



# **New Data Details Automakers' Material Use**

## **Use of Fuel-Saving, Emission-Reducing Aluminum**

### **At All-Time High**

The Aluminum Association's  
Auto & Light Truck Group (ALTG)  
Webinar

Tuesday, April 7, 2009

[www.autoaluminum.org](http://www.autoaluminum.org)

# Today's Agenda

- Introductions
- Ducker Research Highlights
  - North America
  - Global
  - Leading Automakers
  - Emerging Markets
- Why Aluminum?
- Q & A

# Introductions



Buddy Stemple  
Chairman, ALTG  
VP/GM of Specialty Products  
Novelis



Doug Richman  
Vice President of  
Engineering and Technology  
Kaiser Aluminum



Randall Scheps  
Marketing Director of  
Ground Transportation  
Alcoa

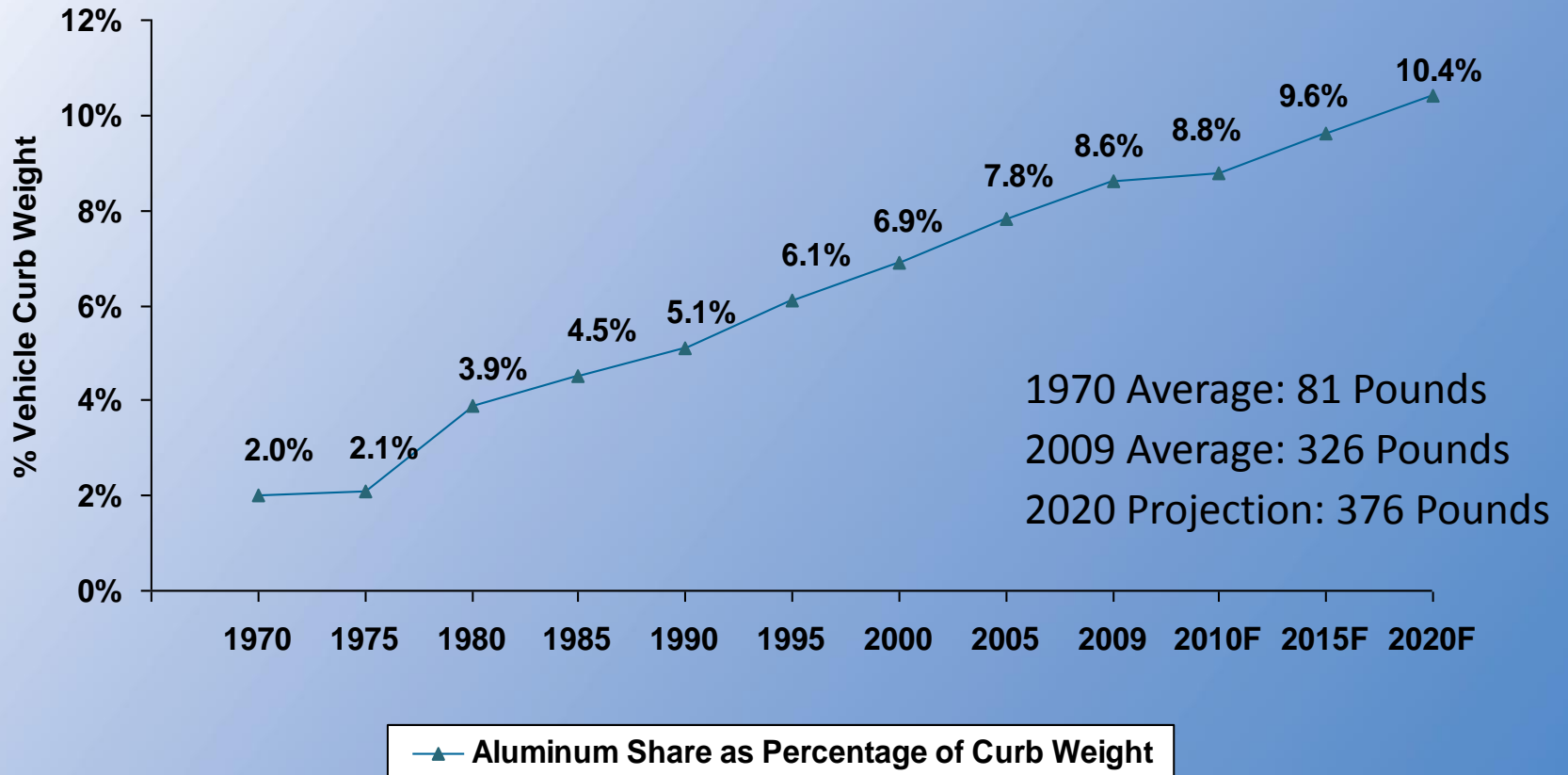
# 2009 Aluminum Growth Study



DUCKER WORLDWIDE

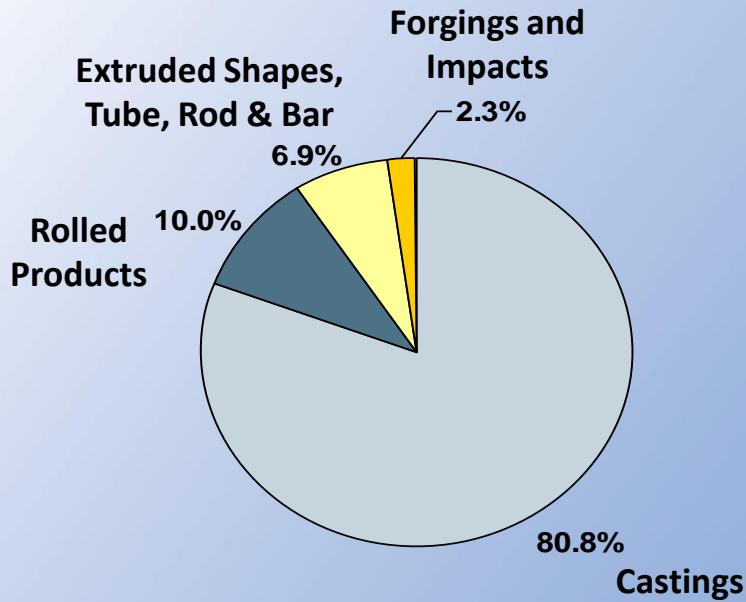
