دائـــرة الـــنـــقـــل
DEPARTMENT OF TRANSPORT

Better Truck Maintenance

How to implement an effective system for truck safety inspections and maintenance management.

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DOT-ST-FRT-G-14-7EN

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Keep trucks safe through safety inspections and maintenance systems

Read on for practical help on how to plan, carry out and record effective truck safety inspection and maintenance procedures.

What is a Truck Safety Inspection and Maintenance System?

A plan of action supported by documented procedures to inspect and maintain trucks to at least the minimum safety standard required by law.

Who is this guide for?

This guide is for anyone with a responsibility to manage one or more trucks registered in Abu Dhabi Emirate.

Why the need for guidance?

In order to protect the public and ensure the safety of road network users, the law requires all vehicles, including heavy vehicles, to be in a safe condition when operated on Abu Dhabi roads. The annual heavy vehicle test standards are the minimum standards for trucks at all times throughout the year. Roadside inspections carried out by Department of Transport and Abu Dhabi Police Directorate of Traffic and Patrols show that in 2013, over 8 out of 10 trucks had one or more defects that would have led to failure at the annual test. Where more advanced systems of maintaining roadworthiness operate, a violation rate at the roadside of around 2 in 10 vehicles is more typical. A planned safety inspection and maintenance system aimed at meeting the annual test standard at all times will improve truck operating standards, reduce truck accidents and as a result, improve road safety.

Federal Law No. (21), of 1995 concerning Traffic and Executive Regulations, Article (173) in the Vehicle Technical Conditions section states:

The vehicle must be designed and manufactured according to the good industry practices; all its parts shall be in a perfect condition, durable, completely and firmly installed. In addition, the vehicle must always be in a condition valid for use and driving, and must meet security and durability requirements stipulated herein or in any other law, so that the same shall not make the driver, passengers, road users susceptible to danger, or inflict damage upon public or private roads or properties.

What are the benefits?

Benefits for your business:

- Improved safety.
- Improved operating reliability of trucks.
- Reduced fuel consumption.
- Reduced engine emissions.
- Reduced overall maintenance and operating costs.
- Trucks in better condition enhancing your company's image and reputation.
- Reduced risk of receiving violations for defects found at roadside checks.
- Increased customer satisfaction resulting from more reliable deliveries and collections.

Benefits for the driver:

- Improved truck driver safety and that of other road users.
- Improved drivers' working environment.
- Reduced driver fatigue and stress.

If your trucks receive many safety related violations, your trade licence could ultimately be at risk.

Common safety defects found in trucks in Abu Dhabi (Defects found during truck inspections for over 500 vehicles in 2013)

Defect description	Vehicles with this defect
Vehicle lights	82 %
Brakes	60 %
Tyres	57 %
Windscreen washers	46 %
Fire extinguishers	29 %
Seat belt	20 %
Suspension	14 %
Windscreen wipers	12 %

These defects, with the exception of some suspension and braking defects, are the type of defect that should be detected by the driver during a daily walk around inspection.

The defects that occur most frequently are lighting defects. In many cases these defects can be repaired quickly at low cost. It is possible that with some basic training, many lighting defects can be repaired by the driver of the vehicle if adequately equipped. The same is true for washer and wiper defects. This could dramatically reduce the number of these defects, and thus, also reduce the number of violations.

Braking and suspension defects are generated by ineffective maintenance, because:

- Vehicle inspections are not regular.
- Vehicle inspections are ineffective (carried out by insufficiently skilled staff).
- Vehicle repairs are ineffective.

An effective maintenance system will save your company time and money and reduce the number of violations your trucks receive at the roadside.

What should be in a truck inspection and maintenance system?

Your plan will depend on many factors, however there are some common themes that each plan should contain (see below):

Section	
1	Daily walk around inspections and defect reporting
2	Facility and staff requirements
3	Regular safety inspections
4	Effective repairs
5	Costing and financial planning
6	Records and documentation
7	Company internal review

1A - Daily walk around inspections

To ensure that the vehicle about to be used is in a roadworthy condition and to support the Truck Safety Inspection and Maintenance Management System, drivers should conduct a walk around safety inspection of their vehicle before each and every work shift. This should be carried out before starting any journey. A new check must be made if the vehicle or trailer was changed during the same shift. An effective system of walk around inspections and defect reporting will improve reliability and reduce violations.

