

Model Year and Vehicle Rating

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Discussion Topics

- Model year rating
- Vehicle rating
- Liability rating
- GLM applications
- Commercial auto applications

Distant Yesterday

- Based exclusively upon MSRP.
- Applied only to 1st party property coverages.
- Same Symbol for both comprehensive and collision.
- Combined with “Age” as opposed to “Model Year” Rating.

Yesterday

- Late 70's 2 significant changes
 - Introduction of Model Year Rating
 - Introduction of Damageability/Repairability into Symbol

Model Year Rating

Age	Factor	Model Year	Factor
		$X + 2$	$(1.05)(1.05)$
		$X + 1$	1.05
1	1.00	X	1.00
2,3	0.85	$X - 1$	0.95
4,5	0.75	$X - 2$	0.90
6 & over	0.65	$X - 3$	0.85

Model Year Rating

- Typically uses constant multiplicative relationship between model years
- Typically 5% for Comprehensive and Collision
- Limited to X model years with catch all for older vehicles

Model Year Rating

- Created a mechanism by which individual vehicle model years could be recognized – ***not really utilized except by several innovators.***
- Some companies are using for liability coverages – inconsistent - some positive, some negative – overlaps with mileage

Model Year

- The ability to use model year effectively together with specific models has not been realized.
 - **E.G. If the 1995 Honda Civic or 2007 Toyota Corolla has the highest theft rate as recently published – shouldn't it have a higher rate than the later models?**

Stolen Cars Vary By Model Year

- Here are the 10 most stolen vehicles as reported by the NICB — the number in parentheses is the model year most stolen:
- [Honda Civic](#) (1995)
- [Honda Accord](#) (1991)
- [Toyota Camry](#) (1989)
- [Ford F-150](#) (1997)
- [Chevrolet C/K 1500](#) (1994)
- [Acura Integra](#) (1994)
- [Dodge Ram Pickup](#) (2004)
- [Nissan Sentra](#) (1994)
- [Toyota Pickup](#) (1988)
- [Toyota Corolla](#) (2007)

Why older cars?

- Mid-1990 Hondas and Toyotas frequently dominate the yearly top-10 stolen car list. Because they are so popular, there is always a market for parts. Thieves like to steal them and chop them up, which can bring in more money than selling the car whole.

Progressive Rating

	Class	MM	Symbol	
1995 Honda Civic	HC1	0.99	5	
1989 Toyota Camry	TC1	0.96	8	
1991 Honda Accord	HA1	1.23	11	92-93 factor, 1.33 for '94-98, drops to .75 in 98
1994 Dodge Caravan	DG1	0.99	8	
1990 Acura Integra	AI1	0.99	14	
1991 Nissan Sentra	NS1	0.9	5	

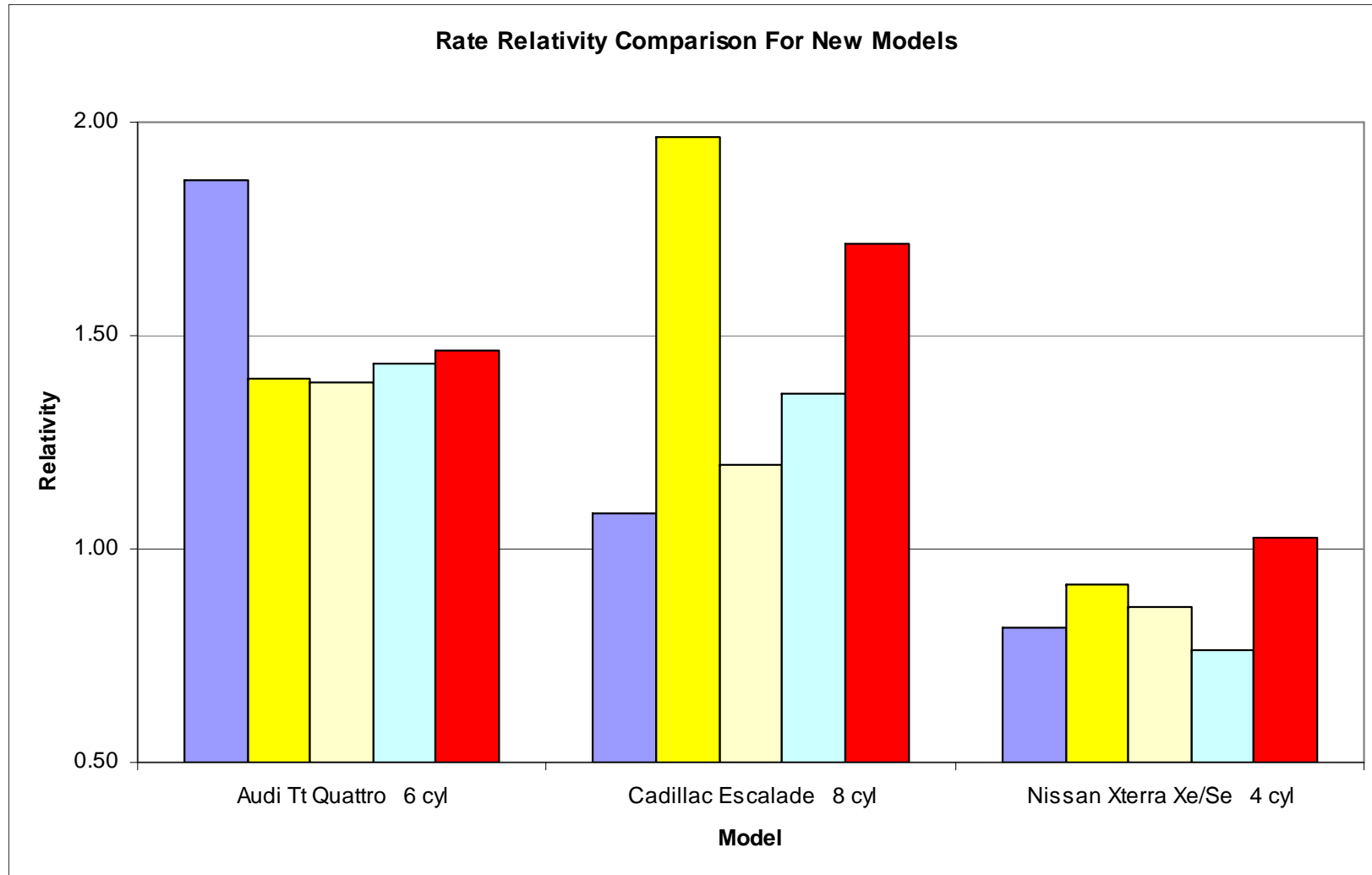
Immobilizer

- 1999 and 2000 Honda Civics do not come with an electronic immobilizer, however all Hondas from 2001 and onward are equipped with an immobilizer. Immobilizers became mandatory on all new cars sold beginning September 2007. The devices enable an engine computer to recognize an electronic code in the key. If the code in the key and the engine don't match exactly, the vehicle can't be started.

