

Active Chassis System for Better Driving Dynamics and Enhanced Small Overlap Crash Performance

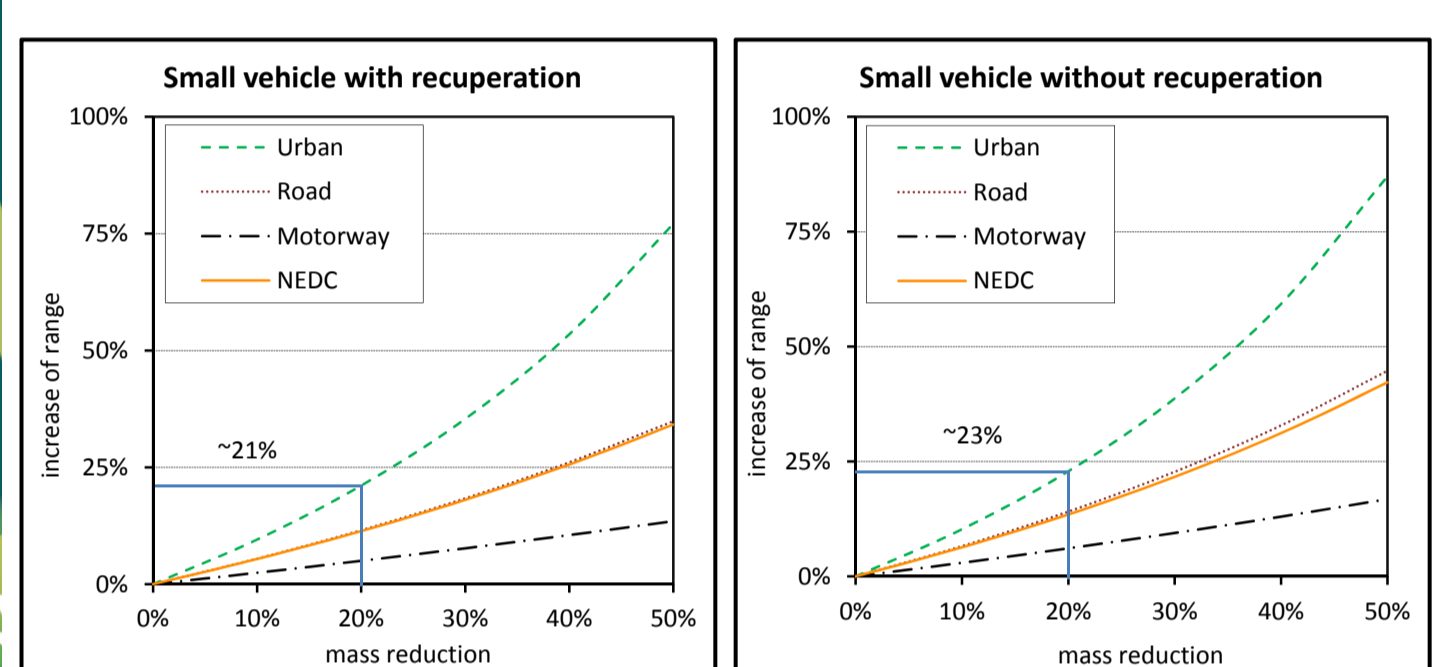
Poster 10546

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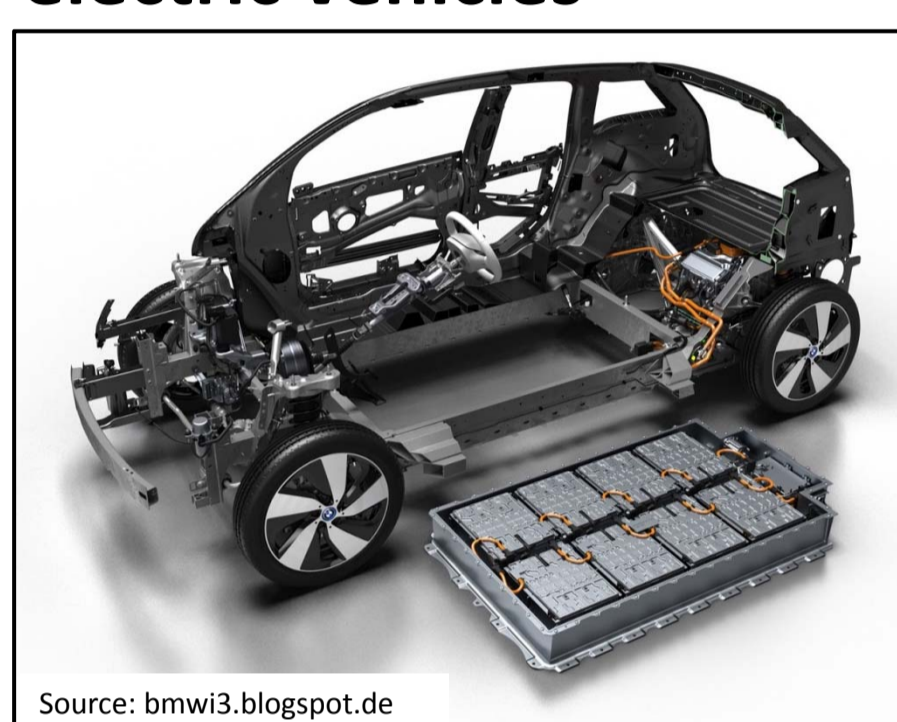
1. The difficulties of a sustainable body design for a full electric vehicle