The daily walk around inspection aims to identify any obvious defects with a vehicle. It should cover the external condition, ensuring in particular, that the lights, tyres, wheel fixings, bodywork, trailer coupling, are working in good condition and safe. The load and any equipment should also be secured.

If used effectively the daily walk around inspection should pick up many defects early on, preventing more serious defects from developing and allow repairs to ensure safer truck operations.

1B - Driver defect reporting

Drivers should fill in a defect form for every shift they work. A new form should be completed if a different vehicle or trailer is used during the shift. Any defects found while the vehicle is in use or on its return to base should be recorded.

As a minimum requirement, the following should be recorded:

- Vehicle registration or fleet number.
- Name of driver.
- Date.
- List of all items inspected and an indication of their condition.
- Details of the defects or symptoms.
- A statement that any defects have been repaired satisfactorily, or that the defect recorded is roadworthy. Either statement should only be made by a person with sufficient authority, knowledge and experience to do so.

Even if no defects are found, the driver should still complete the defect form so that there is evidence that the appropriate checks have been done. This is known as 'nil-defect' reporting. A nil-defect form is a useful way to ensure that the driver is completing the checks as they are required to.

If a defect is identified, then a driver must report this immediately to a responsible person with sufficient authority to ensure that the appropriate action is taken. Completed defect forms, whether defects are recorded in them or not, should be handed in when the driver returns to base.

It is vital that a responsible person with sufficient knowledge and experience is available with authority to take a decision and action to repair any defect found during a daily vehicle inspection.

The skill and experience required for conducting a daily walk around inspection is less than these required for regular safety inspections. Therefore you may decide that drivers with some training, should be capable of conducting these checks.

However as an alternative system the company could use non driving staff to do these walk around checks before the vehicle leaves site.

Whoever conducts the checks should receive sufficient training to ensure that they can detect any relevant defects on all types of vehicles and trailers that they use.

It is necessary to audit the quality of driver checks by having a responsible person to recheck a sample of vehicles periodically.

Each company needs to decide what method of conducting walk around inspections is most appropriate for their operation.

Any defects found should be reported to the maintenance provider. Procedures should also be in place to ensure repairs are organised and completed in an effective and timely manner.

Daily Truck Inspection Form النموذج اليومي لفحص الشاحنة

Driver Name: _____ Date: _____ /_____ /_____ التاريخ: _____ إسم السائق:

Vehicle/Trailer ID: _____ Kilometer Reading: _____ قراءة عداد الكيلومترات: _____ رقم المركبة/المقطورة:

✓	✗	N/A
في حال كان العنصر يعمل if the item is in working order	في حال كان العنصر لا يعمل if the item is not in working order	لا ينطبق if not applicable

