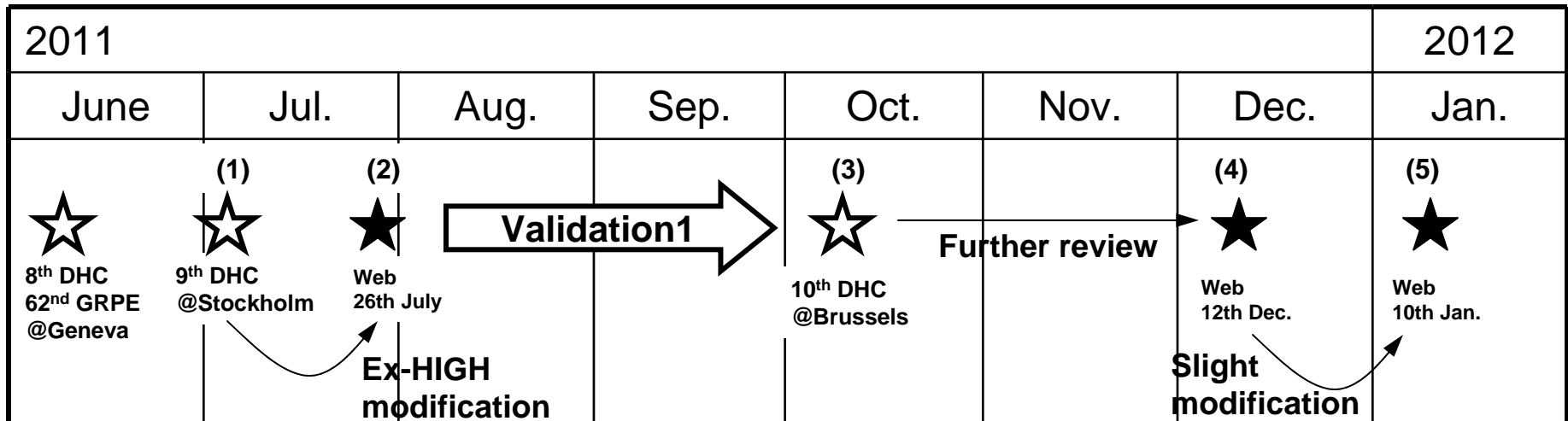


Progress Report of World-wide Light-duty Test Cycle

Prepared by DHC
under GRPE/WLTP informal group

63rd GRPE
19th January 2012
Palais des Nations, Geneva

1. Progress summary after the 8th DHC



- (1) Propose WLTC ver.1 (DHC-09-02, DHC-09-05)
- (2) Provide WLTC ver.2 for validation1
(mainly Ex-HIGH phase was modified based on EU request)
- (3) Report on validation1 test results
Decide 3 months delay for further review on WLTC ver.2
- (4) Review supplemental methodology and WLTC ver.3
Decide to develop the cycle for “Low powered vehicle”
with additional data acquisition
- (5) Provide WLTC ver.4 for validation1b

2. Summary of Validation 1 Test (63rd GRPE, 17-20 Jan. 2012, agenda item 3(a))

- Participate parties : JRC, India, Austria, ACEA, Korea, and Japan.
 - ✓ Difficulty at the low speed part (less than 10km/h).
 - require half clutch operation
 - ✓ Difficulty to trace the cycle for low powered vehicles.
 - ✓ Concern to reproducibility at micro transient portions.
 - ✓ Difficulty to trace the cycle due to max. speed limit of vehicle specification.
 - ✓ Some of vehicles are not completely warmed up at the end of Low phase from cold starting. Middle phase might be necessary for hot start testing, if applicable.
 - ✓ Observed tire slippage at the high acceleration and deceleration.

The reports are available on UN-ECE web site. (DHC10) :

http://www.unece.org/trans/main/wp29/wp29wgs/wp29grpe/wltp_dhc10.html

3. Needs to modify WLTC ver.2 (63rd GRPE, 17-20 Jan. 2012, agenda item 3(a))

Reasons	Actions
Reflection of validation ¹	Some of comments were reflected to WLTC ver.4
Additional requirement from EU (representativeness of “dynamic performance”)	Adopted the supplemental methodology maintaining the original parameter.
Additional requirement from India (difficulty to trace the cycle for low powered vehicles)	Decided to develop the cycle for low powered vehicles. Under the discussion on the definition of “low powered vehicles”.

