FEEDBACK TUTORIAL LETTER

1st SEMESTER 2018

ASSIGNMENT 2

OPERATIONS TRANSPORT MANAGEMENT

OTM611S
Dear students

Thank you for the effort and congratulations in completing your second assignment for this semester.

Remarks on Assignment 2:
You have done well on question 1, mentioning possible urban transport problems experienced in Windhoek, however only few of the students suggested possible solutions to these problems, hence the majority lost marks. Question 2 required you to show how the three elements of in each transport mode in question interacts and impacts on safety. You supposed to do research and report on your findings, by so doing you will learn how safety can be ensure by adhering to safety designs and specifications, operational requirements and maintaining infrastructures.

The biggest problem is that students are not referencing (in text referencing) their work. Please purchase the APA referencing guide from the Library, this document can be used as a guide as you are referencing your assignments. The Namibia University of Science and Technology therefore does not condone any form of academic dishonesty, including plagiarism and cheating on tests and assessments, amongst other such practices. The Namibia University of Science and Technology requires students to always do their own assignments and to produce their own academic work, unless given a group assignment.

All forms of academic dishonesty are viewed as misconduct under the Namibia University of Science and Technology Student Rules and Regulations. Students who make themselves guilty of academic dishonesty will be brought before a Disciplinary Committee and may be suspended from studying for a certain time or may be expelled. All students who are found guilty of academic dishonesty shall have an appropriate endorsement on their academic record, which will never be erased.

Best regards,
Question 1

Windhoek is the centre of most business activities, political affairs, entertainment services, and education services. The provision of transport services as a public utility has certain challenges in Windhoek as a city. Discuss the urban transport problems affecting Windhoek city and recommend possible solutions to each problem. 45 Marks

Students should mention some the problems listed below and suggest possible solution that the City of Windhoek can implement to improve urban transport problems. Urban transport problems are not limited to those listed below, hence students who mentioned problems not discussed below are awarded a correct mark. These problems are highlighted by Rodrigue, (2017).

Traffic congestion and parking difficulties - one of the most prevalent transport problems in large urban areas, usually above 1 million inhabitants. It is particularly linked with motorization and the distribution of the automobile, which has increased the demand for transport infrastructures. Traffic congestion and parking difficulties results in a condition on the road networks that occurs as use increases, and characterized by slow speed, longer trips times. The demand for road space exceed the supply and the vehicles spend the majority of the time parked. Motorization has expanded the demand for parking space, creating space consumption problems particularly in central areas and it also creates additional delays and impairs local circulation.

The Causes of traffic congestion include growth in population, increasing the number of cars annually, Increasing number of trucks and commercial vehicles and small roads for number of cars and motor cycles.
The impacts of traffic congestion and parking difficulties include productivity, Fuel, Wear and tear, Stressed drivers, Delay of Emergencies, Spill over into other roads.

Possible solutions: implementing effective traffic control on city streets would help to reduce congestion problem. Since a lot of street traffic is caused by people looking for a place to park, one way that cities can ease urban congestion, is with systems that assist drivers in finding parking spaces. The City of Windhoek can install a system of sensors that guides drivers to vacant spots.

Expanding the lines or building more roads would also help the solve congestion problem.
Reducing the impacts of trucks: research has proven that trucks contribute to over 20 percent of all urban congestion. This problem could escalate as many cities continue restricting the operation of large vehicles, while the rise of internet shopping makes delivery services more and more important. The city of Windhoek can also encourage the freight transportation companies to use vehicles that are small, more environmentally sound, and less disruptive than trucks, when parked.

Improving public Transportation: Studies show that public transportation relieves congestion on roads that parallel heavy transit corridors.
The following strategies may increase parking supply:

- Minimum Parking Requirements.
- Increase On-Street (Curb) Parking.
- Subsidize Off-street Parking.
- Add Remote Parking Spaces.
- Redesign Existing Parking Facilities.
- Car Stackers and Mechanical Garages.
- Provide Parking Information to Users.

