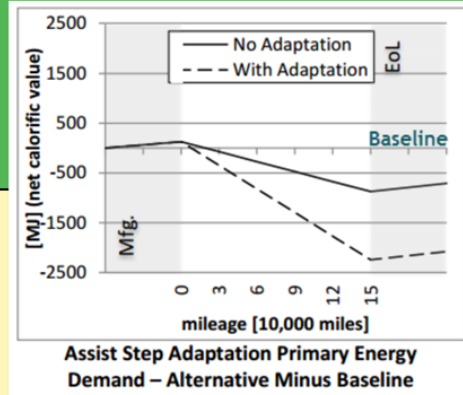
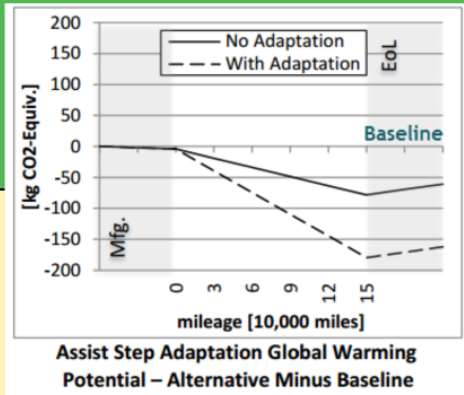


Automotive Lightweighting with Plastics Results in Reduced Fuel Use and CO₂ Emissions



Chevrolet Trailblazer/GMC Automotive Assist Step Cradle-to-Grave LCA

A cradle-to-grave, ISO compliant LCA for the bolster considered a total service life of 150,000 miles:

- 51% lighter plastic assist step for the Chevrolet Trailblazer/GMC replaced steel assist step (runner board)

Conclusions:

- Lighter plastic products performed better than the steel products for global warming potential and primary energy demand
- Even greater benefit potential exists when further mass reduction allows drivetrain reductions and adaptations, increasingly likely under new CAFE standards

Energy and Commuter Savings Equivalents

Lightweighting this one automotive component on all 148,658 GMC 2007 Trailblazers reduces the emission of greenhouse gases by the equivalent of combusting more than 2.7 million gallons of gasoline over the life of the vehicles, which is equivalent to removing 3,182 commuters from area roads for a year. Additional plastics lightweighting can bring additional savings of energy and CO₂ emissions.[†]

[†] Based on EPA Average MPG of 21.5 MPG and EPA value of 19.6 lbs. CO₂/gallon of gasoline, assuming adaptation and a 150,000 mile vehicle service life. Commuter estimate based on a 50 mile round-trip every day for 365 days.



STEEL



PLASTIC



Lighter Weight	✓
Saves Customer Fuel	✓
Consolidates Parts – Easing Storage/Handling	✓
Reduces Assembly Time	✓
Meets Part Performance Tests	✓
Less Primary Energy Used (LCA) [†]	✓
Less Global Warming Potential (LCA) [†]	✓

[†] Cradle-to-grave, peer reviewed, ISO 14040/14044 Standards, Life Cycle Assessment (LCA) conducted by PE International, Inc. 2012, incorporates inputs to manufacture both parts, and complete use phase for 150,000 miles with end-of-life disposal, including 98% recycling rate for steel end-of-life. Contact the Plastics Automotive Center for further information at (248) 244-8920 or on-line

<http://plastics.americanchemistry.com/Education-Resources/Publications/Life-Cycle-Assessment-of-Polymers-in-an-Automotive-Assist-Step.pdf>