A Winner: Car Body Design Development of the Hyundai Sonata

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Background

**European market demands**

- **Styling**
  - Emotional design to express individuality

- **Efficiency**
  - Low cost of ownership

- **Practicality**
  - High load capacity, premium equipment grade

- **Performance**
  - Sportive handling and driving

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Hyundai Sonata at GDIS Conference 2013
Customer Proposition

Fuel Efficiency
• Best in class with 113g CO2/km

Roominess Practicality
• Best in class roominess
• Class leading practicality

Equipment
• 3 USPs: rear seat reclining, auto defog, heated steering wheel

Design
• Sporty and emotional
• Modern interior

Value
• Target best in TCO
• Competitive pricing
Exterior Styling

- Eagle eye style headlamp with LED DRL
- Hyundai family hexagon radiator grill
- Characteristic DLO graphic
- Wing-shape style rear combi lamp applied led and light curtain
- 18 inch alloy wheel in hypersilver color

Contact
Roof-garnish
**Interior Styling**

- 2-circle digilog style with center-digital display
- Center-facia with high-tech appeal
- Dynamical garnish
- Luxury gear-shift knob
- Sleek consol box
Cargo capacity

- Cargo capacity 19.5 cu. ft. (553 liters) with the rear seats occupied
- Up to 60.7 cu. ft. (1718 liters) with the rear seats folded down
Efficiency

Strong TCO performance through:
- High residual value
- 5-year triple care program
- Competitive RCAR performance

Total cost of ownership:

Aerodynamics

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<th>Competition</th>
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Fuel efficiency

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BIW Concept
Development
Process

Model Fix → Design → Test → SOP

Full schedule predecessor 24M

-2

-4

-6

Full schedule i40 18M
**Weight optimization**

- Achieved a 7.6% reduction in BIW weight compared to predecessor.

*EVI (Early Vendor Involvement)*
Part optimization
Center floor

- Rearranging the part assembly allowed for a reduction of the material thickness
- From single part with uniform thickness to three parts with different, optimized thickness
Part optimization
Rear floor

• Change of the form from linear interior to radial interior lead to a material thickness reduction
• Divergence angle to improve airflow and NVH performance

Spare Member (1.0)
Spare Member (0.8)

Rear Floor (0.7)
Predecessor

Applying divergence angle

-1.4 Kg
Body stiffness & lightweight index

- Increased the torsional stiffness by **141%** and the bending stiffness by **19%**.
- Achieved **11%** more torsional and **23%** more bending stiffness compared to competition.