1.1 Motivation: Lightweight Design is still important



1.2. New mass distribution & package situation for electric vehicles

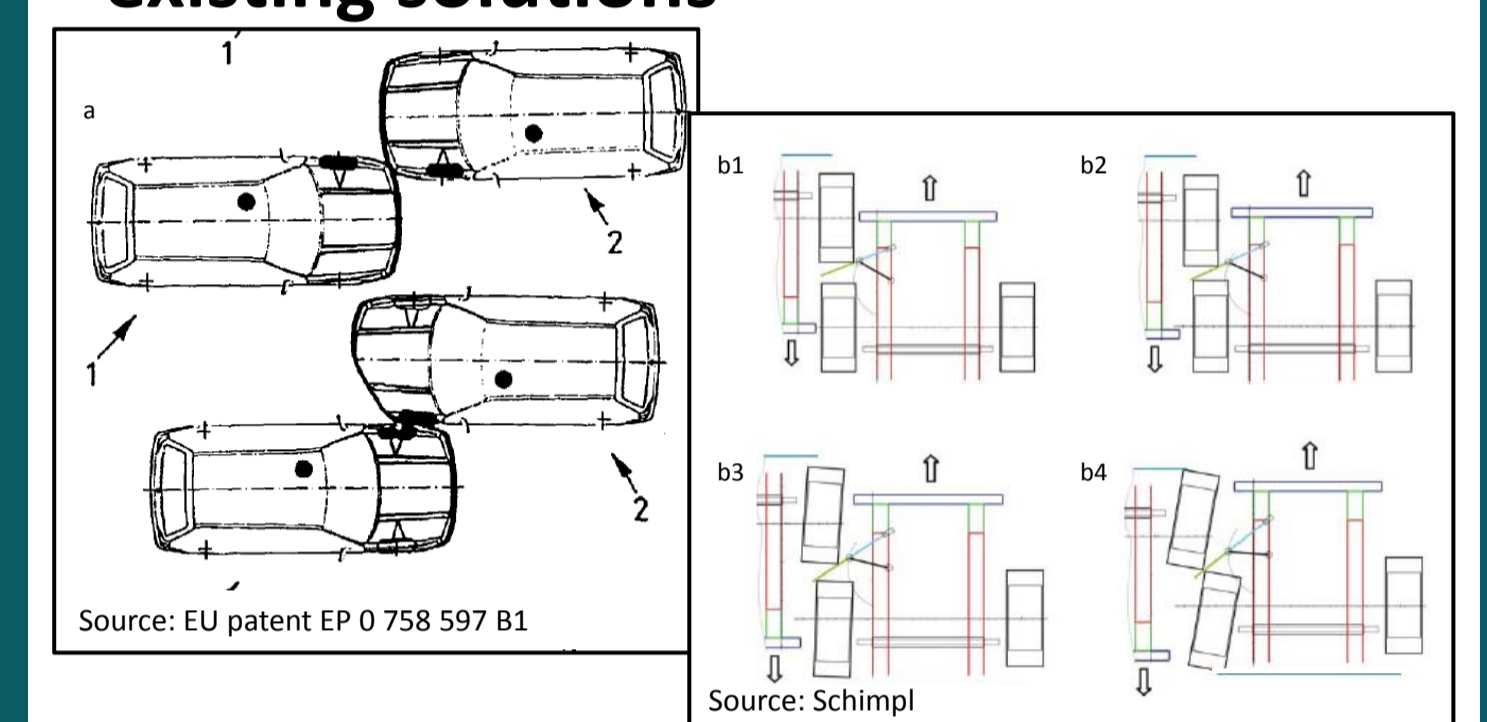
- 230kg additional weight in the floor from battery
- Frontal structure without motor results in less stiffness