Vehicle Rating

- New vehicles are usually rated by “comparison to similar” existing vehicle – **becoming less accurate as new, different vehicle type are being introduced.**

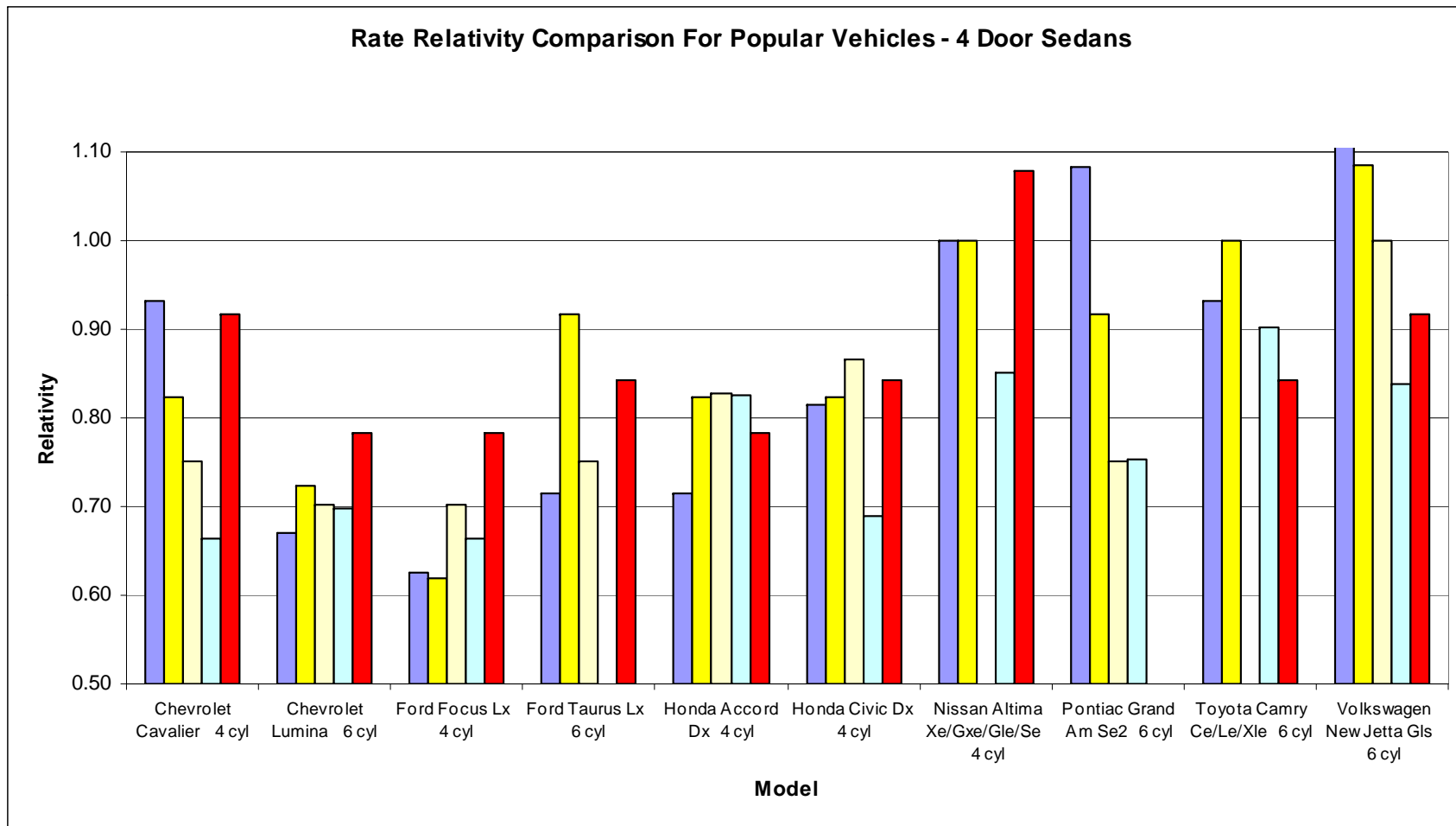
Significant Differences By Company for New Models



Significant Differences By Company for New Models

- Difference in rates > 80%
- The Porsche Boxster symbol assignment from inception dropped at least 5 symbols.

Significant Differences By Company for Most Popular Models



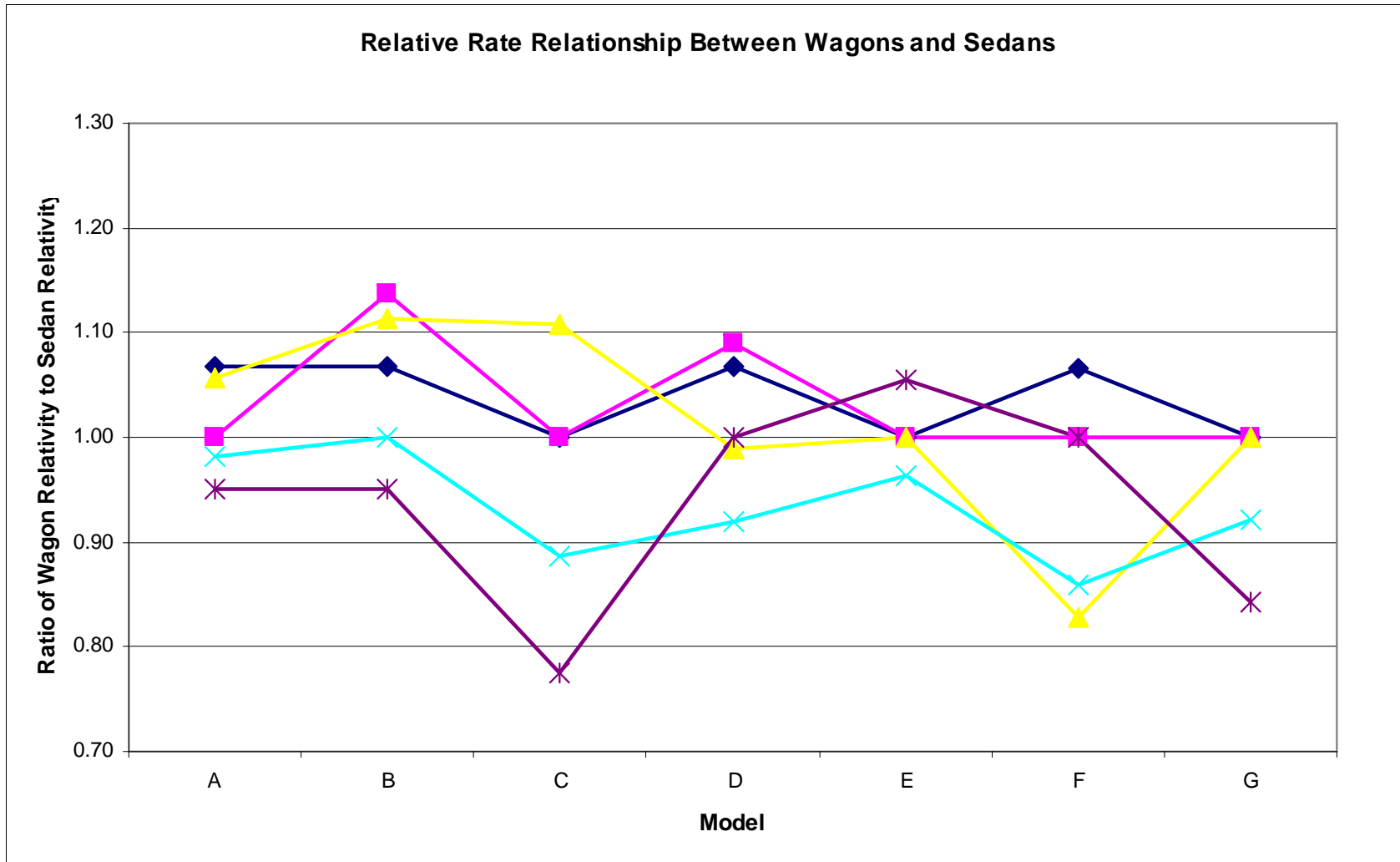
Significant Differences By Company for Most Popular Models

- Smallest difference with high and low company is 16%
- Greatest difference is 44%
- Average difference is 28%