Checks	Order الترتيب	التحقق	✓ ✗ N/A
Approach vehicle - check:		**اقترب من السيارة - تحقق من:**	
Engine oil level	1	مستوى زيت المحرك	
Coolant level	2	مستوى المبرد	
Climb in the cab - from the driver's seat check:		**اصعد إلى قمرة القيادة - تفحص من مقعد السائق:**	
Gauges	3	أجهزة القياس	
Warning lamps	4	مصابيح التحذير	
Signal indicators	5	مؤشرات الإشارة	
Washers	6	بخاخات الماء	
Wipers	7	الماسحات	
Horn	8	بوق المركبة	
Mirrors – adjustment, clean, damage	9	المرايا – التعديل والنظافة والضرر	
Seat is adjustable	10	المقعد قابل للتعديل	
Start the engine – operate:		**أدر المحرك – شغّل:**	
Steering	11	المقود	
Check for excessive exhaust smoke	12	تحقق من وجود دخان عادم زائد عن الحد الطبيعي	
Switch the engine off – operate:		**أطفئ المحرك- شغّل:**	
Foot brake (can you hear any air leaks?)	13	مكابح القدم (هل يمكنك سماع أي أصوات لتسرب للهواء)	
Parking brake	14	مكابح التوقف	
Leave the cab - driver's side front wheel, then all other wheels. Check:		**غادر قمرة القيادة - العجلة الأمامية من جانب السائق، ثم جميع العجلات الأخرى. تحقق من:**	
Wheel nuts	15	صواميل العجلة	
Wheel	16	العجلة	
Tyre	17	الإطار	
Walk round the front of the vehicle – also check:		**تجول حول الجزء الأمامي من المركبة - تحقق أيضاً من:**	
Lights	18	المصابيح	
Licence plate	19	لوحة الرخصة	
Outside of cab	20	خارج المقصورة	
Continue down the passenger side – also check:		**واصل السير في جانب الراكب - تحقق أيضاً من:**	
Mirrors	21	المرايا	
Body	22	الهيكل	
Lights	23	المصابيح	
Trailer coupling and connections	24	ربط المقطورة والتوصيلات	
Load safely secured	25	تثبيت الحمولة بإحكام	
Once at the rear of the vehicle and trailer check:		**بمجرد وصولك إلى الجزء الخلفي من المركبة والمقطورة - تحقق من:**	
Lights	26	المصابيح	
Licence plate	27	لوحة الرخصة	
Reflectors and markers	28	العاكسات والعلامات	

إتمام جولة التحقق حول المركبة Vehicle walk around check completed	✓
جاهزية المركبة للعمل على الطريق Vehicle Roadworthy	
العيوب التي وجدت Defect(s) Found	

Driver Signature: _____ توقيع السائق:

رقم الخلل Defect Number	الوصف Description

في حال وجود الخلل وتصليحه
If defect(s) found and repaired

Signature: _____ التوقيع:

Name: _____ الإسم:

Date: _____ التاريخ:

Position: _____ الوظيفة:

2 – Inspection and maintenance facility and staff requirements

When considering the practical operation of regular safety inspections and maintenance of vehicles, you can:

1. Employ and use your own experienced staff to carry out safety inspections and repairs in-house.
2. Contract out safety inspections and repairs to an external maintenance provider.
3. Use a combination of both.

Regardless of the chosen method certain facility, equipment and staff requirements should be met.

The person(s) carrying out the safety inspections and maintenance of vehicles should be experienced, and preferably qualified in heavy vehicle inspection and maintenance.

They should also have access to adequate facilities and equipment. As a minimum requirement, they should have access to:

- A covered area for the largest vehicle in the fleet.
- Appropriate tools and equipment for all vehicles operated.
- An adequate under-vehicle inspection facility, such as a ramp, hoist or pit if ground clearance is insufficient for a proper inspection to be made.
- Adequate lighting.
- A safe working environment.
- Steam or pressure under-vehicle washing facilities.

If you choose to use an external maintenance provider, you are still responsible for the condition of your vehicles. Therefore the quality of work of any external provider should be regularly assessed. Ideally, a formal written contract should be in place outlining their obligations. Ensure through personal inspection that their premises and equipment used is suitable. The repairer should only use genuine or approved spare parts. Ask the provider to provide evidence of the genuine nature of the spare parts to guard against non-compliant and substandard parts being used.

3 - Regular safety inspections

Regular safety inspections form the core of a Truck Safety Inspections and Maintenance Management System.

As a minimum requirement, all the items covered by the Annual Heavy Vehicle Test should be checked. The same standards applicable at the annual test should be applied when assessing components during a safety

inspection. Manufacturer's tolerances should be used where it is known that they exceed those at the annual test.

These inspections should be undertaken as a separate operation prior to any routine maintenance.