# Auto Aluminum Use Increases

## North American Light Vehicle Aluminum Content Continues Steady Increase



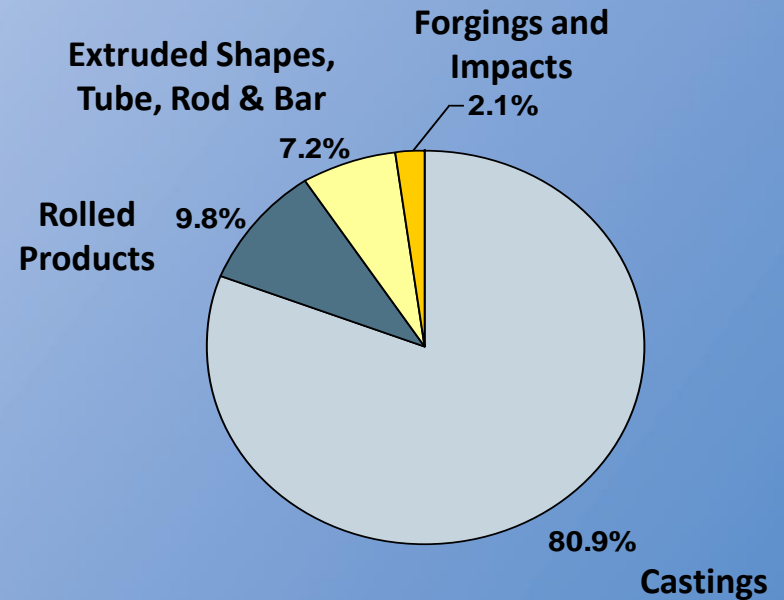
# Aluminum Use Across Product Forms

**2006**



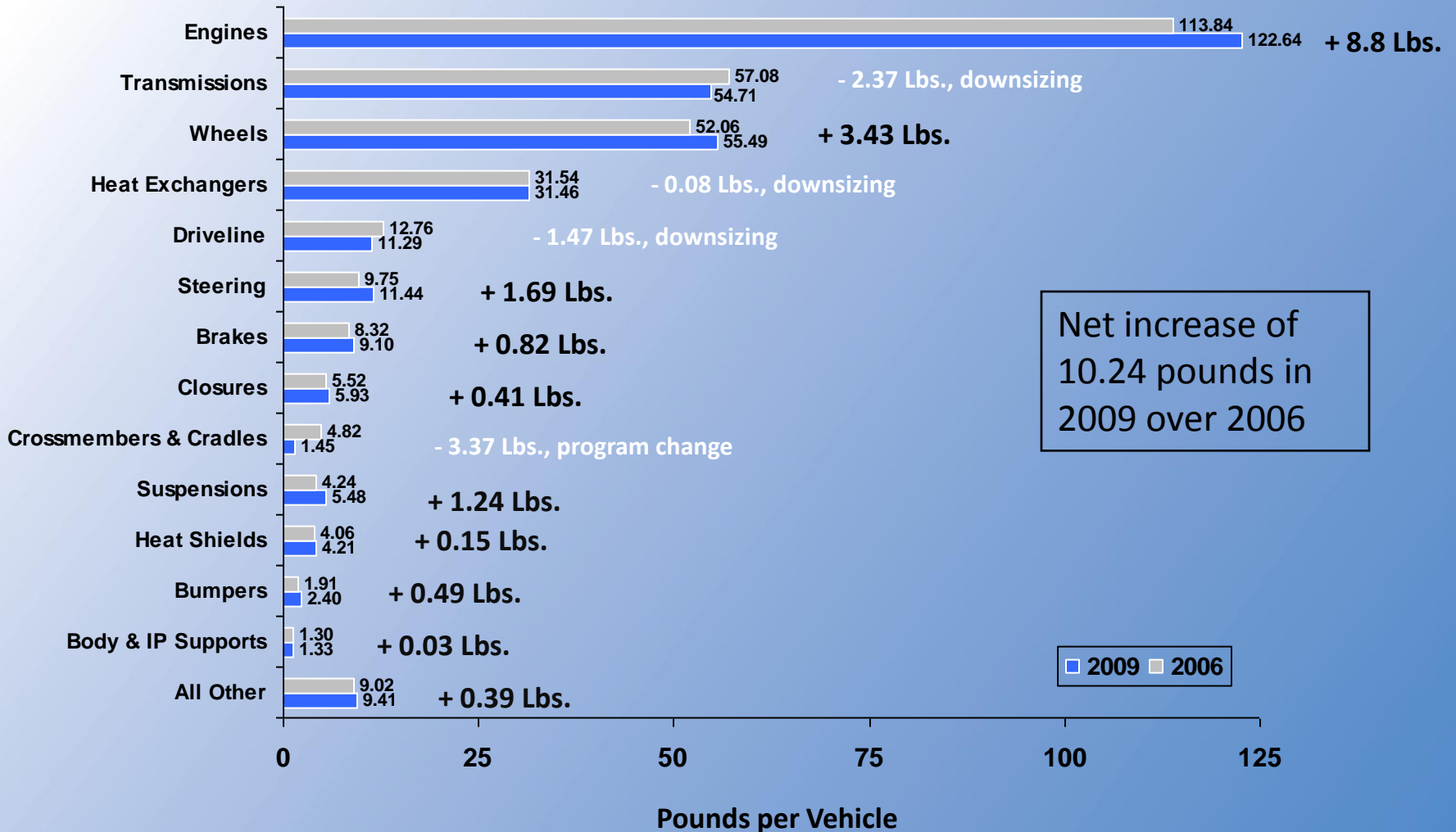
**316 Pounds per Vehicle**

**2009**



**326 Pounds per Vehicle**

# North American Aluminum Components

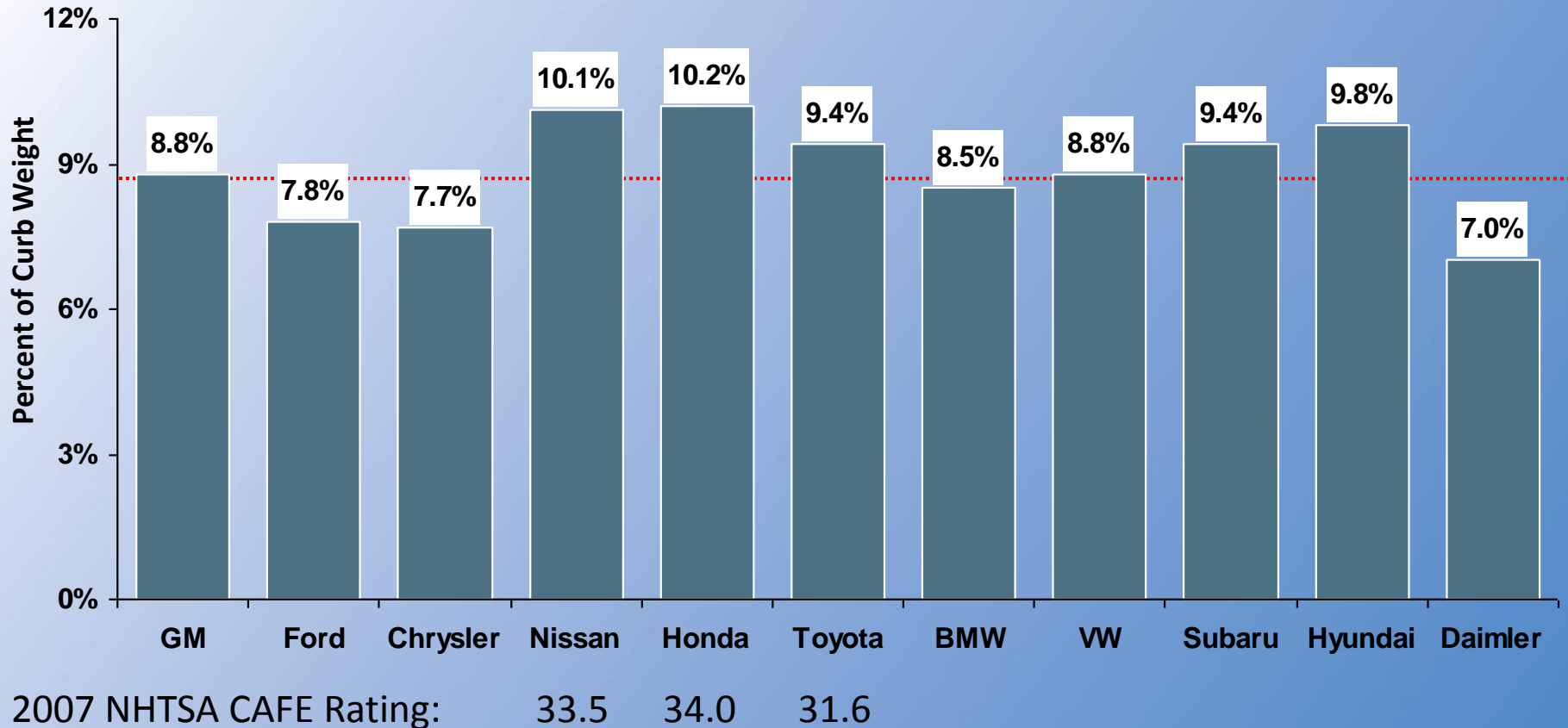


# Aluminum Saturation and Growth Opportunities

<u>Component</u>	<u>Aluminum Share</u>
» Heat exchangers	100%
» Pistons	100%
» Transmission cases	> 98%
» Cylinder heads	> 98%
» Wheels	> 69%
» Engine blocks	> 69%
» Drive shafts	> 50% (RWD)
» <u>Knuckles</u>	> 39%
» <u>Hoods</u>	> 22%
» <u>Control Arms</u>	> 15%
» <u>Bumper</u>	> 11%
<b>Complex Structures</b>	
» Cradles/sub-frames	> 10%
» BIW	----

# Leading OEMs by Aluminum Content

## 2009 Aluminum Content as Percent of Curb Weight



# High Aluminum Content Vehicles Across Vehicle Segments

The following 2009 model year vehicles contain over 400 pounds of finished aluminum or represent at least 10% of the curb weight.\*

