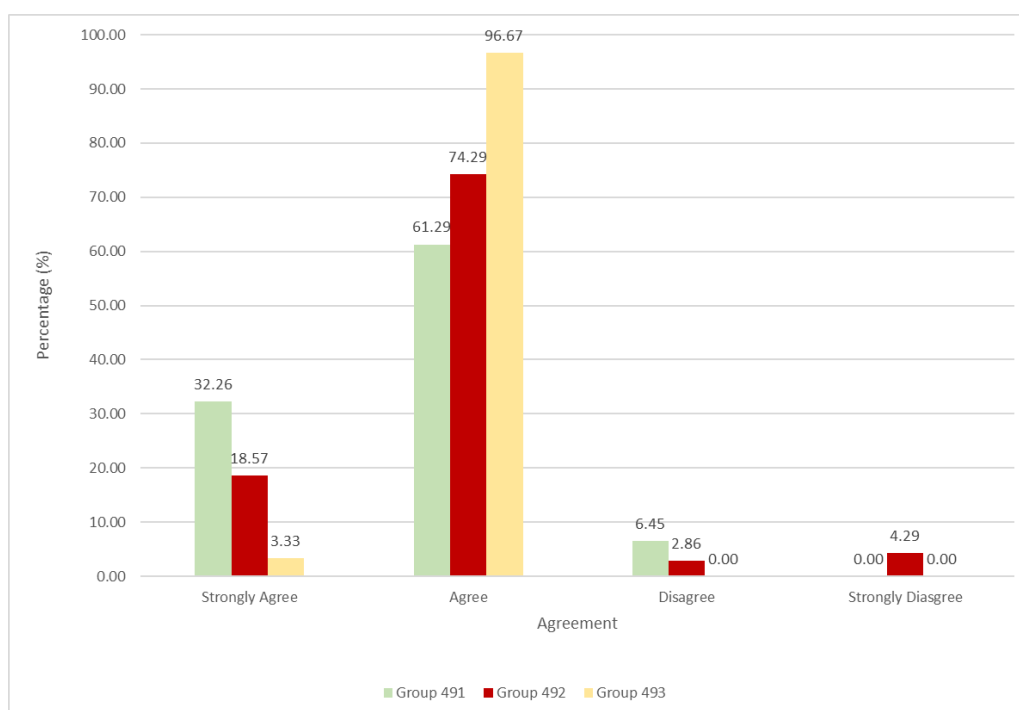


Figure 4.10: The Impact of Technology on the Land Transport and Transport via Pipelines Sector

In terms of whether technology advancement affects the current job in the Land Transport and Transport via Pipelines sector, the responses showed a quite similar connotation. Majority of the respondent agreed that the technology advancement affects the job. Similar to previous question, technology advancement will have an impact to the job in two ways, either positive or negative. In terms of positive impact, technology can save money by replacing or reducing human labour through automation. In terms of negative effects, however, technology can reduce the chance of humans obtaining employment, the difficulty of identifying skilled and competent employees, and the difficulty of adapting to new technologies. However, not all industries within this sector are competent and prepared to optimise their technologies due to the high cost of maintenance. Therefore, manual labour remains relevant and reliable in this industry. The distribution of the findings based on each group is shown in Figure 4.11.

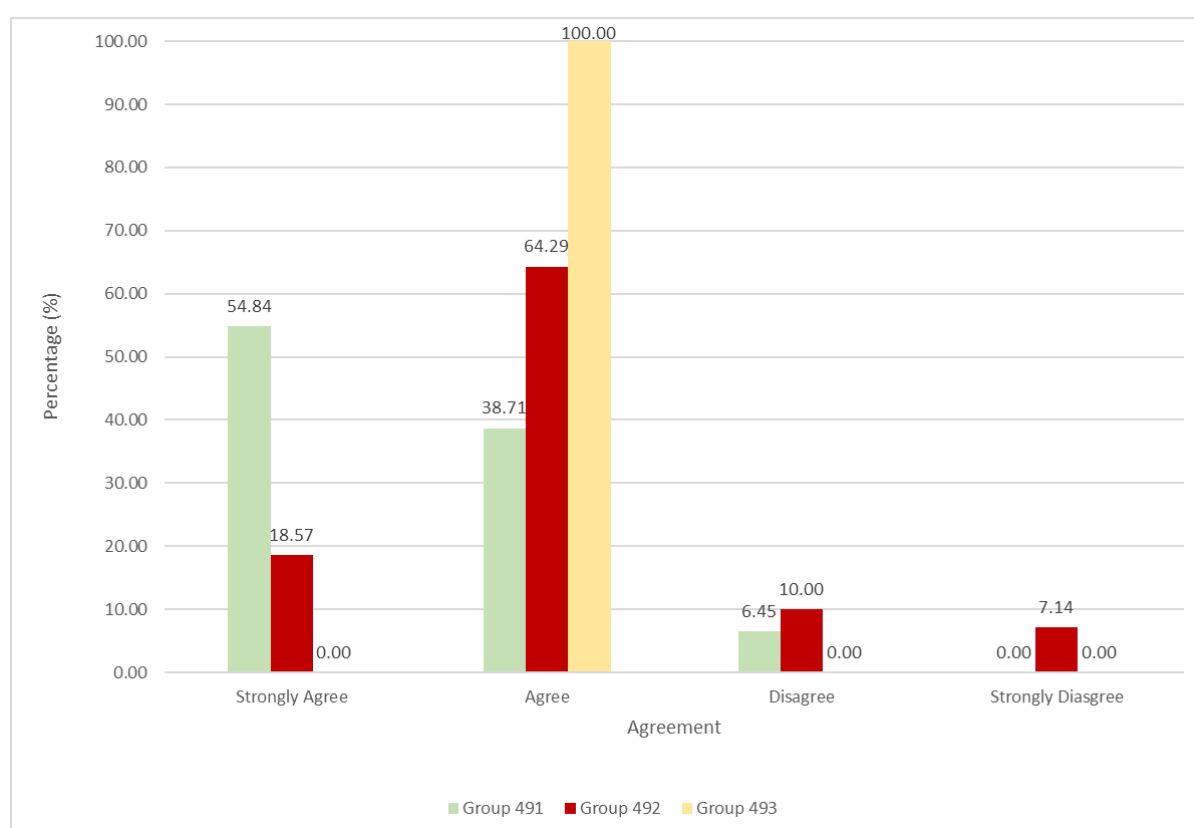


Figure 4.11: The Impact of Technology Advancement on the Current Jobs

In Chapter 2 of this research, nine crucial pillars of technological advancement are discussed, all of which are directly applicable to these industries. Table 4.18 elaborates on the technologies pertinent to the industrial revolution, based on discussions with industry experts.

Table 4.20: Pillars and Elements of Technology & Industrial Revolution Relevant to Land



### Transport and Transport via Pipelines Sector

No.	Pillars of Technology and Industrial Revolution	Technology Elements based on Discussion during FGD and Interview
1	Big Data Analytic	Predictive maintenance, route optimization, customer behavior analysis, network analysis (bottleneck), safety and security analysis
2	Cloud Computing	Fleet management supply chain management, customer relationship management, data storage and management, collaboration and communication among employees and partners
3	Internet of Things	Intelligent transportation system (traffic flow, vehicle tracking, incident management), vehicle tracking and management, smart parking, predictive maintenance environmental monitoring
4	System Integration	Integration of transportation and logistics system, integration of passenger information system, integration of payment system (cashless), integration of ticketing system, integration of maintenance system
5	Cyber-Security	Firewalls, intrusion detection system, regular software updates, securing payment systems (encryption, multi-authentication), protecting connected vehicles
6	Augmented Reality	Real world information in maintenance, training, fleet management, pipeline inspection by providing visual overlays that highlight potential issues
7	Simulation	Tool for traffic management, rail network design, logistics planning, fleet management
8	Autonomous	Autonomous is being used to develop self-driving vehicles and unmanned system without human intervention.
9	Artificial Intelligence	Real-time Monitoring of Pipelines for predictive maintenance for train, rail, lane, vehicles and pipelines., for route optimization, Intelligent Traffic Management Systems

Based on discussions with experts, these are just a few examples of how IR can be used

in the land transportation service industry. By embracing the possibilities of new technology, transportation companies may enhance operations, save costs, and improve customer experience, positioning themselves for success in a rapidly changing industry. The growing demand for technological skills explains a variety of explanations, including, at the very least, the pandemic's lack of physical interaction. These gains do not appear to be diminishing as quickly as the pandemic; rather, Land Transport and Pipeline Transport will continue to ramp up their digitization efforts.

Figure 4.12 to Figure 4.14 depicts the impact of these IR pillars on each group's task area based on percentage (%). Only feedback from a similar sector based on job area is obtained for this question. It is due to only that industry is more acquainted with the technologies that can be applied in their sector. Based on these figures, it shows variety of IR used in the industries operation. For instance, for Group 491, system integration scored 100% for each job area. Based on discussion with experts in rail, the system integration also affects the Freight Cargo Train Operation. For Group 492, cable car and hill tram scored the highest affect of IR from system integration element. However, for this group the most impacted IR based on the highest score between job areas is still on system integration. For Airport Shuttle OCC, only simulation do not really affect this operation. For Automated People Mover operation, system integration, augmented reality, simulation, and autonomous affect this job area. For Group 493, the highest affect of IR for all job areas is on Big Data Analytics and Simulation element.

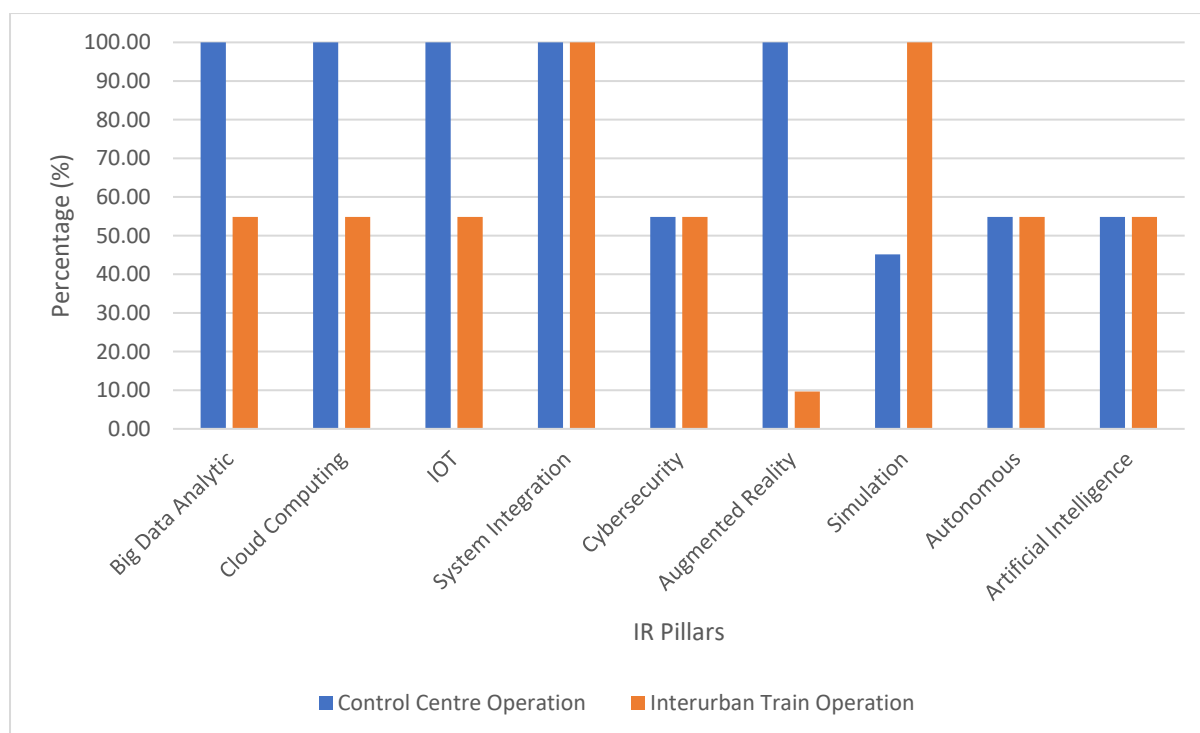


Figure 4.12: Effect of IR based on Job Area (Group 491)

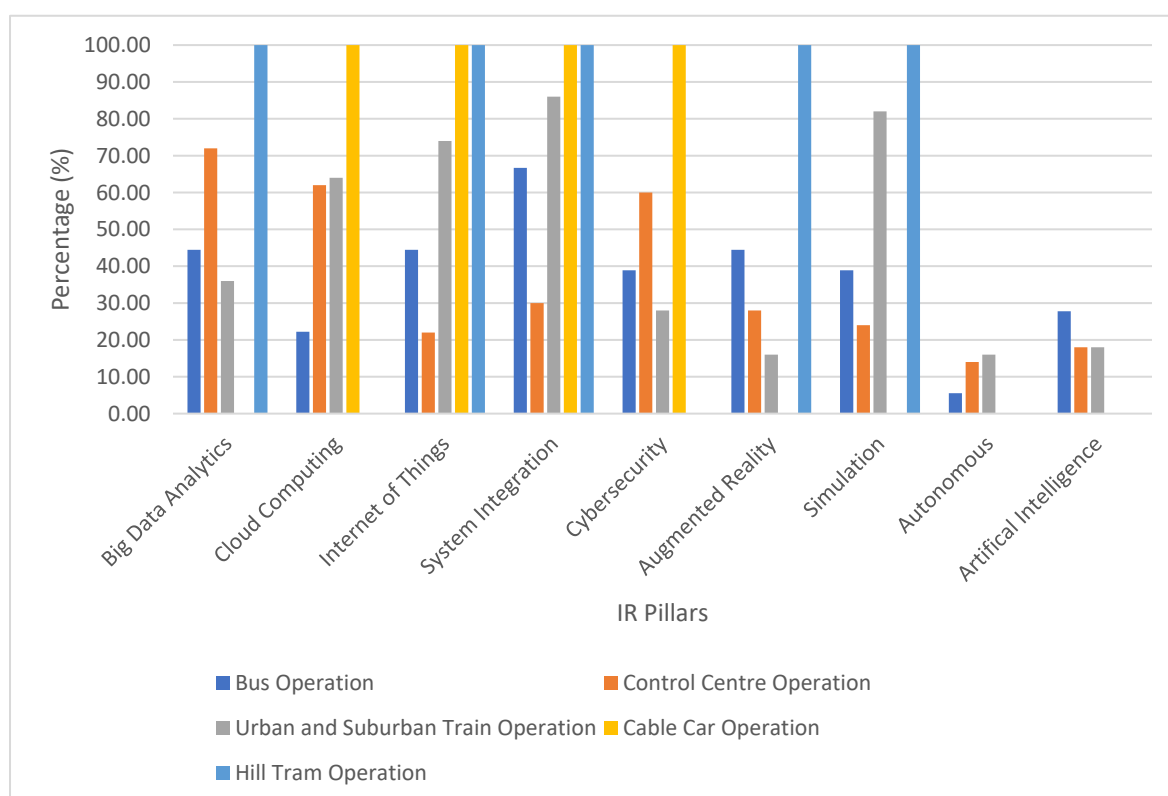


Figure 4.13: Effect of IR based on Job Area (Group 492)

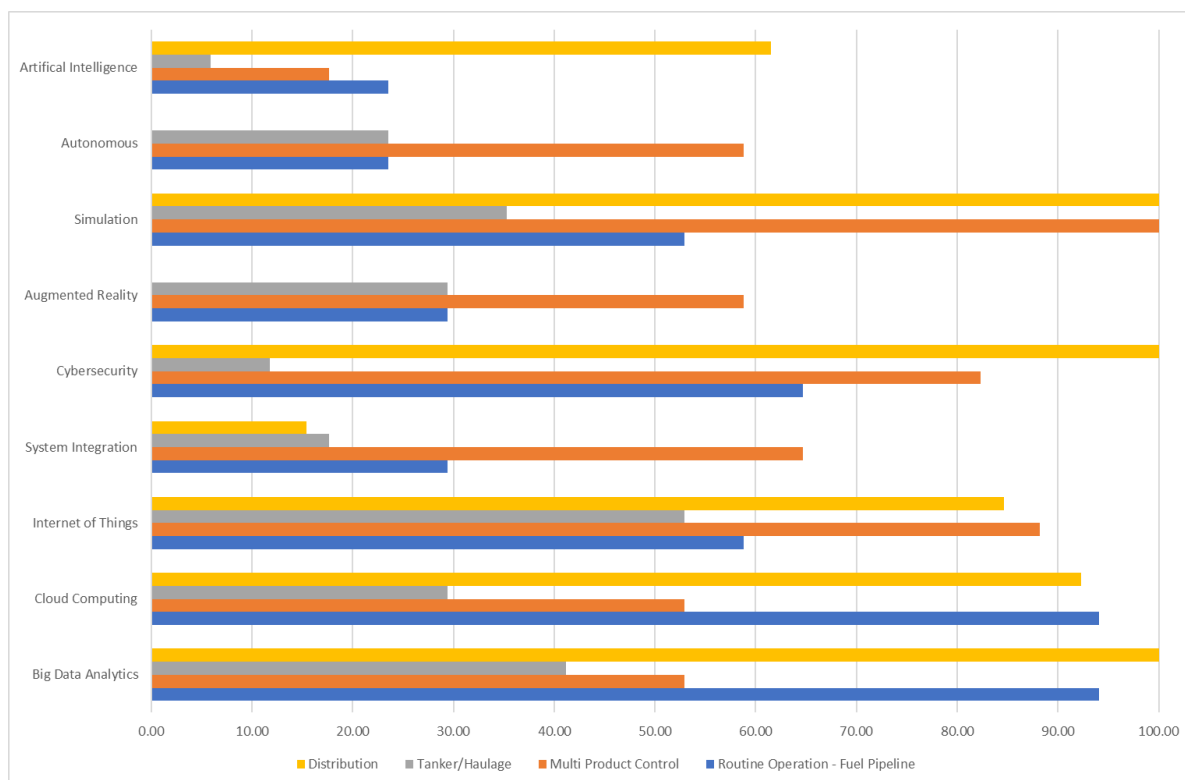


Figure 4.14: Effect of IR based on Job Area (Group 493)

## 4.9 Emerging Skills

Emerging skills are those that are expected to be vital to the sector soon based on recent developments, trends, government policy, or research, such as the technological revolution, sustainability challenges, and many others. Figure 4.15 shows emerging skills based on feedback from survey. The highest emerging skill required in group 491 is analytical solution, 46% followed by train operation system and station operation with 27%. Table 4.17 lists the emerging skills assessed as having a substantial impact on the sector's future, as well as the reasons for their demand for Group 491.