1.3. Current regulations and lack of crash compatibility in reality

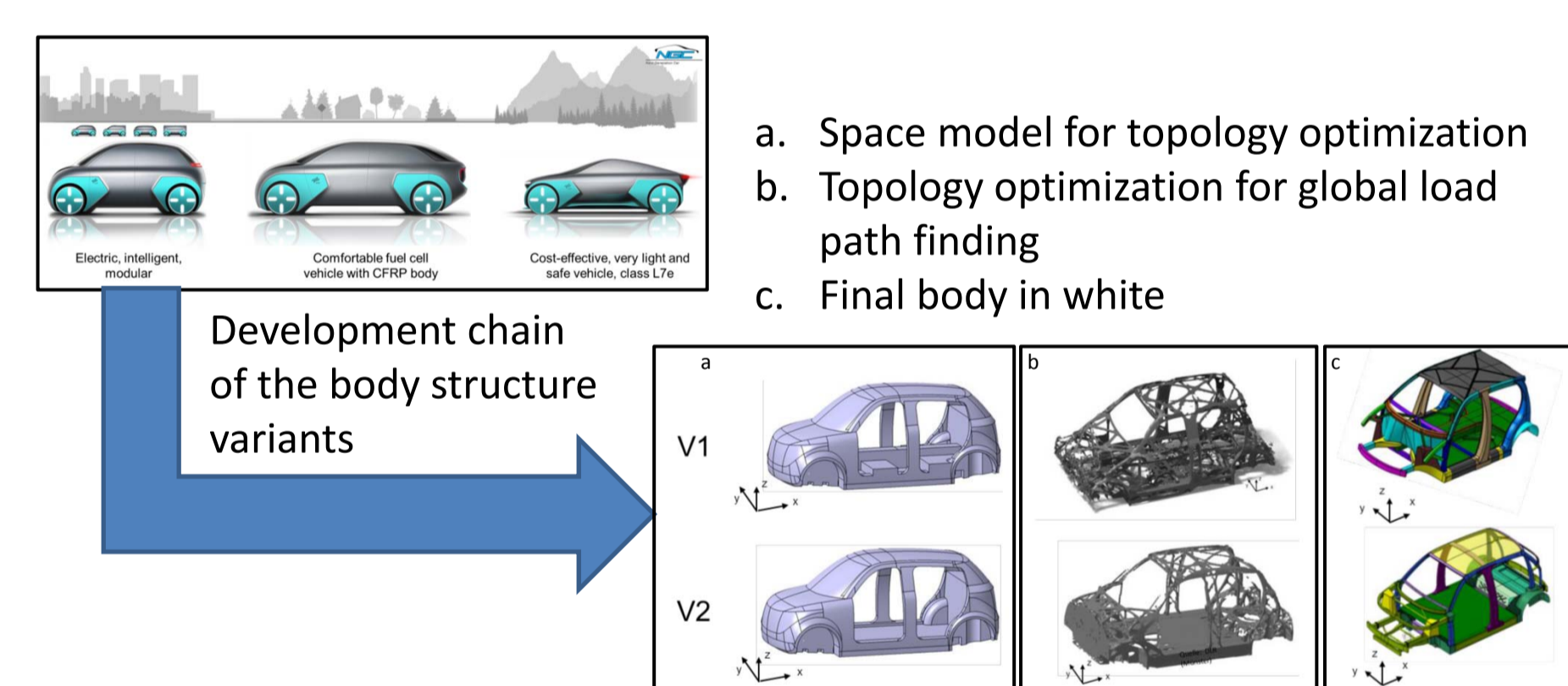