Acura CSX
Acura MDX
Acura NSX
Acura RL
Acura TL
Aston Martin DB9
Aston Martin DBS
Aston Martin Vantage
Audi A6
Audi A7
Audi A8
Audi R8
Audi TT Coupe
Audi TT Roadster
Bentley GT
Bentley GTC
BMW 5 Series
BMW 6 Series
BMW 7 Series
BMW X5
BMW X6
BMW Z4
Buick Allure/Lacrosse
Buick Enclave
Buick Lucerne
Cadillac BRX
Cadillac CTC
Cadillac CTS
Cadillac CTW

Cadillac DTS
Cadillac Escalade**
Cadillac SRX
Cadillac STS
Cadillac XLR
Chevrolet Avalanche
Chevrolet Aveo
Chevrolet Camaro
Chevrolet Cobalt
Chevrolet Corvette
Chevrolet Impala
Chevrolet Malibu**
Chevrolet Suburban
Chevrolet Tahoe**
Chevrolet Traverse
Chrysler Town & Country
Citroen C6
Daimler MB GL-Class
Daimler MB ML-Class
Daimler MB RL-Class
Dodge Caliber
Dodge Caravan
Dodge Challenger
Dodge Charger
Dodge Journey
Dodge Viper
Ferrari F430
Ferrari F599
Ferrari F612

Ford Explorer
Ford Fiesta
Ford Focus
Ford Mustang
Ford Taurus
Ford Taurus
GMC Yukon**
Honda Accord
Honda Civic**
Honda Legend
Honda Odyssey
Honda Pilot
Hummer H3
Hyundai Santa Fe
Hyundai Sonata
Infiniti EX35
Infiniti FX45
Infiniti G35
Infinity M35/45
Infinity QX56
Jaguar XJ
Jaguar XK
Jeep Grand Cherokee
Lamborghini Gallardo
Lamborghini Murcielago
Land Rover Defender
Land Rover Discovery 3
Land Rover Range Rover
Land Rover Range Sport

Lexus GS**
Lexus LS**
Lexus RX 350 / 450H**
Lexus SC
Lincoln MKS
Lincoln MKT
Lincoln Town Car
Maybach 57/62
Mercedes Benz C-Class
Mercedes Benz CLK
Mercedes Benz E-Class
Mercedes Benz S-Class**
Mercedes Benz SL
Nissan Altima**
Nissan Cima
Nissan Fuga
Nissan Maxima
Nissan Quest
Nissan Sentra
Nissan Skyline
Nissan Versa/Tilda
Opel Insignia
Opel Signum
Pontiac G5
Pontiac G6
Pontiac Solstice
Pontiac Vibe
Porsche 911
Porsche Boxter