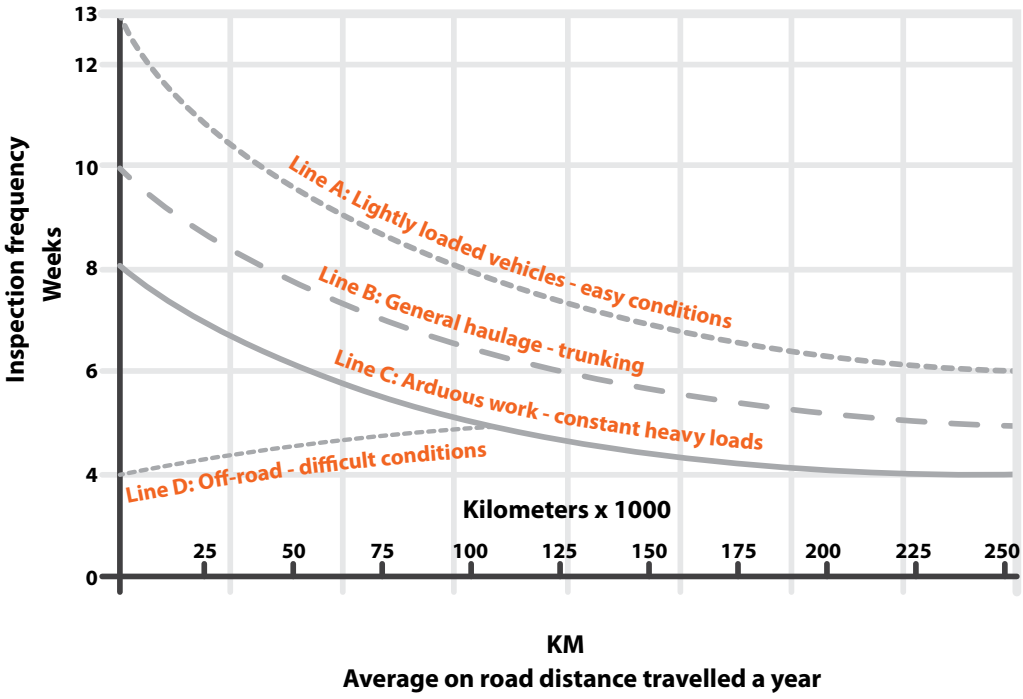
Scheduling safety inspections

Safety inspections normally follow a time-based interval. This makes scheduling simpler to plan. The inspection interval is influenced by:

- The conditions under which a vehicle will be operated.
- The expected annual mileage.
- The recommendations of the vehicle manufacturer.
- Other factors that may increase the risk of vehicles becoming unroadworthy.

Some operations are subject to frequent change due to alternative tasks or different routes, meaning a solely time-based inspection interval is not suitable. In this case, a time and distance-based interval should be used (*whichever comes earlier, the scheduled date or a particular mileage*).

Figure 1 - Inspection frequency guidance



This chart can be used to calculate the frequency of regular safety inspections.

Example: A vehicle that is operated for General Haulage (Line B in figure 1) that travels an average of 125,000 kilometres a year should have a safety inspection every 6 weeks.