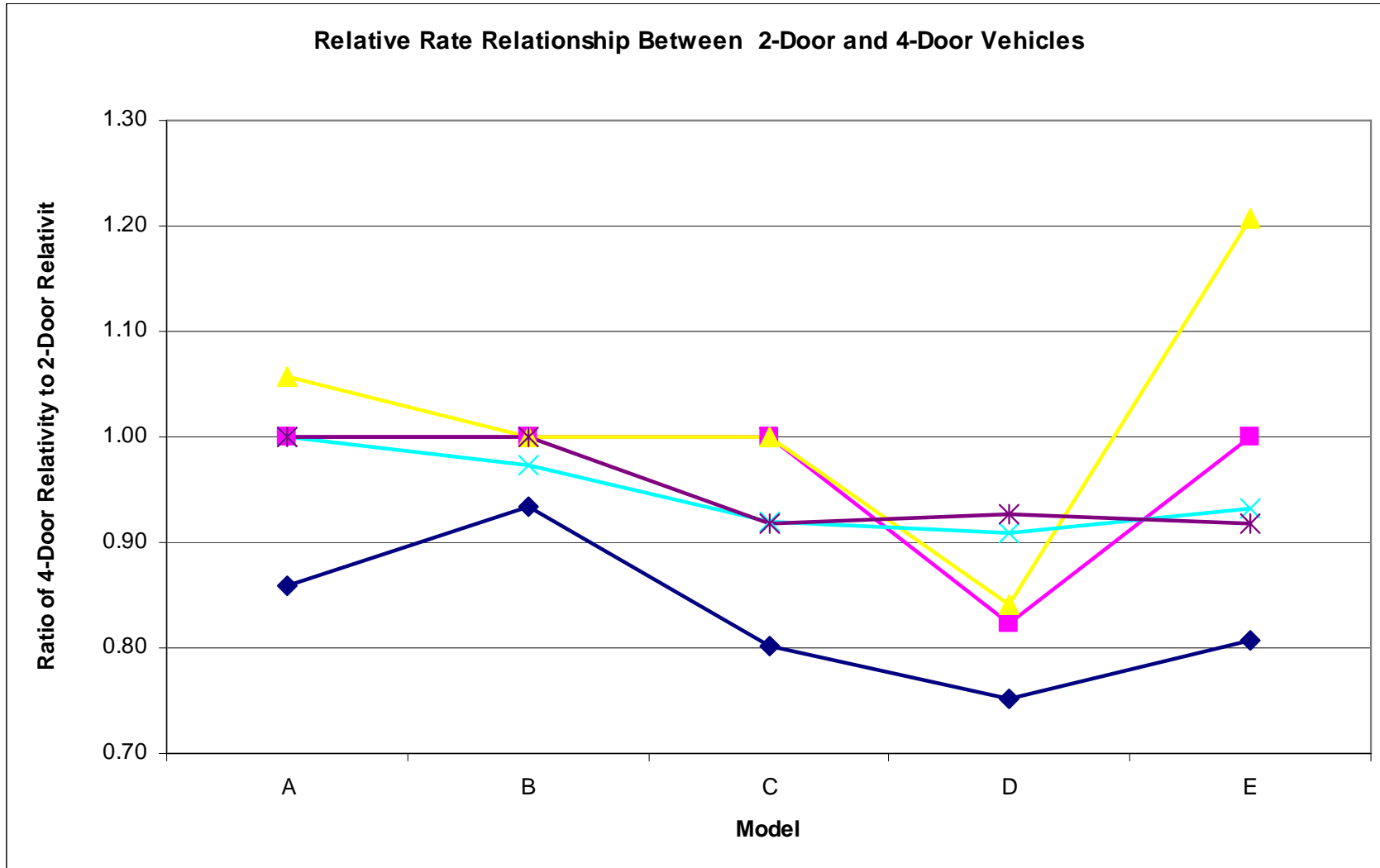
Sports/Luxury Models

- Variations for “published” rates are 32% to 137%
- Differences may be greater as some companies do not provide “published” rates for these models