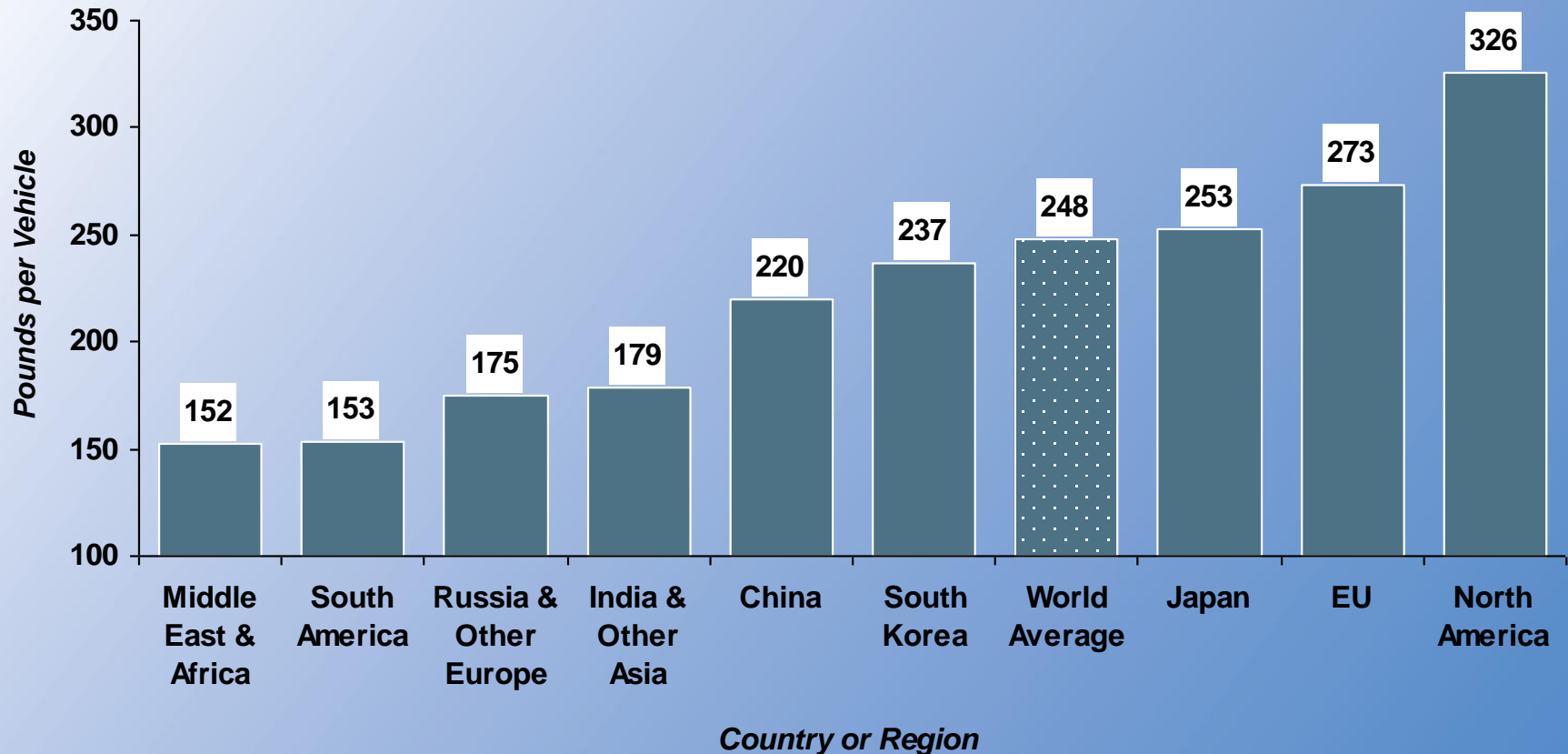
Porsche Cayenne
Porsche Panamera
Renault Espace
Renault Vel Satis
Rolls Royce Drophead
Rolls Royce Phantom
Rolls Royce Sub Phantom
Saab 9-3
Saab 9-5
Saturn Aura**
Saturn Sky
Saturn Vue**
Subaru Legacy
Subaru Tribeca
Toyota Avalon
Toyota Camry**
Toyota Corolla
Toyota Crown Majesta
Toyota Crown Royal
Toyota Highlander**
Toyota Matrix
Toyota Prius**
Toyota Sienna
Toyota Soarer
Volkswagen Phaeton
VW Routan (Chrysler)
Volvo V70
Volvo XC90

\* Some versions of these models may have less than 400 lbs or 10% of aluminum based on selected options such as steel wheels and engine size.

