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# Alphabet Guide to WLTP and emissions

A guide to the  
Worldwide harmonised  
Light vehicle Test  
Procedure (WLTP) for  
fleet decision-makers



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## Introduction

The test procedure for new vehicles has undergone its biggest change in a generation – and it's happened quickly, bringing new rules and changes for both fleet operators and company car drivers.

Phased in since September 2017, WLTP replaces the New European Drive Cycle (NEDC), which has been used to assess vehicles since 1992. WLTP introduces a more demanding drive cycle during the

homologation process, aimed at producing fuel consumption and emissions data which is more representative of on-road driving. The changes are already affecting manufacturers as it means entire model ranges had to undergo re-testing under WLTP before they could be sold in Europe. WLTP also accompanies the introduction of on-road emissions testing – Real Driving Emissions or RDE – designed to ensure compliance with the latest Euro 6 pollutant limits.

For businesses, it's vital to understand how these changes apply to a vehicle fleet. In the UK the NEDC ceases to be customer-facing from 1 April 2020 for Vehicle Excise Duty and 6 April 2020 for BIK tax, with a switch to the new system based on WLTP-derived CO<sub>2</sub> figures.

This Alphabet Guide to WLTP explains the fleet implications, the detail of the changes and steps to mitigate additional costs.

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**Test length:**  
30 minutes instead of 20 minutes

**Test distance:**  
23.2 kilometres instead of 11

**Cold start temperature:**  
14°C instead of 20-30°C

**Stationary time proportion** 13% instead of 25%

**Highest speed:**  
131 km/h instead of 120 km/h

**Average speed:**  
46.6 km/h instead of 34 km/h

## WLTP AND NEDC TEST CONDITIONS

	NEDC	WLTP
Duration	20 minutes	30 minutes
Distance	6.8 miles (11km)	14.6 miles (23.25km)
Time spent stationary	25%	16%
Test Phases	Urban and extra-urban with calculated 'combined' average	Low, Medium, High, Extra High, City (EV/PHEV only), with calculated 'combined' average
Average Speed	21.1mph (34km/h)	29mph (46.5km/h)
Maximum Speed	74.6mph (120km/h)	81mph (131km/h)
Start Temperature(s)	20-30°C	14°C and 23°C
Optional equipment	Wheels and tyres	Individually assessed
Gear shifts	Fixed	Different for each vehicle

# What is WLTP?

The full adoption of WLTP in the UK marks the end of a decade-long process to reform the way vehicles are homologated. It follows the analysis of a working group, established by the United Nations Economic Commission for Europe (UN ECE), which concluded that the NEDC – based on a system developed in the 1970s – was no longer fit for purpose, and set out a timetable for its replacement.

WLTP was introduced on 1 September 2017, from which point all new passenger model types have been assessed under the new