The city of Windhoek may also reduce the demand for parking by raising parking fees.
**Longer Commuting**

- On par with congestion, people are spending an increasing amount of time commuting between their residence and workplace.
- The main reason behind this trend is related to residential affordability as housing located further away from central areas (where most employment companies are) is more affordable.
- Commuters are trading time for housing affordability.

*Solutions:* The City of Windhoek should improve residential affordability for its citizens. People are commuting from nearby towns because accommodation is affordable in those towns. Rent fees must be reduced or control to ensure that the landlord are not over pricing their accommodation facilities.

**Public Transport Inadequacy**

- Many public transit systems, or parts of them, are either over or under used.
- During peak hours, crowdedness creates discomfort for users as the system copes with a temporary higher demand.
- Low ridership makes many services financially unsustainable, particularly in suburban areas.
- In spite of significant subsidies and cross-financing (e.g. tolls) almost every public transit system cannot generate sufficient income to cover its operating and capital costs.

*Solutions:* The city of Windhoek should improve the access to the current public transport. Operations timetable should be increased to 24 hours/7days a week. The city should also buy new model of the vehicles, since some buses are outdated.

**Difficulties for non-motorized transport** - These difficulties are either the outcome of intense traffic, where the mobility of pedestrians, bicycles and vehicles is impaired, but also because of lack of consideration for pedestrians and bicycles in the physical design of infrastructures and facilities.

*Solutions:* The city of Windhoek should ensure that provisions are made for non-motorized transport users. There must be bicycles lanes, pedestrians walkway must be build, and people living with disabilities must be accommodated.

**High maintenance costs** - Cities old transport infrastructure are facing growing maintenance costs as well as pressures to upgrade to modern infrastructure. In addition to the costs, maintenance and repair activities create circulation disruptions.

*Solutions:* The city of Windhoek should source funds from private sector to help to build and maintain the public roads. The city should also from public-private partnership with private companies and should include.

**Environmental impacts and energy consumption** - Pollution, including noise, generated by circulation has become a serious obstacle to the quality of life and even the health of urban populations. Energy consumption by urban transportation has dramatically increased and so the dependency on petroleum.

*Solutions:* The city of Windhoek should develop environmental or green investments initiatives that keep the environment safe and healthier to live in. The city must burn the installations of devices that emit too much noise on cars, few energy consumptions and ensure that garages do not spill oils on the ground during their operations, to keep the city neat.
The city must also undertake environmental impact assessments, in addition to planning and design, construction, operation and maintenance of the roads, in accordance with the guidance of the competent authority and the requirements.

**Land consumption** - Between 30 and 60% of a urban area may be devoted to transportation, an outcome of the over-reliance on some forms of urban transportation. Yet, this land consumption also underlines the strategic importance of transportation in the economic and social welfare of cities.

*Solution:* proper transportation planning of the entire city is required before building the roads since the investments of the infrastructure is irreversible. The city may also consider building a two or three-level stack on top of the existing roads to accommodate the demand.

**Freight distribution** - Globalization and the materialization of the economy have resulted in growing quantities of freight (Cargo or goods) moving within cities. As freight traffic commonly shares infrastructures with the circulation of passengers, the mobility of freight in urban areas has become increasingly problematic.

*Solution:* the city must build priority lanes for freight distribution vehicles. The city may also control the loading and off-loading time of these vehicles. Loading and offloading may be done during the hours when the traffic flow is not high. Off-loading and loading should not be done in the city centre, (companies should not located warehouses in the city centre).

**Automobile Dependency** - Rising automobile mobility can be perceived as a positive consequence of economic development. The acute growth in the total number of vehicles also gives rise to congestion at peak traffic hours on major thorough fares, in business districts and often throughout the urban area.