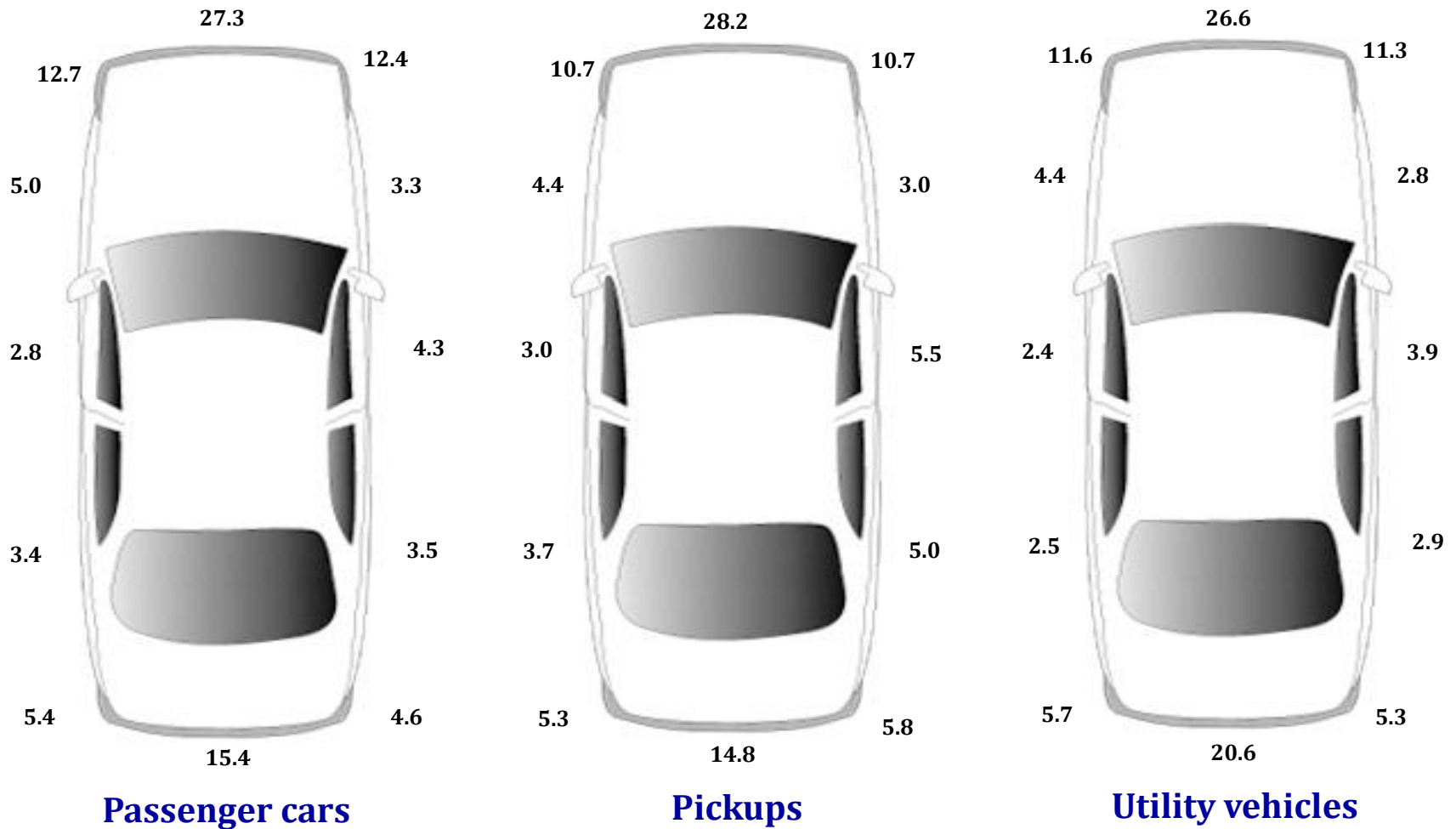
Differences Exist By Type of Models



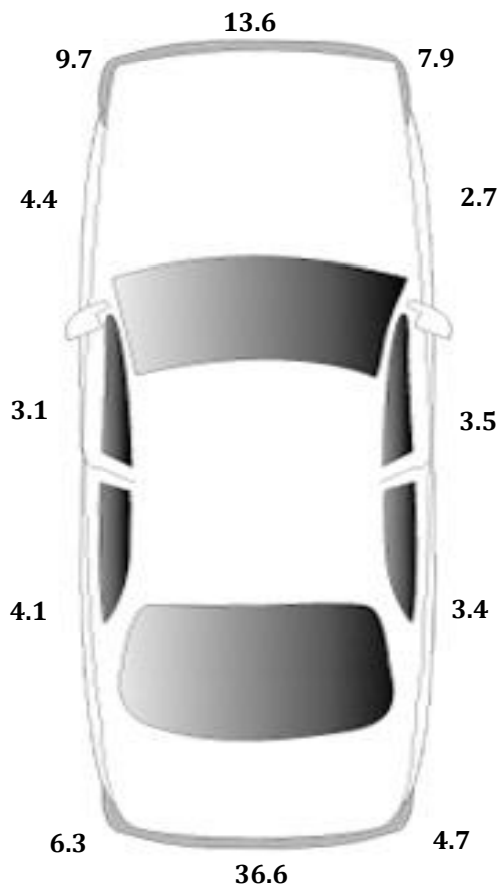
Differences Exist By Type of Models



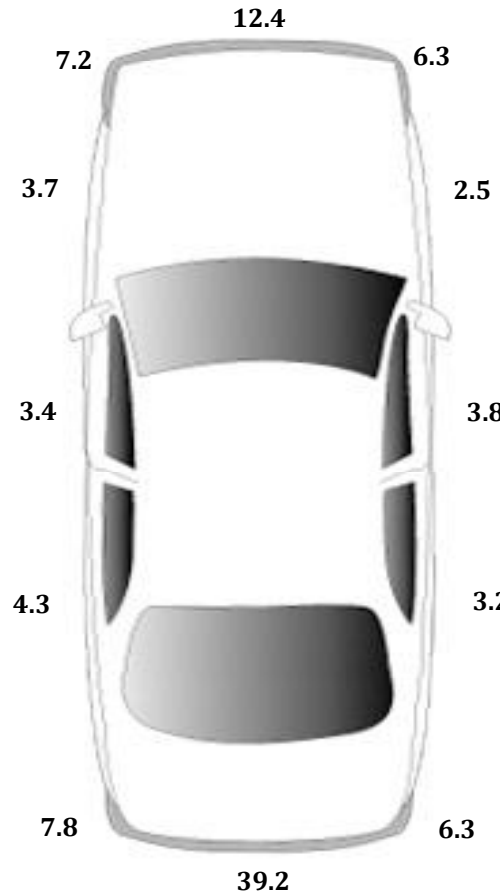
Percent of Collision Claims by Point of Impact By Vehicle Type



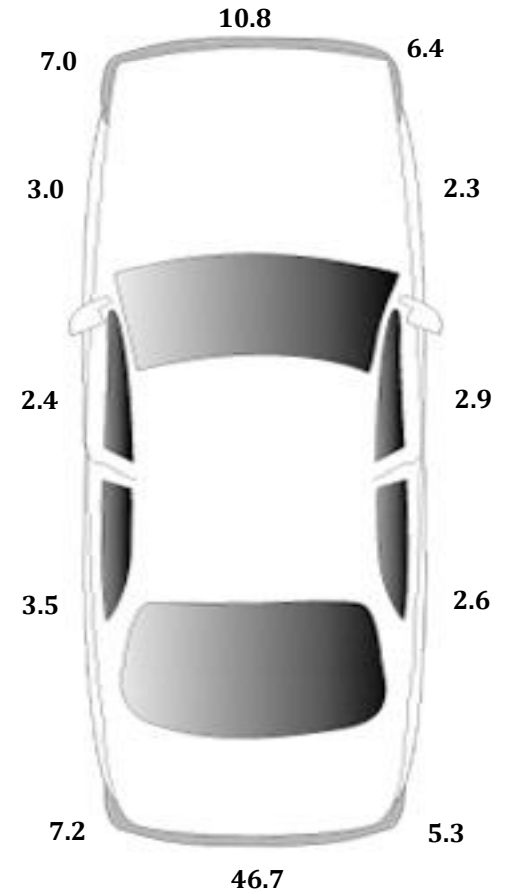
Percent of Property Damage Liability Claims by Point of Impact by Vehicle Type



Passenger cars



Pickups



Utility vehicles

Solution to Rear Accidents

- Back up avoidance device
 - beep, beep, beep
 - camera
- Mirror

Electronic Stability Control

- Electronic stability control could prevent nearly one-third of all fatal crashes and reduce rollover risk by as much as 80%; effect is found on single- and multiple-vehicle crashes

ESC - availability

- ESC is standard on 40 percent of 2006 passenger vehicle models and optional on another 15 percent. It's standard on every 2006 Audi, BMW, Infiniti, Mercedes, and Porsche. Another 8 vehicle makes (Cadillac, Jaguar, Land Rover, Lexus, Mini, Toyota, Volkswagen, and Volvo) offer at least optional ESC on all of their models. But ESC, standard or optional, is limited to 25 percent or fewer models from Chevrolet, Dodge, Ford, Hummer, Mazda, Mitsubishi, Saturn, Subaru, and Suzuki

Aluminum Parts, Hybrid Cars Boost Crash Costs

- Auto repair costs are going up in part because of changes in parts and new, more complex vehicles, an insurance information management firm said.
-(NU Online News Service, March 3, 12:25 p.m. EST)

What do Callaway Golf Clubs and Lamborghini have in common?



Woven Carbon Fiber vs. Forged Carbon



Driving Technology

The photo above shows part of a Callaway club using traditional weave (left) versus one using Forged Composite. In the latter case, fiber chips are mashed together like composite hash browns and formed in a mold so accurate that even part numbers can be stamped into the piece.



Forged Carbon advantages



- Standard woven carbon fiber is typically made layer by layer and infused with epoxy or in premade sheets, which are baked to a form in a vacuum oven known as an autoclave.
- Forged composite takes a different route by taking a toothpaste-like mixture of carbon fibers and epoxy and forming parts in a mold with over six tons of pressure.
- The result is cheaper carbon-fiber-reinforced materials that can be made in less time.

Edmunds - Top 10 High-Tech Car Safety Technologies

1. Tire-pressure monitoring
2. Adaptive cruise control/collision mitigation
3. Blind-spot detection/side assist/collision warning
4. Lane-departure warning/wake-you-up safety
5. Rollover prevention/mitigation
6. Occupant-sensitive/dual-stage airbags
7. Emergency brake assist/collision mitigation
8. Adaptive headlights and/or night-vision assist
9. Rearview camera
10. Emergency response

Liability Vehicle Rating

ISO Liability Rating

- GLM analysis based upon:
 - Manufacturer
 - Chassis type
 - Weight
 - Horsepower
 - Wheelbase
 - Height
 - Width

ISO Liability Rating

- 2-way GLM analysis using combination of curb weight and chassis type (although manufacturer had highest r^2).

ISO Liability Rating

- Manufacturer was the most significant variable but rejected based upon credibility concerns.
- Chassis type was very significant thus 2-way GLM used to test chassis type in combination with other variables other than Manufacturer.
- Best fit achieved with Weight and Chassis type.

ISO Liability Rating

- For liability – curb weight indications are different depending on chassis type –
 - Frame – predicted relativity increases as weight increases.
 - UniBody - predicted relativity decreases as weight increases.
- First Party Coverages - predicted relativity always decreases as weight increases.

Predictive Modeling Applications

Advantages of using Vehicle Characteristics for Rating

- **Easier to rate newer vehicle types.**
- More accurate reflections of safety equipment and other vehicle characteristics.
- For physical damage coverages, and now Liability and PIP vehicle differences can account for significant differences in rates between different insureds.
- Reflect specific differences by Model Year

Considerations

- Need VIN.
- Append external data via Polk, HLDI, ISO, CARFAX or other.

