

EC study to review the appropriateness of **crash pulses** used in current EU legislation

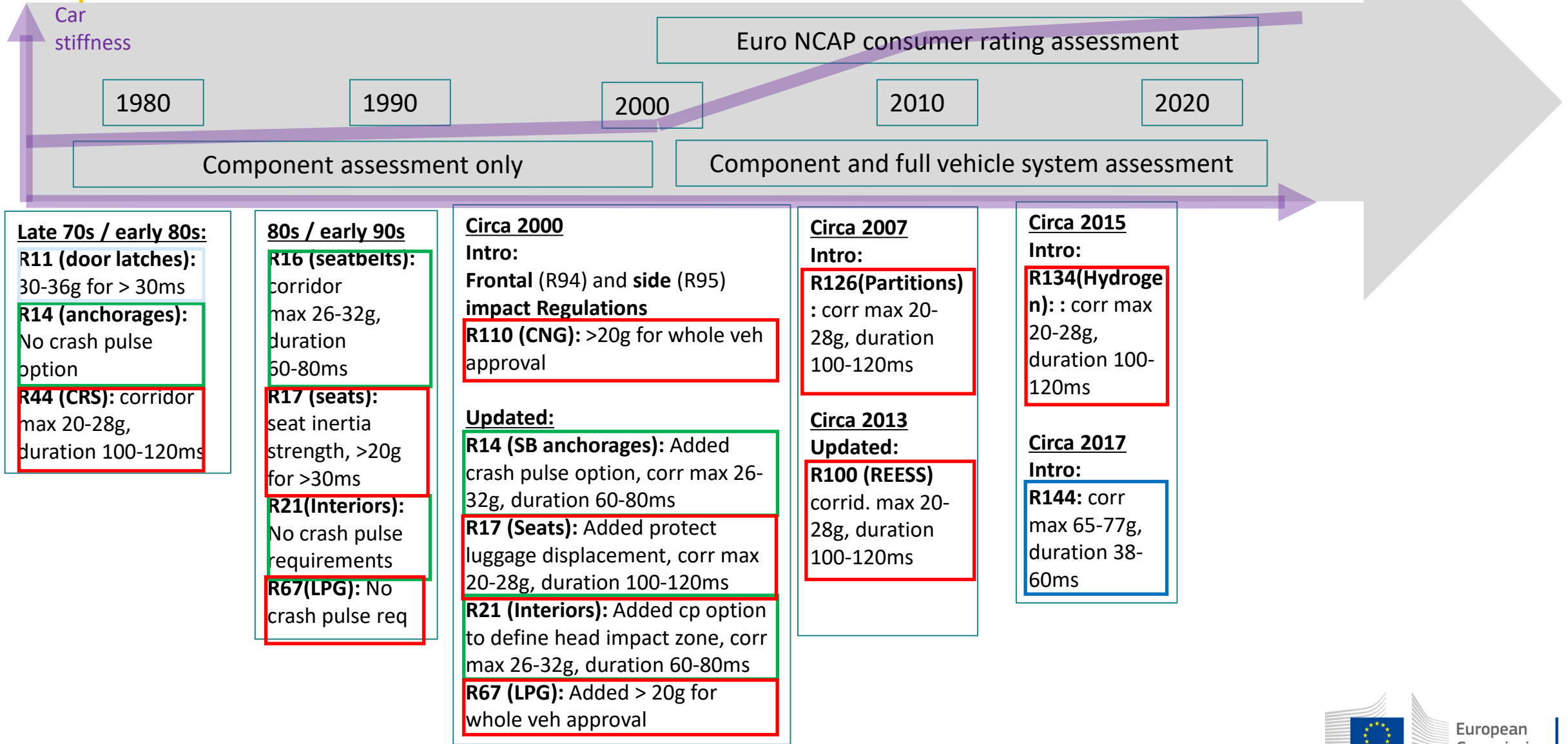
*Directorate-General for Internal Market, Industry,
Entrepreneurship and SMEs*