1.4. Principle of deflection and existing solutions

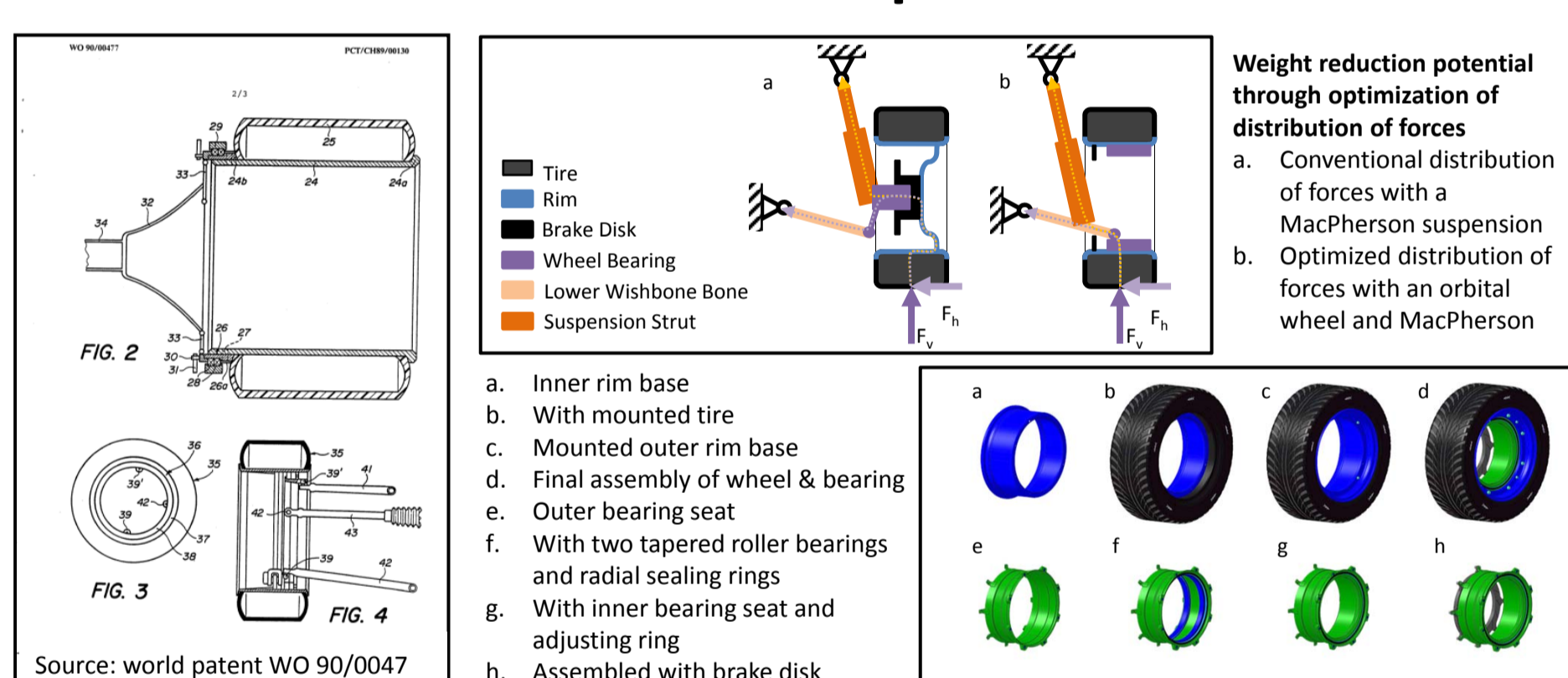


2. The new suspension