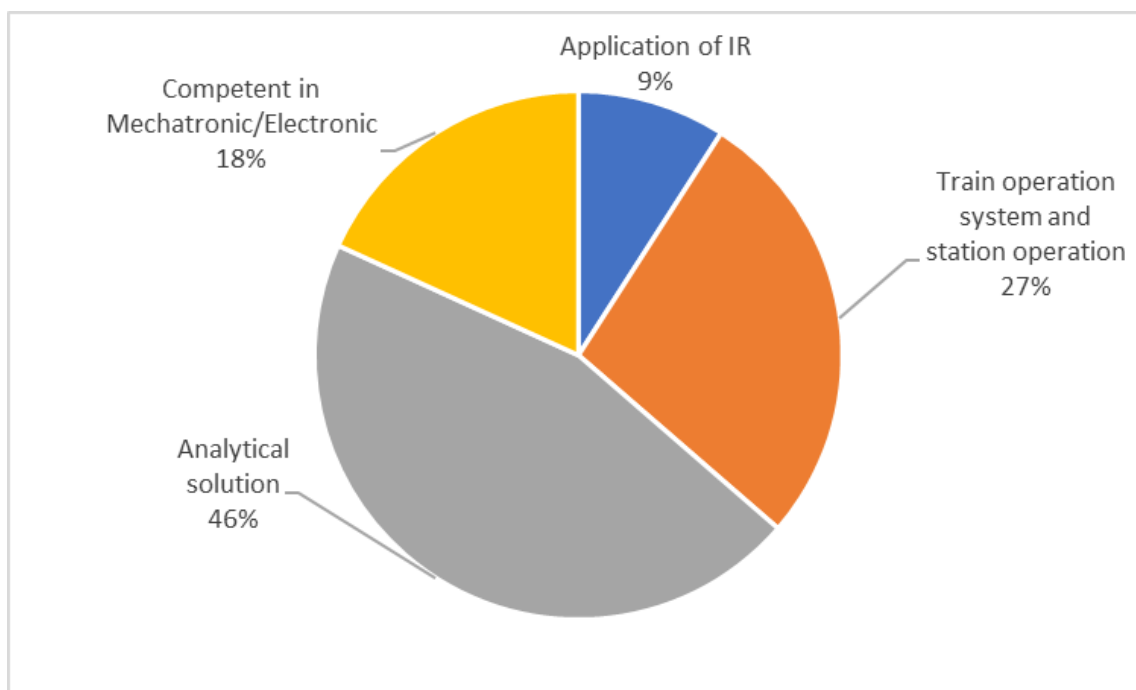


Figure 4.15: Emerging Skills Required By The Industry (Group 491)

Table 4.21: Emerging Skills and Requirement for Group 491

No	Future Emerging Skills	Reasons for the Requirement of Emerging Skills based on Survey
1.	Application of IR	All this skill important for the purpose of to analyze real time data to help improve reliability, availability and services.
2.	Analytical solution	To provide technical report tendency of failure and enhance new process and SOP.
3.	Train Operation system and station operation	To enhance skill among the train employees
4.	Competent Person in or mechatronics electronics	Useful for working environment that involve installation, evaluation, trouble shooting and design

Figure 4.16 shows the survey findings on emerging skill from Group 492. It shows quite similar response with Group 491. It demonstrates that driving competency scored at 100%, highlighting the value of driving ability in the sector, and that the implementation of IR in the cable car/hill tram sector scored at 100%. Additionally, the urban/suburban train industry's

100% result demonstrates the value of analytical solutions. Meanwhile, reasons for each response are tabulated in Table 4.20. For airport shuttle operation, knowledge in IoT, data analysis as well as decision making tools and applications will be crucial in the future competency skills. Reason for the requirement of these emerging skills are due to fast response, accurate information, fault proof methodology, right and precise decision making. All in all, these emerging skills can assist in improving the service and the operation of this sector.

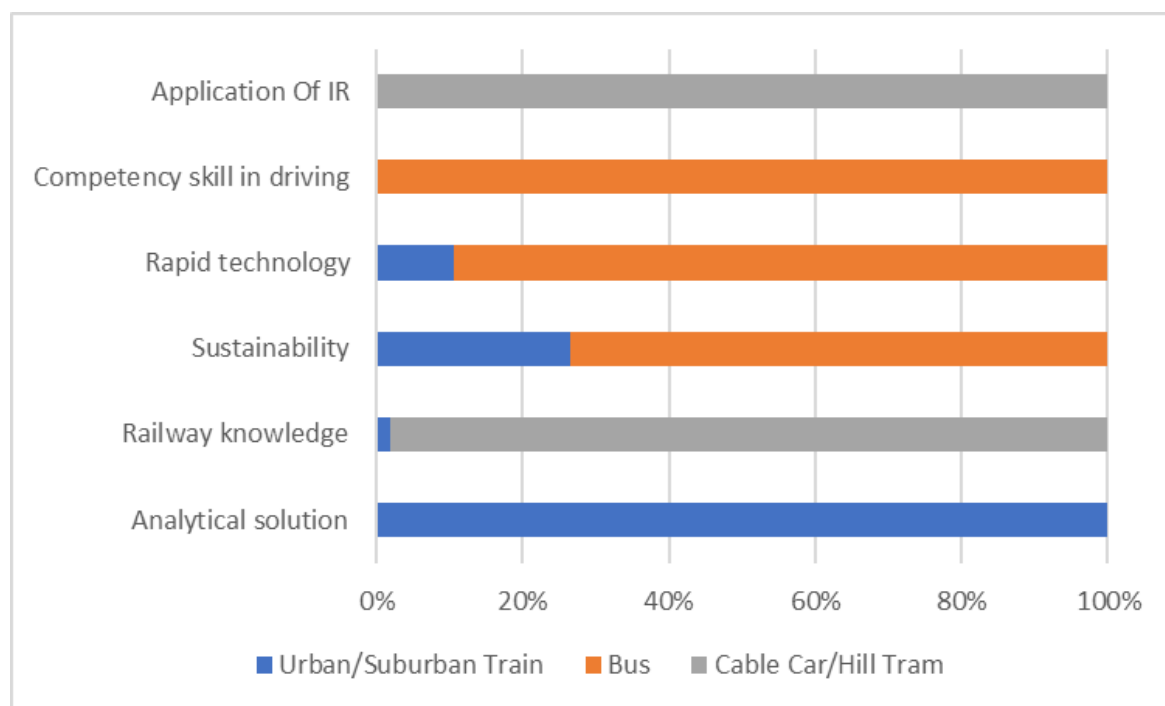


Figure 4.16: Emerging Skills Required By The Industry (Group 492)

Table 4.22: Emerging Skills and Requirement for Group 492

No	Future Emerging Skills	Reasons for the Requirement of Emerging Skills based on Survey
1.	Analytical solution	Technical skill for railways sector
2.	Railway knowledge	Rapid development of rail project
3.	Sustainability	Green energy etc.
4.	Rapid technology	Rapid technology in the industry
5.	Competency skill in driving	Enhancement of skills
6.	Application of IR	Improving system, operation and service

Figure 4.17 shows the survey findings on emerging skill from Group 493. It shows that water industry in Group 493 required more emerging skill such as application of IR and data analytical in contrast with oil and gas industry. Meanwhile, reasons for each response are quite similar to previous response in Group 491 and 492.

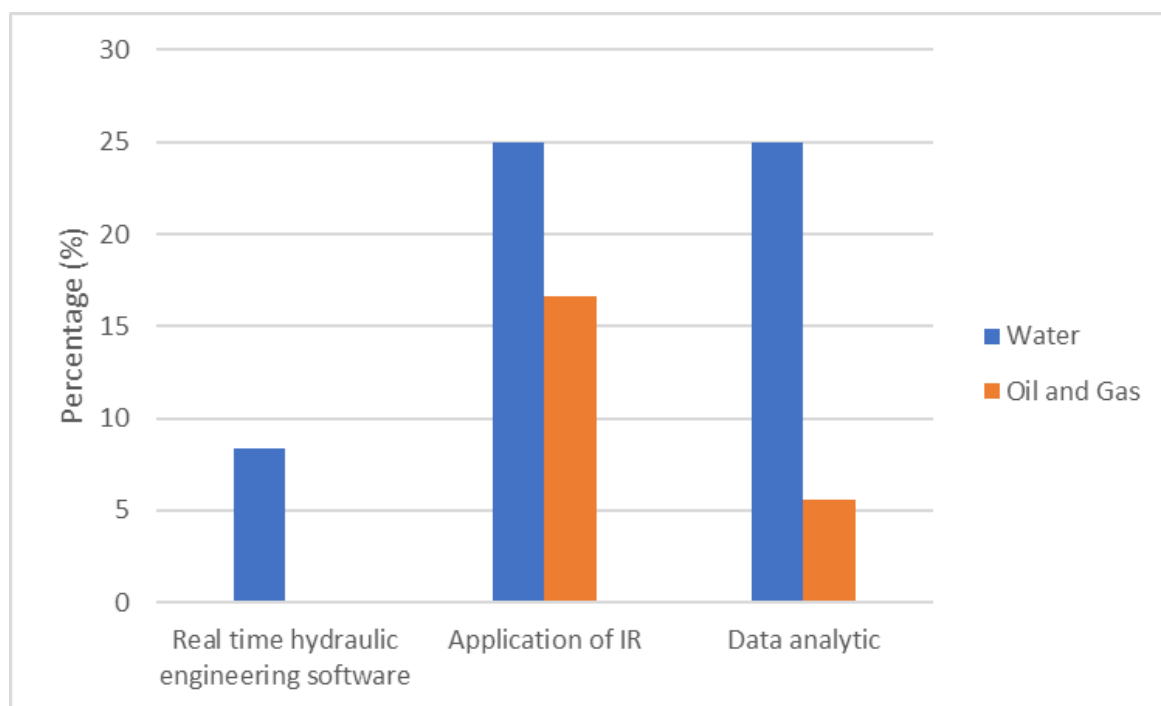


Figure 4.17: Emerging Skills Required By The Industry (Group 493)

In general, technology in general will make life easier. The expectations from changes or advancement in technology means the passengers will have the best experience in using the transport system. Elements like ease of communication, transaction processes, seamless/effortless transfer and on-time scheduling will contribute significantly in delighting the passengers' experience.

#### 4.10 Challenges Related to Land Transport and Transport Via Pipelines Activities

This section explores into the most common issues affecting this industry. Table 4.21 summarises survey and FGD responses. These three top issues were identified through the survey and discussed with experts during the FGD – insufficient manpower, low wages and pressure of maintaining profitability. However, for low wages, this issue not affected to the oil and gas industry. Figure 4.18 shows the elements for these main issues for this sector.

Table 4.23: Most Common Issues of Land Transport and Transport via Pipelines Sector

No	Key Issues	Discussions	Suggestions from FGD
1.	Insufficient manpower	<ul style="list-style-type: none"> <li>• Demanding work condition.</li> <li>• Unattractive wages and fringe benefits.</li> </ul>	<ul style="list-style-type: none"> <li>• Minimum wage policy.</li> <li>• Review wages scheme on productivity based.</li> <li>• Employee retention</li> <li>• Partner with educational institutions to attract new graduates and offer internships or apprenticeships to develop new talent.</li> </ul>
2.	Low wages	<ul style="list-style-type: none"> <li>• Salary wages does not match with productivity and job requirements.</li> </ul>	<ul style="list-style-type: none"> <li>• Profit sharing – changing the mindset of the managerial to create harmonise salary scheme.</li> <li>• Performance based pay</li> </ul>
3.	Pressure of maintaining profitability	<ul style="list-style-type: none"> <li>• Fluctuating demand - Transport companies can experience fluctuating demand for their services, which can make it difficult to forecast revenue and plan for capacity needs.</li> <li>• Rising costs - Transport companies face rising costs for fuel, labour, maintenance, and other expenses, which can eat into profit margins. This is especially true for long-haul trucking, where fuel costs</li> </ul>	<ul style="list-style-type: none"> <li>• Develop long-term strategic plans that include forecasting demand, identifying opportunities for growth, and planning for potential challenges.</li> <li>• Implement strategies to manage costs, such as optimizing routes, reducing fuel consumption, and adopting more efficient technologies.</li> <li>• Compliance with regulations by investing in training and development for employees, adopting best practices, and</li> </ul>



No	Key Issues	Discussions	Suggestions from FGD
		<p>can account for a significant portion of operating expenses.</p> <ul style="list-style-type: none"> <li>• Regulation - The transport sector is subject to a range of regulations that can impact profitability. For example, environmental regulations may require transport companies to invest in cleaner vehicles or adopt more fuel-efficient practices, which can be expensive.</li> <li>• Technology - Example, adopting autonomous vehicles or other advanced technologies requires a significant investment in research and development, as well as in training employees to use these new tools.</li> </ul>	<p>staying up to date with industry standards.</p>

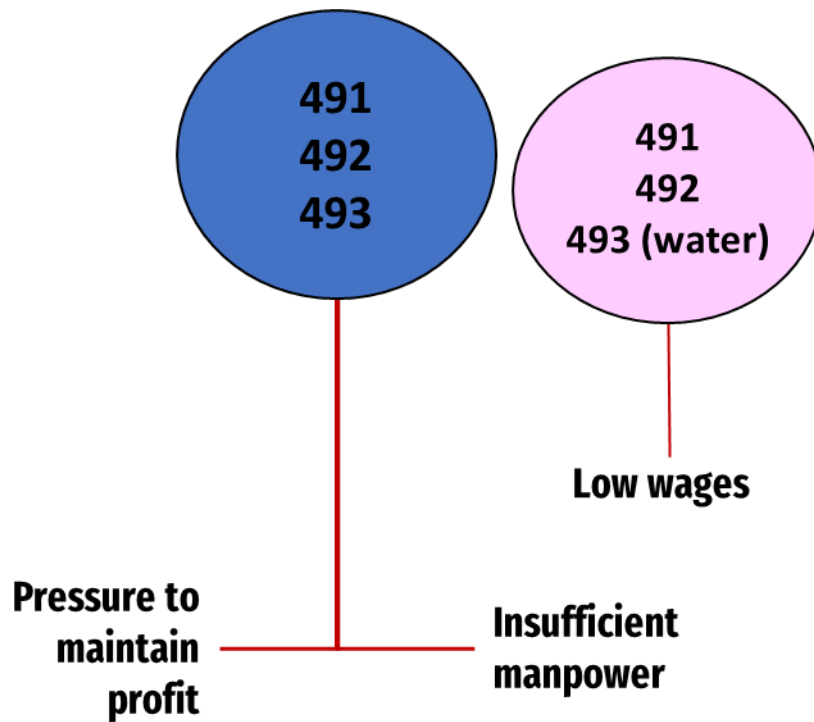


Figure 4.18: The Most Common Issues in This Sector

Figure 4.19 to Figure 4.21 shows the findings related to issues in this sector. Based on the survey, issues among agreement on issues among each group is different. For Group 491, insufficient manpower scored the highest agreement (refer to scale of 4). The least agreement for Group 491 is on high dependency on foreign labour (refer to scale of 1). Most respondents agreed that insufficient manpower, low skilled workforce, high labour cost charge by sub-con and pressure to maintaining profit are the highest related issues Group 491 (scored more than 50%). For Group 492, insufficient manpower and rapid technological change scored the highest agreement (refer to scale of 4) (scored more than 50%). Like Group 491, the least agreement for Group 492 is on high dependency on foreign labour (refer to scale of 1).