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Objectives of the research

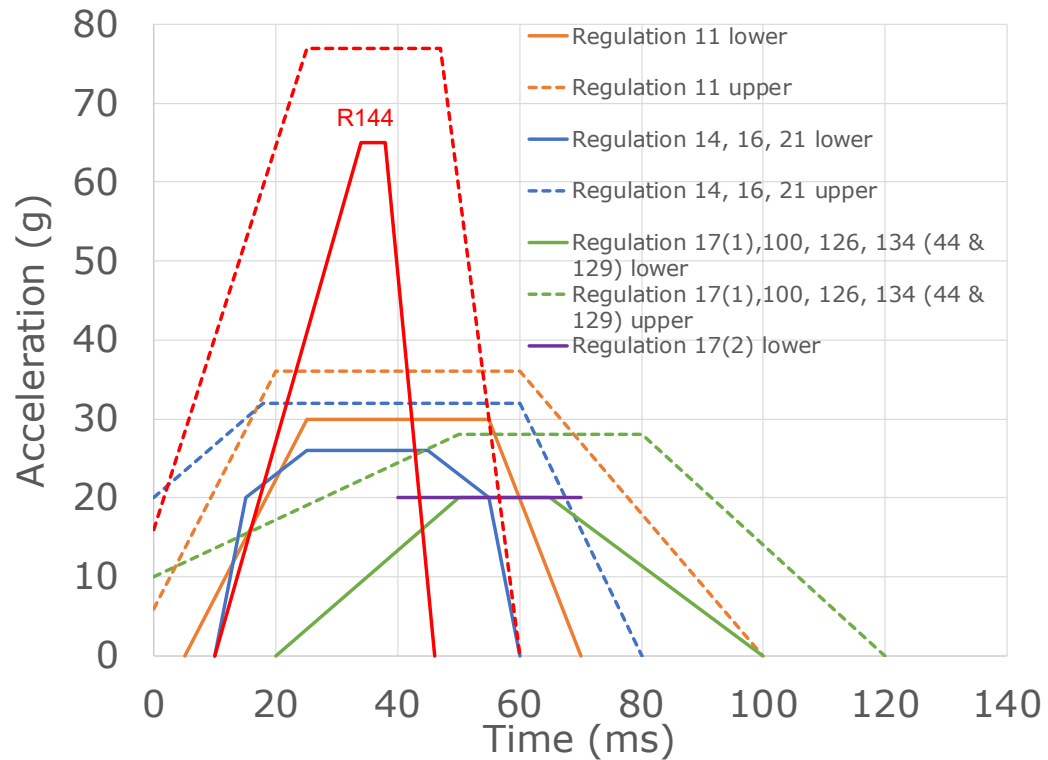
- Review crash pulses in current legislation and assess their appropriateness
- Identify potential amendments to regulations and assess the potential benefits as well as any (unintended) consequences
- Study carried out by TRL (2021 Edwards *et al*)
 - <https://data.europa.eu/doi/10.2873/58935>

Background – evolution of regulations



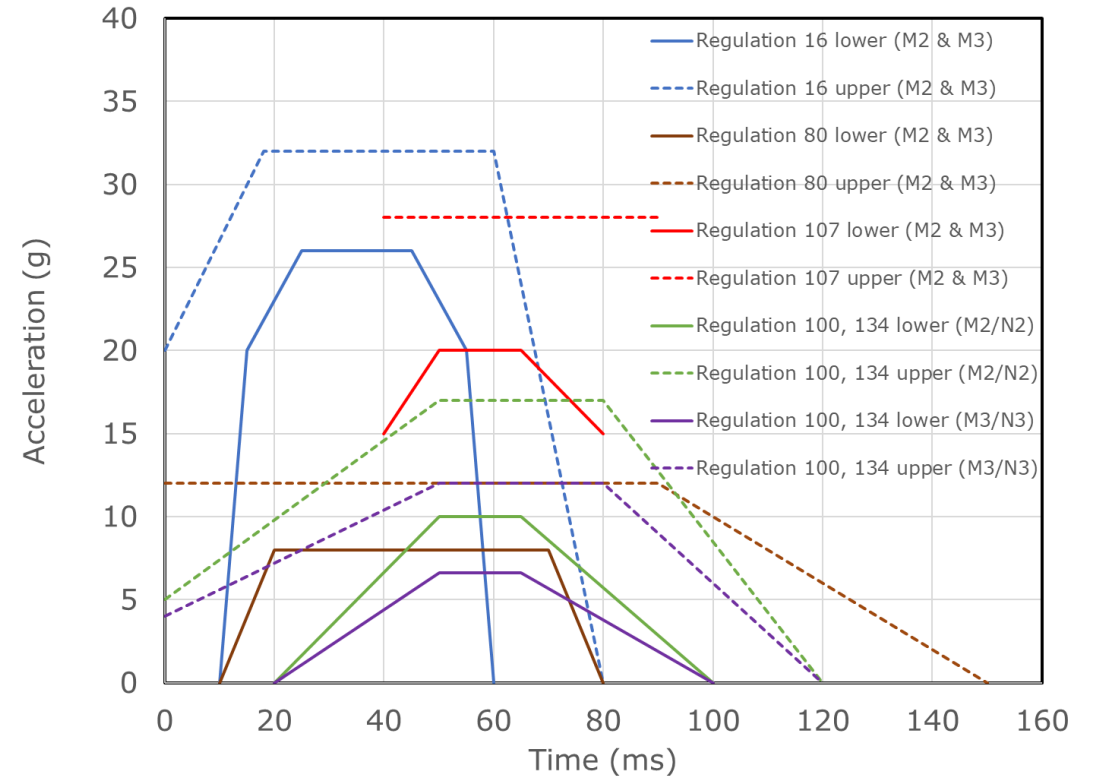
Regulatory crash pulses as they exist (frontal)