Possible Vehicle Characteristics

Model year	High performance code	Roof type
Symbol	Ton rating	Transmission
Daytime running lights	Vehicle existing damage	Theft deterrence device
Anti lock brakes	Anti theft device	New / Used indicator
ESC (Electronic stability control)	Emergency brake assist/collision mitigation	
Airbags/passive restraint	Cost price new	Blind-spot detection/side assist/collision warning
Height, weight, wheel base	Body type	Tire Pressure Monitoring
Engine type/size	Emergency response	# of doors
Make	Lane Keeping	Backup avoidance
Model	Adaptive headlights and/or night-vision assist	Construction
Segmentation	Fuel type	

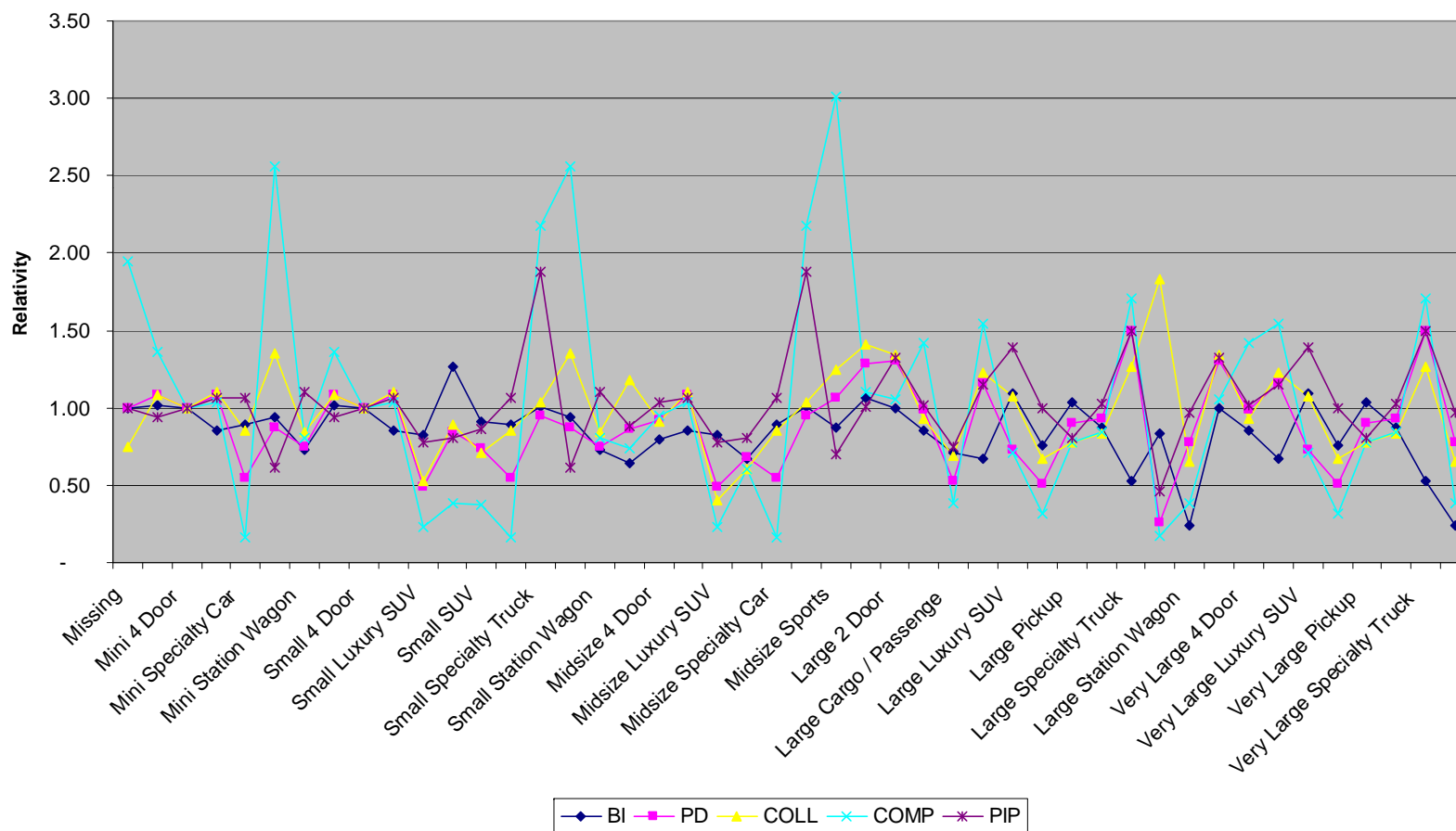
Additional Non-traditional Characteristics

- Branded title
- Length of last ownership
- Salvaged
- Prior damage
- Was vehicle repossessed
- Lien/Lease

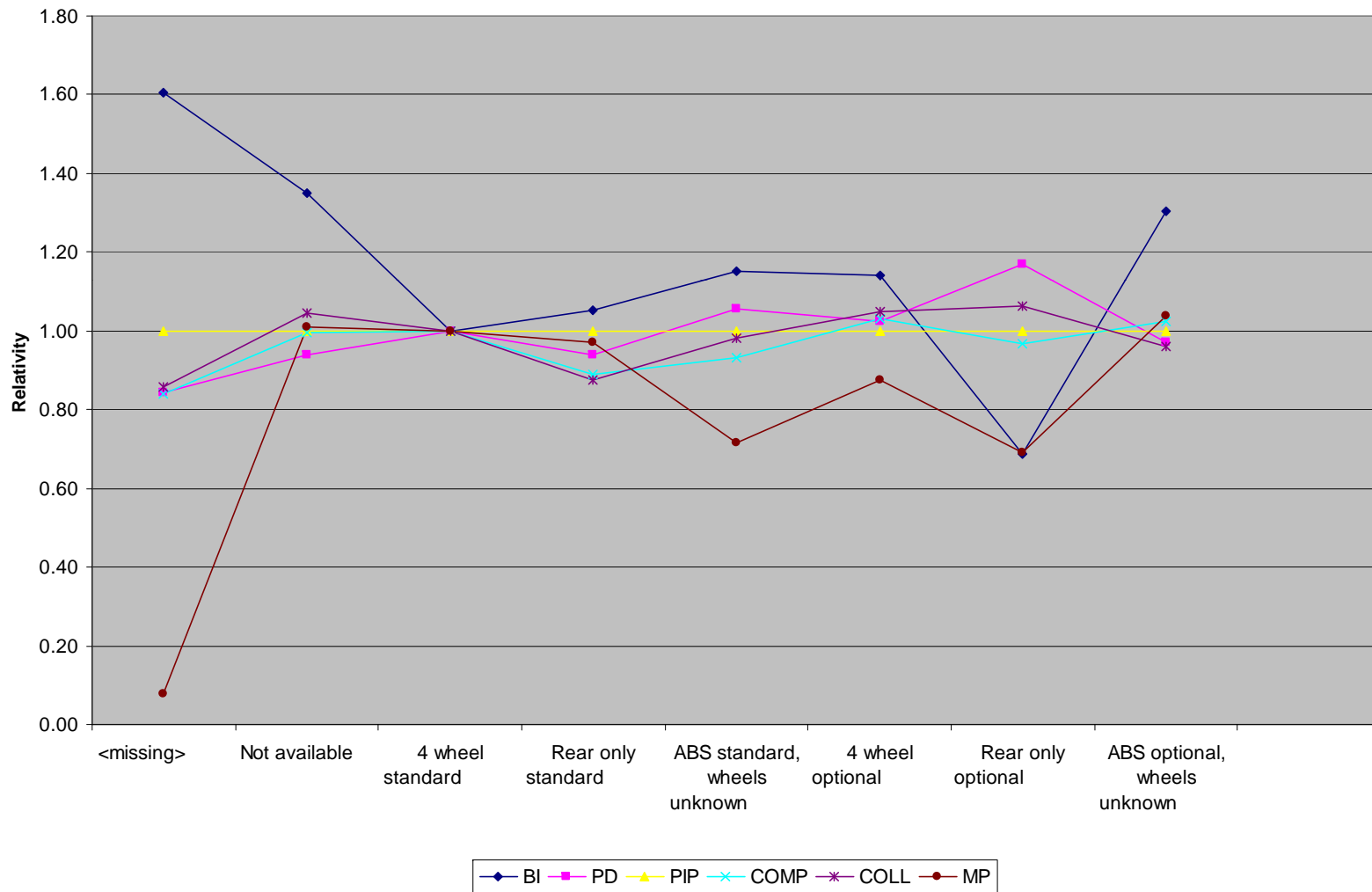
Segmentation Example

Compact Pickup	Full Size Utility	Basic Economy (Car)
Midsize Pickup	Sport Utility	Lower Midsize (Car)
Fullsize Pickup	Mini Sport Utility	Upper Midsize (Car)
Heavy Duty Pickup	Medium/Heavy Trucks	Upper Midsize Specialty (Car)
Minivan (Passenger)	Basic Luxury (Car)	Traditional Large (Car)
Minivan (Cargo)	Middle Luxury (Car)	Basic Sporty (Car)
Passenger Van	Prestige Luxury (Car)	Middle Sporty (Car)
Full Size Van (Cargo)	Entry Level (Car)	Prestige Sporty (Car)

