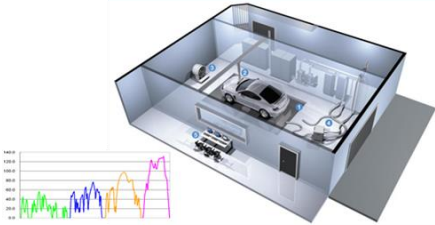

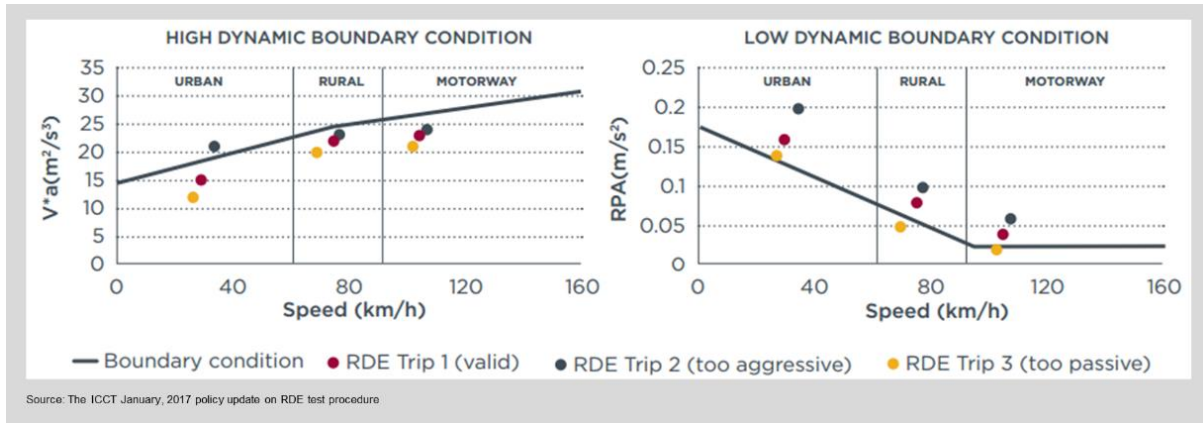


The purpose of the Real Driving Emission (RDE) test is to confirm the laboratory results under real-life conditions ensuring that a vehicle meets the regulated limits not only in the test cell but also on the road. The RDE tests does not replace WLTP laboratory tests.

During an RDE test, the vehicle is driven on public roads facing a multitude of conditions that can vary substantially from those during a conventional emission test on a chassis dynamometer.

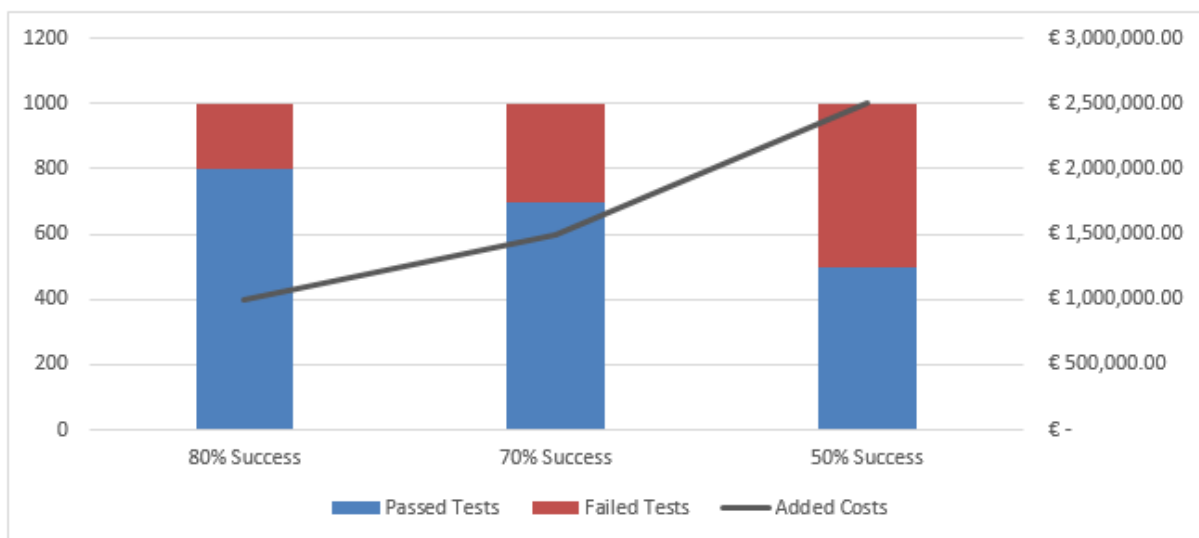
	Conventional Chassis Test	RDE Test
<b>Duration:</b> <b>Altitude:</b> <b>Temperature:</b>	WLTP: 30 min. – FTP75: 40 min. °C Standard atmospheric pressure, without gradient 20°C ± 5°C	90 to 120 min. Normal: up to 700m    Extend: 700 to 1300m Normal: 0 to 30°C    Extend: -7 to 0°C, 30 to 35°C
<b>Drive Pattern</b>		 <b>Urban</b> 0-60 km/h 34% ± 10% (>29%) Average vehicle speed 15-40 km/h <b>Rural</b> 60-90 km/h 33% ± 10% <b>Motorway</b> 90-145 km/h 33% ± 10% Cover speed range of 90 – 110 km/h 100+ km/h over 5 min.
<b>Environmental Conditions</b>	Controlled test cell environment	Temperature, barometric pressure, wind, rain, road conditions, slope, etc.
<b>Other Conditions</b>	None	Movement of pedestrians, traffic lights, stop/resume, driving behavior, steering angle, etc.
		Test environment and conditions change constantly <b>Difficult to repeat!</b>

An RDE test needs to cover three types of operation: urban, rural, and motorway. For each of these modes, the test driver must meet the distance requirements along with the regulated trip composition, stay inside the requested environmental conditions, and fulfill the driving dynamic boundary conditions. Overly aggressive or passive driving will result in a failed test.



Consequently, the RDE legislation will extend the testing demands, add significant technical challenges, require further equipment such as PEMS and calibration infrastructure imposing additional costs. Every failed test will have adverse effects on these costs and have implications for the vehicle development schedule. Therefore, the goal of every vehicle manufacturer is to maximize the yield of their RDE test.

Each RDE test takes about 1.5 to 2 hours after soaking the vehicle for at least six hours. A commonly assumed cost per test runs somewhere between €2,000 to €3,000. Considering the required resources, consumables, and availability of the test vehicle for further testing, the damage of failing a test can quickly add up to €-5,000. A typical test yield is somewhere between 50 to 70 percent. Based on an estimated one thousand tests per year, failed tests can result in an additional price tag of more than €1 million.



HORIBA's RDE CoDriver is a mobile app that navigates the test drivers through the complex RDE requirements, helping them to achieve the primary goal: getting the most out of the RDE testing. The key features of the app include:

- Ensuring RDE tests will meet the required criteria regarding trip composition, driving dynamics and environmental conditions
- Increasing the test yield while reducing cost and overhead
- Working in conjunction with the OBS-ONE PEMS for actual testing
- Training inexperienced drivers using the GPS signal of the mobile device without the need for using a PEMS