Frontal: M1 & N1



Note: Regulations 67 & 110 pulse magnitude > 20g

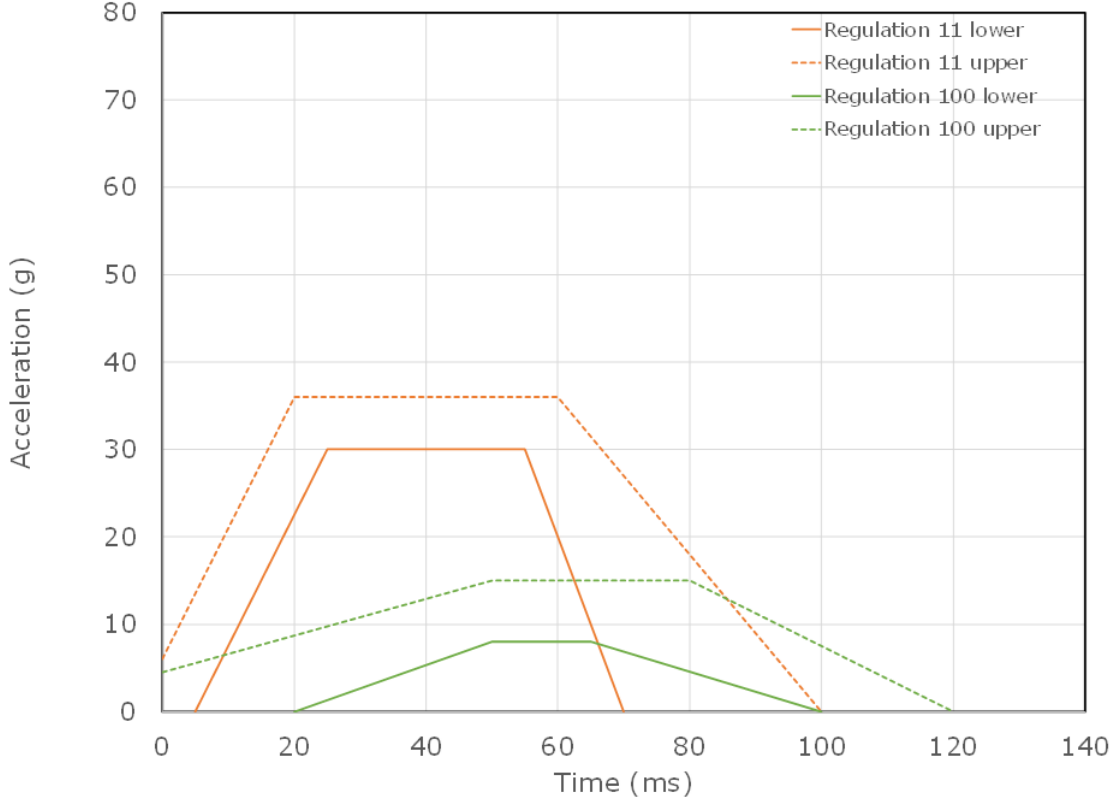
Frontal: M2/N2 & M3/N3



Note: Regulations 67 & 110 pulse magnitude: M2/N2 > 10g; M3/N3 > 6.6g

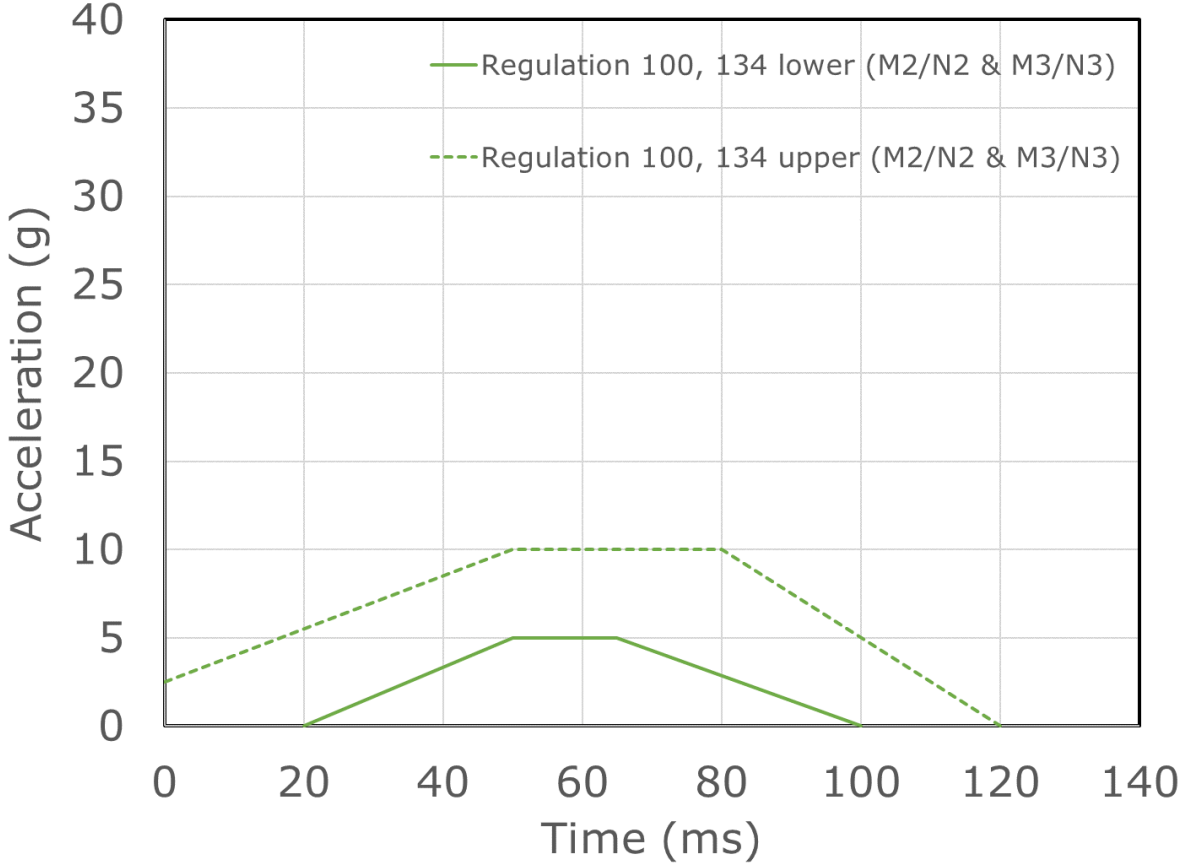
Regulatory crash pulses as they exist (side)

