Can smaller, fuel efficient and lighter vehicles be as safe?

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The Shift to Low Carbon

- UK aims to reduce carbon emissions by at least 26% by 2020
- Road vehicles produce 19% of the UK's CO_2 emissions
- Government and industry efforts are focused on:
  - Improving existing technologies
  - Growing next generation ultra-low carbon technologies

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A Vehicle Safety Research Perspective

- A view from accident research

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UK Shift to Low Carbon Vehicles

- Next 5 years
  - Improved efficiency of new cars
  - Increased take-up of new model hybrids
  - Vehicle charging infrastructure initiatives
  - Early market ultra-low carbon vehicles
- 5 to 10 years
  - Ultra-low carbon vehicles enter large scale production
- 10 years +
  - Combinations of hybrids, downsized powertrains & light weight vehicles become dominant
  - Mass market development of ultra-low carbon vehicles

Abridged from “Ultra-low Carbon in the UK”, HM Government, 2009

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Driving and Collision Phases

Normal Driving

⇒ Pre-crash

⇒ Crash

⇒ Post-crash

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Normal Driving
(*Some safety considerations*)

- Driving behaviours, inc. smarter driving & speed choices
- Low rolling resistance tyres
- Fuel management considerations
- Maintenance & breakdown
- Recycling & disposal

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Pre-crash
(*Some primary safety considerations*)

- Speed
- Handling and braking
- The Human Machine Interface (HMI)
- Hearing very quite vehicles

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Crash
(*Some secondary safety considerations*)

- Occupant protection
- Vehicle mass and compatibility
- Structural performance
- Pedestrian protection

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Post-crash
(*Some tertiary safety considerations*)

- Alternative battery technologies
- Fire, chemical & electrical hazards
- Rescue
- Safety of emergency service personnel

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Summary so far: *some potential safety issues*

- Primary safety
  - New types of defect (eg electrical)
  - Handling or braking issues
  - HMI issues
- Secondary safety
  - Crashworthiness, structural performance (conventional, new, smaller, more lightweight vehicles)
  - Vehicle mass and size compatibility
  - Pedestrian protection
- Tertiary safety
  - Sources of fire, chemical or electrical burns
  - Entrapment, ease of rescue
- Public, emergency services & vehicle maintenance
  - Health & safety precautions for all involved
  - Safe & effective extrication methods
  - Procedures for safe & effective vehicle service & testing

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Can low CO_2 vehicles be safe?

- Safety and environmental solutions can be mutually beneficial
- More coordinated policies on safety & sustainability
- Work towards a safe transport system
- Recommendations:
  - encourage sharing of research and crash test findings, research for potential new crash scenarios inc. real-world accidents to track safety performance & trends, & adequate training for a variety of personnel involved.

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