*Solution: The City of Windhoek may introduce the Bus/rail coordination*

- The coordination happens when various types of public transport are integrated to provide links between one form of transport (e.g. buses) to another form of transport (e.g. trains).
- It is done through-ticketing; only one ticket is required for a journey which includes travel by bus and rail;
- It requires expansion of parking capacity and improvements in the security of parking/links between parking and public transport;
- There should be timetable co-ordination, better facilities for interchange, better connections and co-ordination of public transport services and improved information for customers.

**Loss of public space** - The majority of roads are publicly owned and free of access. Traffic flows influence the life and interactions of residents and their usage of street space. More traffic impedes social interactions and street activities. People tend to walk and cycle less when traffic is high.

*Solution: The city of Windhoek may develop walkway and also invest in planning the outlook of the city. Planting more trees and building parks and lots recreational facilities within the suburb may encourage people to walk, hence creating social interactions.*

**Accidents and safety** - Growing traffic in urban areas is linked with a growing number of accidents and fatalities, especially in developing countries. Accidents account for a significant share of recurring delays. As traffic increases, people feel less safe to use the streets.
Solution: The City of Windhoek should strictly enforce measures that aim at changing drivers’ attitude and stopping them from consuming alcohol when driving, as these are the most common causes linked to crashes in Windhoek. The city should also educate the transport users on the impacts of accidents to the society and economy of the country.

Other strategies to manage transport problems include the following:

*Park and ride:* motorist can park their vehicles at a car park and on their route and make the rest of the journey to the city on a bus or train.

*Priority lanes for busses and high occupancy vehicles:*
- Lanes that ensure that vehicles with 2 or more passengers (buses, taxis, seven seater etc.) have exclusive access to a less congested lane, particularly during peak hours.

**Question 2**

There are three elements (operator, driver, and vehicle) considered in forming up legislation to regulate the safety of transport operations in all modes of transport. These elements interact to form the total transport system. The cause of accidents can be traced to the boundary between these subsystems. Discuss the safety regulations incorporating these elements (operator, driver, and vehicle) in the following modes of transportation.

**a) Road transport**

The students may be guided by the following regulations:

*Road haulage:* operator’s licence ensure safe & proper operation of heavy goods vehicles by suitable qualified people. Regulations cover goods over 3.5 tonnes gross vehicle weight, i.e. weight of the vehicle & its load

1. Restricted licence: carriage of own goods in own vehicles for own business & trade
2. Standard national: carry for hire and reward within a country
3. Standard international: carriage of goods for hire and reward for both the country and abroad.

**Applicant has to prove to the licencing authority that:**

a) Good reputation
b) Appropriate financial standing to run and maintain the vehicles
c) Professionally qualified

**Licensing authority can:**

a) Refuse an application on the grounds of not meeting the original conditions
b) Attach additional conditions to the licence regarding operation of the licence
c) Grant a licence for fewer vehicles than the applicant requested
d) Grant a license for a shorter period than the usual five years
e) Withdraw or suspend the licence if the operator cease to meet the original issuing conditions.

Road Transport Operator like Namibia Construction Authority should also ensure Routine Maintenance of the road infrastructures as follows:

**Routine Ad-hoc**

Routine maintenance may be defined as those treatments that are applied to a pavement, in order to keep the pavement functioning properly. As such, routine maintenance is sometimes referred to as “reactive maintenance.” This suggests that it is work that is performed as a reaction to a specific distress. Routine maintenance is performed on pavements as they begin to show signs of deterioration, but is generally considered to be a wasted effort on pavements that are severely distressed.