Side: M1 & N1



Note: Regulations 67 & 110 pulse magnitude > 8g

Side: M2/N2 & M3/N3

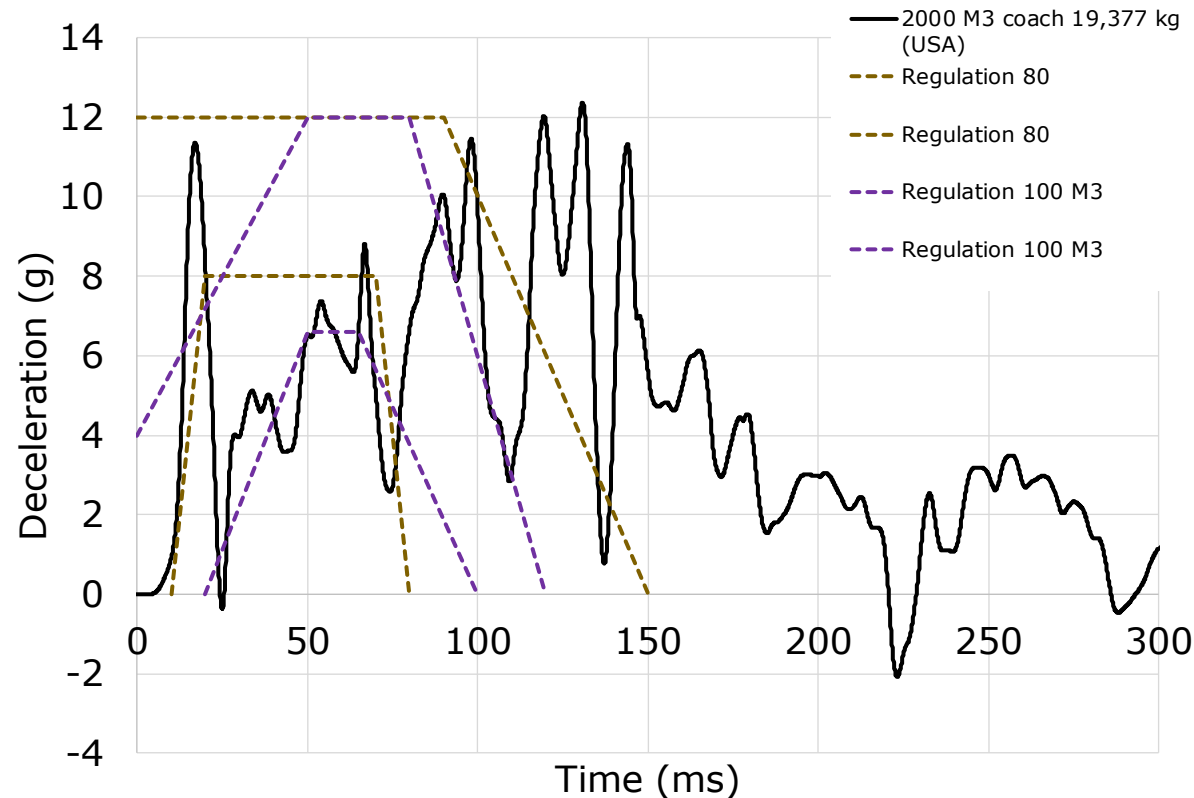


Note: Regulations 67 & 110 pulse magnitude > 5g

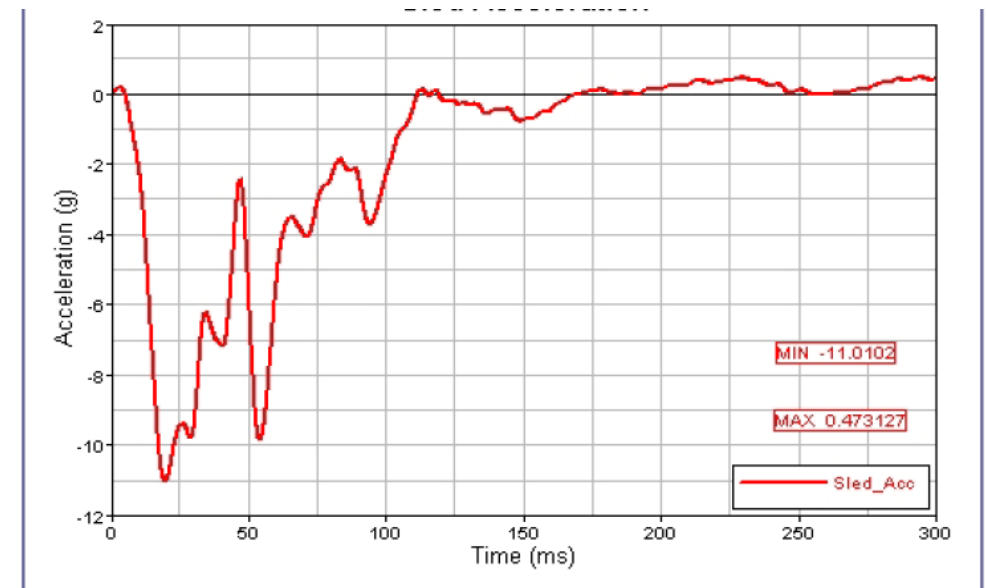
Comparison M3 frontal impact (example 1)

Limited data shows R100 and R80 corridors reasonably representative in terms of pulse magnitude but duration is much shorter than rigid barrier test