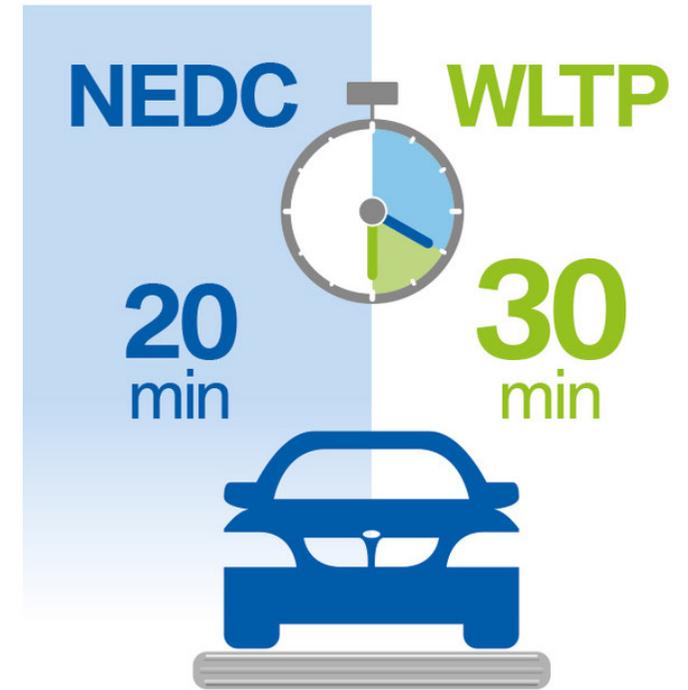
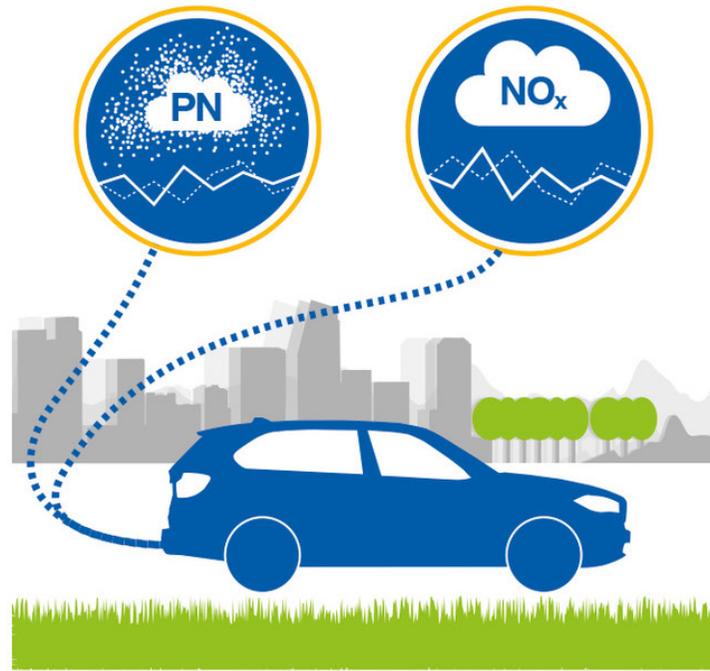
system. The phase-in process for commercial vehicles followed 12 months later. Testing is still undertaken under controlled laboratory conditions, but the process has been revised to reflect real-world driving more accurately than the NEDC. Vehicles cover around twice as much distance, at a higher average speed, and with more aggressive acceleration and braking than under the outgoing regime. A comparison of the two test cycles is shown in the table above.

Testing encompasses four cycles, each with unique acceleration

and braking intensities to simulate different road conditions. Manufacturers also have to produce figures recognising the weight, aerodynamic and rolling resistance effects of optional equipment – such as bigger wheels and tyres, bodykits and panoramic sunroofs.

Despite this complexity, deadlines have been tight. All except run-out vehicles were required to be WLTP-tested by 31 August 2018, and since 1 September 2019 models without WLTP-derived fuel consumption and CO<sub>2</sub> data cannot be sold new in Europe.

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## Real Driving Emissions (RDE)

The Real Driving Emissions (RDE) test appeared on many fleets' radars when it became part of the UK's car tax system in 2018.

Phased in alongside WLTP, RDE introduces the first on-road test element for vehicle homologations, proving emission control systems are as effective in use as they are under laboratory conditions.

RDE adds a second stage to the test process, where vehicles are required to meet Euro 6 emission limits under WLTP conditions in strictly controlled laboratory conditions, followed by a separate on-road test in real traffic.

This uses a Portable Emissions Measurement System (PEMS) which analyses the particulate matter and nitrogen oxide (NO<sub>x</sub>) content of their exhaust emissions.

On-road testing takes between 90 and 120 minutes, evenly split between urban, rural and motorway conditions, and vehicles must meet Euro 6 pollutant limits in all three situations.

As the process and equipment are new, RDE is being launched in phases with progressively stricter limits. Cars certified to RDE1 (Euro 6d-Temp) must emit less than 2.1 times the Euro 6 NO<sub>x</sub> limit of

80mg/km for diesel and 60mg/km for petrol engines, tightening to 1.43 times for RDE2-compliant (Euro 6d) vehicles.

In 2023, it's expected that conformity factors will be removed, aligning laboratory and on-road emissions limits.

All new cars must meet RDE1 limits, while RDE2 compliance becomes mandatory from 1 January 2021. Incentives in place to encourage fleets to opt for RDE2 compliant diesel vehicles include exemption from the 4% company car tax charge and a one-band reduction in first-year vehicle excise duty.

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## Company Car Tax

Click [HERE](#) for more on Company Car Tax

The more dynamic driving style of WLTP affects vehicles' combined fuel consumption and CO<sub>2</sub> figures, usually despite there being limited or no mechanical changes involved.

According to a report by the European Union Joint Research Committee, petrol, diesel and hybrid (excluding Plug-in Hybrid and Battery Electric) vehicles emit an average 21% more CO<sub>2</sub> than under NEDC testing. Variations can be anywhere between 10% and 30%.

In the UK, where company car tax is based on a car's CO<sub>2</sub> emissions, fleet operators and drivers are particularly exposed to additional liability due to this change.