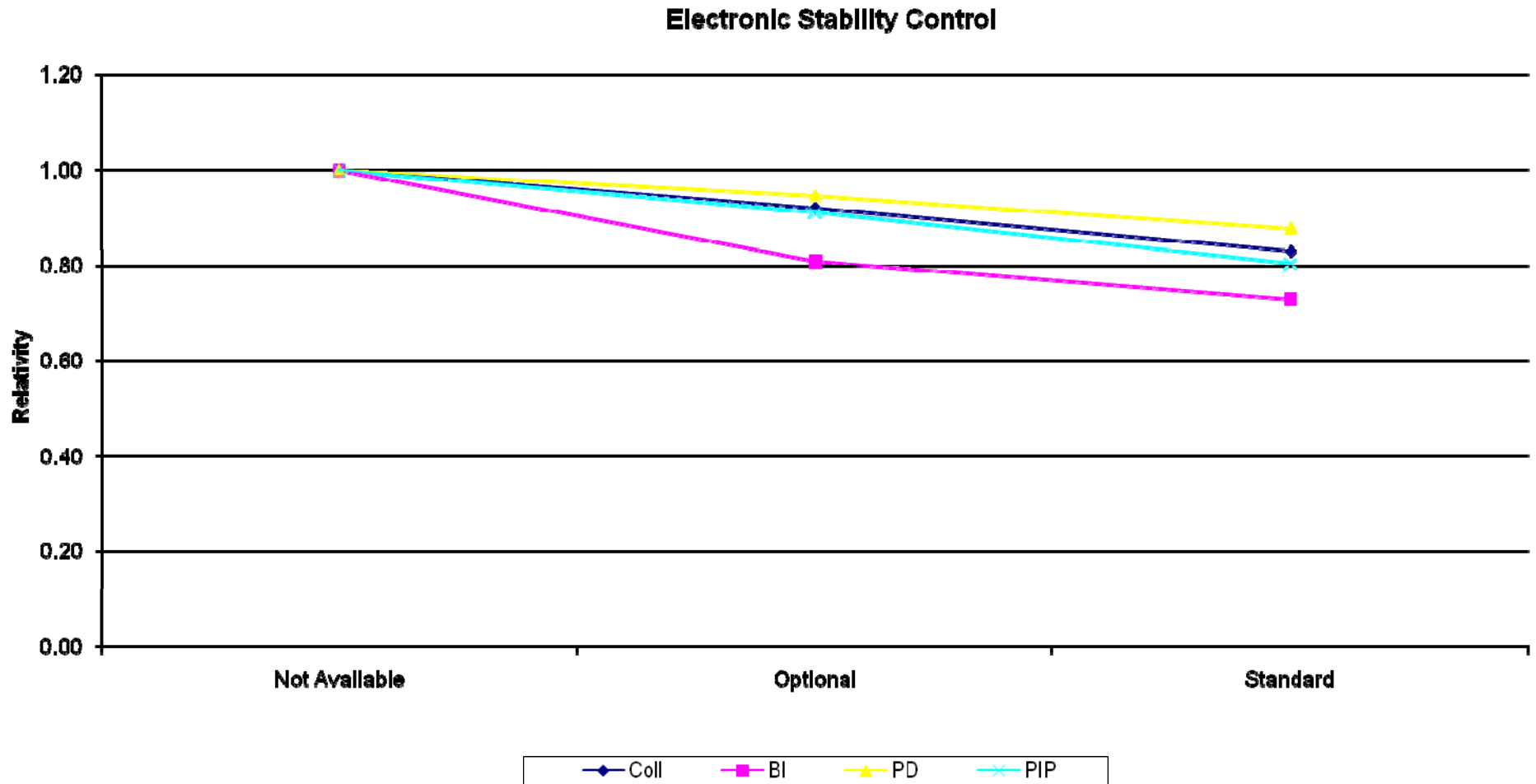
Vehicle Class - Indicated Pure Prem Relativities