concept of the NGC-UMV

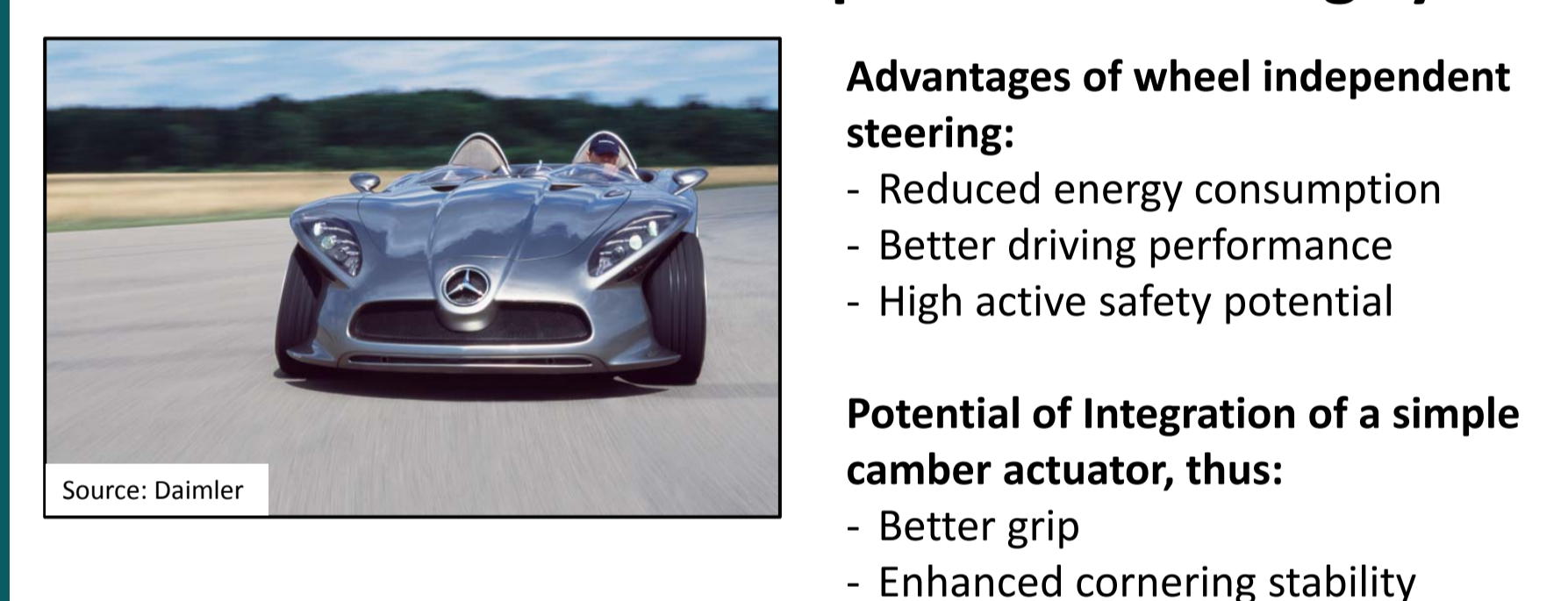
2.1. Next Generation Car - Urban Modular Vehicle