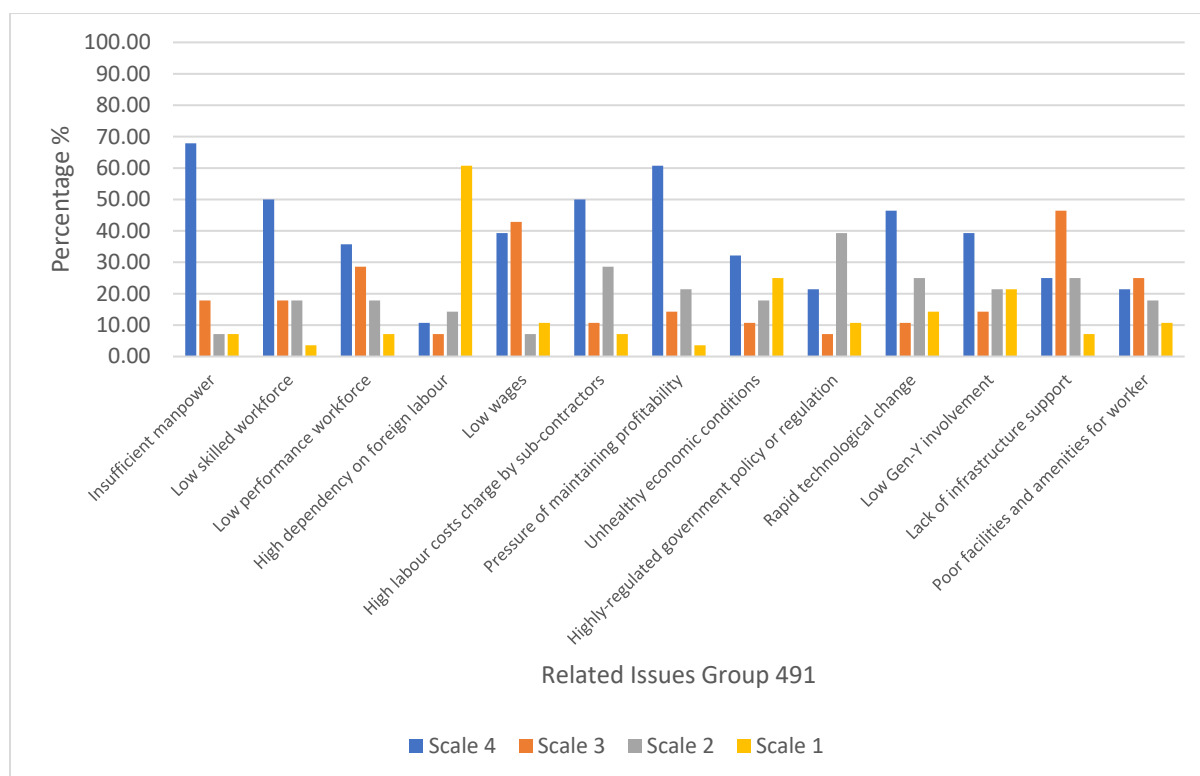


Figure 4.19: Related Issues in Group 491

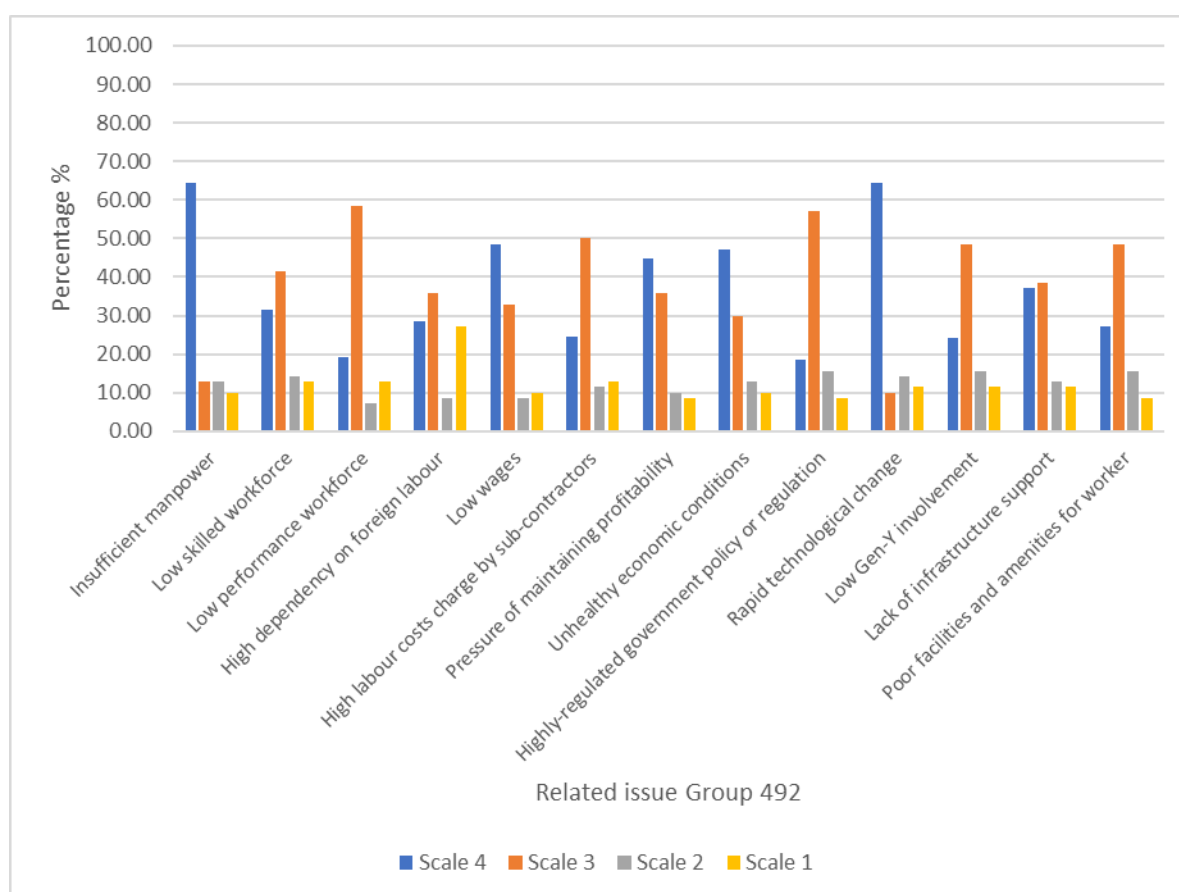


Figure 4.20: Related Issues in Group 492

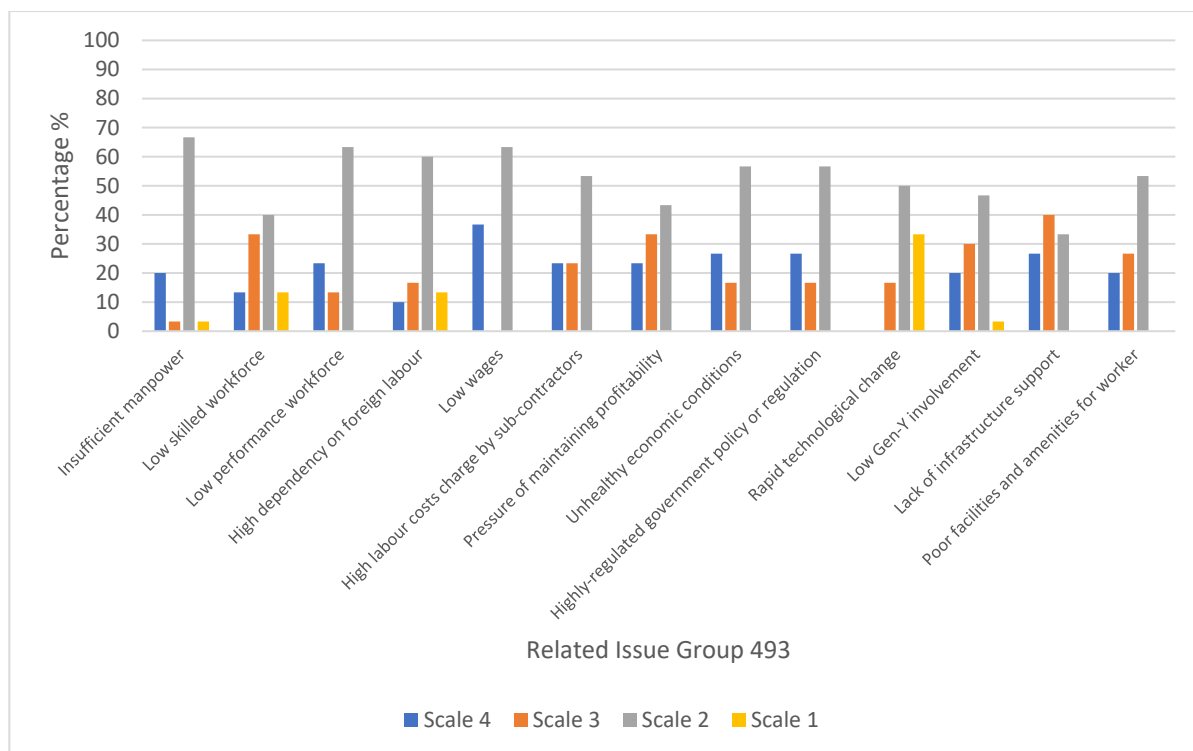


Figure 4.21: Related Issues in Group 493

Figure 4.21 shows the related issues in Group 493. Group 493, low wages scored the highest agreement (refer to scale of 4). Based on the survey findings, respondents for this issue are highlighted by the employees from water industry. The least agreement for Group 493 is on rapid technological change (refer to scale of 1). However, based on the survey, there are also other issues related to this sector, such as:

- issues (i.e: delay in public transportation operation such as connectivity between train station) that spread quickly even though the issues are considered minor by the industry may affect the image of this transport service sector, and
- supply support part and assembly program from Original Equipment Manufacturer.

#### 4.11 Mapping OS to Available NOSS

The industry is concerned about knowledge and talent deficits, as was previously mentioned. It is essential that the training curriculum, which includes requirements for certification, be updated. A mapping between the created OS and NOSS is presented below in light of this. The upcoming NOSS should concentrate on upgrading and adapting current NOSS to the OS, and only then, utilising the guidelines in the OF, can a new set of NOSS be generated for an area that has not yet been developed. As a result, Table 4.22 until Table 4.25 for each group provided a mapping of the occupational structure and accessible NOSS.

Table 4.42: Mapping Existing NOSS with OS (H491) (1/2)

<b>MSIC SECTION</b>	<b>(H) TRANSPORTATION AND STORAGE</b>		
<b>MSIC DIVISION</b>	<b>(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES</b>		
<b>MSIC GROUP</b>	<b>(491) Transport via railways</b>		
<b>AREA LEVEL</b>	<b>Interurban Passenger Rail Operation</b>	<b>Interurban Passenger ETS Operation</b>	<b>Interurban Train Operation Control Center</b>
<b>LEVEL 8</b>	NJT	NJT	NJT
<b>LEVEL 7</b>	NJT	NJT	NJT
<b>LEVEL 6</b>	<b>Head of Interurban Passenger Rail Operation</b>	<b>Head of Interurban Passenger ETS Operation</b>	<b>Head of Operation Control Center</b>
<b>LEVEL 5</b>	<b>Assistant of Head of Interurban Passenger Rail Operation</b>  H491-001-5:2017 Railway Signalling and Communication Management TP-710-5:2016 Railway Operations & Control Management H491-005-2:2020 Railways Station Operation	<b>Assistant of Head of Interurban ETS Operation</b>  H491-001-5:2017 Railway Signalling and Communication Management TP-710-5:2016 Railway Operations & Control Management H491-005-2:2020 Railways Station Operation	<b>Assistant Head of Operation Control Center</b>  H491-001-5:2017 Railway Signalling and Communication Management TP-710-5:2016 Railway Operations & Control Management

MSIC SECTION	(H) TRANSPORTATION AND STORAGE		
MSIC DIVISION	(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES		
MSIC GROUP	(491) Transport via railways		
AREA LEVEL	Interurban Passenger Rail Operation	Interurban Passenger ETS Operation	Interurban Train Operation Control Center
LEVEL 4	<b>Train Operation Executive</b>  TP-710-4:2016 Railway Operations & Control Administration H491-004-3:2020 Rail Operation Control	<b>ETS Captain</b>  TP-710-4:2016 Railway Operations & Control Administration	<b>Chief Controller</b>  TP-710-4:2016 Railway Operations & Control Administration H491-001-4:2017 Railway Signalling and Communication Coordination
LEVEL 3	<b>Train Driver Supervisor</b>  H491-005-3:2020 Railways Station Operation Supervision TP-711-3:2014 EMU Operation Supervision TP-720-3:2014 Locomotive Driver Supervision H491-004-3:2020 Rail Operation Control	NJT	<b>Control Center Operation Controller</b>
LEVEL 2	<b>Train Driver</b>  TP-711-2:2014 EMU Operation TP-720-2:2014 Locomotive Driving Operation	NJT	NJT
LEVEL 1	<b>Assistant Locomotive Driver</b>	NJT	NJT

Table 4.25: Mapping Existing NOSS with OS (H491) (2/2)

<b>MSIC SECTION</b>	<b>(H) TRANSPORTATION AND STORAGE</b>		
<b>MSIC DIVISION</b>	<b>(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES</b>		
<b>MSIC GROUP</b>	<b>(491) Transport via railways</b>		
<b>AREA LEVEL</b>	<b>Freight Cargo Operation</b>	<b>Freight Cargo Coordination</b>	<b>Freight Cargo Support Operation</b>
<b>LEVEL 8</b>	NJT	NJT	NJT
<b>LEVEL 7</b>	NJT	NJT	NJT
<b>LEVEL 6</b>	<b>Head of Freight Cargo Operation</b>	<b>Head of Freight Cargo Coordination</b>	<b>Head of Freight Cargo Support Operation</b>
<b>LEVEL 5</b>	<b>Assistant Head of Freight Cargo Operation</b>  TP-710-5:2016 Railway Operations & Control Management	<b>Assistant Head of Freight Cargo Coordination</b>  TP-710-5:2016 Railway Operations & Control Management TP-710-4:2016 Railway Operations & Control Administration	<b>Assistant Head of Freight Cargo Support Operation</b>  TP-710-5:2016 Railway Operations & Control Management TP-710-4:2016 Railway Operations & Control Administration
<b>LEVEL 4</b>	<b>Head of Terminal</b> TP-710-4:2016 Railway Operations & Control Administration	<b>Head of Terminal</b> TP-710-4:2016 Railway Operations & Control Administration	<b>Head of Terminal</b> TP-710-4:2016 Railway Operations & Control Administration
<b>LEVEL 3</b>	<b>Head of Yard</b>	<b>Under Foreman</b>	<b>Head of Shunting</b>
<b>LEVEL 2</b>	<b>Shunting Driver</b>  TP-711-2:2014 Locomotive Driving Operation	<b>Shunting Driver</b>  TP-711-2:2014 Locomotive Driving Operation	<b>Shunting Driver</b>  TP-711-2:2014 Locomotive Driving Operation
<b>LEVEL 1</b>	NJT	NJT	NJT

Table 4.26: Mapping Existing NOSS with OS (H492)

<b>MSIC SECTION</b>	<b>(H) TRANSPORTATION AND STORAGE</b>			
<b>MSIC DIVISION</b>	<b>(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES</b>			
<b>MSIC GROUP</b>	<b>(492) Other Land Transport</b>			
<b>AREA LEVEL</b>	<b>Bus Operation</b>	<b>BOCC</b>	<b>Urban and Suburban Passenger Rail Operation</b>	<b>Urban and Suburban Operation Control Center</b>
<b>LEVEL 8</b>	NJT	NJT	NJT	NJT
<b>LEVEL 7</b>	NJT	NJT	NJT	NJT
<b>LEVEL 6</b>	NJT	NJT	<b>Head of Passenger Rail Operation</b>	<b>Head of Train Operation Control Centre</b>
<b>LEVEL 5</b>	<b>Head of Bus Operation</b>	<b>Head of BOCC</b>	<b>Assistant Head of Passenger Rail Operation</b> H491-001-5:2017 Railway Signalling and Communication Management TP-710-5:2016 Railway Operations & Control Management TP-710-4:2016 Railway Operations & Control Administration	<b>Assistant Head of Train Operation Control Centre</b>  H491-001-5:2017 Railway Signalling and Communication Management TP-710-5:2016 Railway Operations & Control Management TP-710-4:2016 Railway Operations & Control Administration
<b>LEVEL 4</b>	<b>Assistant Head of Bus Operation</b>	<b>Assistant of BOCC</b>	<b>Train Executive</b>  TP-710-4:2016 Railway Operations & Control Administration H491-004-3:2020 Rail Operation Control TP-710-5:2016 Railway Operations & Control Management	<b>Chief Controller</b>  H491-001-4:2017 Railway Signalling and Communication Coordination TP-710-4:2016 Railway Operations & Control Administration
<b>LEVEL 3</b>	<b>Supervisor</b>  H492-001- 3:2017 Road Transportation Safety Management	<b>Traffic Controller</b> H492-001- 3:2017 Road Transportation Safety Management	<b>Train Supervisor</b>  H491-005-3:2020 Railways Station Operation Supervision TP-711-3:2014 EMU Operation Supervision TP-720-3:2014 Locomotive Driver Supervision (for Train Sabah State Railway)	<b>Train Controller Operator</b>