\*\* Hybrid and non-hybrid models

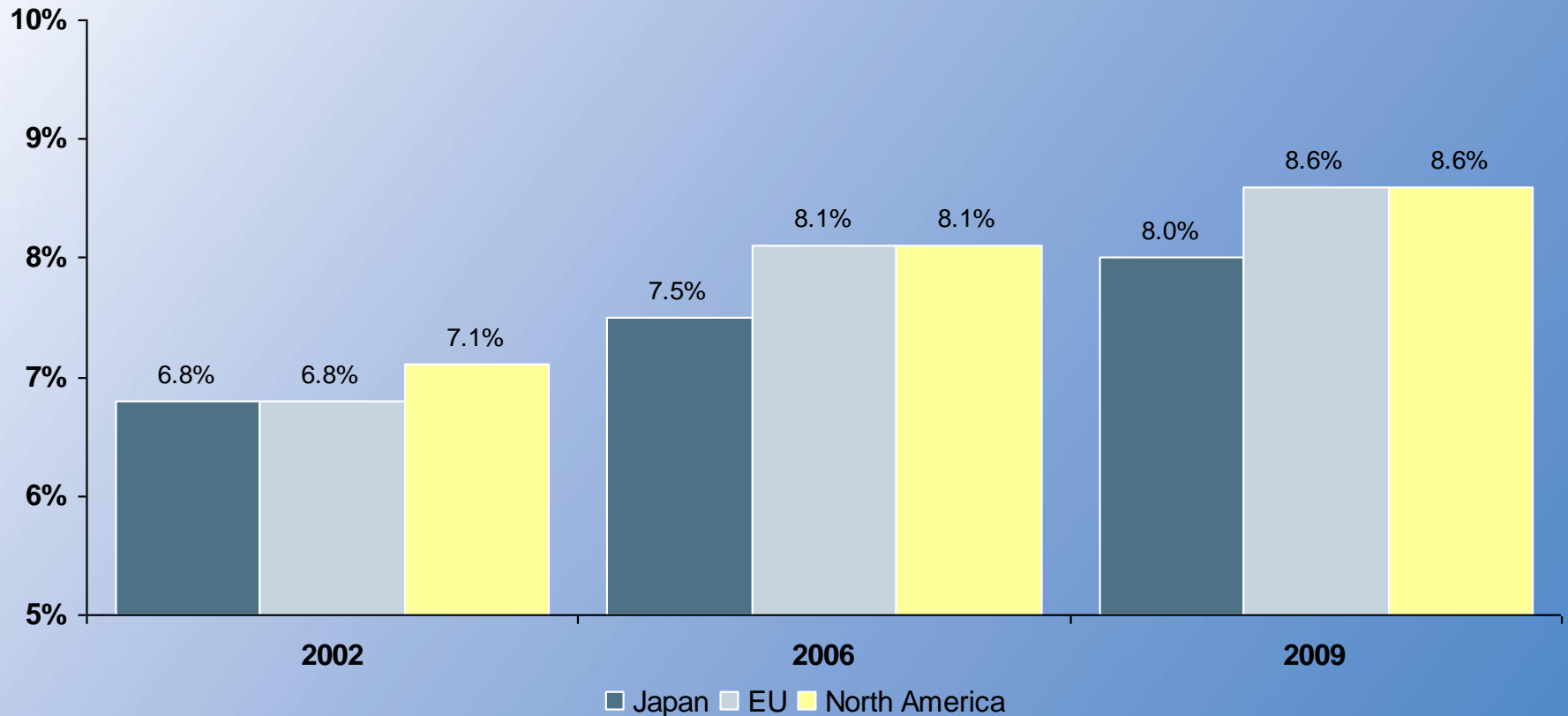
# North America Leads Content Use

## Pounds per Vehicle by Country or Region



# Worldwide Use Increases

## Light Vehicle Aluminum Content as a Percent of Curb Weight – All Vehicle Segments



# Component Application Comparison By Region

## Pounds Per Average Vehicle

Segment	North America			European Union			Japan (Excludes A Segment)		
	2002 R	2006 R	2009 F	2002 R	2006 R	2009 F	2002 R	2006 R	2009 F
Engines	92.66	113.84	122.64	80.60	90.22	94.38	98.00	99.0	107.31
Transmission & Driveline	62.04	69.46	66.0	34.00	34.19	34.6	45.30	48.0	48.19
Chassis, Suspension & Steering	13.76	18.73	18.37	18.10	22.63	25.51	6.50	7.85	7.89
Wheels	49.32	52.06	55.49	31.35	39.74	44.56	39.20	42.59	44.53
Heat Exchangers	32.00	31.56	31.46	24.30	27.03	27.1	26.40	30.0	30.05
Brakes	5.48	8.32	9.1	6.00	10.48	11.33	3.69	7.52	7.72
Closures	4.32	5.52	5.93	5.30	10.77	11.35	0.60	4.08	4.27
Body & IP Beams	1.00	1.30	1.33	3.90	6.2	6.36	0.30	0.46	0.22
Heat Shields	3.82	4.06	4.21	2.60	3.00	3.3	1.20	2.36	2.43
Bumper Beams	1.35	1.91	2.4	3.13	6.07	6.0	1.71	1.52	1.28
All Other Components	9.03	9.02	9.41	8.50	8.49	8.65	6.10	7.01	7.11
<b>Total</b>	<b>271.78</b>	<b>316.16</b>	<b>326.34</b>	<b>217.78</b>	<b>258.82</b>	<b>273.14</b>	<b>229.00</b>	<b>250.40</b>	<b>261.00*</b>

# Aluminum Achieves 40 Years of Growth



**2009 Nissan Altima – D Segment  
310 Pounds of Aluminum**



**2009 Honda Civic – C Segment  
409 Pounds of Aluminum**



**2009 Chevrolet Traverse – E Segment  
422 Pounds of Aluminum**



**2009 Dodge Charger – E Segment  
413 Pounds of Aluminum**



The Aluminum Association, Inc.