US coach (circa MY 2000) Frontal FWRB at 50 km/h



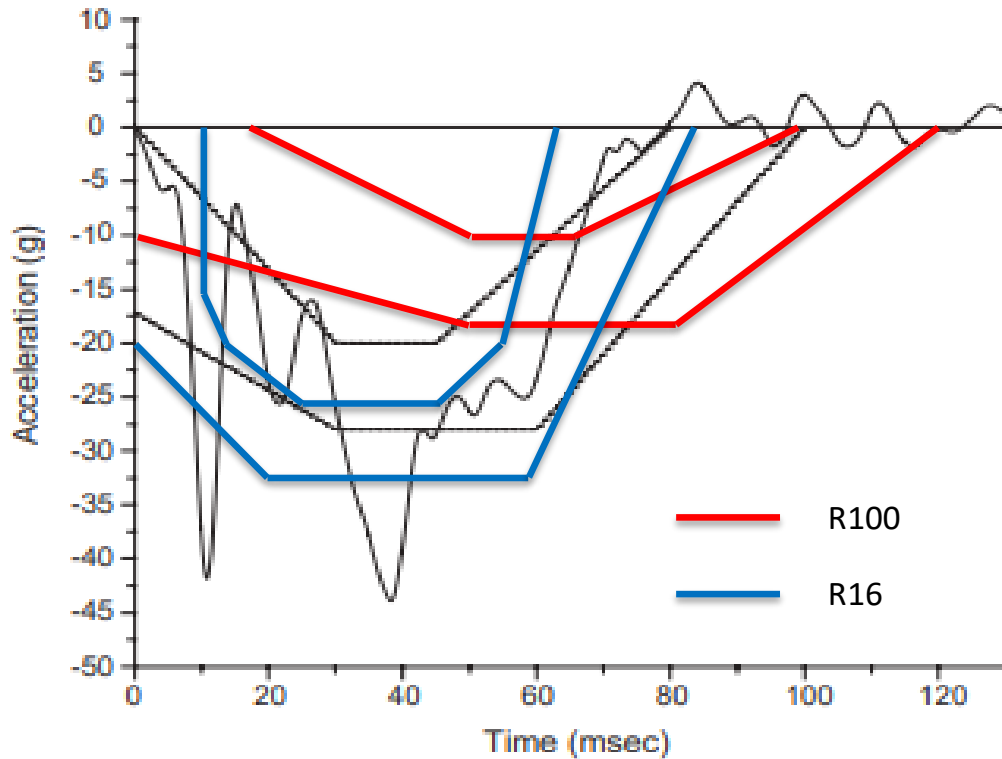
Simulation US city bus vs MPV both at 50 km/h



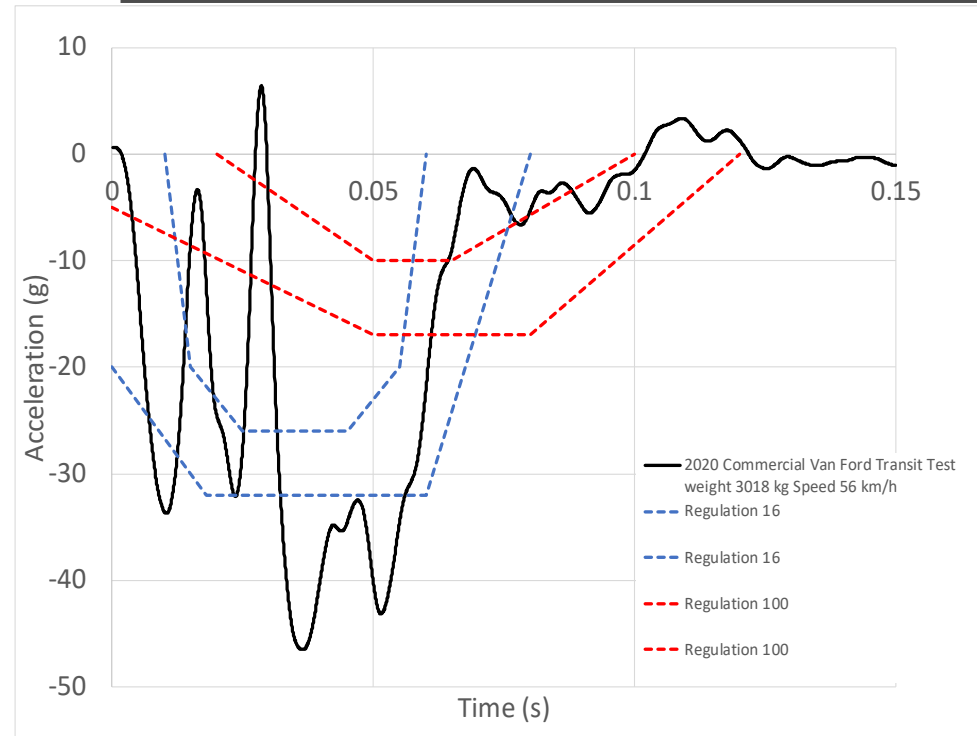
Comparison M2 frontal impact (example 2)