MSIC SECTION	(H) TRANSPORTATION AND STORAGE			
MSIC DIVISION	(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES			
MSIC GROUP	(492) Other Land Transport			
			H491-004-3:2020 Rail Operation Control	
LEVEL 2	Bus Driver	NJT	<b>Train Driver</b>  TP-720-2:2014 Locomotive Driving Operation (for Train Sabah State Railway) TP-711-2:2014 EMU Operation H491-005-2:2020 Railways Station Operation	NJT
LEVEL 1	NJT	NJT	NJT	NJT

Table 4.27: Mapping Existing NOSS with OS (H493)

MSIC SECTION	(H) TRANSPORTATION AND STORAGE			
MSIC DIVISION	(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES			
MSIC GROUP	Transport via Pipeline (Water)			
	Tanker/Haulage Operation	Transport via Pipeline Operation		
AREA LEVEL	Tanker/Haulage Operation	Routine Operation – Liquid and Gaseous Fuel Pipeline	Multi-product Pipeline Control	Pipeline Distribution Operation
LEVEL 8	NJT	NJT	NJT	NJT
LEVEL 7	NJT	NJT	NJT	NJT
LEVEL 6	NJT	NJT	NJT	NJT
LEVEL 5	Operation Manager	Operation Manager	Operation Manager	Distribution Manager
LEVEL 4	Operation Executive / Driver Trainer	Operation Engineer	Planner	<b>Engineer / Executive</b> CM-021-4:2014 Water Distribution Operation

<b>MSIC SECTION</b>	<b>(H) TRANSPORTATION AND STORAGE</b>			
<b>MSIC DIVISION</b>	<b>(49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES</b>			
<b>MSIC GROUP</b>	<b>Transport via Pipeline (Water)</b>			
	<b>Tanker/Haulage Operation</b>	<b>Transport via Pipeline Operation</b>		
				Management
<b>LEVEL 3</b>	<b>Driver Supervisor</b> H492-001-3:2017 Road Transportation Safety Management	<b>Operation Executive</b> H492-001-3:2017 Road Transportation Safety Management	<b>Shift Supervisor</b>	<b>Supervisor</b> CM-021-3:2014 Water Distribution Supervision
<b>LEVEL 2</b>	<b>Driver</b>	<b>Operation Technician</b>	<b>Control Room Operator</b>	<b>Operator</b> CM-021-2:2014 Water Distribution Operation
<b>LEVEL 1</b>	NJT	NJT	NJT	<b>General Worker</b>

Based on the above Tables, currently, only 16 NOSS have been developed that are related to H49 industries as mentioned in Chapter 2 mapped to the current OS. As indicated in the above Tables, there are also many NOSS that are connected to a single job title. This is because the OS job title covers under the H49 groups, whereas the developed NOSS is focused on a single product. In addition, the previous document of OF H49 already mapped NOSS accordingly. However, most of it was removed due to unrelated and belong to other group according to MSIC 2008 due to activities that are not related specifically for Section H49. To conclude, the NOSS document needs to be created for the important job titles stated in the OS. Below is list of current NOSS as in Chapter 2 that not listed in this section with their reasons:

- a) Due to maintenance activity (Division 33, Group 331): H491-001-3: 2017, H491-001-2: 2017, H491-002-5: 2017, H491-002-4: 2017, H491-002-3: 2017
- b) Due to on board service (service, not operation, Section 52 Group 522): H491-003-3: 2020, H491-003-2:2020

- c) Due to inspection activity (Division 33, Group 331): TP-720-1:2014
- d) Due to terminal activity (Division 52 Group 522): IL-010-5:2012, IL-010-4:2012, IL-010-3:2012
- e) Due to pipeline installation supervision (Division 36 Group 360): H493-001-3:2019, H493-001-2:2019

#### **4.12 Conclusion**

This chapter discussed the research findings based on document review, survey, and FGD as well as interview with industry representatives. The development of the Occupational Structure (OS), Occupational Responsibilities (OR), and Occupational Description (OD) for the Land Transport and Transport via Pipelines sector are three primary findings that have been delivered in Section 4.3 to Section 4.5. The OS and OR not only provide information on job competency, job areas applicable, and skill level based on MOSQF level descriptors, but they also reflect alternative career routes within the Land Transport and Transport via Pipelines sector. The professions and skills in demand, as well as the specific methods offered by various parties to bridge the skills gaps within the industry, are further clarified so that the stakeholders involved might overcome such problems. In addition, job relevant to technology and industrial revolution also have been elaborated in this chapter. Emerging skills and challenge related to this sector also have been explained in this chapter. Mapping OS to available NOSS also has been tabulated in this chapter. The next Chapter will go over the debates, recommendations, and conclusion based on the general findings of this OF.

## **CHAPTER V**

### **DISCUSSION, RECOMMENDATIONS AND CONCLUSION**

#### **5.1 Introduction**

This chapter provides the main outlines of the findings gained throughout the Occupational Framework (OF) for Land Transport and Transport via Pipelines. The objective of this chapter is to provide a comprehensive discussion, recommendations, and conclusion based on the findings of the study on the Occupational Structure (OS) for Land Transport and Transport via Pipelines. The research has completed all of the research objectives that were thoroughly addressed in Chapter 4 and will be finalised in this chapter.

To achieve these objectives, a mixed-methods study approach was employed, applying a variety of data collection techniques, including document review, focus group discussion, interview, and survey. The findings of this study will guide workforce planning, training and development, recruitment and retention, and other human resource management practises with respect to the occupational structure, responsibilities, and job descriptions for the sector.

This chapter will discuss the main findings of the study, including the establishment of the occupational structure, responsibilities, and job descriptions for each group in these industries. The chapter will also include recommendations based on the findings of the study, including the identification of critical job titles and proposed job titles related to the current national technological and industrial revolution. This chapter will present the study's conclusions and contributions to the field of workforce development in the Land Transport and Pipeline Transport sector.

## 5.2 Discussion

The discussion in this section will be organized according to the research objectives, with each objective being addressed separately.

### 5.2.1 Objective 1: Establishment of Occupational Structure (OS)

- **To establish OS for the Land Transport and Transport Via Pipelines sector based on MSIC 2008 by examining job areas, job titles and relevant competency level.**

Under Division H49 of MSIC 2008, 18 job areas have been identified. Figure 4.3 depicts all job areas under H49. Meanwhile, Table 4.2 in Chapter 4 shows the overall job title in H49. A total of 77 job titles have been identified, including 33 critical job titles and 30 industrial revolution-related job titles, which all be included in the OS. The description of the absence of Occupational Structure for some economic activities has also been explained in Section 4.3. This is mainly caused some job activities do not have firm aggregate distribution of work structure. With eight job areas, Group 492 has the greatest number of job areas. Meanwhile, Groups 491 and 493 have six and four job areas, respectively. Table 4.3, Table 4.6 and Table 4.10 in Chapter 4 show the description of each job area based on group in H49. Meanwhile, Table 4.4, Table 4.5, Table 4.7, Table 4.8, Table 4.9, Table 4.11 and Table 4.12 tabulate the OS and summary of job title for each group under H49.

These job areas are listed as follows: H491: (1) Interurban Passenger Rail Operation, (2) Interurban Passenger ETS Operation, (3) Interurban Train Operation Control Centre, (4) Freight Cargo Train Operation, (5) Freight Cargo Train Coordination, (6) Freight Cargo Train Support Operation; H492: (7) Bus Operation, (8) Bus Operation Control Centre (BOCC), (9) Urban and Suburban Passenger Rail Operation, (10) Urban and Suburban Train Operation Control Center, (11) Cable Car Operation, (12) Hill Tram Operation, (13) Automated People Mover Operation, (14) Automated People Mover Operation Control Centre (OCC) or known as Airport Shuttle OCC; H493: (15) Tanker/Haulage Operation, (16) Routine Operation – Liquid and Gaseous Pipeline, (17) Multi-Product Pipeline Control, and (18) Pipeline Distribution Operation. The job titles in this table are highlighted with an asterisk (\*) if they are either a critical job or a job relevant to the technological and industrial revolution, or both. In addition, the lowest level in this sector is Level 1, while the highest level is Level 6. Table 4.4 until Table 4.9 in Chapter 4 shows the OS for H49. Figure 5.1 shows the number of job

areas and job titles for H49.

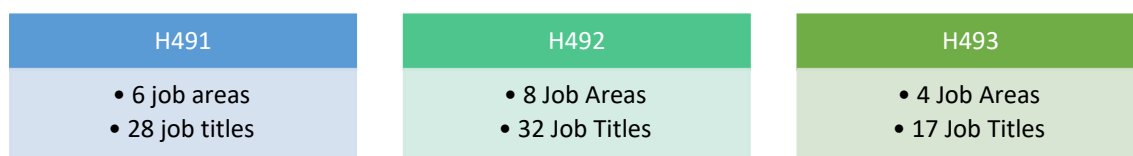


Figure 5.1: Number of Job Areas and Job Title for H49

The number of job areas and titles identified for each group reflects the niche character of the Land Transport and Transport via Pipelines and the specific skill sets required for each job area. Operation that involves passenger and other commodities are the primary elements within this industry. In conclusion, this sector offers a vast array of employment opportunities, with a variety of job levels and areas of expertise to look into. This information is also useful for companies and decision-makers seeking to increase their competitiveness and adapt to the altering market demands.

### 5.2.2 Objective 2: Occupational Responsibilities (OR)

- **To establish OR that outline the main work activities and tasks for each job titles**

The OR describes the main duties associated with each of the job titles in the OS. These responsibilities also match with the relevant area and level of each individual position in the Land Transport and Transport via Pipelines sector. The OR will act as the future reference for the development of the National Occupational Standards Specification (NOSS) for the Land Transport and Transport via Pipelines activity that falls under the MSIC 2008, Division H49. The OR can be found in Table 4.13 until Table 4.17. The results of this analysis provide a comprehensive overview of the occupational responsibilities of the industry and provide insights into the skills and competencies required for different roles. This information is valuable for industry players and decision makers who are looking to improve their competitiveness and meet the changing demands of the market, as well as for job seekers who want to understand the requirements for different positions within the industry.

### 5.2.3 Objective 3: Occupational Descriptions (OD)

- **To establish OD for each job title in demand based on the proposed OS.**

The OD for this part was gathered through FGD, interviews, and review of related documents. These OD will serve as the primary reference for the development of the NOSS, which will emphasize on the specifics of required competencies for each job scope. Description of each critical job title that consist of summary of responsibility, skill, knowledge and attribute have been demonstrated in Annex 3. In total for job in demand, based on Table 4.16, there are nine jobs in demand in the main operations of Group 491, with nine identified as critical by experts. For Group 492, there are 19 jobs in demand, with 16 job titles classified as critical. For Group 493, there are 10 jobs in demand, with eight determined as critical jobs.

The discussion with the SMEs with the input from survey findings also identified the several factors as illustrated in Figure 4.4 under Chapter 4 as the reasons for the shortage of jobs in demand. It shows that eight reasons to the shortage of jobs in demand; i) remuneration offered not par with skills and experiences, ii) lack of suitable candidates in term of qualifications, right knowledge, skill and experience, iii) less salary, iv) standard of career perception, v) not interested with job and shift work, vi) no flexibility, vii) industrial exposure to high education system and viii) lack of promotion. Less salary and lack of promotion in job is the top reasons for this shortage. To address these challenges, companies and academic institutions need to work together to provide practical experience, competitive compensation, relevant skills training, employee retention strategies, and career growth opportunities.

As depicted in Table 4.18 under Section 4.6, job in demand and critical jobs are gathered based on findings from FGD and interview sessions, as well as survey findings. According to discussions with experts in the field, all the jobs listed in this section are in high demand because this position is vital for ensuring the operation runs efficiently. Nonetheless, jobs are relatively easy to fill, despite requiring specialised skill sets. Several efforts have been made to improve the career image of the transport sector in order to retain skilled employees in this sector, particularly in rail transport, in response to government and related agencies initiatives.

### 5.2.4 Objective 4: Critical Jobs Titles

- **To identify the critical jobs titles in the Land Transport and Transport Via Pipelines sector**

Critical job titles were gathered based on discussion with experts during FGD and interview. The critical job titles were derived from the list of jobs in demand. Out of 38 jobs in demand, 35 job titles are identified as critical. The most critical job titles for the Land Transport and Pipeline Transport industry are tabulated in the OS and listed in Chapter 4. Table 5.1 shows list of critical job titles for the Land Transport and Transport via Pipelines sectors.

Table 5.1: The Critical Job Title

Group	Critical Job
491	<p>Interurban Passenger Rail Operation:</p> <ul style="list-style-type: none"> <li>i. Train Operation Executive</li> <li>ii. Train Driver Supervisor</li> <li>iii. Train Driver</li> </ul> <p>Interurban Passenger ETS Operation:</p> <ul style="list-style-type: none"> <li>i. ETS Captain</li> </ul> <p>Interurban Train Operation Control Centre:</p> <ul style="list-style-type: none"> <li>i. Chief Controller</li> <li>ii. Control Center Operation Controller</li> </ul> <p>Freight Cargo Operation/Coordination/Support Operation:</p> <ul style="list-style-type: none"> <li>i. Shunting Driver</li> </ul>
492	<p>Bus Operation:</p> <ul style="list-style-type: none"> <li>i. Bus Driver</li> </ul> <p>Bus Operation Control Centre:</p> <ul style="list-style-type: none"> <li>i. Controller</li> </ul> <p>Urban and Suburban Passenger Rail Operation:</p> <ul style="list-style-type: none"> <li>i. Train Executive</li> <li>ii. Train Driver</li> </ul> <p>Urban and Suburban Train OCC:</p> <ul style="list-style-type: none"> <li>i. Chief Controller</li> <li>ii. Train Controller Operator</li> </ul> <p>Cable Car Operation:</p> <ul style="list-style-type: none"> <li>i. Technical Executive</li> <li>ii. Technician</li> </ul> <p>Hill Tram Operation:</p> <ul style="list-style-type: none"> <li>i. Technician</li> </ul>



Group	Critical Job
	<ul style="list-style-type: none"> <li>ii. Driver</li> </ul> <p>Automated People Mover Operation:</p> <ul style="list-style-type: none"> <li>i. Executive</li> <li>ii. Technical Officer</li> <li>iii. Technician</li> </ul> <p>Automated People Mover Operation Control Centre:</p> <ul style="list-style-type: none"> <li>i. Engineer</li> <li>ii. Technical Officer</li> <li>iii. Control Centre Operator</li> </ul>
<b>493</b>	<p>Tanker/Haulage Operation:</p> <ul style="list-style-type: none"> <li>i. Operation Executive</li> <li>ii. Driver</li> </ul> <p>Routine Operation – Liquid and Gaseous Pipeline:</p> <ul style="list-style-type: none"> <li>i. Operation Engineer</li> <li>ii. Operation Technician</li> </ul> <p>Multi-Product Pipeline Control:</p> <ul style="list-style-type: none"> <li>i. Planner</li> <li>ii. Control Room Operator</li> </ul> <p>Pipeline Distribution Operation:</p> <ul style="list-style-type: none"> <li>i. Executive</li> <li>ii. Operator</li> </ul>

To address the talent shortage in the H49 sector, organisations must provide employees with hands-on experience, affordable salaries, relevant skills training, and career advancement opportunities. This is going to boost employee retention and contribute to attract new talent. In terms of specific competencies, Section 4.7 of Chapter 4 has highlighted several knowledge, skill, and attitude-related competencies. From the figures as stated in Section 4.7, it shows that different industries have different requirement on competencies. However, there are quite similarities in which are very important to every related industry particularly on the knowledge on standard operating procedure (SOP) as well as safety and security. It probably due to this sector is related to service operation which involves passenger, customer or end user and provide the delivery service under cargo operation. It also deals with dangerous goods as stated in Section 2.5.3 which involved strict procedures to handle with it. Hence, the knowledge on SOP as well as safety and security are very vital in ensuring the safety of all related parties within the service operation.

Overall, the competencies listed in Section 4.7 are very important to all job in the Land Transport and Transport via Pipelines regardless of the level and job titles. However, the level of importance may differ following the specific functional job responsibilities. Furthermore, the most common issue for this sector is pressure to maintain profit, insufficient manpower and less salary. It is hoped that with several efforts by the government and related agencies in promoting and supporting this sector, it will help to reduce the criticalness of these issues.

### **5.2.5 Objective 5: Job Title Related to Technology and Industrial Revolution**

- **To determine job title related to technology and industrial revolution for the Land Transport and Transport via Pipelines**

The integration of technology in industrial relations is driving significant changes in the job market and creating new job opportunities. As mentioned in Section 4.8, the Industrial Revolution also had an impact on the transportation industry. This situation has arisen because this technology provides a more accurate journey plan, a suitable emergency plan in the event of an accident, and a breakdown contingency plan. In accordance with the results of the survey, industrial revolution applications related to system integration had the greatest effect on Groups 491 and 492. Meanwhile, application related to big data and simulation are the greatest for Group 493. It is because the operation of the pipeline requires a great deal of monitoring, as it is difficult to predict what will occur inside the pipe when liquids and gases are involved. The findings shows that there is 30 Job Titles related to the Technology and Industrial Revolution. Majority of the jobs related to technology and industrial revolution are in Level 5 with 15 job titles, followed by Level 4 with 11 job titles, and Level 3 with 4 job titles.