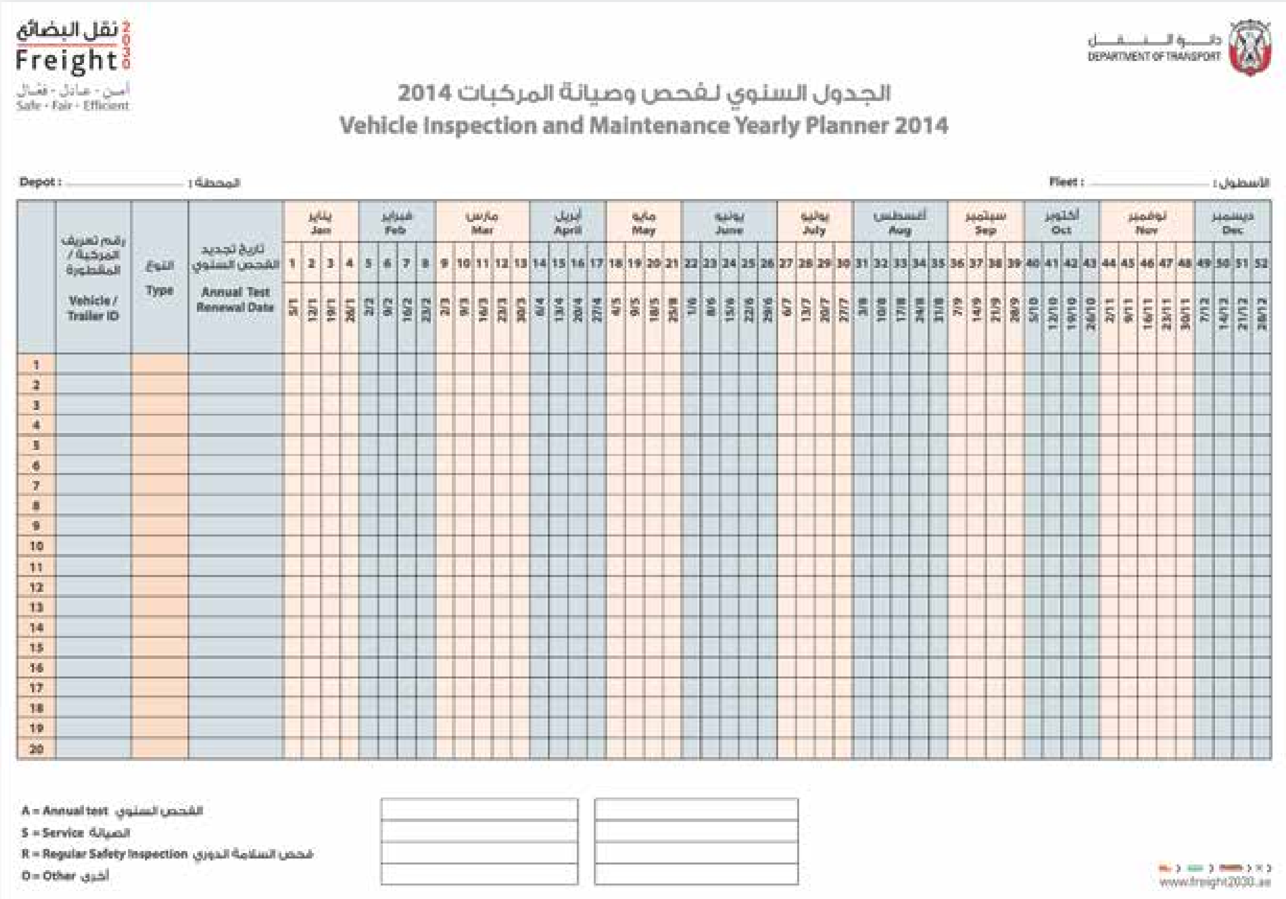
However, the chart is only a guide and it is the responsibility of the operator to increase these frequencies should the operating conditions demand it, or decrease them if the record of vehicle condition during safety inspections shows that vehicles are maintaining roadworthiness.

Routine maintenance and repairs identified by the safety inspections should - where possible - be carried out directly following a regular safety inspection. When a defect that would lead to a failure at annual test is found, then the vehicle must not be operated on the road until a satisfactory repair is completed.

Planning for safety inspections

Once the frequency of regular safety inspections have been decided, they need to be planned for. A simple and effective method is to use a 12 month wall planner showing all heavy vehicles. A sample wall planner can be found in Appendix A. Alternatively, a computer based spreadsheet or specialised software package could be used. The dates for inspections should be displayed prominently to serve as a clear reminder.

Whatever planning tool you use, it should set safety inspection dates at least six months in advance. You should include dates of vehicle annual test and re-registration and other planned servicing needs. Each activity should be clearly identified so the planner is as clear as possible.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الجدول السنوي لفحص وصيانة المركبات 2014
Vehicle Inspection and Maintenance Yearly Planner 2014

Depot : ____________ المحطة :

Fleet : ____________ الأسطول :