Filling a pothole is an example of a routine maintenance activity: It cannot be scheduled before the pothole appears and it should not be left unattended once the pothole has developed. However, if there are too many potholes present, a more comprehensive repair may be needed.
In addition to pothole repair, routine maintenance treatments applied to pavements include edge patching, crack sealing and filling, and shoulder repair. Routine maintenance works are divided into the following works types:

- **NON PAVEMENT (N):** These include all the activities that are accomplished outside of the road surface, like clearing side drains & culverts, vegetation control, line-marking, road signs repair, guard rail repair, etc.
- **PAVEMENT (P):** These are works responding to minor pavement defects caused by a combination of traffic and environmental effects, for example, crack sealing, patching, edge repair; shoulders re-gravelling and grading.

**Routine Opérations**

Routine operations may be defined as those activities that are conducted on an annual basis to ensure that the road is functioning properly. Routine Operations is not only limited to pavement related treatments, but also include other operational activities.

**Driver:**

The driver is any person that wish to drive a mechanically propelled vehicle on the road must have a driver’s licence, for both heavy goods vehicles and public services.

When applying a heavy goods vehicle, applicant must:
- Past medical history, with current medical certificate from the doctor
- History of any previous traffic convictions
- Type of ordinary driving licence currently held
- Public service vehicle/lorry goods vehicle licence as may be appropriate

**The vehicle**

- The width, height and length of the vehicle and trailer and the load, diameter of wheels, width, nature and conditions of tyres.
- The emission of smoke, vapour, ash sparks and grit
- Vehicle noise
- The minimum weight unladen of all vehicles, maximum weight to be transmitted to the road and the condition under which these weights may be required to be tested.
- The particulars that should be marked on vehicles and trailers
- The towing or drawing of other vehicles by the motor vehicle
- Number and nature of brakes
- The testing and inspection of vehicles by authorized persons
- The appliances fitted for signaling the approach of a motor vehicle.

**b) Air Transport**

Safety of the passengers and crew of the aircraft must be the prime consideration of those people concerned with the industry.

Aviation industry has three separate entities:
- Aircraft manufacturers:
- Airline operators
- Airport management

International Civil Aviation Organization (ICAO) established on 4 April 1947 after a conference decision in Chicago:
- Ensure safety and growth of civil air transport throughout the world
- Encourage developments of airports and navigation facilities for international civil navigation
- Reduce wasteful competition
- Ensure all nations have a fair opportunity to operate international airlines
- Avoid discrimination between the contracting nations

ICAO has an assembly, with representation from each country, and a meeting is held every three years. The quorum is 50%

**The operator**

The operator should hold an airport licence and the terms of the licence should be followed:
- The applicants must be fit in the air transport and fit to operate aircraft
- Have financial and other resources to operate the aircraft

CAA attach specific terms to the licence. CAA can revoke, suspend or vary the licence conditions by giving the holders 21 days notice with reasons.

Air transport licence applies to all registered aircraft in a country and a foreign operator who wish to use the registered aircraft.

Responsibilities of the operator:

- Each aircraft must have a designated commander
- It is the duty of the operator to ensure that all radios stations and navigational aids along the proposed route of the aircraft are adequate for safe navigation.
- The operator must ensure that the airfields en route are adequate to accommodate the aircraft in its likely loaded condition.
- It is the operator’s duty to ensure that all personnel employed on the aircraft as crew hold the required licences.
- Operators must ensure that no simulated emergency maneuvers will take place during the flight.
- It is the operator’s responsibility to ascertain that the aircraft is loaded properly before the flight.
- Each aircraft must have on board a flight manual which includes all intended airports’ operating minima

**The Driver**

Applicant for an airline pilot’s licence should satisfy:

1. Medical requirements: provide a medical certificate that states s/he is free from physical disabilities, defects of sight, hearing, and colour vision. Examination must be repeated every after six months.
2. Flying experience: satisfactory completion of set number of hours’ flying including flying, pilot in command hours, cross country flying and oversees flying.
3. Flying test requirements: applicants have to undergo a general flight test, an aircraft type test and an instrument rating test

Schedules (must be approved by CAA) regarding flying hours and duty time are laid down by the operator for each route.