Understanding the swiftly changing landscape of this sector necessitates a review of emerging skills. With technology playing an ever-increasing role in the transportation sector, it is essential for individuals and organisations to perpetually learn and sharpen these emerging skills in order to remain competitive. The findings regarding emerging skills will be beneficial for individuals seeking to enter this industry as well as for organisations seeking to upskill their workforces and maintain market competitiveness. This section will ensure that individuals and organisations have the necessary knowledge and competencies to succeed in this swiftly evolving industry by highlighting the most in-demand skills. Individuals and organisations will

remain competitive in the swiftly changing landscape of the land transport and transport via pipelines if they maintain these emerging skills. Based on the findings in Section 4.9 of Chapter 4, application of industrial revolution and analytic skill shows the highest emerging skill for all groups. Reason for the requirement of these emerging skills are due to fast response, accurate information, fault proof methodology, right and precise decision making. Mapping of current NOSS to the proposed OS also have been tabulated in Section 4.11 in Chapter 4. Justification for current NOSS that has been not mapped are also mentioned in this section.

### **5.3 Recommendations**

It is hoped that the outcome of this OF will be utilised as a reference to fulfil future intentions of developing qualified personnel and certifying Malaysians in this area, thereby enhancing the quality of the local sector and boosting Malaysia's worldwide competitiveness. There are a number of approaches for resolving or moderating the demand and supply of labour. It may involve developing and maintaining collaborations with other agencies or departments, as well as educational institutions, to boost external talent pools, and training current staff to match new skill requirements. The ultimate aim of the OF is to serve as a reference for the industry's future plans to develop skilled workers and certify Malaysians in this sector, with the aim of enhancing the quality of the local sector and ultimately boosting Malaysia's global competitiveness.

The OS was created by incorporating feedback from focus group discussions and it highlights the various job areas, job titles, and career paths based on competency levels. During the development of the OS, a number of challenges were identified for H49 industries in Malaysia. Taking these findings into consideration, recommendations have been proposed for this sector:

1. To continue and streamline efforts in NOSS development for areas under the sector in line with the findings of this analysis. This includes the development of the NOSS for the sectors and sub-sectors that are in demand and have not been developed. Currently, there are 30 NOSS are currently available, as indicated by the mapping of OF to NOSS. However, some of developed NOSS, also been used in other Section as it has mix of job scope even though under different job area. In addition, it is suggested to develop more NOSS, particularly for critical jobs;
2. To compliment Malaysia Standard Classification of Occupation (MASCO) with the additional job titles in the Land Transport and Transport via Pipelines sector;

3. To continuously promote the use of this OF by industry players in order to effectively improve the career structure of their employees;
4. To enhance collaboration with learning institution and related agencies to develop syllabus that matches the industry requirement.
5. The government and stakeholder need to take an action plan (such as provide incentive to logistics company that hired the local worker and conduct the training programs in order to increase the workforce performance) regarding the main issues related to the Land Transport and Transport via Pipelines sector.
6. To relate this document with the current policy and initiatives by the government and related agencies.

### **5.3 Limitation**

One of the primary limitations of this research is the short time frame for conducting a thorough literature review and data collection on the H49 Occupational Framework. The framework covers three distinct groups, including transport via railways, other land transport and pipeline transport. Each group has its own set of competencies and skills, making it challenging to conduct a comprehensive analysis in a limited amount of time. Furthermore, obtaining up-to-date data on industry growth, employment trends, and other relevant factors can also be challenging, particularly given the constantly evolving nature of the industry. As a result, this data for this research needs to be updated a few times in order to provide a complete and accurate picture of the current state of each group within the H49 division.

In summary, while this research provides valuable insights into the potential benefits of the H49 Occupational Framework, its limitations include the short time frame for literature review and data collection, the complexity of the framework's three distinct groups, and the rapidly evolving nature of the industry. Future research with a more extended time frame and more extensive data collection may be necessary to provide a more complete and accurate understanding of the competencies and skills required for each group within the H49 division.

## 5.4 Conclusion

In conclusion, the Occupational Framework is a document composed of a) the Occupational Structure, which identifies the job areas, job titles at different levels, which is classified according to the Malaysia Occupational Standard Qualification Framework (MOSQF) Level Descriptors; b) Occupational Descriptions (OD); c) Occupational Responsibilities (OR); and the Competency in demand. In total, there are 77 job titles with 18 job areas. Group 492 shows the largest job areas with eight job areas. Meanwhile, for Group 491 and Group 493, there are six and four job areas, respectively. Within these 18 job areas, there are 33 critical jobs, 30 job related to technology and industrial revolution for H49. This document also emphasises job in demand, critical jobs, emerging skills, and jobs related with technological and the industrial revolution. In addition, issues pertinent to this sector are discussed such as related to pressure in maintaining profitability, insufficient manpower and low wages. Various research approaches, including document analysis, focus groups with industry experts, interviews, and surveys, are used to achieve the conclusions. Both descriptive and content analysis were applied to the data. This document will serve as the primary guide for developing the NOSS and updating MASCO. Furthermore, it can help stakeholders to stay ahead of the curve and to anticipate and respond to changes in the industry.

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## **ANNEX 2: QUESTIONNAIRE**

**ANNEX 2: QUESTIONNAIRE****OCCUPATIONAL FRAMEWORK SURVEY****DIVISION H49 : LAND TRANSPORT AND  
TRANSPORT VIA PIPELINES****DEPARTMENT OF SKILLS DEVELOPMENT  
MINISTRY OF HUMAN RESOURCES****A. INTRODUCTION**

In collaboration with the Department of Skills Development (DSD), Ministry of Human Resources, the researcher is currently conducting an analysis on the Occupational Framework of the H49 Land Transport and Transport via Pipelines Sector.

The research aims to establish the Occupational Structure for the Land Transport and Transport via Pipelines Sector by examining job areas, job titles, and levels; determine the Occupational Description and Responsibilities for each job; examine the jobs and competencies in demand; identify critical job titles; and propose emerging job titles related to national technology and industry revolutions.

We would like to extend our heartfelt gratitude upon your cooperation in answering this survey. Please fill in where necessary in the form provided. Any recommendation is deeply appreciated. Thank you for your time and cooperation.

Your Sincerely,

H49 Researcher

## B. GENERAL INSTRUCTION

This survey is dedicated for all staff working under the Land Transport and Transport Via Pipelines. The term Land Transport and Transport Via Pipeline is based on the Malaysian Industrial Classification 2008 (MSIC 2008) under “Section H49 Land Transport and Transport Via Pipelines”.

Under this classification, transport activities refer to the following organization:

- i. **491 - Transport via railways:** Passenger rail transport and/or freight using railroad rolling stock on mainline networks (interurban, connected between cities, extensive geographic area), freight rail transport over short-line freight railroads (interurban)
- ii. **492 - Other land transport:** All land-based transport activities including rail transport as part of urban or suburban transport system (i.e: Light Rail Transit, Express Rail Link, Monorail)
- iii. **493 - Transport via pipeline:** Transport of gases, liquids, water, slurry, waste and other commodities via pipelines

This survey contains **SIX SECTIONS**. Please attempt all sections and select or fill in where applicable.

## C. SURVEY RESPONDENT DETAILS

Type of transport sector you represent (based on Section B).

*Please TICK (/) where appropriate*

- ☐ Rail Industry (Interurban)
- ☐ Rail Industry (Urban or Suburban)
- ☐ Other Land Transport
- ☐ Pipeline Transport (Water)
- ☐ Pipeline Transport (Oil and Gas Industry)
- ☐ Pipeline Transport (Slurry)
- ☐ Pipeline Transport (Waste)
- ☐ Other: \_\_\_\_\_

**SECTION 1: DEMOGRAPHY**

## 1. Age:

*Mark only one circle.*

- ☐ Below 30
- ☐ 31 - 40
- ☐ 41- 50
- ☐ Above 51

## 2. Gender:

*Mark only one circle.*

- ☐ Male
- ☐ Female

## 3. Overall numbers of years in the industry:

*Mark only one circle.*

- ☐ Below 5 years
- ☐ 6 – 10 years
- ☐ 11 – 20 years
- ☐ 21 – 30 years
- ☐ Above 31 years

## 4. Position in the organization:

*Mark only one circle.*

- a. Specialist/Managing Director/General Manager
- b. Manager
- c. Executive/Engineer
- d. Assistant Manager
- e. Fiel Engineer
- f. Others (*please specify*): \_\_\_\_\_

## 5. Location of your organization in Malaysia

*(Please specify the state only):* \_\_\_\_\_

## SECTION 2: COMPETENCY IN DEMAND

2.1 Listed below are a set of competency attributes (knowledge, skill and attitude) related to personnel involved in Land Transport and Transport via Pipelines. Rate the Level of Importance to the set of competency attributes by using the following 5 point Likert Scale:

**Scale:**

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Not at all Important	Slightly Important	Important	Fairly Important	Very Important

### 2.1.1 Knowledge

<b>No</b>	<b>Level</b> <b>Attribute</b>	<b>1:</b> <b>Not at all</b> <b>Important</b>	<b>2:</b> <b>Slightly</b> <b>Important</b>	<b>3:</b> <b>Important</b>	<b>4:</b> <b>Fairly</b> <b>Important</b>	<b>5:</b> <b>Very</b> <b>Important</b>
1	Policy					
2	Standard Operating Procedure					
3	Rules and Legislation of the Industry					
4	Safety and security					
5	Product knowledge					
6	Other (please specify):					

### 2.1.2 Skill

<b>No</b>	<b>Level</b> <b>Attribute</b>	<b>1:</b> <b>Not at all</b> <b>Important</b>	<b>2:</b> <b>Slightly</b> <b>Important</b>	<b>3:</b> <b>Important</b>	<b>4:</b> <b>Fairly</b> <b>Important</b>	<b>5:</b> <b>Very</b> <b>Important</b>
1	Technical skill					
2	Communication					



	skill					
3	Diagnostic skill					
4	Trouble / problem solving skill					
5	Administration skill					
6	Leadership skill					
7	Data collection and sorting skill					
8	Planning and forecasting skill					
9	Analytical skill					
10	Competent in using computer or laptop					
11	Competent in using other mechanical devices					
12	Information Technology					
13	Training and coaching					
14	English language competency					
15	Interpersonal					
16	Other (please specify):					

### 2.1.3 Attitude

No	Level Attribute	1: Not at all Important	2: Slightly Important	3: Important	4: Fairly Important	5: Very Important
1	Negotiation					
2	Teamwork					
3	Multi-tasking					
4	Flexibility					
5	Professionalism					

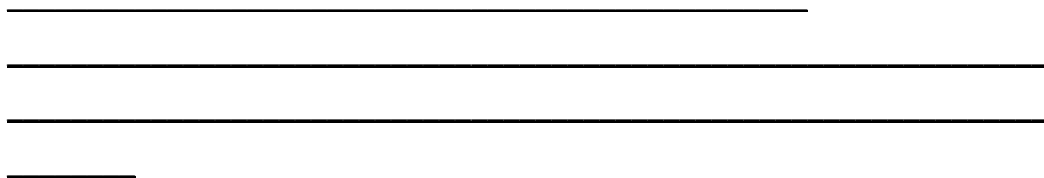
6	Attention to detail					
7	Resilience					
8	Agility					
9	Dependability					
10	Work ethic					
11	Career management (career growth and development, succession planning)					
12	Self-esteem					
13	Other (please specify):					

2.2 The current graduates, trainees, apprentices, and current workers possess the skills required by the industry. Please TICK (/) where appropriate in the box below.

Strongly Disagree	Disagree	Agree	Strongly Agree

2.3 What are the reasons for the skills gap (skills possessed by employees that do not match the competencies in demand by the industry)? You may TICK (/) more than one where applicable.

- ☐ Education mismatch
- ☐ Training mismatch
- ☐ Major changes in traditional training and new skills requirements
- ☐ Attitude (for example, lack of desire to work)
- ☐ Misalignment between how job seekers are communicating their skills in their CV
- ☐ Employers do not clarify the skills they require in the job specifications
- ☐ Other (*please specify*):



### SECTION 3: JOBS IN DEMAND

3.1 Listed below are job titles or positions under each Group for Land Transport and Transport via Pipelines (refer to B: General Instruction for Definition) . Based on your observation, which job area is experiencing shortage of manpower in Land Transport and Transport via Pipelines?

Tick (/) where applicable.

#### Questions:

##### 3.1.1 Only for Group 491 - Transport via railways

No	Job Title	Low Shortage	Moderate Shortage	High Shortage	Not Relevant
1	Chief Technical Officer				
2	Head of Signaling & Communication Department				
3	General Manager (Head of Department)				
4	Head of Train Operation				
5	Head of Operation Control Center				
6	Senior Manager of Signaling and Communication				
7	Chief Controller (Supervisor)				
8	Manager of Signaling & Communication				
9	Engineer				
10	Train Driver Supervisor				
11	Control Center Operation Controller				
11	Senior Technician				
12	Technical Assistant				
13	Scheduler				
14	ETS Captain				
15	Locomotive Driver				

16	EMU Driver				
17	Shunting Driver				
18	Programmer				
19	Analyst				
20	Technician				
21	Stewardess				
22	Admin Clerk				
23	Fitter				
24	Assistant Locomotive Driver				
25	Head of Terminal (Freight)				
26	Head of Yard				
27	Under Foreman				
28	Shunting Driver				
29	Other (please specify):				

### 3.1.2 Only for Group 492 - Other land transport

No	Job Title	Low Shortage	Moderate Shortage	High Shortage	Not Relevant
1	Head of Signaling & Communication Department				
2	Head of Department				
3	Train Operation Manager				
4	Operation Control Centre Manager				
5	Line Manager				
6	Chief Controller				
7	Line Coordinator				
8	Engineer/Associate				
9	Train Supervisor				
10	Power Controller				

11	Communication Controller				
12	Engineering Controller				
13	Train Controller Operator				
14	Scheduler				
15	Transit/Train Driver				
16	Programmer				
17	Analyst				
18	Technician				
19	Admin				
20	Chief of Operating Officer				
21	Head of Business Operation				
22	Bus Operation Manager				
23	Senior Executive				
24	Executive				
25	Supervisor				
26	Bus Driver				
27	Head of Section (Cable Car)				
28	Technical Executive (Cable Car)				
29	Technical Supervisor (Cable Car)				
30	Technician (Cable Car)				
31	Head of Engineering (Hill Tram)				
32	Engineer/Executive (Hill Tram)				
33	Supervisor (Hill Tram)				
34	Technician (Hill Tram)				
35	Driver (Hill Tram)				
36	General Worker (Hill Tram)				
37	Track Transit System (Aero Train) Manager				
38	Engineer for Operation Control Centre				
39	Executive/Engineer for APM				

40	Technical Officer				
41	Control Centre Operator				
42	Technician				
43	Other (please specify):				

### 3.1.3 Only for Group 493 - Transport via pipeline

No	Job Title	Low Shortage	Moderate Shortage	High Shortage	Not Relevant
1	Operation Manager (Tanker/Haulage)				
2	Operation Manager (Routine Operation)				
3	Operation Manager (Multi Product Pipeline Control)				
4	Operation Executive (Tanker/Haulage)				
5	Driver Trainer (Tanker/Haulage)				
6	Driver Supervisor (Tanker/Haulage)				
7	Driver (Tanker/Haulage)				
8	Operation Engineer(Routine Operation)				
9	Planner (Multi Product Pipeline Control)				
10	Shift Supervisor (Multi Product Pipeline Control)				
11	Control Room Operator (Multi Product Pipeline Control)				
12	HSE Executive (Routine Operation)				
13	Admin Executive (Routine Operation)				
14	Operation Technician (Routine Operation)				
15	Plant Manager (Distribution)				

16	Distribution Manager				
17	Non-revenue Manager				
18	Head of Engineering Department				
19	Engineering Manager				
20	Chemist				
21	Engineer/Executive				
22	Instrument Engineer				
23	Supervisor (Distribution)				
24	Technician (Distribution)				
25	Chargeman				
26	Operator (Distribution)				
27	General Worker (Distribution)				
28	Fitter (Distribution)				
29	Other (please specify):				

3.2 State the reason for **HIGH SHORTAGE** in Job in Demand.

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## SECTION 4: EMERGING SKILLS

Emerging skills are skills that are expected to be important to the industry in the near future based on recent events, trends, government policies, or research. For example, the technology revolution, issues of sustainability, and many other things are examples of emerging skills.

4.1 Identify future emerging skills that affect the productivity of your current job.

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4.2 Provide reasons for the requirement of Emerging Skills that you mentioned on your previous answer.

