

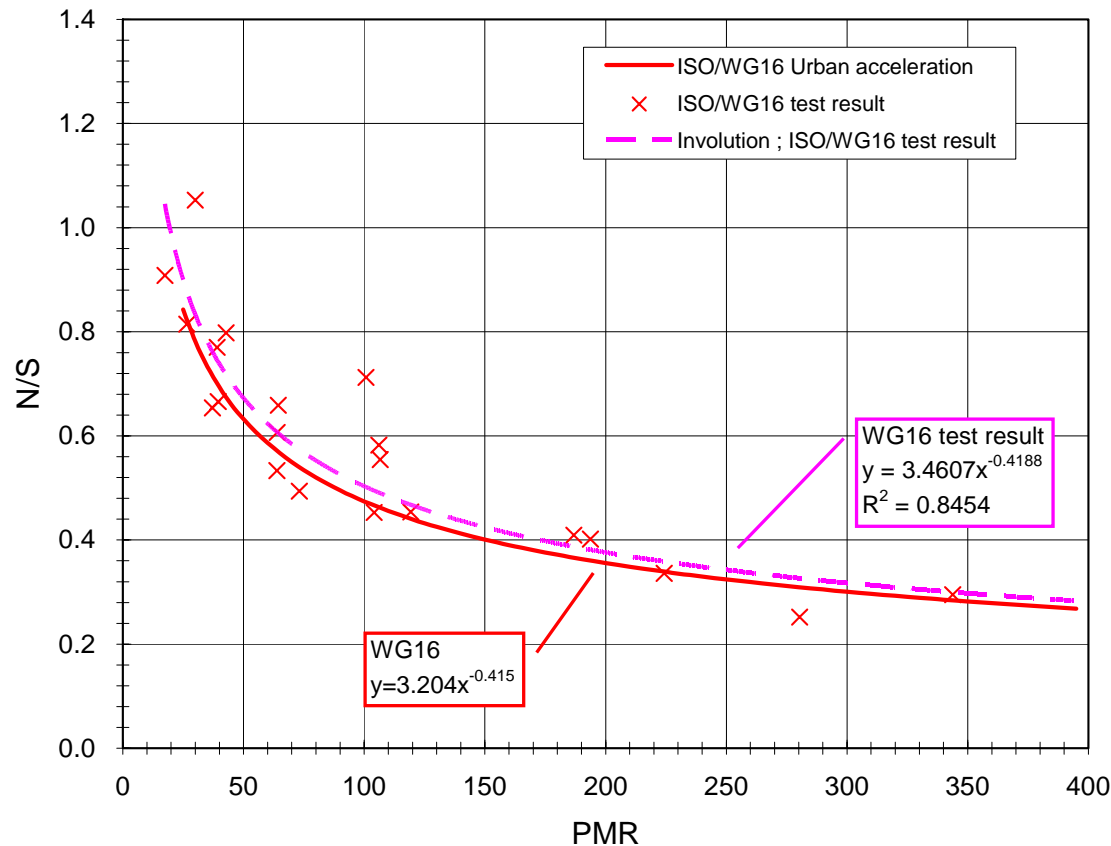
# Maximum engine speed during acceleration