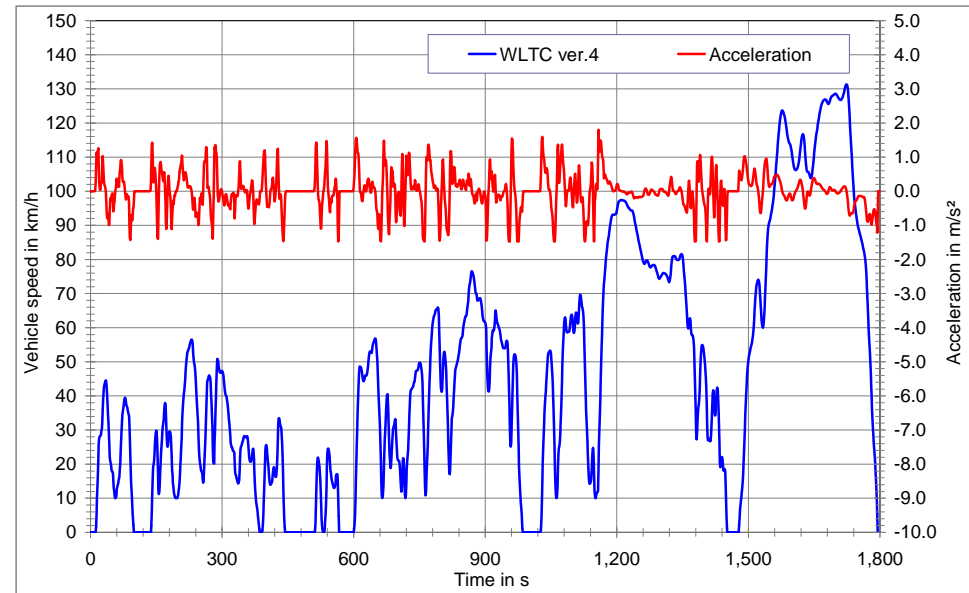
4. Characteristics of WLTC ver.4 (63rd GRPE, 17-20 Jan. 2012, agenda item 3(a))

WLTC version 4 was developed to reflect validation1 test results and to apply supplemental methodology.

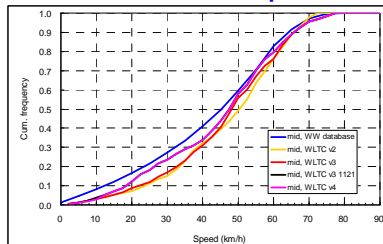
WLTC ver. 4

Reflection of validation1

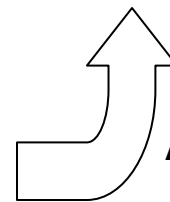
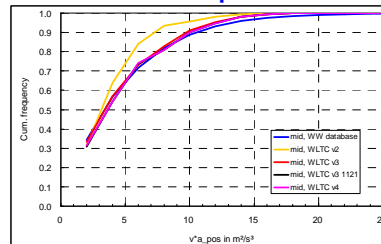
- ✓ Set minimum speed @ 10km/h during the short-trip
- ✓ Smoothen the extremely micro transient portions
- ✓ Set maximum acceleration @ 95 percent tile



Cum. Frequency of Vehicle speed



Cum. Frequency of $V * a_{positive}$



Apply supplemental methodology

5. Gear shift point

- **Two(2) methods are under the development**
 - **Japan: Vehicle speed basis**
 - based on in-use data analysis
 - Vehicle speed and Acceleration basis
 - classified vehicle category and gearbox
 - Passenger car / Light duty commercial vehicle
 - (5 / 6 speed gearbox for reference)
 - **EU: Engine speed basis**
(will be proposed at the end of January)
- **Two methods are evaluated during validation1b test**



6. Next Actions

