



LeasePlan

What's next?

How to prepare your light commercial vehicle fleet for WLTP and RDE

An overview of the upcoming challenges and proposed steps

Contents

1	Introduction	2
2	Pollutant reduction	5
3	Current challenges	7
4	LeasePlan's advice	10
5	Conclusion	12

1 Introduction

As of September 2019, WLTP and RDE will become the norm for all light commercial vehicles (LCVs). Between them, these two new tests determine the levels of pollutants such as CO₂ emissions, fuel/energy consumption and the electric range for light-duty vehicles. The introduction of these tests for passenger vehicles in 2018 created various challenges for fleet managers. Therefore, this white paper is aimed at providing an overview of the upcoming changes and helping fleet managers to tackle the resulting challenges in order to make their LCV fleets futureproof.

NEDC: New European Driving Cycle, the old laboratory test for measuring CO₂ levels of vehicles (among other things)

WLTP: Worldwide harmonised Light vehicle Test Procedure, an improved laboratory test measuring CO₂ levels of vehicles among other things

RDE: Real-Driving Emissions' test, on-the-road test for pollutants

LCV: Light Commercial Vehicle, for a specific definition for this white paper, please see the 'Definition of LCVs' section on page 3

ICE: Internal Combustion Engines, vehicles powered by a traditional combustion engine as opposed to electric vehicles

CO₂: Carbon Dioxide, Greenhouse gas produced by vehicles

NOx: Nitrogen Oxide, produced from the reaction of nitrogen and oxygen gases in the air during combustion, especially at high temperatures in ICE vehicles, in particular diesel-powered vehicles

TCO: Total Cost of Ownership, the sum of all the cost incurred of the lifetime of a leased vehicle



Definition of LCVs

LCV is a broad term. For the purposes of this white paper, LCVs are defined as vehicles in class II and III (reference mass 1,305-3,500 kg) of the UNECE vehicle category code N1. N1 vehicles in class I (less than 1,305 kg) have been required to be WLTP tested since September 2018 and represent a small percentage of LCV sales. N2 and N3 vehicles (trucks over 3,500 kg) must also be WLTP tested from September 2019 onwards. Since these account for just a small percentage of most fleets, however, this white paper only focuses on N1 vehicles in class II and III.

What are WLTP and RDE?

The Worldwide Harmonised Light-Duty Vehicles Test Procedure (WLTP) and Real Driving Emissions (RDE) test represent an improved testing cycle for vehicles to replace the existing New European Driving Cycle (NEDC). Over the years, there have been changes in driving styles (for instance, average speeds have increased) and – stimulated by the growing relevance of a vehicle’s emission values – OEMs have become more sophisticated at ‘outsmarting’ the test. As a result, NEDC has been proven to be ineffective at accurately measuring the level of pollutants like CO₂; for example, in 2014, actual emissions measured independently were found to be up to 40% higher than the NEDC values.

The WLTP and RDE have been developed in response to this. These two tests are designed to test vehicles under more realistic conditions to generate more accurate fuel consumption and emission-related results. The tests were introduced for passenger cars back in September 2018 and will be introduced for LCVs (see ‘Definition of LCVs’ for more details) as of September 2019.

WLTP and RDE tests explained

Just like NEDC, WLTP is conducted in a laboratory to reduce external factors. Among other things, the results are used to determine the CO₂ emission level for each vehicle. WLTP extends the testing cycle and makes it more dynamic than the NEDC cycle, thus giving more realistic CO₂ levels for the same car model. Furthermore, under NEDC testing the CO₂ level is the same irrespective of the configuration of a vehicle. Under WLTP, the CO₂ level varies depending on each vehicle’s specific configuration (leather seats, wider tyres, etc.).