#3/GRB/R41 informal group meeting

# Maximum engine speed during acceleration

<Results of N/S 95 analysis by ISO/WG 16 & reproducibility in track test>

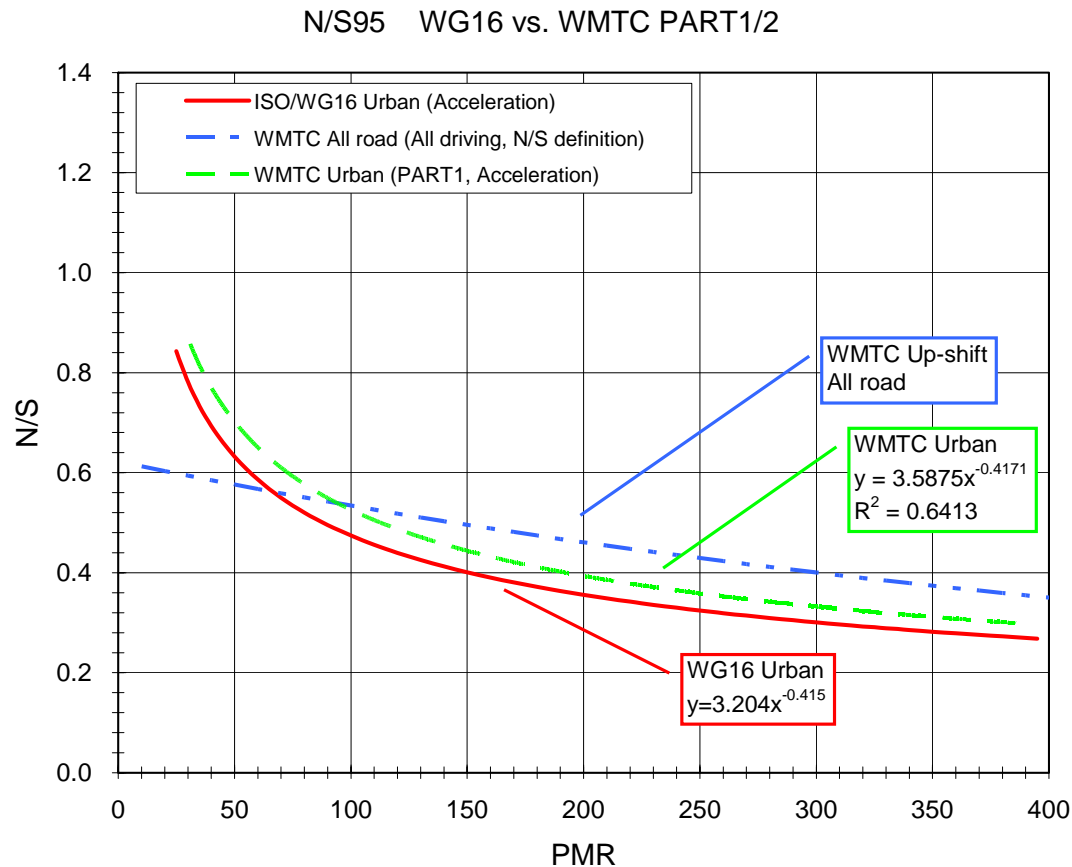
N/S95 WG16 fundamental study vs. WG16 test result



- Measured engine speed with new noise test method correctly reproduces 95% percentile of engine speed for accelerations in real world traffic.
- Under such a circumstance, ISO/WG16 new test method could be considered to be most appropriate to reproduce real world traffic.