Proposals for the reform of company car tax were published by HM Treasury in July 2019 to accommodate WLTP changes, following a consultation process with fleet operators, and these become law in April 2020.

The changes introduce a two-tiered company car tax system based on the vehicle's date of registration. Cars registered before 6 April 2020 are taxed according to the bands announced in 2017, with their rates frozen until the end of the 2022/23 tax year.

Registrations after this date have a WLTP-derived CO<sub>2</sub> figure, with a 2% reduction in company car tax bands for 2020/21, rising by 1% in the two subsequent financial years. The two tiers align in 2022/23.

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# Company Car Tax (continued)

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New bands for vehicles emitting 50g/km CO<sub>2</sub> or less, and the 4% BIK tax charge for non-hybridised diesel models which don't meet Euro 6d/RDE2 requirements, also apply under the new system. Company car tax bands are shown in the table opposite.

Budget 2020 confirmed the 2022/23 rates will continue unchanged for tax years 2023/24 and 2024/25.

## COMPANY CAR TAX

CO <sub>2</sub> emissions (g/km)	Electric range (miles)	2020-21		2021-22		2022-23
		BIK% NEDC <sup>1</sup>	BIK% WLTP <sup>2</sup>	BIK% NEDC <sup>1</sup>	BIK% WLTP <sup>2</sup>	BIK% All
0	All	0	0	0	1	0
1-50	>130	2	0	2	1	2
1-50	70-129	5	3	5	4	5
1-50	40-69	8	6	8	7	8
1-50	30-39	12	10	12	11	12
1-50	<30	14 (18)	12 (16)	14 (18)	13 (17)	14 (18)
51-54	-	15 (19)	13 (17)	15 (19)	14 (18)	15 (19)
55-59	-	16 (20)	14 (18)	16 (20)	15 (19)	16 (20)
60-64	-	17 (21)	15 (19)	17 (21)	16 (20)	17 (21)
65-69	-	18 (22)	16 (20)	18 (22)	17 (21)	18 (22)
70-74	-	19 (23)	17 (21)	19 (23)	18 (22)	19 (23)
75-79	-	20 (24)	18 (22)	20 (24)	19 (23)	20 (24)
80-84	-	21 (25)	19 (23)	21 (25)	20 (24)	21 (25)
85-89	-	22 (26)	20 (24)	22 (26)	21 (25)	22 (26)
90-94	-	23 (27)	21 (25)	23 (27)	22 (26)	23 (27)
95-99	-	24 (28)	22 (26)	24 (28)	23 (27)	24 (28)
100-104	-	25 (29)	23 (27)	25 (29)	24 (28)	25 (29)
105-109	-	26 (30)	24 (28)	26 (30)	25 (29)	26 (30)
110-114	-	27 (31)	25 (29)	27 (31)	26 (30)	27 (31)
115-119	-	28 (32)	26 (30)	28 (32)	27 (31)	28 (32)
120-124	-	29 (33)	27 (31)	29 (33)	28 (32)	29 (33)
125-129	-	30 (34)	28 (32)	30 (34)	29 (33)	30 (34)
130-134	-	31 (35)	29 (33)	31 (35)	30 (34)	31 (35)
135-139	-	32 (36)	30 (34)	32 (36)	31 (35)	32 (36)
140-144	-	33 (37)	31 (35)	33 (37)	32 (36)	33 (37)
145-149	-	34 (37)	32 (36)	34 (37)	33 (37)	34 (37)
150-154	-	35 (37)	33 (37)	35 (37)	34 (37)	35 (37)
155-159	-	36 (37)	34 (37)	36 (37)	35 (37)	36 (37)
160-164	-	37 (37)	36 (37)	37 (37)	36 (37)	37 (37)
165-169	-	37 (37)	37 (37)	37 (37)	37 (37)	37 (37)
170+	-	37 (37)	37 (37)	37 (37)	37 (37)	37 (37)

<sup>1</sup> Cars registered before 6 April 2020, which use NEDC CO<sub>2</sub> figures. <sup>2</sup> Cars registered on or after 6 April 2020, which use WLTP CO<sub>2</sub> figures. Figures in brackets relate to non-hybrid diesels which are not certified as RDE2-compliant.

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## Practical Considerations

### Fuel Consumption.

Most WLTP-tested vehicles are no less economical than those using NEDC data. In fact, WLTP's tougher test conditions can highlight ongoing improvements in efficiency and enable more accurate whole-life cost modelling as it uses data which better reflects real-world use.