	رقم تعريف المركبة / المقطورة Vehicle / Trailer ID	النوع Type	تاريخ تجديد الفحص السنوي Annual Test Renewal Date	يناير Jan				فبراير Feb				مارس Mar					أبريل April				مايو May				يونيو June					يوليو July				أغسطس Aug					سبتمبر Sep				أكتوبر Oct				نوفمبر Nov					ديسمبر Dec			
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
				5/1	12/1	19/1	26/1	2/2	9/2	16/2	23/2	2/3	9/3	16/3	23/3	30/3	6/4	13/4	20/4	27/4	4/5	9/5	18/5	25/5	1/6	8/6	15/6	22/6	29/6	6/7	13/7	20/7	27/7	3/8	10/8	17/8	24/8	31/8	7/9	14/9	21/9	28/9	5/10	12/10	19/10	26/10	2/11	9/11	16/11	23/11	30/11	7/12	14/12	21/12	28/12
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A = Annual test الفحص السنوي
S = Service الصيانة
R = Regular Safety Inspection فحص السلامة الدوري
O = Other أخرى

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Recording and reporting

A written form should be completed for every regular safety inspection whether a vehicle defect is found or not. Each regular safety inspection form should include at least the following:

- Name of owner/operator
- Name of inspector
- Date of inspection
- Vehicle registration
- Mileage reading
- A list of all items to be inspected
- An indication of the condition of each item inspected
- Details of any defects found
- A statement to show if any defects have been repaired

4 – Effective repairs

Once a defect has been identified and reported, it is important that the severity of the defect is assessed and consequently the urgency required for repair is decided.

Defects can be categorised into four main types:

Defect type	Defect description	Action required
Safety Related Defect (Code 4)	A serious defect that compromises the roadworthiness of the vehicle, or render the vehicle illegal to be used on the highway as per Federal Road Traffic Law. An example of a code 4 defect is an air leak from the braking system.	The defect should be repaired as a priority. vehicle cannot be used on the road until the repairs are completed.
Serious Mechanical Defect (Code 3)	A serious mechanical defect that will worsen and increase cost if left unrepaired. This type of defect cannot develop to become a safety related defect, but may lead to major mechanical failure if unattended. An example of a code 3 defect is engine oil level below minimum.	The vehicle cannot be used on the road until the repairs are completed.
Mechanical Defect (Code 2)	A minor defect that does not compromise safety at present and will not cause further damage if operated for a short period of time but needs to be corrected. An example of a code 2 defect is brake linings approaching the wear limit.	Repair should be scheduled. However the vehicle can be used in the short term.
Cosmetic Defect (Code 1)	A minor fault that does not compromise safety and will not cause further damage or cost as it is an aesthetic fault. An example of a code 1 defect is a dented door panel.	This is the lowest priority of repair. The vehicle can be used as normal.

Prioritising defects in this way allows you or your staff to take the right decision to maintain heavy vehicle safety. It is possible for the same defect to be categorised differently. For example, a worn brake lining may suddenly deteriorate changing a Code 2 into a Code 4 defect. There are many examples of code shift.

5 - Costing and financial planning

As any transport operator should know, the cost of running a vehicle is more than just buying the vehicle and paying for driver wages and fuel. Other costs need to be planned for and averaged over the year. Maintenance is one of these costs.

Some maintenance costs may be predictable, such as renting a maintenance workshop. Others are not, such as unexpected mechanical breakdowns. You should budget so that you have enough funds throughout the year to cover these costs. If sufficient funds are not available you cannot be sure that your vehicle(s) will be operated safely.