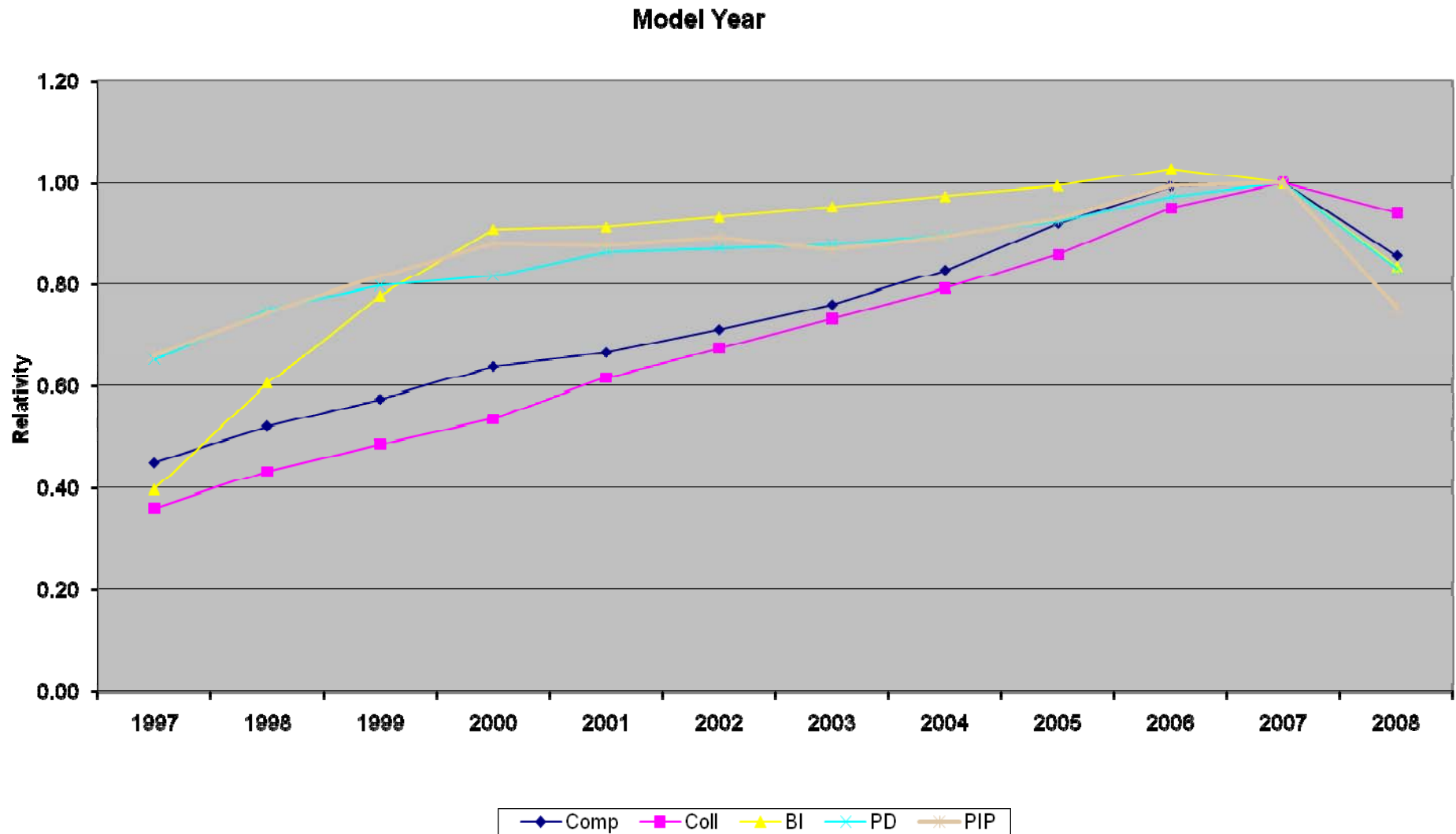
Anti_lock_brakes



Results - Electronic Stability Control

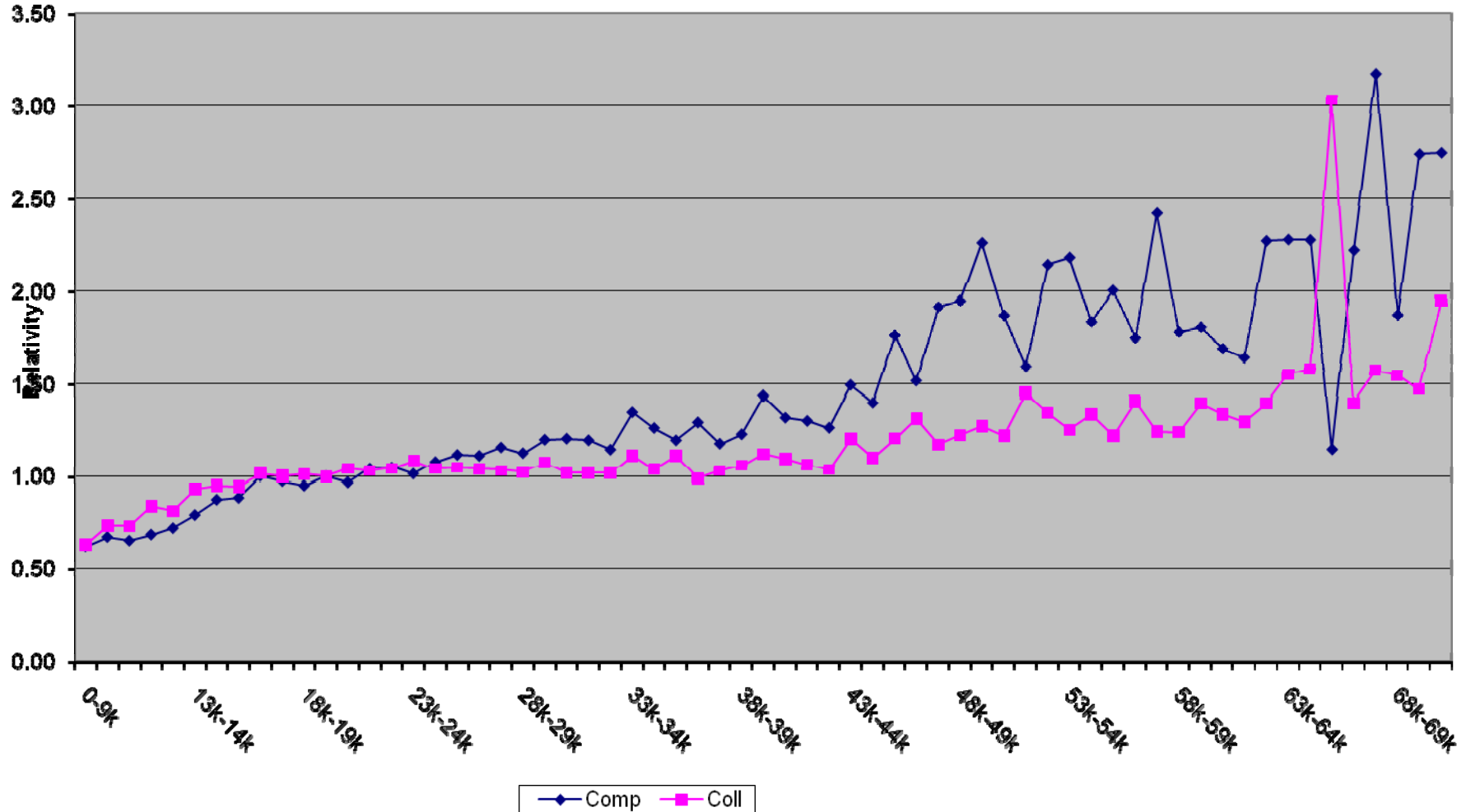


Results - Model Year

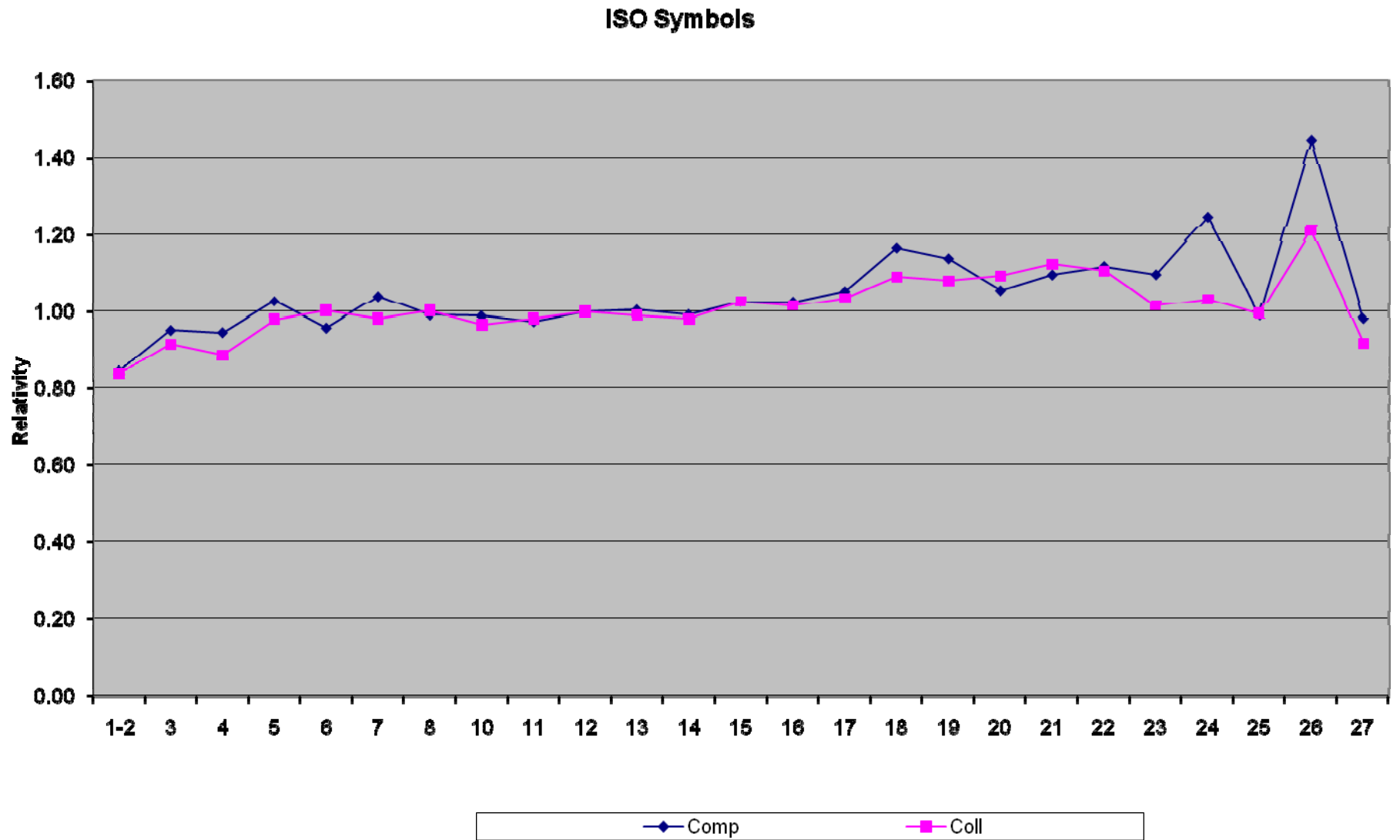


Results - Base List Price (Polk)