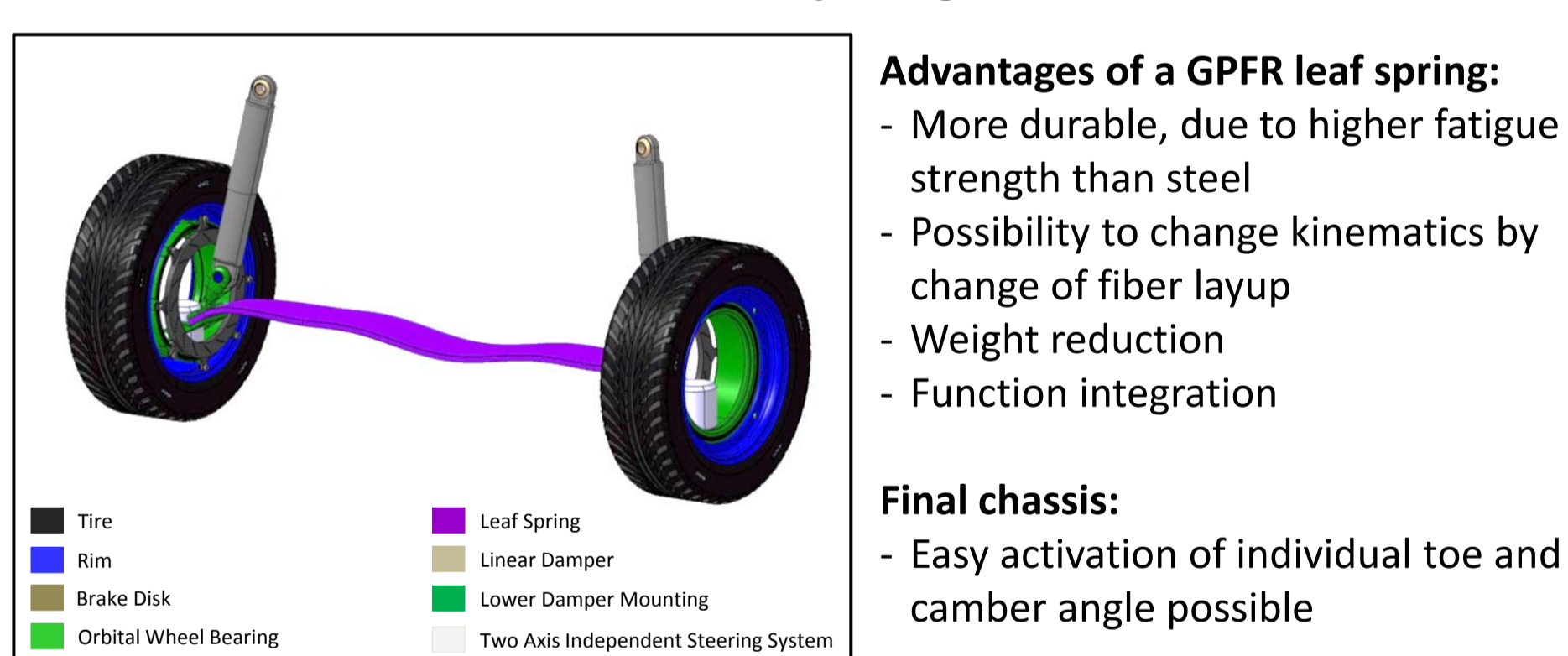
2.2. The orbital wheel concept



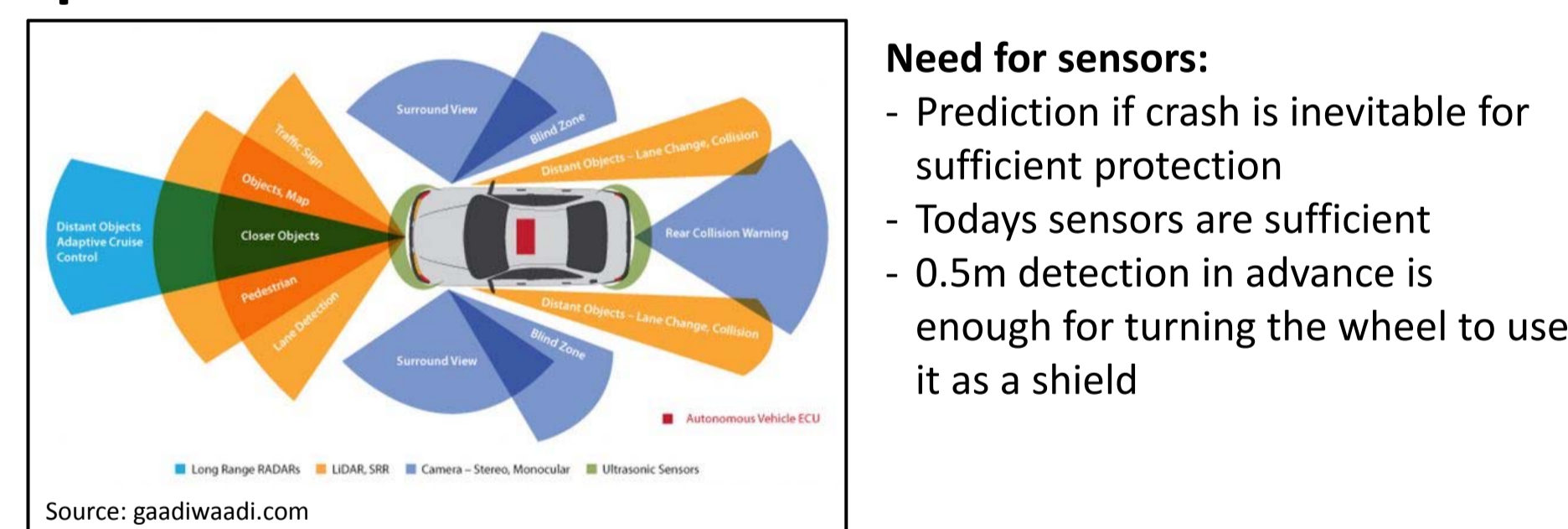
2.3. Active two axis independent steering system