Pilot cannot fly if the total flying hours in the past 28 days is more than 100 hours or if the total for the past year was more than 900 hours.

Every pilot must keep a personal log book which records dates of flights, type of aircraft and actual flying time.

**In order to ensure safety, the Commander has the following duties:**

Before the each flight:
- To check that the flight can be safely made
To check that all the necessary equipment is on board the aircraft
To check that the aircraft is fit for the intended flight
To check that the balance and weight calculation has been fulfilled & the results are within the specified laid down limits
To check that there is sufficient fuel on board for the flight, including enough reserves.
To make sure that all the pre-flight checks as laid down in the operations manual are carried out completely.

During the flight:
- To ensure that one pilot remains at the controls at all times
- To ensure that passengers understand the emergency procedures

The vehicle
- The regulations concerning the safety of aircraft is referred as airworthiness regulations
- CAA is responsible for issuing airworthiness certificates to aircraft meeting airworthiness requirements
- The aircraft must be registered, and the application must provide the certificate of airworthiness, the type of certificate issued in the country of manufacture and the flight manual of CAA.
- these documents are used to determine whether the aircraft is designed and tested to the level of safety equivalent to airworthiness requirements standards
- The certificate of airworthiness is valid for a limited period.
- The renewal procedures involve an engineer checking the relevant maintenance records that determines what work is required on the aircraft to maintain its airworthiness.
- Maintenance engineers must be licensed by the CAA to issue certificates of aircraft maintenance.

Airports Management
The operator of the Airports like Namibia Airports Company must adhere to ICAO ICAO safety regulations and requirements.
- ICAO operational airports are laid down in annex 14 to the convention (agreement)
- Operations procedures and local facilities must meet the ICAO requirements before issued aerodrome (airport) licence
- Annual renewal of the licence is subject to satisfactory reports from regular CAA inspections
- The holder is required to produce and maintain an aerodrome manual for that airport.
- Copies of manual should be available for reference by all airports staff responsible for the management and operations use of airports. Aerodrome manual include:
  - Technical administration
  - Aerodrome characteristics
  - Operational procedures
  - Rescue and fire fighting services
  - Medical facilities
  - Aerodrome lighting
  - Signals and surface markings
  - Air traffic services and communications and navigational aids

Government and international agencies set and regulate agreed standards for safe operations of the sea transport. Safe operation of ships is required in three sections:
- Safety of human life and health
Safety of the ship and its cargo
Safety of the environment

In order to ensure safe operation, shipping registration is required:
- All ships are registered in some countries, however legislation criteria for the registration of merchant ship varies from countries to countries
- No common adopted standards throughout the world except that each ship carries a document of identification issued by country of registry. Document is called certificate of registry or ship’s register.
  - Full description on the ship, name of owners
  - Type of construction, main dimension, official number, place and date of building, description of engines & boilers, details of gross and net tonnages, master’s name and certificate number.
- Flags of convenience: countries that allow any individual or companies to register a ship under their flag.

Operators
1. Maritime and Coastguard Agency
   - Responsible for implementing the shipping related legislation concerned with safety of life, crew licencing and pollution from the ships
   - Duties relating to the safety of ships:
     - Certification of the flag ships
     - Investigation and reporting of casualties (victims)
     - Random general inspection of both domestic and foreign ships
     - Surveys of life saving appliances, radio equipment and issue of certificates
     - Surveys of passenger ships and the issue of certificates
     - Surveys of crew accommodation
     - Surveys of structural fire protection arrangements
     - Examination of ship’s officers and the issue of licences (certificate of competency)
     - Prevention of accidents to seamen
   - Certificate of ship safety include: load line, radio equipment, safety equipment and safety of construction
2. International Maritime Organization (IMO)
   IMO was formed in 1948 as specialized agency of United Nations, and it is a sea transport consultative and advisory body for member states. IMO provides machinery for governments to co-operate and exchange information relating to standard of marine safety and prevention & control of marine pollution by ships to obtain international agreements
   - Provision of forum for discussion and make decisions to establish international standards
   - Encourage all member states to adopt relevant international standards quickly
   - Provide advice and assistance to member state in implementing the international standards by incorporating provisions into their national legislation and develop the appropriate administration body
   - Give adequate training of technical and administrative nature to administration officials
   - Allow port state control to be exercised in an effective and equitable manner
   - Monitor and analyze deficiency reports from flag states and the responses received from flag states to maintain awareness of the problem ships not up to standard
   - Obliging party to a convention to apply requirements of that convention to ensure that no ‘more favourable’ treatment is given to non-party
3. Maritime Administration of Namibia
Directorate of Maritime Affairs