# Key Growth Drivers for Aluminum



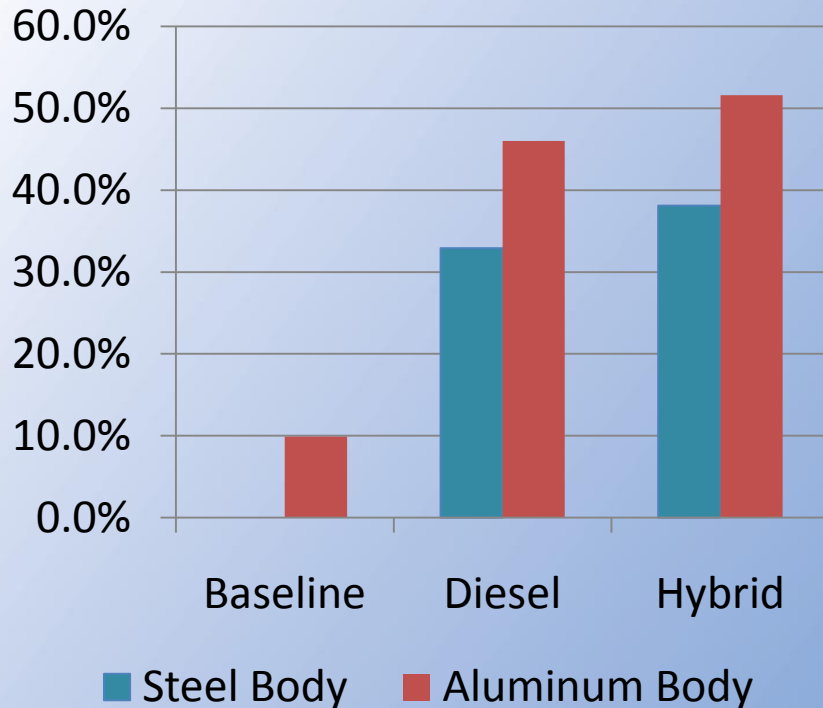
# Leading Experts Agree: Lightweighting “Very Important” to Reach CAFE Levels

**25%** – Fuel economy improvement to come from weight savings, as predicted by **material experts** and **body engineers**

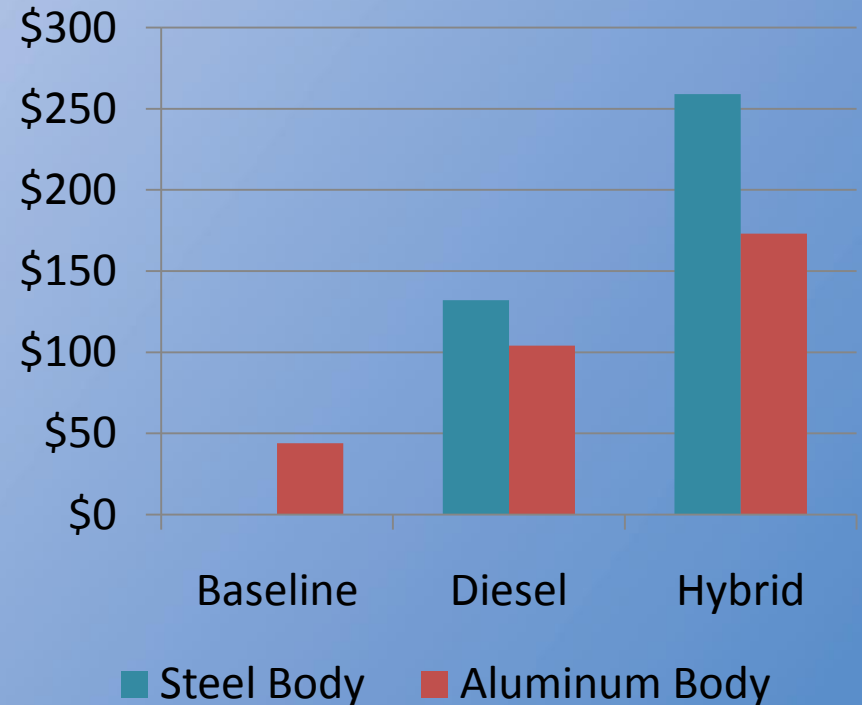
**50%** – Fuel economy improvement to come from weight savings, as predicted by **powertrain experts**