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## SECTION 5: OCCUPATION RELATED TO TECHNOLOGY

	Strongly Disagree	Disagree	Agree	Strongly Agree
5.1 The Industrial Revolution would have an impact on the land and pipeline transport. Please <b>TICK (/)</b> where appropriate.				
<b>a. Please specify why.</b> <hr/> <hr/> <hr/>				

	Strongly Disagree	Disagree	Agree	Strongly Agree
5.2 Technology advancements directly affect my industry. Please <b>TICK (/)</b> where appropriate.				
<b>a. Please specify why.</b> <hr/> <hr/> <hr/>				









9	Planner (Multi Product Pipeline Control)									
10	Shift Supervisor (Multi Product Pipeline Control)									
11	Control Room Operator (Multi Product Pipeline Control)									
12	HSE Executive (Routine Operation)									
13	Admin Executive (Routine Operation)									
14	Operation Technician (Routine Operation)									
15	Plant Manager (Distribution)									
16	Distribution Manager									
17	Non-revenue Manager									
18	Head of Engineering Department									
19	Engineering Manager									
20	Chemist									
21	Engineer/Executive									
22	Instrument Engineer									
23	Supervisor (Distribution)									
24	Technician (Distribution)									
25	Chargeman									
26	Operator (Distribution)									
27	General Worker (Distribution)									
28	Fitter (Distribution)									
29	Other (please specify):									

5.3.4 Please add any comment, recommendation, or suggestion.

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## SECTION 6: RELATED ISSUES

Below are the current issues that need to be addressed for the betterment of the workforce in the Land Transport and Transport via Pipelines sector. Do you agree? Rate the Level of Agreement to the key issue by using the following 4 point Likert Scale:

1	2	3	4
Strongly Disagree	Disagree	Agree	Strongly Agree

	Key Issue	1	2	3	4
1	Insufficient manpower				
2	Low skilled workforce				
3	Low performance workforce				
4	High dependency on foreign labour				
5	Low wages				
6	High labour costs charge by sub-contractors				
7	Pressure of maintaining profitability				
8	Unhealthy economic conditions				
9	Highly-regulated government policy or regulation				
10	Rapid technological change				
11	Low Gen-Y involvement				
12	Lack of infrastructure support				
13	Poor facilities and amenities for worker				
14	Other (please specify):				

On behalf of the development team, we would like to thank you for your time and willingness to participate in this survey!

**\*END\***



**ANNEX 3: OCCUPATIONAL DESCRIPTION (OD)**

**ANNEX 3: OCCUPATIONAL DESCRIPTION (OD)****SECTION : (H) TRANSPORTATION AND STORAGE****DIVISION : (49) LAND TRANSPORT AND TRANSPORT VIA PIPELINES****GROUP :****(491) Transport via Railways****(492) Other Land Transport****(493) Transport via Pipeline**

<b>MSIC DIVISION</b>	<b>:</b>	<b>H49 - Land Transport and Transport Via Pipelines</b>
<b>MSIC GROUP</b>	<b>:</b>	<b>H491 - Transport via Railways</b>
<b>AREA</b>	<b>:</b>	<b>Interurban Passenger Rail Operation</b>
<b>JOB TITLE</b>	<b>:</b>	<b>Train Operation Executive</b>
<b>LEVEL</b>	<b>:</b>	<b>4</b>

### **Job Responsibilities:**

Train Operation Executive is responsible to coordinate of train drivers to ensure a smooth and efficient administration of day-to-day business and activities, monitor the safety of train, staff, passengers and cargo and also coordinate the operation, alternate service and emergency response plans for the safe, reliable and efficient services.

### **Knowledge:**

- Train signaling and electrification system.
- Train Control.
- Control Centre Operations.
- Emergency Response Plan.

### **Skills:**

- Administrative.
- Management.
- Communication and presentation.
- Interpersonal.
- People management.
- Computer literate.
- Analytical.

### **Attributes (Attitude):**

- Understand mission, visions, objectives, business processes, standards and regulations.
- Good team player and able to work together with all levels of cross-functional team.
- Non-disclosure of company's confidential information.
- Possess relevant knowledge and skills.
- Critical and analytical in solving problems.
- High level of dedication and responsibility.
- Take ownership of company's possession and assets.
- Willing to learn and take instruction explicitly.
- Physically and mentally fit, healthy and alert at all times.
- Ideas for continuous improvement.

**MSIC DIVISION** : **H49 - Land Transport and Transport Via Pipelines**  
**MSIC GROUP** : **H491 - Transport via Railways**  
**AREA** : **Interurban Passenger Rail Operation**  
**JOB TITLE** : **Train Driver Supervisor**  
**LEVEL** : **3**

**Job Responsibilities:**

Train driver supervisor is responsible to prepare timetable for the train drivers to ensure a smooth and efficient administration of day-to-day train rostering; support the operation, alternate service and emergency response plans for the safe, reliable and efficient services and also to identify training needs for train drivers

**Knowledge:**

- Knowledge of train Signaling and Electrification System.
- Knowledge of Train Control.
- Knowledge of Control Centre Operations.
- Knowledge of Emergency Response Plan.

**Skills:**

- Administrative.
- Communication and presentation.
- Interpersonal.
- People management.
- Computer literacy.

**Attributes (Attitude):**

- Understand mission, visions, objectives, business processes, standards and regulations.
- Good team player and able to work together with all levels of cross-functional team.
- Non-disclosure of company's confidential information.
- Possess relevant knowledge and skills.
- Critical and analytical in solving problems.
- High level of dedication and responsibility.
- Take ownership of company's possession and assets.
- Willing to learn and take instruction explicitly.
- Physically and mentally fit, healthy and alert at all times.

<b>MSIC DIVISION</b>	<b>:</b>	<b>H49 - Land Transport and Transport Via Pipelines</b>
<b>MSIC GROUP</b>	<b>:</b>	<b>H491 - Transport via Railways</b>
<b>AREA</b>	<b>:</b>	<b>Interurban Passenger Rail Operation</b>
<b>JOB TITLE</b>	<b>:</b>	<b>Train Driver</b>
<b>LEVEL</b>	<b>:</b>	<b>2</b>

### **Job Responsibilities:**

Train driver is responsible to drive the train in accordance with the schedule and ensure train punctuality, safety, reliability; communication is maintained with the station and control centre all times, shunting is the job of safely moving trains between yards and platforms/depot, adhere to train operation Rules and Regulations and also conduct pre and post inspection.

### **Knowledge:**

- Knowledge of train signaling and electrification system.
- Knowledge of train control.
- Knowledge of control centre operations.
- Knowledge of emergency response plan.

### **Skills:**

- Communication and presentation.
- Interpersonal.
- Problem-solving capacity.

### **Attributes (Attitude):**

- Understand mission, visions, objectives, business processes, standards and regulations.
- Good team player and able to work together with all levels of cross-functional team.
- Non-disclosure of company's confidential information.
- Possess relevant knowledge and skills.
- Critical and analytical in solving problems.
- High level of dedication and responsibility.
- Take ownership of company's possession and assets.

<b>MSIC DIVISION</b>	<b>:</b>	<b>H49 - Land Transport and Transport Via Pipelines</b>
<b>MSIC GROUP</b>	<b>:</b>	<b>H491 - Transport via Railways</b>
<b>AREA</b>	<b>:</b>	<b>Interurban Passenger ETS Operation</b>
<b>JOB TITLE</b>	<b>:</b>	<b>ETS Captain</b>
<b>LEVEL</b>	<b>:</b>	<b>4</b>

### **Job Responsibilities:**

ETS captain is responsible to drive the train in accordance to the schedule and ensure train punctuality, safety, reliability; communication is maintained with the station and control centre all times; adhere to train operation rules and regulations. In addition, to facilitate the movement of passengers by providing information to the passengers, to ensure operation, alternate service and emergency response plans for the safe, reliable and efficient services and also to conduct pre and post inspection.

### **Knowledge:**

- Train signaling and electrification system.
- Train Control.
- Control Centre Operations.
- Emergency Response Plan.

### **Skills:**

- Administrative.
- Communication and presentation.
- Interpersonal.
- People management.
- Computer literate.
- Customer service.
- Problem-solving capacity.

### **Attributes (Attitude):**

- Understand mission, visions, objectives, business processes, standards and regulations.
- Good team player and able to work together with all levels of cross-functional team.
- Non-disclosure of company's confidential information.
- Possess relevant knowledge and skills.
- Critical and analytical in solving problems.
- High level of dedication and responsibility.
- Take ownership of company's possession and assets.
- Willing to learn and take instruction explicitly.
- Physically and mentally fit, healthy and alert at all times.

<b>MSIC DIVISION</b>	<b>:</b>	<b>H49 - Land Transport and Transport Via Pipelines</b>
<b>MSIC GROUP</b>	<b>:</b>	<b>H491 - Transport via Railways</b>
<b>AREA</b>	<b>:</b>	<b>Interurban Train Operation Control Centre</b>
<b>JOB TITLE</b>	<b>:</b>	<b>Chief Controller</b>
<b>LEVEL</b>	<b>:</b>	<b>4</b>

### **Job Responsibilities:**

Chief controller is responsible to Supervising a group of Control executives on their daily task and responsibilities to meet the set service level standards, prepare daily Event Log report, incident reports and any requested report inclusive of participation in any committee as instructed for the establishment of incident investigation team and improvement initiatives, to ensure the implementation of Alternate Service or Failure Management to secure maximum safety to staff, public and operations as well as to minimize service disruption, to providing effective and well disseminated communications flow during Failure Management or Crisis especially to customer in order to give clear directions and alleviate pressure faced by staffs at stations, as to always give the effort in ensuring operation continuity. Identify training needs and safe operations of Trains as well as making sure Rules and Procedures and Operations Plans are followed.

### **Knowledge:**

- Train signalling and electrification system.
- Supervisory control and data acquisition (SCADA).
- Communication System.
- Emergency Response Plan.
- Control Centre Operation.

### **Skills:**

- Administrative.
- Communication and presentation.
- Interpersonal.
- People management.
- Computer literacy.
- Problem solving.

### **Attributes (Attitude):**

- Understand mission, visions, objectives, business processes, standards and regulations.
- Good team player and able to work together with all levels of cross-functional team.
- Work Ethic.
- High level of dedication and responsibility.

<b>MSIC DIVISION</b>	<b>:</b>	<b>H49 - Land Transport and Transport Via Pipelines</b>
<b>MSIC GROUP</b>	<b>:</b>	<b>H491 - Transport via Railways</b>
<b>AREA</b>	<b>:</b>	<b>Interurban Train Operation Control Centre</b>
<b>JOB TITLE</b>	<b>:</b>	<b>Control Centre Operation Controller</b>
<b>LEVEL</b>	<b>:</b>	<b>3</b>

### **Job Responsibilities:**

Control Centre Operation Controller is responsible to provide prompt, accurate, up to date and clear information to train drivers and passenger at station; assist Chief Controllers by monitor passenger movements at station and train. In addition, to monitor station openings and closings, assist Chief Controller in external communications, report faults promptly and also to assist Chief Controller in calling up additional operating staff during Major Incident and disseminate incident and progress messages to all relevant parties during degraded and emergency mode of operation.

### **Knowledge:**

- Train signalling and electrification system.
- Supervisory control and data acquisition (SCADA).
- Communication system.
- Emergency response plan.
- Control centre operation.

### **Skills:**

- Administrative.
- Communication and presentation.
- Interpersonal.
- Computer literate.
- Problem solving.

### **Attributes (Attitude):**

- Able to work in stress environment.
- Good team player and able to work together with all levels of cross-functional team.
- Work Ethic.
- High level of dedication and responsibility.
- Self-ownership.
- Willing to learn and take instruction.
- Physically and mentally fit, healthy and alert at all times.



<b>MSIC DIVISION</b>	<b>:</b>	<b>H49 - Land Transport and Transport Via Pipelines</b>
<b>MSIC GROUP</b>	<b>:</b>	<b>H491 - Transport via Railways</b>
<b>AREA</b>	<b>:</b>	<b>Freight Cargo Operation/Coordination/Support Operation</b>
<b>JOB TITLE</b>	<b>:</b>	<b>Shunting Driver</b>
<b>LEVEL</b>	<b>:</b>	<b>2</b>

**Job Responsibilities:**

Shunting driver is responsible to safely moving trains between yards and platforms/depot and to adhere to train operation Rules and Regulations.

**Knowledge:**

- Train signaling and electrification system.
- Train control.

**Skills:**

- Communication and presentation.
- Interpersonal.
- Problem-solving capacity.

**Attributes (Attitude):**

- Understand mission, visions, objectives, business processes, standards and regulations.
- Good team player and able to work together with all levels of cross-functional team.
- Non-disclosure of company's confidential information.
- Possess relevant knowledge and skills.
- Critical and analytical in solving problems.
- High level of dedication and responsibility.
- Take ownership of company's possession and assets.

<b>MSIC DIVISION</b>	<b>:</b>	<b>H49 - Land Transport and Transport Via Pipelines</b>
<b>MSIC GROUP</b>	<b>:</b>	<b>H492 - Other Land Transport</b>
<b>AREA</b>	<b>:</b>	<b>Bus Operation</b>
<b>JOB TITLE</b>	<b>:</b>	<b>Bus Driver</b>
<b>LEVEL</b>	<b>:</b>	<b>2</b>

### **Job Responsibilities:**

Bus driver is responsible to comply with rules and regulatory requirements, to respond and report the occurrence of incidents, accidents and hazard identification, to operate buses by the assigned bus service routes and timetables, to conduct pre and post visual inspection on bus conditions and also to record log driver's log book

### **Knowledge:**

- Operation of the buses.
- Passengers' safety.
- Emergency response procedure.
- Routes and bus journey.

### **Skills:**

- Defensive driving.
- Handling emergency situation (i.e. accident).
- Customer service.
- Ability to work independently.
- Interpersonal communication.

### **Attributes (Attitude):**

- Ability to interact with all levels.
- Mature personality.
- Teamwork.
- Professionalism.
- Resilience.
- Flexibility.
- Work ethic.
- Dependability.
- Agility.

<b>MSIC DIVISION</b>	<b>:</b>	<b>H49 - Land Transport and Transport Via Pipelines</b>
<b>MSIC GROUP</b>	<b>:</b>	<b>H492 - Other Land Transport</b>
<b>AREA</b>	<b>:</b>	<b>Bus Operation Control Centre</b>
<b>JOB TITLE</b>	<b>:</b>	<b>Traffic Controller</b>
<b>LEVEL</b>	<b>:</b>	<b>3</b>

### **Job Responsibilities:**

Bus Traffic Controller is responsible to coordinate drivers schedule, monitoring driver's compliance to the regulatory requirements (APJ, APAD and other agencies, monitor driver behaviour ensuring high level of customer service, utilizing GPS systems to monitor drivers and vehicles movement , ensure accurate records of fuel usage, maintain a fleet of available vehicles that are safe and fit for service to support day-to-day operation that are up to date with safety equipment, ensure that all drivers are competent with company standards and best practices, review vehicle maintenance operation procedures to ensure compliance with safety regulations, coordinate third-party activity, liaise with the management of Control Centre Operations on irregularities encountered during bus service route operations and monitor driver's log book.

### **Knowledge:**

- Operational management.
- SOP compliance.
- Regulatory compliance.

### **Skills:**

- Strong communication and negotiation skills.
- Good analytical skill.
- Attention to detail and organization.

### **Attributes (Attitude):**

- Negotiation
- Teamwork
- Multi-tasking
- Work ethic
- Resilience
- Career management

<b>MSIC DIVISION</b>	<b>:</b>	<b>H49 - Land Transport and Transport Via Pipelines</b>
<b>MSIC GROUP</b>	<b>:</b>	<b>H492 - Other Land Transport</b>
<b>AREA</b>	<b>:</b>	<b>Urban and Suburban Passenger rail Operation</b>
<b>JOB TITLE</b>	<b>:</b>	<b>Train Executive</b>
<b>LEVEL</b>	<b>:</b>	<b>4</b>

### **Job Responsibilities:**

Train executive is responsible to coordinate train drivers to ensure a smooth and efficient administration of day-to-day business and activities, to monitor the safety of train, staff, passengers and cargo. As well as, to coordinate the operation, alternate service and emergency response plans for the safe, reliable and efficient services.

### **Knowledge:**

- Knowledgeable in train signaling and electrification system.
- Train control.
- Control centre operations.
- Emergency response plan.

### **Skills:**

- Administrative.
- Management.
- Communication and presentation.
- Interpersonal.
- Leadership.
- People management.
- Entrepreneurship.
- Computer literacy.

### **Attributes (Attitude):**

- Understand mission, visions, objectives, business processes, standards and regulations.
- Good team player and able to work together with all levels of cross-functional team.
- Non-disclosure of company's confidential information.
- Possess relevant knowledge and skills.
- Critical and analytical in solving problems.
- High level of dedication and responsibility.
- Take ownership of company's possession and assets.
- Willing to learn and take instruction explicitly.
- Physically and mentally fit, healthy and alert at all times.