- to ensure safety of life and property at sea; prevent and combat pollution of the marine environment by ships and to promote Namibia’s maritime interests.

Division: Legal & International Maritime Affairs

- To draft, review and promote implementation of national maritime legislation. To provide for advise to the Government on the necessary maritime policies.

Division: Maritime Pollution Control and Search & Rescue

- To prevent and combat ship-sourced pollution in the marine environment and provide maritime Search and Rescue services in Namibia waters.

Division: Surveys & Inspections

Ensure safety of vessels by carrying out surveys, inspections and certify Namibian Vessels; execute port state and flag state control; conduct registration and certification of Namibian Seafarers; register Namibian vessels, etc.

Drivers

Licensing

The candidate for licensing must first have sufficient time at sea. Then the potential captain must pass an examination on navigation, safety and operations. Those who are academically challenged may, under certain circumstances, request oral examinations.

The path for a ship captain include the following steps:

- Step 1: Choose a Career Path.
- Step 2: Attend Coast Guard-Approved Academy Training.
- Step 3: Gain Experience as a Deck Officer.
- Step 4: Earn Credentials.
- Step 5: Advance to Rank of Ship Captain.

Vehicles

Ships adhere to the following requirements to ensure safety:

- alternative designs and arrangements;
- safe areas and the essential systems to be maintained while a ship proceeds to port after a casualty, which will require redundancy of propulsion and other essential systems;
- on-board safety centres, from where safety systems can be controlled, operated and monitored;
- fixed fire detection and alarm systems, including requirements for fire detectors and manually operated call points to be capable of being remotely and individually identified;
fire prevention, including amendments aimed at enhancing the fire safety of atriums, the means of escape in case of fire and ventilation systems; and

Time for orderly evacuation and abandonment, including requirements for the essential systems that must remain operational in case anyone main vertical zone is unserviceable due to fire.

d) Rail transport

Operator
The operator for rail transport especially in Namibia also oversee the operational activities, maintenance and development of rail infrastructure. TransNamib is a legislation body that monitor safety on the railway by:

- Approve and monitor all new railway works and rolling stock to ensure they meet acceptable safety standards
- Considering, accepting and monitoring railway safety cases as suggested by the train operating companies
- Develop a programme of planned inspections of the railway to ensure that organizations involved in constructing, maintaining and operating railway are complying with health and safety regulations
- Investigating accidents and dangerous occurrences on the railway
- Reports on trends in accidents and incidents on the railway

Driver
The driver of the train (also called locomotives engineers) must comply with the following requirements:

1. Meet the general qualifications.
   - He/she must be at least 18 years of age.
   - He/she must pass a background check and a drug screen.
   - He/she must be able to work alone for long periods of time, handle emergency situations and think for yourself.

2. Attend formal training, which will consist of classroom study and hands-on experience. Training may take several weeks or several months. The program must be approved by the Railroad Administration. Most train drivers attend schools operated by the railroad company, but some may choose to attend a community college and earn an associate’s degree in railroad operations.

3. Get an entry-level job with a railroad company, such as a laborer, rail yard worker, brakeman or conductor. Gain additional skills and experience. The applicant wants to drive commuter trains, he/she may have to begin by driving buses.