# Aluminum Creates Value for Alternative Powertrains

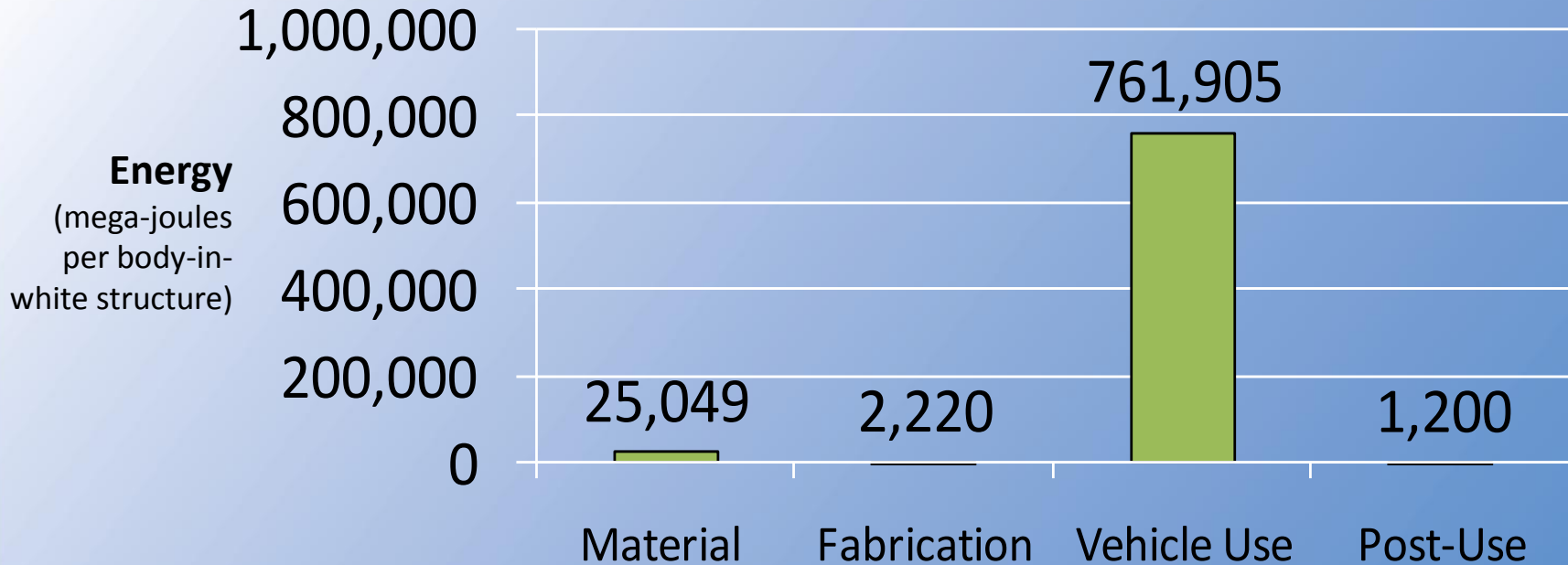
## Percent Increase in MPG



## Cost per 1 MPG Increase



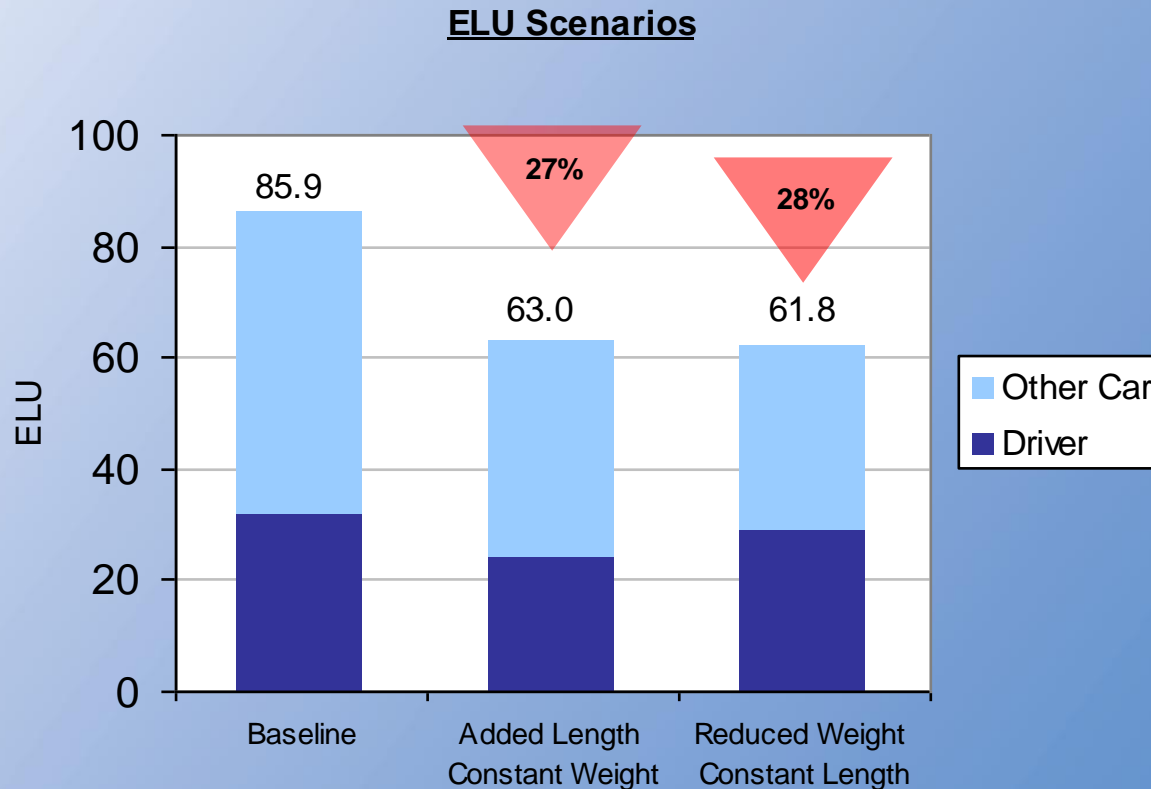
# Aluminum Life Cycle Saves on Emissions



Source: USAMP

# Aluminum Can Improve Safety

- Adding crush space without adding weight improves safety 27%
- Reducing weight further improves fleet safety



# Honda Pilot: Increased Size, Strong on Safety



Size	Longer, taller and wider without weight gain
Safety	5-star ratings on front and side impact tests
Fuel economy	Rates better than competitors
Emissions	Reduced as a result of best fuel economy for segment
Performance	Zero to 60 performance improved by one second
Cost	Retails for less than competition, yet more efficient

# Auto Aluminum Use Climbs

The future offers lighter, cleaner and better-performing vehicles for all consumers.



Chevy Volt



BMW X6



# Question & Answer

Please submit any questions through the question box on  
your screen



# **The Aluminum Association's Auto & Light Truck Group (ALTG)**

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