Limited data shows R100 corridor not representative of current M2 buses (large van types) and that R16 corridor fits better

Mini-bus (circa MY 2000) FWRB at 50 km/h

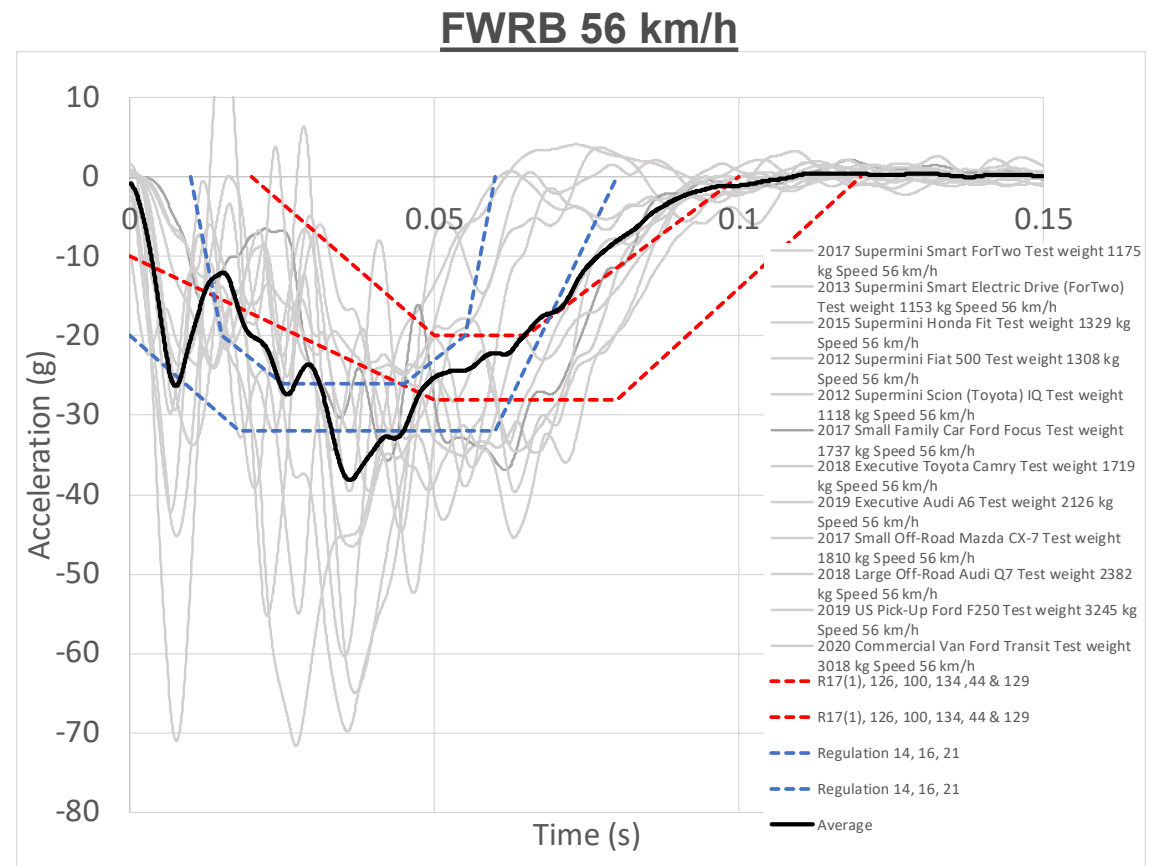
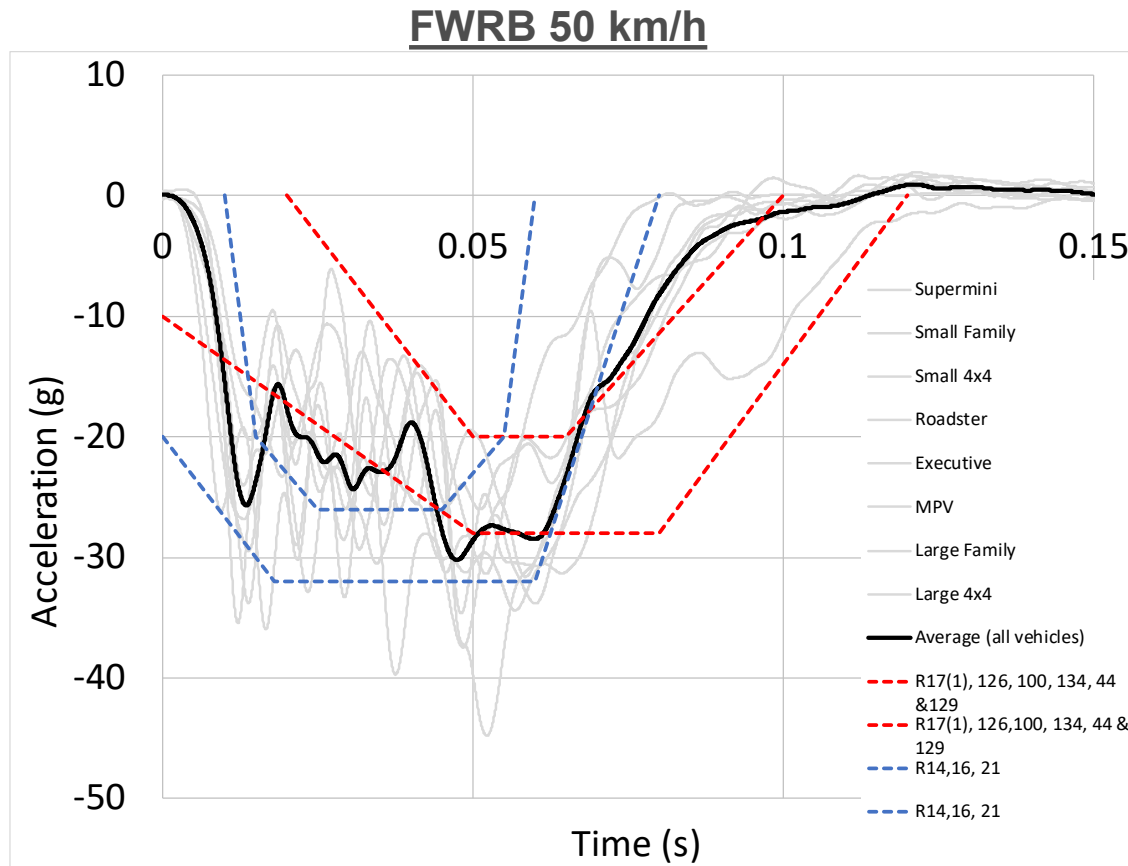