4. The applicant must pass the qualifying exams for different positions and work your way up to driver. Before the applicant can drive a train, he or she must pass a federal licensing exam. The applicant have to attend additional training in the classroom, in simulators and on the job before you can take the licensing exam. The applicant will also be required to periodically pass additional tests to maintain his or her license.

Vehicle

Trains must meet essential requirements can be summarised as safety, reliability and availability, health, environmental protection, technical compatibility and accessibility.

Technical specification of trains includes:

- Control Command and Signalling
Question 3

Explain any five elements of the maintenance programme 15 Marks

The purpose of the maintenance programme is to maintain a fleet of vehicles, using predictive, preventative and corrective maintenance, in such a manner that the time the vehicle is not operating is minimized whilst ensuring that maintenance costs are kept as low as possible.

• Predictive maintenance approach: strives to detect the onset of equipment degradation and to address the problems as they are identified. This type of maintenance programme bases maintenance needs on the actual condition of the equipment, rather than on predetermined schedule and it is time based.

Predictive maintenance approach has the following advantages:
• Provides increased component operational life and availability
• Allows for pre-emptive corrective actions
• Results in decrease in equipment and/or process downtime
• Lowers costs for parts and labour
• Provides better product quality
• Improves worker and environmental safety
• Raises worker morale
• Increase energy savings
• Results in an estimated 8% to 12% cost savings over which might result from a predictive maintenance program

Predictive maintenance approach has the following disadvantages
• Increases investment in diagnostic equipment
• Increases investment in staff training
• Savings potential is rarely seen by management

Preventive maintenance (PM) approach: conducted to keep equipment working and/or extend the life of the equipment. Preventive Maintenance aim to prevent failure of the equipment before it actually occurs. It is designed to preserve and enhance equipment reliability by replacing worn
components before they actually fail. PM activities include equipment checks, partial or complete overhauls at specified periods, oil changes, lubrication and so on. Workers can record equipment deterioration so they know to replace or repair worn parts before they cause system failure.

**Maintenance intelligence:** this is a computerised maintenance management system (CMMS) based tools to help prevent or predict failure. This approach is a use-based maintenance triggered at regular intervals of time or odometer readings. E.g. an engine oil change every six months or 15,000 km. CMMS packages also assist with predictive technologies such as condition-based maintenance (CBM) that monitor the health of an asset or its component.

**Maintenance schedules:** keeping schedules (records) of what service intervals each vehicle in the fleet has and when each vehicle is next due for a service.

- Service intervals are based on kilometre and time intervals and differ greatly between vehicles and manufacturers.
- The schedule assist in the company to abide by the manufacturers’ requirements for services. Failure to do so can result in the warranties not honoured.
- The manufacturers’ recommendations and requirements in respect of meeting the maintenance needs of vehicles are carried out on a continual basis, throughout the determined life of the vehicle.
- The maintenance programme must be adapted to cater for requirements of the components that are incorporated in the build-up of the vehicle.

**Maintenance authorization:** repairs and service cost should be authorized by the fleet manager prior to any work being done on a vehicle.

- A detailed written servicing record report listing the work done, parts and fluids used and costs incurred on each job.
- Workshop job card is created for each vehicle entering inspection, service and/or defect rectification.
- Each job card should include the following information:
  - Details of all the work required to be carried out
  - Actual work carried out
  - Name of staff and hours worked
  - Details of spare parts and materials used
  - Space for the cost of work

**Tracking maintenance history:** records should be kept in order to have a history of distance travelled and maintenance carried out per vehicle. Maintenance history can manage the following aspects:

- Vehicles not being serviced
- Vehicles with high cents per kilometer (CPK) costs
- Swapping vehicles travelling many kilometers with those travelling less kilometers.
- Monitoring driver abuse

Total: 100 Marks
References