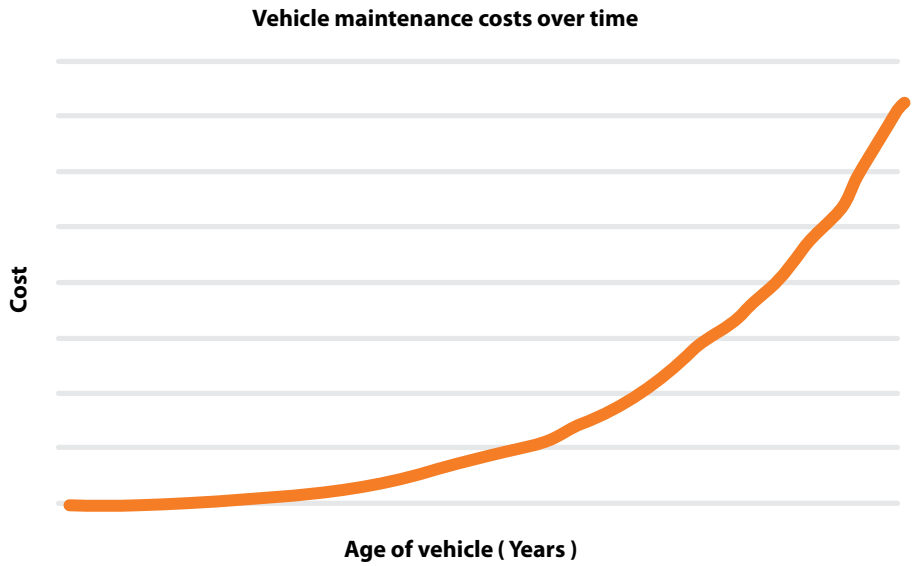

Figure 2 – Model of vehicle maintenance cost

Maintenance costs tend to be low for a new vehicle, as the majority of repairs are minor. As the vehicle gets older and the total mileage increases, the major parts begin to need replacing so the cost of maintenance increases (Figure 2).

However, the lifetime costs of maintaining a vehicle will vary depending on the usage factors .

(see page 9 - Figure 1).

These usage factors and the history of maintenance costs should be used to make your maintenance budget accurate.

If usage factors are not considered then the budget allocated to maintain a vehicle may be less than what is required to keep all vehicles on the road.

6 - Records and documentation

Documented evidence of inspections or maintenance should be kept for a minimum of 3 years. However many operators keep records for the lifetime of the vehicle.

Each vehicle should have its own file in which any maintenance or inspection documents relating to that vehicle are kept. These records should include:

- When the vehicle had its last Annual Roadworthiness Test.
- Details of what maintenance was carried out.
- All regular safety inspection forms.
- Driver defect forms.
- Details of when defects were rectified.

It is also advised that the following are included:

- Total number of maintenance hours worked on a vehicle (this could be broken down into time periods, monthly for example).
- Parts and service invoices.

Keeping records makes it simple to monitor the reliability and cost of maintaining each vehicle and provide information to ensure appropriate scheduling of maintenance.

7 – Company internal review

You should review your Safety Inspections and Maintenance Management System at least annually when well established, but probably more frequently to check that it is working effectively.

A review shows what is working and what is not. The review can be carried out by a suitable person in your staff or by a third party. It should include:

- Quality monitoring for vehicles that have recently undergone repair through re-inspecting or undertaking a safety inspection of a sample of vehicles.
- Quality monitoring for driver daily walk around checks to ensure that they are effective.
- Comparing driver defect report forms with safety inspection records for the same date to ensure consistency.
- Monitoring pass rate at annual test to ensure the effectiveness of the repairer.
- Monitoring downtime for vehicles to ensure utilisation is optimised.

Paperwork should also be reviewed. This will reveal any incomplete records and may also show patterns of defects. If many defects are reported regularly it could mean that:

- There are not enough regular safety inspections.
- Daily walk around inspections are not being completed correctly.
- Defects are not being corrected promptly or effectively.

Maintenance system checklist

The table below should be used as a checklist to ensure that all the procedures are in place for your Safety Inspections and Maintenance Management System.

Task	Yes or No? (✓ or ✗)
Has the frequency of regular safety inspection been calculated?	
Has a 12 month planner been completed and prominently displayed?	
Does the planner include all required maintenance events?	
Is a form available enabling all inspections and defects found to be recorded?	
Have facility requirements been assessed?	
Have staff requirements been assessed?	
Are procedures in place for daily walk around inspections?	
Is a driver defect form available to drivers?	
Has the capability of drivers to conduct daily walk around inspections been assessed?	
Have the costs of the safety inspections and maintenance been planned?	
Are procedures in place for documented evidence of all safety inspections and maintenance to be kept for 18 months?	
Are procedures in place for an internal review?	

Further information

For more information and further material to support your Safety Inspections and Maintenance Management System, please visit www.freight2030.ae