# Maximum engine speed during acceleration

## <Comparison between N/S analysis by ISO/WG16 & re-analyzed WMTC database>

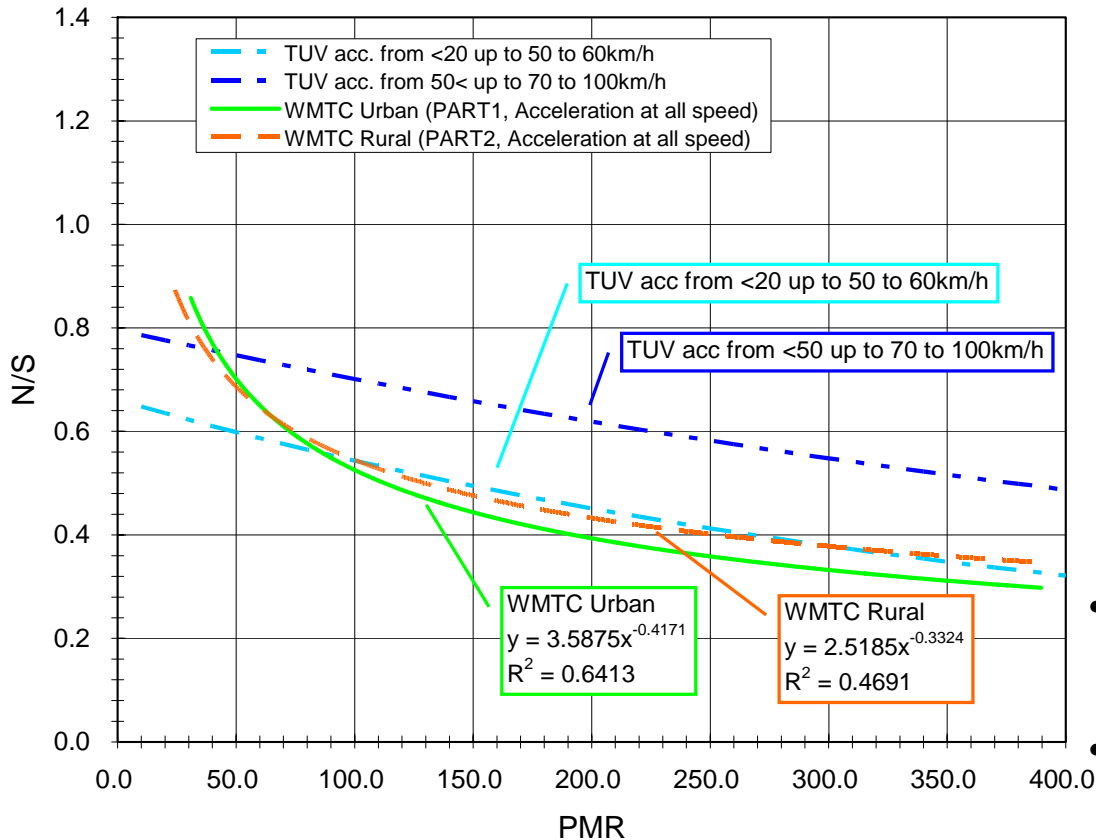


- Defined maximum engine speed during acceleration based on re-analysis of WMTC database using WG16 method is almost equivalent to that obtained by analysis (WG16 URBAN) in the establishing phase of ISO/WG 16.
- N/S difference between WMTC Urban and evaluation data for exhaust emission mode (WMTC Up-Shift) is caused by difference in data sampling conditions.
  - <Difference>
  - ~ Driving types
  - WMTC Urban :Part 1
  - WMTC Up-shift :  
Part 1, 2 and 3

# Maximum engine speed during acceleration

<Comparison between N/S95 analysis of WMTc database and TUV analysis>

N/S95 WMTc PART1/2 vs. TUV analysis



- This graph shows comparison between the engine speed curves presented in 2<sup>nd</sup> informal group meeting by TUV and the curves from the WMTc database for PART 1 and PART 2 (acceleration modules)

<Result>

There is no obvious difference between the WMTc Urban and the TUV analyses in the low speed acceleration range (Acc. from 20 up to 50 to 60km/h)

The TUV analysis in the middle speed acceleration range (Acc. from 50 up to 70 to 100km/h) shows higher engine speeds than the WMTc PART 2 analysis.

<Probable Causes>

- Urban and rural accelerations tend to be affected by differences in traffic stream and traffic regulations
- While WMTc Rural analysis is weighed on regional basis (EU, US and JAPAN), TUV analysis comprises only European driving data

# Maximum engine speed during acceleration

## <Conclusion>

- ISO/CD362 new test method shows good reproducibility of engine speed in real world conditions during acceleration in urban situations.
- The target ISO/WG16 engine speed curve is nearly equivalent to that obtained from WMTC database analysis of maximum engine speeds during acceleration in Part 1 operating conditions (alignment of WG16 procedure to be considered once full WMTC database analysis is done (see also below))
- There is a difference in data used for the WMTC gearshift procedure analysis and the ISO/WG 16 noise test development
- The TUV analysis presented in previous informal group meeting shows higher engine speeds than those in WMTC PART 2 (Rural).

## Outstanding issues

- Completion of analysis of maximum engine speeds during accelerations in Part 1 driving conditions based on TUV/IMMA consolidated database and subsequent alignment of ISO/WG 16 test method
- Initiation/completion of analysis of accelerations at higher engine speeds in the consolidated database (to complement data analysis for rural areas as presented by TUV), as the basis for discussing additional sound emission provisions

End