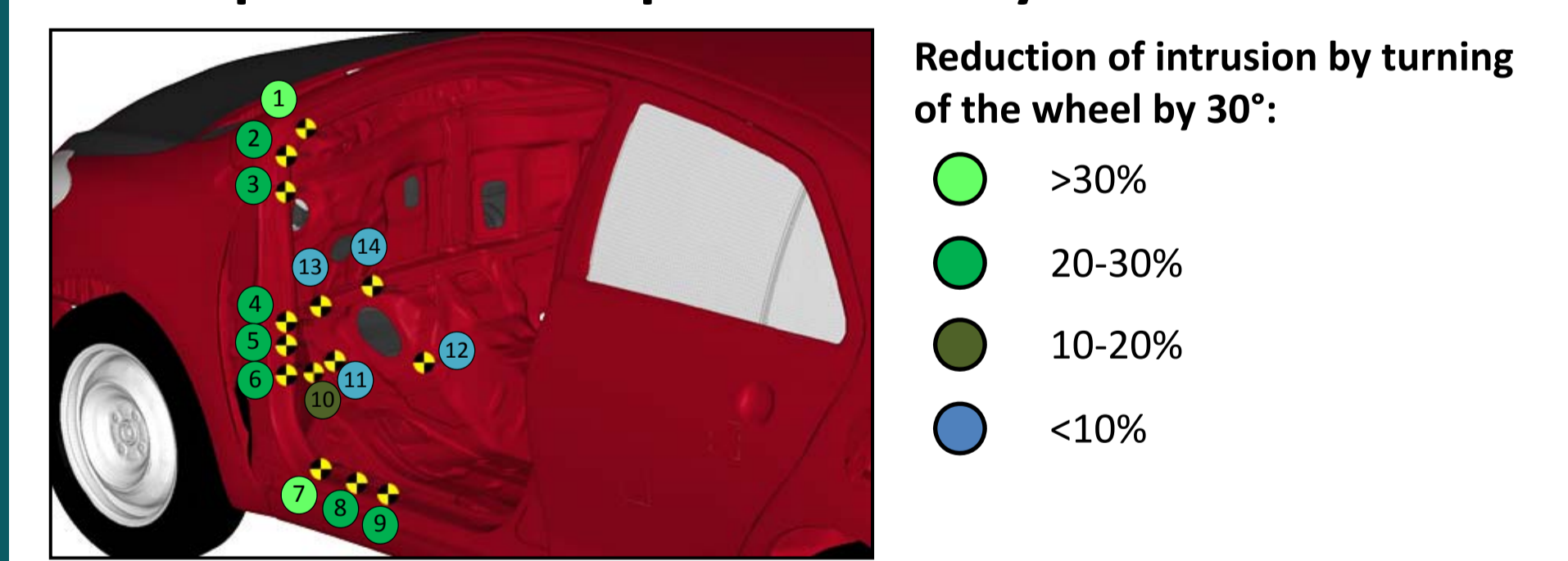
2.4. GFRP transverse leaf spring and final chassis



2.5. Activation of the system for enhanced crash performance



2.6. The wheel as deflection shield is enough for an improvement in passive safety



3. Conclusion and outlook

- New crash test scenarios like the IIHS small overlap crash test and new all electric vehicle concepts demand new safety solutions
- NGC-UMV suspension concept with its two axis steering system is a promising answer
- Proved feasibility by first static and dynamic simulations
- Next steps are to dimension the needed torsion moments of the two axis steering system, to detail the concept and to design the transverse leaf spring

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