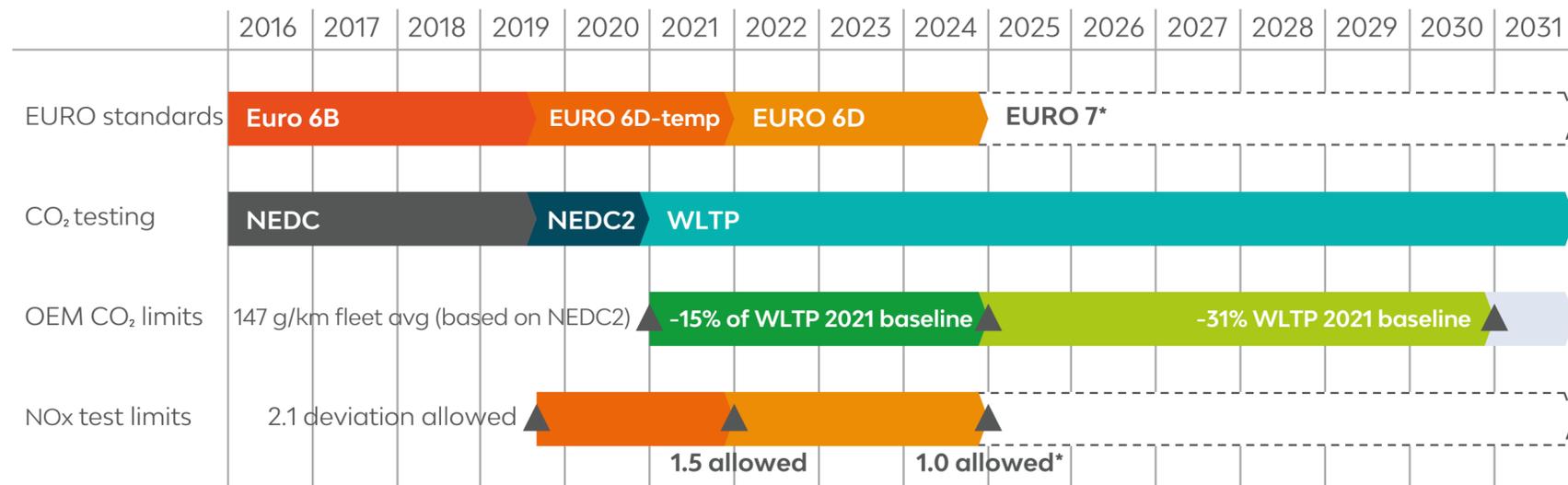
Additionally, to WLTP, RDE is being introduced for LCVs to ensure toxic pollutants like NO_x are measured accurately. Reducing such pollutants in urban areas is a top priority for all European countries because high levels of NO_x pose a health hazard. RDE tests consist of driving a car on public roads under a wide range of different conditions to verify that legislative caps for pollutants are not exceeded ¹.

Category code	Gross vehicle weight (GVW)	Sub-category (based on mass)	Start WLTP	
N1	≤3,500 kg	Class I: <1,305 kg	Sep-18	
		Class II: 1,305 kg < GVW < 1,760 kg	Sep-19	
		Class III: 1,760 kg < GVW < 3,500 kg	Sep-19	
N2	3,500 kg < GVW < 12,000 kg	NA	Sep-19	
N3	> 12,000 kg			

¹ To find out more about RDE, please visit this [website](#) developed by ACEA

2 Pollutant reduction

The timeline of EU emission legislation for LCV's



*not yet confirmed

An extensive and complex web of legislation is in place to rein in emissions and pollutants. Some of the main aspects include:

- EURO standards: EURO standard 1 was introduced in 1992 and includes limits for the acceptable amounts of CO₂, NO_x and particulate matter emitted from vehicles. These standards have been updated multiple times since 1992.
- CO₂ test values: NEDC was introduced to determine whether the EURO standards for CO₂ are met. This is being replaced by the WLTP test in September 2019.
- OEM CO₂ limits: Besides meeting CO₂ limits for individual vehicles determined by the tests, OEMs will also need to meet a fleet average CO₂ level by 2021. For LCVs, this is set at an average of 147 g/km CO₂ per LCV sold.
- RDE test limits: From September 2019 onwards, there is a maximum permissible deviation of the NO_x level between what is tested in RDE and what is formalised in the EURO standards.



The EURO 6 standard set in 2014 is currently still in place. However, some updates have been introduced to include the results of the new WLTP and RDE tests. The EURO 6D-temp requires OEMs to pass the WLTP test and to pass RDE with a maximum deviation of 2.1 times the NO_x limit². By 2022, this so-called conformity factor will be reduced to 1.5 for LCVs (formalised in EURO 6D) and it is expected the EU will not allow for anymore deviation by 2025 (which is expected to be formalised in in EURO 7).