<b>MSIC DIVISION</b>	<b>:</b>	<b>H49 - Land Transport and Transport Via Pipelines</b>
<b>MSIC GROUP</b>	<b>:</b>	<b>H492 - Other Land Transport</b>
<b>AREA</b>	<b>:</b>	<b>Urban and Suburban Passenger Rail Operation</b>
<b>JOB TITLE</b>	<b>:</b>	<b>Train Driver</b>
<b>LEVEL</b>	<b>:</b>	<b>2</b>

### **Job Responsibilities:**

Train driver is responsible to drive the train in accordance with the schedule and ensure train punctuality, safety, reliability and communication is maintained with the station at all times. Shunting is the job of safely moving trains between yards and platforms/depot and also to provide excellent customer service/support to public and staff on board the train with regards to service information, safety and health, cleanliness, emergency response, first aider assistance and support the implementation of alternate service plan for safe and efficient service.

### **Knowledge:**

- Business processes, standards and regulations.
- Knowledgeable in good team player and able to work together with all levels of cross-functional team.
- Non-disclosure of company's confidential information.
- Train-driving license and other relevant certification requirements.

### **Skills:**

- Communication and presentation.
- Interpersonal.
- Problem-solving capacity.

### **Attributes (Attitude):**

- Understand mission, visions, objectives, business processes, standards and regulations.
- Good team player and able to work together with all levels of cross-functional team.
- Non-disclosure of company's confidential information.
- Possess relevant knowledge and skills.

<b>MSIC DIVISION</b>	<b>:</b>	<b>H49 - Land Transport and Transport Via Pipelines</b>
<b>MSIC GROUP</b>	<b>:</b>	<b>H492 - Other Land Transport</b>
<b>AREA</b>	<b>:</b>	<b>Urban and Suburban Train Operation Control Centre</b>
<b>JOB TITLE</b>	<b>:</b>	<b>Chief Controller</b>
<b>LEVEL</b>	<b>:</b>	<b>4</b>

### **Job Responsibilities:**

Chief controller is responsible to supervising a group of control executives on their daily task and responsibilities to meet the set service level standards, prepare daily Event Log report, incident reports and any requested report inclusive of participation in any committee as instructed for the establishment of incident investigation team and improvement initiatives, responsible in managing the implementation of Alternate Service or Failure Management to secure maximum safety to staff, public and operations as well as to minimize service disruption, to responsible in providing effective and well disseminated communications flow during Failure Management or Crisis especially to customer in order to give clear directions and alleviate pressure faced by staffs at stations, as to always give the effort in ensuring business continuity. As well as, to supervise the operations of Control Room (shift) mainly on S&TC, SCADA, BMS and communications. Identify training needs as to maintain high level of staff competencies, responsible for safe operations of Automatic Trains and Manual Trains as well as making sure Rules and Procedures, Operations Plans and Failure Management Strategies are followed through and highlight the area that can be improved.

### **Knowledge:**

- Automatic Train Control System (S&TC).
- SCADA
- Building Management System.
- Communication System.
- Emergency Response Plan.
- Control Centre Operation.
- Resource Management.
- Planning and Budgeting.
- Cost Saving Initiative.
- Customer Service.

### **Skills:**

- Administrative.
- Management.
- Communication and presentation.
- Interpersonal.
- Leadership.
- People management.
- Computer literacy.

**Attributes (Attitude):**

- Understand mission, visions, objectives, business processes, standards and regulations.
- Good team player and able to work together with all levels of cross-functional team.
- Non-disclosure of company's confidential information.
- Possess relevant knowledge and skills.
- Critical and analytical in solving problems.
- High level of dedication and responsibility.
- Take ownership of company's possession and assets.
- Willing to learn and take instruction explicitly.
- Physically and mentally fit, healthy and alert at all times.
- Ideas for continuous improvement.
- Cost, Quality & Safety conscious.

<b>MSIC DIVISION</b>	<b>:</b>	<b>H49 - Land Transport and Transport Via Pipelines</b>
<b>MSIC GROUP</b>	<b>:</b>	<b>H492 - Other Land Transport</b>
<b>AREA</b>	<b>:</b>	<b>Urban and Suburban Train Operation Control Centre</b>
<b>JOB TITLE</b>	<b>:</b>	<b>Train Controller Operator</b>
<b>LEVEL</b>	<b>:</b>	<b>3</b>

### **Job Responsibilities:**

Train controller operator is responsible to operating automatic and manual trains and also responsible in power distribution system and all associated system and ensure current implementation of operation and failure management

### **Knowledge:**

- Train Signalling and Electrification System.
- Supervisory control and data acquisition (SCADA).
- Communication System.
- Emergency Response Plan.
- Control Centre Operation.

### **Skills:**

- Administrative.
- Communication and presentation.
- Interpersonal.
- Computer literacy.
- Problem solving.

### **Attributes (Attitude):**

- Able to work in stressful environment.
- Good team player and able to work together with all levels of cross-functional team.
- Work Ethic.
- High level of dedication and responsibility.
- Self-ownership.
- Willing to learn and take instruction.
- Physically and mentally fit, healthy and alert at all times.



<b>MSIC DIVISION</b>	<b>:</b>	<b>H49 - Land Transport and Transport Via Pipelines</b>
<b>MSIC GROUP</b>	<b>:</b>	<b>H492 - Other Land Transport</b>
<b>AREA</b>	<b>:</b>	<b>Cable Car Operation</b>
<b>JOB TITLE</b>	<b>:</b>	<b>Technical Executive</b>
<b>LEVEL</b>	<b>:</b>	<b>4</b>

#### **Job Responsibilities:**

Technical executive is responsible to guide, coordinate and supervise the critical requirements of operation and maintenance activities for SkyCab and SkyGlide that involve various engineering disciplines including Mechanical, Electrical, Hydraulic and Control system, to assist Head of Section to plan and strategize in order to achieve Department of Engineering's Key Performance Index (KPI) and targets every year, to plan the manpower scheduling, and update the schedule as and when needed and also to ensure the operation and maintenance are carried out as per ISO 9001:2015 requirements.

#### **Knowledge:**

- Electrical, Electronic, Mechanical and Hydraulic Engineering.
- Organizational behaviour knowledge.
- Business management strategies.
- Quality management.
- Emergency Response Plan (ERP) – DOSH requirement.

#### **Skills:**

- Administrative.
- Communication and presentation.
- Interpersonal.
- People management.
- Ability to read system schematics.
- Advanced troubleshooting.
- Understanding of safety and equipment procedures.
- Communication.
- Ability to work with heavy equipment.

#### **Attributes (Attitude):**

- High discipline and respect superior and subordinate.
- Committed with mission, visions, objectives, SOP, ISO, standards and regulations.
- Good team player and able to work together with all levels of cross-functional team.
- High level of integrity. Non-disclosure of company's confidential information.
- Possess strong relevant knowledge and skills.
- Critical and analytical in solving problems.

- High level of dedication and responsibility.
- Take ownership of company's possession and assets.
- Willing to learn and take instruction explicitly.
- Physically and mentally fit, healthy and alert at all times.

<b>MSIC DIVISION</b>	<b>:</b>	<b>H49 - Land Transport and Transport Via Pipelines</b>
<b>MSIC GROUP</b>	<b>:</b>	<b>H492 - Other Land Transport</b>
<b>AREA</b>	<b>:</b>	<b>Cable Car Operation</b>
<b>JOB TITLE</b>	<b>:</b>	<b>Technician</b>
<b>LEVEL</b>	<b>:</b>	<b>2</b>

### **Job Responsibilities:**

Technician is responsible to conduct, measure and test the daily critical operational requirements of the Cable Car & Outdoor Lift Operation in order to enhance quality of operation services thus increase customer's satisfaction toward provided services, to records all required documents and checklist as per SOP (Operation & Maintenance), to strictly follow the Manufacturer Operation Manual at all time, to strictly follow station posting and working schedule, to strictly follow the Bad Weather & Technical Issue Guideline that covers bad weathers including strong wind and lightning condition, to follow the Operation Execution Procedure when in operation with regard to customer's safety, to liaise with Customer Relation Management (CRM) Department on any concerned matters with regards to the operation of the cable car as and when needed, to ensure required records and checklist are done accordingly, and to identify, closely monitor and ensure critical parameters/ parts / equipment's of the cable car are at optimum level and to trigger the needs for maintenance projects.

### **Knowledge:**

- Mechanical, electrical, hydraulic, and control systems.

### **Skills:**

- Ability to read system schematics.
- Good troubleshooting skills.
- Understanding of safety and equipment procedures.
- Communication.
- Ability to work with heavy equipment.

### **Attributes (Attitude):**

- Understand mission, visions, objectives, business processes, standards and regulations.
- Good team player and able to work together with all levels of cross-functional team.
- Non-disclosure of company's confidential information.
- Possess relevant knowledge and skills.
- Critical and analytical in solving problems.
- High level of dedication and responsibility.
- Take ownership of company possession and assets.

<b>MSIC DIVISION</b>	<b>:</b>	<b>H49 - Land Transport and Transport Via Pipelines</b>
<b>MSIC GROUP</b>	<b>:</b>	<b>H492 - Other Land Transport</b>
<b>AREA</b>	<b>:</b>	<b>Hill Tram Operation</b>
<b>JOB TITLE</b>	<b>:</b>	<b>Technician (Control Room Staff)</b>
<b>LEVEL</b>	<b>:</b>	<b>2</b>

### **Job Responsibilities:**

Technical is responsible to conduct routine maintenance and repairs on the tramway system to ensure that it is functioning safely and efficiently. This would involve inspecting cables, cars, and other components, lubricating moving parts, replacing worn or damaged parts, and performing any necessary repairs, to diagnosing the issue and implementing a solution, to follow safety protocols, identifying potential hazards, and reporting any safety concerns to your supervisor, to responsible for documenting all maintenance and repair work that you perform on the tramway system. This would involve maintaining accurate records of maintenance schedules, repairs, and inspections, and ensuring that all documentation is up-to-date and in compliance with relevant regulations and standards and also to communicate effectively with other members of the tramway operation team, including other technicians, engineers, and supervisors. This would involve providing updates on maintenance and repair work, reporting any issues or concerns, and collaborating with other team members to ensure that the tramway system is functioning safely and efficiently.

### **Knowledge:**

- Mechanical, electrical, hydraulic, and control systems.

### **Skills:**

- Ability to read system schematics.
- Good troubleshooting skills.
- Understanding of safety and equipment procedures.
- Communication.
- Ability to work with heavy equipment.

### **Attributes (Attitude):**

- Understand mission, visions, objectives, business processes, standards and regulations.
- Good team player and able to work together with all levels of cross-functional team.
- Non-disclosure of company's confidential information.
- Possess relevant knowledge and skills.

<b>MSIC DIVISION</b>	<b>:</b>	<b>H49 - Land Transport and Transport Via Pipelines</b>
<b>MSIC GROUP</b>	<b>:</b>	<b>H492 - Other Land Transport</b>
<b>AREA</b>	<b>:</b>	<b>Hill Tram Operation</b>
<b>JOB TITLE</b>	<b>:</b>	<b>Driver</b>
<b>LEVEL</b>	<b>:</b>	<b>1</b>

**Job Responsibilities:**

Driver is responsible to maintain safe driving practices and following standard driving procedures, to communicate with dispatch staff via radio or phone to notify them of any delays or other issues, to maintain a safe working environment by following all Occupational Safety and Health Administration (OSHA) regulations, as well as company policies and procedures, to staying alert for any hazardous conditions that may cause accidents or injuries to passengers, reporting any mechanical issues with the vehicle to maintenance staff, to stay aware of current events that may impact traffic flow or safety concerns such as road construction or severe weather events and also to report unsafe driving conditions to supervisors or dispatchers.

**Knowledge:**

- Train Signaling and electrification System.
- Train Control.
- Control Centre Operations.
- Emergency Response Plan.

**Skills:**

- Communication and presentation skills.
- Interpersonal skills
- Problem-solving capacity

**Attributes (Attitude):**

- Understand mission, visions, objectives, business processes, standards and regulations.
- Good team player and able to work together with all levels of cross-functional team.
- Non-disclosure of company's confidential information.
- Possess relevant knowledge and skills.
- Critical and analytical in solving problems.
- High level of dedication and responsibility.
- Take ownership of company's possession and assets.

<b>MSIC DIVISION</b>	<b>:</b>	<b>H49 - Land Transport and Transport Via Pipelines</b>
<b>MSIC GROUP</b>	<b>:</b>	<b>H491 - Transport via Railways</b>
<b>AREA</b>	<b>:</b>	<b>Automated People Mover (APM) Operation</b>
<b>JOB TITLE</b>	<b>:</b>	<b>Executive</b>
<b>LEVEL</b>	<b>:</b>	<b>4</b>

### **Job Responsibilities:**

APM operation executive responsibilities is to plan, manage and execute the daily operation and works carried out according to the specified quality standards, to prepare and update a timely and accurate reporting for the assigned APM systems and facilities as per standard operating procedure, to adhere with policies; procedures; guidelines; local/international regulations, legislation and quality management system, to coordinate effectively and timely during any system crisis and emergency situation and ensure Operational Control Centre is well manned. Also, to coordinate and communicate with shift executives on the planning, managing and supervising outstanding issues related to APM daily operational for completion, to assess and provide technical advice on the operation and maintenance of the APM System for continuous improvement action. In addition, is to develop staff competency and skill in order to improve the effectiveness of operation and maintenance activities as well as to verify the standards documentation checklists and forms are being compiled and keep the records up to date.

### **Knowledge:**

- APM systems.
- Train Control.
- Control Centre Operations.
- Emergency Response Plan.

### **Skills:**

- Administrative.
- Management.
- Communication and presentation.
- Interpersonal.
- Leadership.
- People management.
- Computer literacy.
- Analytical.
- Problem solving.

**Attributes (Attitude):**

- Understand mission, visions, objectives, business processes, standards and regulations.
- Good team player and able to work together with all levels of cross-functional team.
- Work Ethic.
- High level of dedication and responsibility.
- Self-ownership.
- Willing to learn and take instruction.
- Physically and mentally fit, healthy and alert at all times.
- Cost, Quality & Safety conscious.

<b>MSIC DIVISION</b>	<b>:</b>	<b>H49 - Land Transport and Transport Via Pipelines</b>
<b>MSIC GROUP</b>	<b>:</b>	<b>H491 - Transport via Railways</b>
<b>AREA</b>	<b>:</b>	<b>Automated People Mover (APM) Operation</b>
<b>JOB TITLE</b>	<b>:</b>	<b>Technical Officer</b>
<b>LEVEL</b>	<b>:</b>	<b>3</b>

### **Job Responsibilities:**

Technical officer is responsible to liaise with APM O&M Executive on any emergency and proposed works to be carried out to minimize disruption to airport operation, to manage and supervise the daily works and preventive maintenance carried out by technicians to ensure the works done are according to the specified maintenance standards and quality, to execute the plan preventive maintenance and repairs works according to the specified maintenance standards, to assist the O&M Executive on the planning, managing and supervising of the career development program as well as developing technically competent personnel, to inspect, monitor and provide technical advice on the operating and maintenance of the APM System unit as well developing technically competent personnel, to troubleshooting problems and executing necessary repair in the event system breakdown, to inspect, verify all works, repairs, operational and plan preventive maintenance carried out by technician under supervision, and to implement and ensure checklists and forms are being compiled and keep up to date according to specified International Standard Certification and Standard Operating Procedure.

### **Knowledge:**

- APM systems.
- Train Control.
- Control Centre Operations.
- Emergency Response Plan.

### **Skills:**

- Administrative skills.
- Communication and presentation skills.
- Interpersonal skills.
- People management skills.
- Computer literate.
- Problem solving.

### **Attributes (Attitude):**

- Understand mission, visions, objectives, business processes, standards and regulations.
- Good team player and able to work together with all levels of cross-functional team.
- Non-disclosure of company's confidential information.
- Possess relevant knowledge and skills.
- Critical and analytical in solving problems.
- High level of dedication and responsibility.



- Take ownership of the company's possession and assets.
- Willing to learn and take instruction explicitly.
- Physically and mentally fit, healthy and alert at all times.

<b>MSIC DIVISION</b>	<b>:</b>	<b>H49 - Land Transport and Transport Via Pipelines</b>
<b>MSIC GROUP</b>	<b>:</b>	<b>H491 - Transport via Railways</b>
<b>AREA</b>	<b>:</b>	<b>Automated People Mover (APM) Operation</b>
<b>JOB TITLE</b>	<b>:</b>	<b>Technician</b>
<b>LEVEL</b>	<b>:</b>	<b>2</b>

### **Job Responsibilities:**

Technician responsibilities is to liaise with the Technical Officer on any emergency and proposed works to be carried out to minimize disruption to fleet operation, to execute the daily works and preventive maintenance to ensure the works done are according to the specified maintenance standards and quality. Also, to assist the Technical Officer on a competency development program, to troubleshooting problems and executing necessary repair in the event system breakdown. In addition, to inspect of all carried out works, repairs, operational and plan preventive maintenance and to ensure checklists and forms are completed and recorded according to specified format.

### **Knowledge:**

- APM systems.
- Train Control.
- Control Centre Operations.
- Emergency Response Plan.

### **Skills:**

- Administrative.
- Communication and presentation.
- Interpersonal.
- People management.
- Computer literacy.
- Problem solving.