Mini-bus (MY 2020) FWRB at 56 km/h



Comparison M1/N1 frontal impact (example 3)

Shows R129 corridor not representative of current vehicles – average is higher and individual peaks significantly higher; focus on 50 km/h data because equivalent to R137



Conclusions

- Refer to Table 18 of the study (pages 139 to 147) with the summary of potential updates by regulation
 - <https://data.europa.eu/doi/10.2873/58935>
- Downstream alignment necessary in some cases, for example
 - If R129 pulse is increased, the R145 ISOFIX pull force is no longer representative as it is expected to then exceed 8 kN
 - The R80 equivalency between dynamic and static tests need to be reviewed as forces should also become higher
- Limited real-world issues found in literature and accident data
- Lack of concrete cost-effectiveness data (at this stage)

Discussion in GRSP

- Consideration by delegates and Contacting Parties if any action based on this research needs to be prioritized
 - The European Commission has an obligation to evaluate vehicle safety by July 2027 (Article 14 of General Safety Regulation (EU) 2019/2144) and will take this research into account at that time
- Recommendations from GRSP to GRSG
 - Notably for UN Regulation No 67 (LPG) and 110 (CNG) as covered by this research, to ensure consistency with UN Regulation No 134 / GTR No 13 (hydrogen safety)

Thank you

Images:
European Commission and TRL

For further information:

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