To ensure the fleet average CO₂ target of 147 g/km by 2021 remains reasonable for OEMs under WLTP, a calculation tool has been developed to convert WLTP values back to NEDC; these values are called 'NEDC correlated' or 'NEDC2'. NEDC2 values will no longer be used beyond 2021. WLTP will then become the standard, with the average WLTP CO₂ level in 2021 providing a baseline for future new limits (-15% by 2025 and -30% by 2030).

² 2017 EU action to curb air pollution by cars: Questions and Answers [link](#)

3 Current challenges

'Fool me once'

The introduction of WLTP in the passenger car market in September 2018 sent a shockwave through the industry. Many OEMs underestimated the time needed to properly test vehicles under WLTP conditions, with the result that some car models could not be sold after September until WLTP CO₂ levels had been determined. To make matters worse, numerous passenger car models were determined to have a significantly higher CO₂ level under WLTP, making them uncompetitive in some countries due to high CO₂-based taxation.

For LCVs, taxation is based on weight rather than CO₂ in most European countries³. However, the NOx results from RDE are causing headaches for OEMs of LCVs: if an LCV scores more than 2.1 times over the NOx standard set in EURO 6, the vehicle simply may not be sold. For example, the EURO 6 standard for NOx is 105 mg/km for N1 class II LCVs. As of September 2019, an LCV is not allowed to emit more than 2.1 times the EURO 6 standard. For an LCV in N1 class II, this means maximum emissions of 2.1 x 105 mg/km NOx = 220.5 mg/km under the RDE test.

To put this limit in perspective, A 2016 study by TNO (a Dutch research organization) focussed on road tests of LCVs and found among other things that real-world emission levels of NOx were sometimes up to eight times as high as allowed⁴. While that study was not conducted according to the exact RDE test standards, it does paint a picture of the current difference between what is allowed under EURO6D-temp and the real-world emissions of LCVs. Needless to say, this poses a major challenge for OEMs.

³ To see all the vehicle tax-related legislation across Europe, please go to [this document](#) published by ACEA in 2019

⁴ 2017 TNO NOx emissions of 18 diesel light commercial vehicles: results of the Dutch light-duty road vehicle emission testing programme [link](#)





Therefore, many OEMs have chosen to revisit their engine designs to ensure they meet the WLTP deadline of September 2019. A negative side effect of this strategy for fleet managers is that the current availability of LCVs is limited as OEMs are more focused on working on new engines which will comply with the NOx limits set in EURO 6.

A weighty concern

Apart from the increased rigidity of the test cycle, the new rules for the test weight of LCVs are also a cause for concern for OEMs. Under current NEDC testing, the weight of LCVs is determined by taking the empty mass (or 'unladen mass') plus 100 kilograms⁵. Since September 2018, WLTP has required testing of all possible configuration combinations for passenger vehicles. This in itself has proved to be a daunting task, and will be virtually impossible for LCVs in view of the numerous racking options – which are also often done in the aftermarket. This is forcing OEMs to scale down on options for some LCV models before September 2019.

To soften the blow somewhat, the EU determined that for most LCVs any configuration can be regarded as payload and that an LCV is always tested with 28% of its payload capacity (apart from so-called multi-staged vehicles where the configuration is significantly different⁶). While this has simplified WLTP testing for LCVs compared to passenger vehicles, it still means a significant increase in additional test weight compared to the NEDC test. This could also contribute to a higher RDE-tested NOx level compared to NEDC, and may even lead to LCVs failing to meet the EURO 6 standard thresholds as a result.

This further increases the need for OEMs to revisit their range of LCV models, thus causing more uncertainty for fleet managers regarding whether the current choice of LCV models will still be available from September 2019 onwards.

⁵ 2016 TNO publication: NEDC - WLTP comparative testing [link](#)

⁶ 2017 ACEA presentation on multi-stage vehicles under RDE [link](#)



Unpredictability

Apart from creating uncertainty about the availability of LCVs, WLTP and RDE can also have consequences for the total cost of ownership (TCO), which is determined by estimating the costs that are likely to be incurred over the lifetime of the vehicle's lease contract. The impact of the need to renegotiate model-related discounts and recalibrate expected fuel spend, combined with the long-term outlook for LCVs with an internal combustion engine (ICE), will require a re-evaluation of how the TCO is calculated. In turn, this may lead to an increase.