### **Attributes (Attitude):**

- Understand mission, visions, objectives, business processes, standards and regulations.
- Good team player and able to work together with all levels of cross-functional team.
- Non-disclosure of company's confidential information.
- Possess relevant knowledge and skills.
- Critical and analytical in solving problems.
- High level of dedication and responsibility.
- Take ownership of the company's possession and assets.

<b>MSIC DIVISION</b>	<b>:</b>	<b>H49 - Land Transport and Transport Via Pipelines</b>
<b>MSIC GROUP</b>	<b>:</b>	<b>H491 - Transport via Railways</b>
<b>AREA</b>	<b>:</b>	<b>Airport Shuttle Operation – Control Centre Operation</b>
<b>JOB TITLE</b>	<b>:</b>	<b>Engineer</b>
<b>LEVEL</b>	<b>:</b>	<b>4</b>

### **Job Responsibilities:**

Engineer responsibilities is to plan, manage and execute the daily operation and works carried out according to the specified quality standards, to prepare and update a timely and accurate reporting for the assigned APM systems and facilities as per standard operating procedure, to adhere with policies; procedures; guidelines; local/international regulations, legislation and quality management system. Coordinate effectively and timely during any system crisis and emergency situation and ensure Operational Control Centre is well manned, to coordinate and communicate with shift executives on the planning, managing and supervising outstanding issues related to APM daily operational for completion. Assess and provide technical advice on the operation and maintenance of the APM System for continuous improvement action, to develop staff competency and skill in order to improve the effectiveness of operation and maintenance activities as well as to verify the standards documentation checklists and forms are being compiled and keep the records up to date.

### **Knowledge:**

- APM systems.
- Train Control.
- Control Centre Operations.
- Emergency Response Plan.

### **Skills:**

- Administrative.
- Management.
- Communication and presentation.
- Interpersonal.
- Leadership.
- People management.
- Computer literacy.
- Analytical.
- Problem solving.

### **Attributes (Attitude):**

- Understand mission, visions, objectives, business processes, standards and regulations.
- Good team player and able to work together with all levels of cross-functional team.
- Maintain work ethic.

- High level of dedication and responsibility.
- Self-ownership.
- Willing to learn and take instruction.
- Physically and mentally fit, healthy and alert at all times.

<b>MSIC DIVISION</b>	<b>:</b>	<b>H49 - Land Transport and Transport Via Pipelines</b>
<b>MSIC GROUP</b>	<b>:</b>	<b>H491 - Transport via Railways</b>
<b>AREA</b>	<b>:</b>	<b>Airport Shuttle Operation – Control Centre Operation</b>
<b>JOB TITLE</b>	<b>:</b>	<b>Technical Officer</b>
<b>LEVEL</b>	<b>:</b>	<b>3</b>

### **Job Responsibilities:**

Technical officer responsibilities is to liaise with APM O&M Executive on any emergency and proposed works to be carried out to minimize disruption to airport operation, to manage and supervise the daily works and preventive maintenance carried out by technicians to ensure the works done are according to the specified maintenance standards and quality, to execute the plan preventive maintenance and repairs works according to the specified maintenance standards, to assist the O&M Executive on the planning, managing and supervising of the career development program as well as developing technically competent personnel. Also to inspect, monitor and provide technical advice on the operating and maintenance of the APM System unit as well developing technically competent personnel, to troubleshooting problems and executing necessary repair in the event system breakdown, to inspect, verify all works, repairs, operational and plan preventive maintenance carried out by technician under supervision as well as to implement and ensure checklists and forms are being compiled and keep up to date according to specified International Standard Certification and Standard Operating Procedure.

### **Knowledge:**

- APM systems.
- Train Control.
- Control Centre Operations.
- Emergency Response Plan.

### **Skills:**

- Administrative.
- Management.
- Communication and presentation.
- Interpersonal.
- Leadership.
- People management.
- Computer literacy.
- Analytical.
- Problem solving.

### **Attributes (Attitude):**

- Understand mission, visions, objectives, business processes, standards and regulations.
- Good team player and able to work together with all levels of cross-functional team.

- Maintain work ethic.
- High level of dedication and responsibility.
- Self-ownership.
- Willing to learn and take instruction.
- Physically and mentally fit, healthy and alert at all times

<b>MSIC DIVISION</b>	<b>:</b>	<b>H49 - Land Transport and Transport Via Pipelines</b>
<b>MSIC GROUP</b>	<b>:</b>	<b>H491 - Transport via Railways</b>
<b>AREA</b>	<b>:</b>	<b>Airport Shuttle Operation Control Centre</b>
<b>JOB TITLE</b>	<b>:</b>	<b>Control Centre Operator</b>
<b>LEVEL</b>	<b>:</b>	<b>2</b>

### **Job Responsibilities:**

The control centre operator is responsible to provide prompt and accurate daily tasks and responsibilities to meet the APM system service level standards, to assist Engineer by monitoring daily APM systems monitoring and operational, to monitor Power Distribution System SCADA and station status, to assist Engineer for internal and external communications as per Standard Operating Procedure, to promptly report faults as per specified Standard Operating Procedure to disseminate incident and progress messages to all relevant parties during any system crisis and emergency situation as per Standard Operating Procedure and to properly log data and alarm triggered in Operation Control Centre via standard form in the event of Data Log system failure.

### **Knowledge:**

- APM systems.
- Train Control.
- Control Centre Operations.
- Emergency Response Plan.

### **Skills:**

- Administrative.
- Communication and presentation.
- Interpersonal.
- People management.
- Computer literacy.
- Problem solving.

### **Attributes (Attitude):**

- Understand mission, visions, objectives, business processes, standards and regulations.
- Good team player and able to work together with all levels of cross-functional team.
- Non-disclosure of company's confidential information.
- Possess relevant knowledge and skills.
- Critical and analytical in solving problems.
- High level of dedication and responsibility.
- Take ownership of the company's possession and assets.
- Willing to learn and take instruction explicitly.
- Physically and mentally fit, healthy and alert at all times.

**MSIC DIVISION** : **H49 - Land Transport and Transport Via Pipelines**  
**MSIC GROUP** : **H493 - Transport via Pipeline**  
**AREA** : **Tanker**  
**JOB TITLE** : **Operation Executive**  
**LEVEL** : **4**

### **Job Responsibilities:**

Operation executive responsibilities is to monitor daily delivery operations as per schedule prepared, to communicate with client on delivery issues, to escalate incident to operation manager and execute ERP, to prepare weekly and monthly performance report, to coordinate fleet availability with maintenance team, to strategize transport operation within allocated yearly budget, to execute improvement projects on transport operations as well as to prepare Training Need Analysis (TNA) for all staff.

### **Knowledge:**

- HSSE management.
- Performance monitoring.
- Logistic planning.
- Product handling and control.
- Route management.
- Project management.

### **Skills:**

- Communication.
- Interpersonal.
- Problem solving.
- Analytical.
- Diagnostic.

### **Attributes (Attitude):**

- Teamwork.
- Multitasking.
- Resilience.
- Flexibility.



<b>MSIC DIVISION</b>	<b>:</b>	<b>H49 - Land Transport and Transport Via Pipelines</b>
<b>MSIC GROUP</b>	<b>:</b>	<b>H493 - Transport via Pipeline</b>
<b>AREA</b>	<b>:</b>	<b>Tanker / Haulage Operation</b>
<b>JOB TITLE</b>	<b>:</b>	<b>Driver</b>
<b>LEVEL</b>	<b>:</b>	<b>2</b>

**Job Responsibilities:**

Haulage driver is responsible to comply with rules and regulatory requirements, to ensure the road tankers in a good condition before and after deliver the product by conduct inspection Pre Departure Checklist (PDC) and Post Journey Checklist (PJC) ,to communicate with workshop on any defect on truck, to operate truck equipment safely as per standard operating procedure, to follow loading and unloading procedure as detailed by loading plant and customer requirements, to record own work hours, driving time and rest hours, to report to management of all non-conformance/infringement i.e near miss, incident/accident etc. , to perform delivery as per Journey Management Plan (JMP) and also to execute Emergency Response plan in case of incident.

**Knowledge:**

- Occupational health, safety and environment.
- Standard operating procedure.
- Product handling.
- Emergency response.
- Road regulations.

**Skills:**

- Technical.
- Report writing.

**Attributes (Attitude):**

- Work ethic.
- Adherence to procedure.
- Attention to detail.

<b>MSIC DIVISION</b>	<b>:</b>	<b>H49 - Land Transport and Transport Via Pipelines</b>
<b>MSIC GROUP</b>	<b>:</b>	<b>H493 - Transport via Pipeline</b>
<b>AREA</b>	<b>:</b>	<b>Routine Operation – Liquid and Gaseous Fuel Pipeline</b>
<b>JOB TITLE</b>	<b>:</b>	<b>Operation Engineer</b>
<b>LEVEL</b>	<b>:</b>	<b>4</b>

**Job Responsibilities:**

Operation engineer responsibilities is to manage pipeline integrity projects, to implementation of the facility integrity program, review and continual improvement of work manual and procedures, to execute pipeline repair/mitigation plans and recommendations for Preventative & Mitigative measures, based on results of pipeline integrity assessments, to communicate with regulatory agencies regarding integrity work plans, to work with the pipeline integrity team coordinating budgetary planning of integrity assessments, to act as lead project manager for field execution of integrity assessment actively monitor costs relative to approved PO and budget allocation, to plot repair locations using in-line inspection data and GPS as well as to review technical report prepared by technicians on routine inspection

**Knowledge:**

- SAP/SCADA proficiency.
- Performance monitoring.
- Product handling and control.
- HSE management.
- Maintenance planning.
- Project management.

**Skills:**

- Communication.
- Interpersonal.
- Problem solving.
- Analytical.
- Diagnostic.

**Attributes (Attitude):**

- Teamwork.
- Attention to detail.
- Multitasking.
- Dependability.
- Demonstrate working knowledge of Integrity Management Plan, facility integrity, corrosion control, piping system and applicable best practices.

<b>MSIC DIVISION</b>	<b>:</b>	<b>H49 - Land Transport and Transport Via Pipelines</b>
<b>MSIC GROUP</b>	<b>:</b>	<b>H493 - Transport via Pipeline</b>
<b>AREA</b>	<b>:</b>	<b>Routine Operation – Liquid and Gaseous Fuel Pipeline</b>
<b>JOB TITLE</b>	<b>:</b>	<b>Operation Technician</b>
<b>LEVEL</b>	<b>:</b>	<b>2</b>

### **Job Responsibilities:**

Operation technician is responsible to ensure correct operation of pipeline as per standard operating procedure, to perform periodic inspection and routine maintenance on pipeline system, to monitoring the pipeline to ensure no leakage and verification against control room, to perform routine test, maintain and repair pipeline equipment including valve, flange and filtration system and also to fill up maintenance checklist, service report and other required documents.

### **Knowledge:**

- Management tools.
- Standard operating procedure.
- Pipeline monitoring system.

### **Skills:**

- Technical.
- Report writing.
- Diagnostic.
- Computer literacy.

### **Attributes (Attitude):**

- Work ethic.
- Adherence to procedure.
- Resilience.
- Attention to detail.

<b>MSIC DIVISION</b>	<b>:</b>	<b>H49 - Land Transport and Transport Via Pipelines</b>
<b>MSIC GROUP</b>	<b>:</b>	<b>H493 - Transport via Pipeline</b>
<b>AREA</b>	<b>:</b>	<b>Multi-Product Pipeline Control</b>
<b>JOB TITLE</b>	<b>:</b>	<b>Planner</b>
<b>LEVEL</b>	<b>:</b>	<b>4</b>

#### **Job Responsibilities:**

Planner responsibilities is to coordinate production capacity and available stock against customer demands, to monitor operation activity within budget, to obtain output goods information (available stock, percentage of defectives etc.) through collaboration with quality control and warehouse/ plant, to plan goods transportation timeline and switching between different goods, including cooldown/ purging period, to plan output quantity to each customer and liaise with control room operator on the operation plan for each transport, to synchronize multiple supply points stock availability, to communicate finalized transportation plan to customers as well as to liaise with maintenance and facilities team on downtime required for pipeline cleaning, corrosion inhibitor injection etc.

#### **Knowledge:**

- Product knowledge.
- Production process.
- Warehouse management.
- Customer service.

#### **Skills:**

- Data management and sorting.
- Analytical.
- Interpersonal.
- Planning and forecasting.
- Computer literacy.

#### **Attributes (Attitude):**

- Teamwork.
- Attention to detail.
- Multitasking.
- Agility.

**MSIC DIVISION** : **H49 - Land Transport and Transport Via Pipelines**  
**MSIC GROUP** : **H493 - Transport via Pipeline**  
**AREA** : **Multi-Product Pipeline Control**  
**JOB TITLE** : **Control Room Operator**  
**LEVEL** : **2**

**Job Responsibilities:**

Control room operator is responsible to operate Distributed Control System (DCS) / SCADA, to interface with contractor on any changes from subsystem to DCS / SCADA, monitor process flow condition to achieve targeted quality and quantity, to coordinate crew formation based on operation process requirement, to do pre-operation preparation activities, to provide input to technicians to carry out equipment functioning test activities (field site) in effective and safe manner and also to log instrument and equipment status and communicate with maintenance team for required repair.

**Knowledge:**

- DCS / SCADA control system proficiency.
- Standard operating procedure.
- Instrument operation.

**Skills:**

- Planning and forecasting.
- Diagnostic.
- Communication.
- Interpersonal.

**Attributes (Attitude):**

- Multitasking.
- Adherence to procedure.
- Attention to detail.

<b>MSIC DIVISION</b>	<b>:</b>	<b>H49 - Land Transport and Transport Via Pipelines</b>
<b>MSIC GROUP</b>	<b>:</b>	<b>H493 - Transport via Pipeline</b>
<b>AREA</b>	<b>:</b>	<b>Pipeline Distribution Operation</b>
<b>JOB TITLE</b>	<b>:</b>	<b>Executive</b>
<b>LEVEL</b>	<b>:</b>	<b>4</b>

#### **Job Responsibilities:**

Executive responsibilities is to analyse, prepare and monitor corrective & preventive maintenance program, to plan and execute for future upgrading of pump house and water network system, to assist in budget preparation & related resources requirements, to approval of pumping & water distribution operation, to analyze data on any issues related to water distribution for future upgrading or improvement, to implement and adhere to the safety, health and environmental, to plan, monitor and execute the maintenance works related to water distribution, to handling customers complaint, to coordinate and monitor all the supervisor within zone, to handling and manage all panel contractors related to maintenances as well as to to plan for application of green technology and sustainability.

#### **Knowledge:**

- Standard Operating Procedure for Water Distribution.
- Act, Rules and Legislation related to water industry.
- Safety and security at site or related to the water distribution.
- Product knowledge of pipe, meter, reservoir and other related to water distribution.
- Pipe installation method and procedures.
- Water supply system and network management system.
- Related technology e.g SCADA and telemetry system.
- Pressure management tools and equipment.
- Minor & major repair.
- Emergency Response Plan (ERP).

#### **Skills:**

- Capable in preparing an effective technical report.
- Effective communications - formal or informal.
- Critical and analytical thinking.
- Problem solving skills.
- Leadership & empowerment i.e. motivational, empathy.
- Well verse in latest technologies i.e. software & hardware.
- Computer literate.
- Time management

#### **Attributes (Attitude):**

- Very good negotiations skills.

- Strong team player and approachable.
- Multi-tasking & flexibility in carrying routine work.
- Attention to detail.
- Resilience, agility and dependability.
- To assure and maintain a professionalism & good work ethic in any condition of working.

<b>MSIC DIVISION</b>	<b>:</b>	<b>H49 - Land Transport and Transport Via Pipelines</b>
<b>MSIC GROUP</b>	<b>:</b>	<b>H493 - Transport via Pipeline</b>
<b>AREA</b>	<b>:</b>	<b>Pipeline Distribution Operation</b>
<b>JOB TITLE</b>	<b>:</b>	<b>Operator</b>
<b>LEVEL</b>	<b>:</b>	<b>2</b>

### **Job Responsibilities:**

Pipeline Distribution Operation Operator is responsible to record pump operation, reservoir or service tank level, flowmeter and any data related to water distribution within job scope, to implement maintenance follow schedules for valve systems in pump house or reservoir, to do cleaning and maintenance work inside or outside pump house, to do minor repairs for all equipment at reservoir or pump house and also to report all administrative data, faulty and any works related to job scope to superior.

### **Knowledge:**

- Pumping operation, method and procedures.
- Water supply system tools & equipment.
- Product specification requirements.
- Pressure management tools and equipment.
- Occupational Health and Safety regulations.
- Green technology and sustainability.

### **Skills :**

- Read, record and interpret instrumentation readings.
- Technical skills (installation & activation, maintenance, operate machine or tools).
- Performance test for pipes, valves, equipment related to distribution.
- Preparation of tools, equipment for valves & pipe specials/accessories installation and maintenance works.
- Preparation of tools, equipment for pipes installation & maintenance works.
- Utilize tools & equipment for maintenance works.
- Carry out mechanical or distribution systems installations.

### **Attributes (Attitude):**

- Resilient, agile and reliable.
- Teamwork and approachable.
- Multi-tasking.
- Flexible in work.
- Professional with integrity.
- Ethical.