### Company Car Tax.

Although clarity on company car tax is welcomed, HM Treasury's proposed two percentage-point reduction for vehicles with WLTP CO<sub>2</sub> figures might not be enough to protect operators and drivers from increased tax liability. For businesses reliant on diesel vehicles, choosing models which are certified Euro6d/RDE2 compliant will avoid the 4%

tax charge applied since 2018, which could reduce additional costs. It could also be worth re-examining CO<sub>2</sub> caps for your choice list to help drivers continue to select appropriate vehicles.

### Vehicle Excise Duty.

Vehicle Excise Duty is based on WLTP CO<sub>2</sub> data from 1 April 2020, but the bands are not altering to accommodate the changes. Budget 2020 announced a call for evidence looking at ways to reform VED, possibly using narrower bands.

### Capital Allowances.

WLTP could also affect capital allowances for vehicles purchased or

leased by businesses, as bands are based on CO<sub>2</sub> emissions and are not being modified. In 2020/21, for vehicles emitting 110g/km CO<sub>2</sub> or less, businesses can write down 18% of the depreciation cost or 100% of their lease payments against tax. This falls to 6% and 85% respectively for models emitting 111g/km or more.

Ultra-low emission vehicles (emitting 50g/km or less) purchased outright qualify for a 100% first-year capital allowance. From April 2021, the 100% FYA will apply only to zero-emission vehicles. The 18% WDA will apply to cars with CO<sub>2</sub> emissions of 50g/km or less, with the 6% WDA applying to cars with CO<sub>2</sub> emissions of 50g/km or more. Leasing companies are excluded from claiming the first-year allowance.

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## More Reasons to Plug In

Fleets account for half of all new vehicles registered in the UK, and HM Treasury sees them playing a vital role in the ongoing transition to low-emission drivetrains.

WLTP has a specific test cycle for plug-in vehicles, with a unique 'City' phase designed to represent urban-area driving and weighted average fuel consumption and CO<sub>2</sub> figures calculated by the car's

zero-emission electric range, which underpins its ability to be driven on battery power for a large share of its journeys. As a result, CO<sub>2</sub> figures for Plug-In Hybrid Electric Vehicles are often no higher than they were under NEDC.

HM Treasury first announced a staged set of BIK tax bands for cars emitting 50g/km of CO<sub>2</sub> or less in 2017, based on CO<sub>2</sub> emissions and

### FINANCIAL SUPPORT FOR PLUG-IN FLEETS

- **Grant Funding** – The 2020 Budget on 11 March extended the Government Plug-in Grant scheme until 2022/23 for ultra-low emission cars, motorcycles, taxis and vans. Cars with a price of £50,000\* or less with zero CO<sub>2</sub> emissions are eligible for a Plug-in Car Grant of up to £3,000 against their purchase price. Homeowners and businesses can also claim up to £500, or 75% of the installation cost, for a workplace charging point. The grant rate reduces to £350 on 01 April 2020.
- **Benefit-in-Kind** – April tax reforms revitalise incentives for drivers and fleets to use low-emission vehicles, with bands weighted by electric range for the first time. Drivers choosing a zero-emission electric car benefit from zero BIK tax in 2020/21, with VED also zero-rated. Drivers charging at work also do not pay BIK tax on the electricity used.
- **Capital Allowances** – Businesses can claim a 100% first-year allowance for vehicles emitting 50g/km CO<sub>2</sub> or less, or for the cost of installing workplace charging points. From April 2021, the 100% FYA will apply only to zero-emission vehicles. The 18% WDA will apply to cars with CO<sub>2</sub> emissions of 50g/km or less, with the 6% WDA applying to cars with CO<sub>2</sub> emissions of 50g/km or more. Leasing companies are excluded from claiming the first-year allowance.

electric range. The WLTP tax reforms from April 2020 extend the two-band reduction to these vehicles, and re-introduces the 0% band for fully-electric models, which was withdrawn from 6 April 2015.

Cars emitting 50g/km of CO<sub>2</sub> or less and offering a zero-emission electric range of more than 130 miles qualify for the 0% BIK tax rate from 6 April 2020, even if they were registered before that date.

\*The plug-in vehicle grant will be taken off the purchase price of the vehicle. For private, business, fleet or demonstration models this means the actual price paid by the customer, including any discount, not the recommended retail price. This definition of purchase price includes: number plates, vehicle excise duty, VAT (as applicable) and excludes any optional extras, delivery charges and first registration fee.