Due to the stricter WLTP and RDE tests, OEMs are revisiting their engine designs. Some of them may use the revision of the engine to launch a new version of an LCV model. In this case, existing discounts negotiated on the previous model will no longer be valid. This could result in an increase in costs as LCV fleet policies often prescribe the ordering of specific models, yet the new version will not be available at the same discounts.

Another aspect to be reconsidered within the TCO of an LCV is the expected fuel spend. This is currently based on NEDC-measured CO₂ values reported by the OEMs. When WLTP values are introduced for LCVs, this calculation will need to be recalibrated in line with the new CO₂ values.

Last but not least, the long-term outlook is set to favour electric LCVs over ICE LCVs. Besides Europe-wide initiatives to limit emissions, there are also local urban Access Regulation Schemes such as Low Emission Zones which are putting the LCV industry under pressure to produce increasingly fuel-efficient LCVs. These developments could have an impact on the TCO of ICE LCVs.

e-LCVs

An e-LCV is an electric battery-powered LCV. Currently, the choice of e-LCVs is still limited and the ranges of today's models make them only feasible for daily travel distances of less than 150km (within urban areas). But this does not mean they are not yet being deployed; companies that use LCVs for last-mile deliveries – such as courier services – have already begun introducing e-LCVs. In the years ahead, more new models will be launched with greater ranges, and this will increase the number of use cases in which e-LCVs are available alternative to ICE LCVs.

4 LeasePlan's advice

Manage your LCV fleet proactively

It is vital for fleet managers to adopt a proactive approach, starting right now. Based on lessons learned from the introduction of WLTP & RDE in the passenger car market and our experience in the LCV market, we propose the following steps:

Short-term actions

- 1) Identify renewals in your current LCV fleet for the next 12 months (until Q2 2020).
- 2) Contact the leasing supplier to discuss the OEM availability of the LCV models to be replaced.
- 3) In the case of limited supply for certain models, factor in longer lead times and order in advance if necessary.
- 4) Assess together with the leasing supplier whether it would be beneficial to place an order for delivery before September 2019.

Medium-term actions

- 5) To keep the LCV ordering process running smoothly from September 2019 onwards, it is wise to inform the fleet-management team in good time and to allow for a certain financial deviation from the thresholds set in the LCV policies.
- 6) Contact all selected LCV OEMs to check which discounts will apply to newly introduced models and renegotiate new discounts if necessary.
- 7) Recalibrate the expected fuel spend in the TCO to reflect the switch from NEDC CO₂ values to WLTP CO₂ values.



Long-term actions

- 8) Check whether your selection of LCV models is aligned with the current and proposed Access Regulation Schemes in the urban areas in which your company operates.
- 9) Evaluate the TCO of your current fleet and include the distance travelled daily by LCVs to determine whether introducing E-LCVs would make financial sense.

These steps will help to reduce your CO₂ levels and financial impact, and hence ensure you are optimally prepared for the upcoming changes in September 2019 and beyond.





5 Conclusion

After many years of gradual evolution for LCVs, suddenly a lot is changing all at once (WLTP, RDE, EURO 6D-temp, average CO₂ limits for OEMs, to name but a few). These developments are causing considerable confusion, which is making it hard for fleet managers to know how best to act. At the time of writing this white paper there are still many uncertainties, in particular relating to precisely how the introduction of WLTP and RDE will affect the market. However, the impact on fleet managers can be minimised by implementing the following steps:

- Manage the LCV fleet proactively, starting now.
- Once all WLTP and RDE results for the (new) car models are in, determine their financial impact on the current fleet.
- Evaluate legislative externalities which could affect the TCO and consider introducing E-LCVs where it makes sense.

Looking ahead, WLTP and RDE will not be the last emission-related challenges for LCV fleets; future challenges include the introduction of more (and stricter) urban Access Regulation Schemes and the expected reduction in the permissible deviation from the RDE test from 2.1 to 1.5 by 2020, to name but a few. Hopefully, this white paper will help fleet managers to take efficient, effective and timely action with regards to the introduction of WLTP and RDE for LCVs in September 2019.

Interested in learning more?

Please [contact](#) our International Consultancy Services team.

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