Base List Price

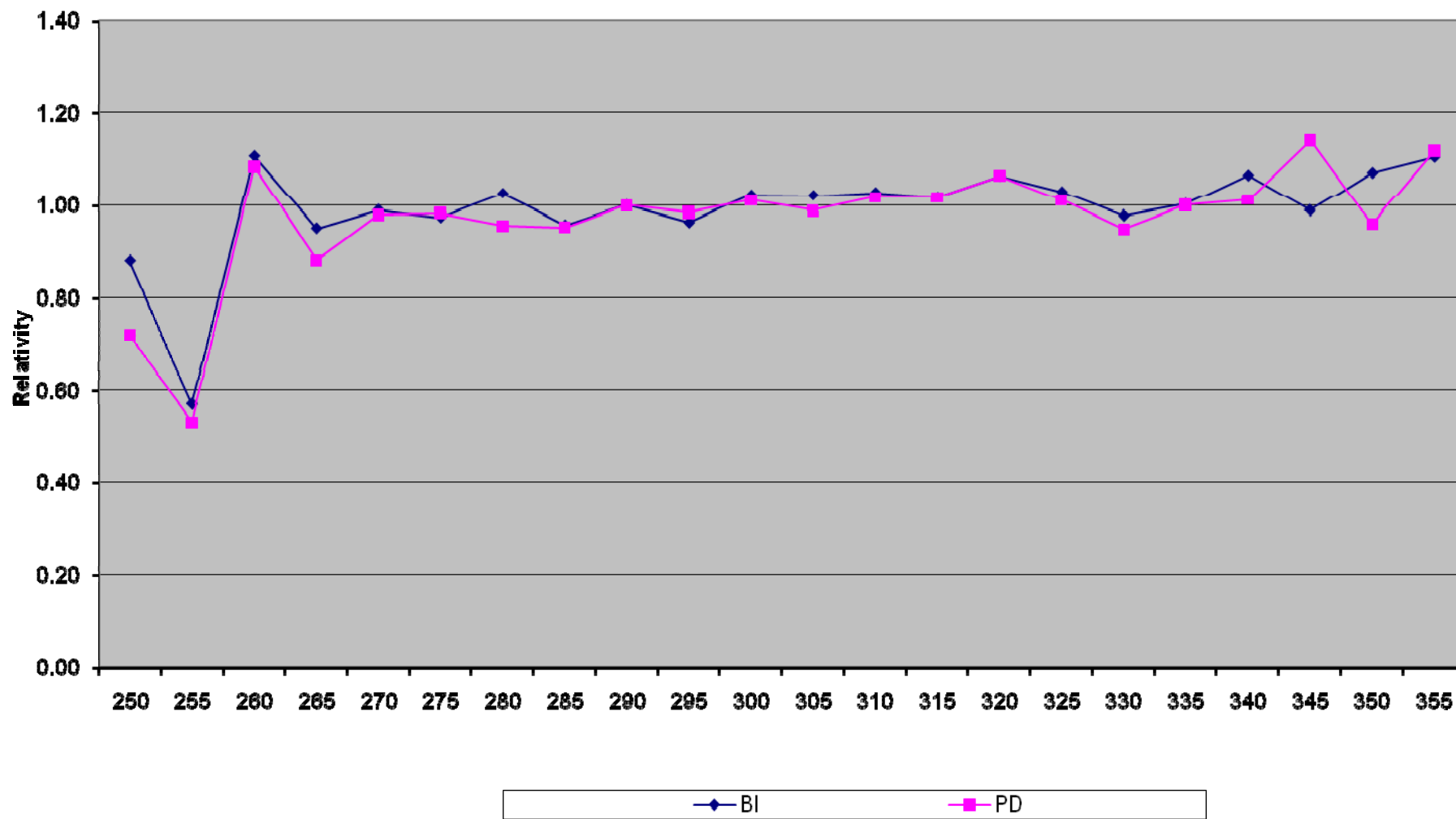


Results - ISO Symbols



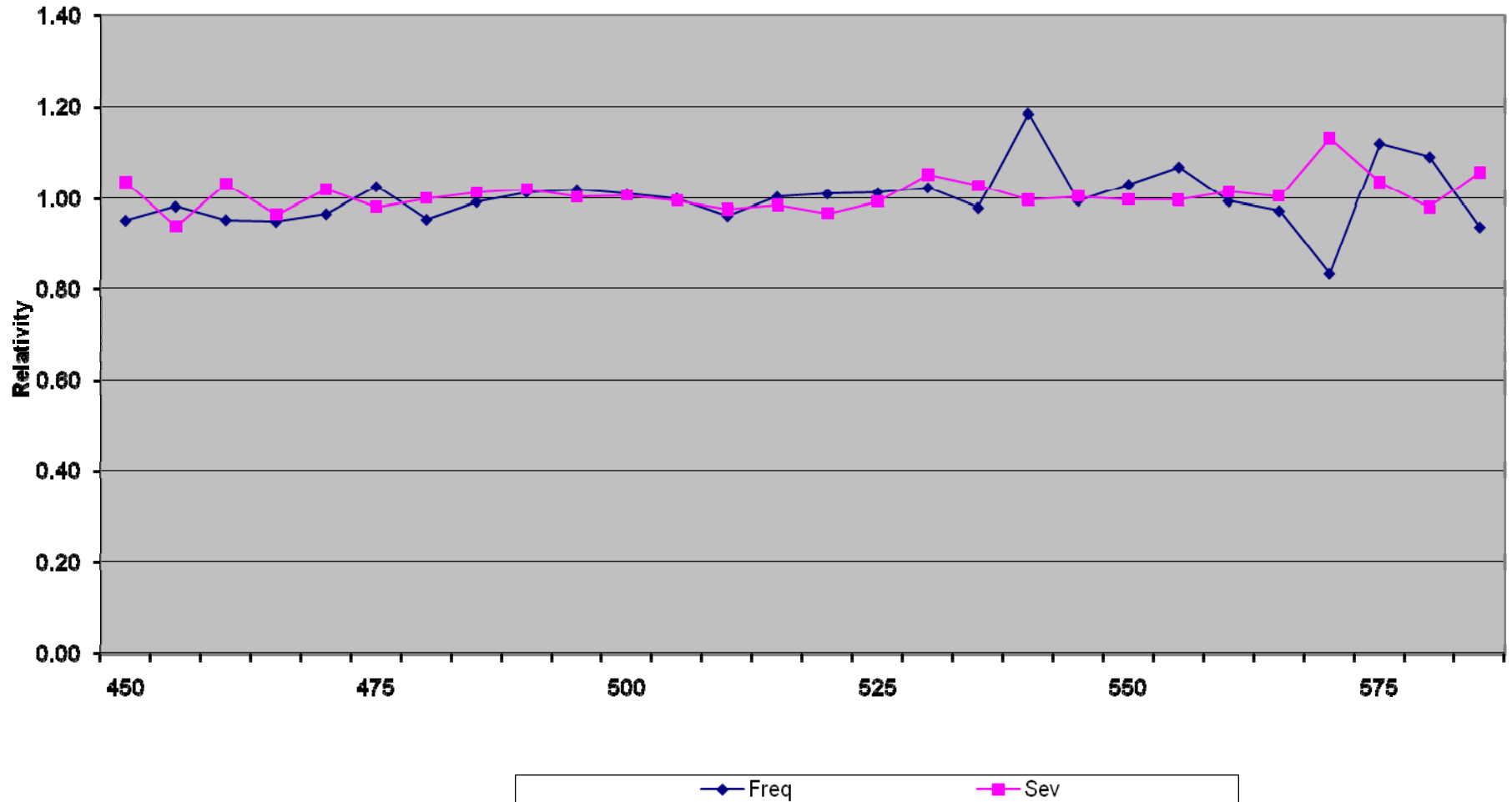
Results - ISO Symbols (Liability)

ISO Symbols (Liability)



Results - ISO Symbols (PIP)

ISO Symbols (PIP)



Good Timing to Evaluate Change

- ISO in process of changing physical damage symbols from 27 to 75
- ISO will no longer have access to HLDI data

Effect of Latest Economic Crisis on Rating

- New cars sales for January '09 down 40-50%
- Cash for clunkers
- Premium trend effects
- Potential effect on older cars which are being kept longer
- More fuel efficient cars

The new small cars

Fiat-Chrysler 500



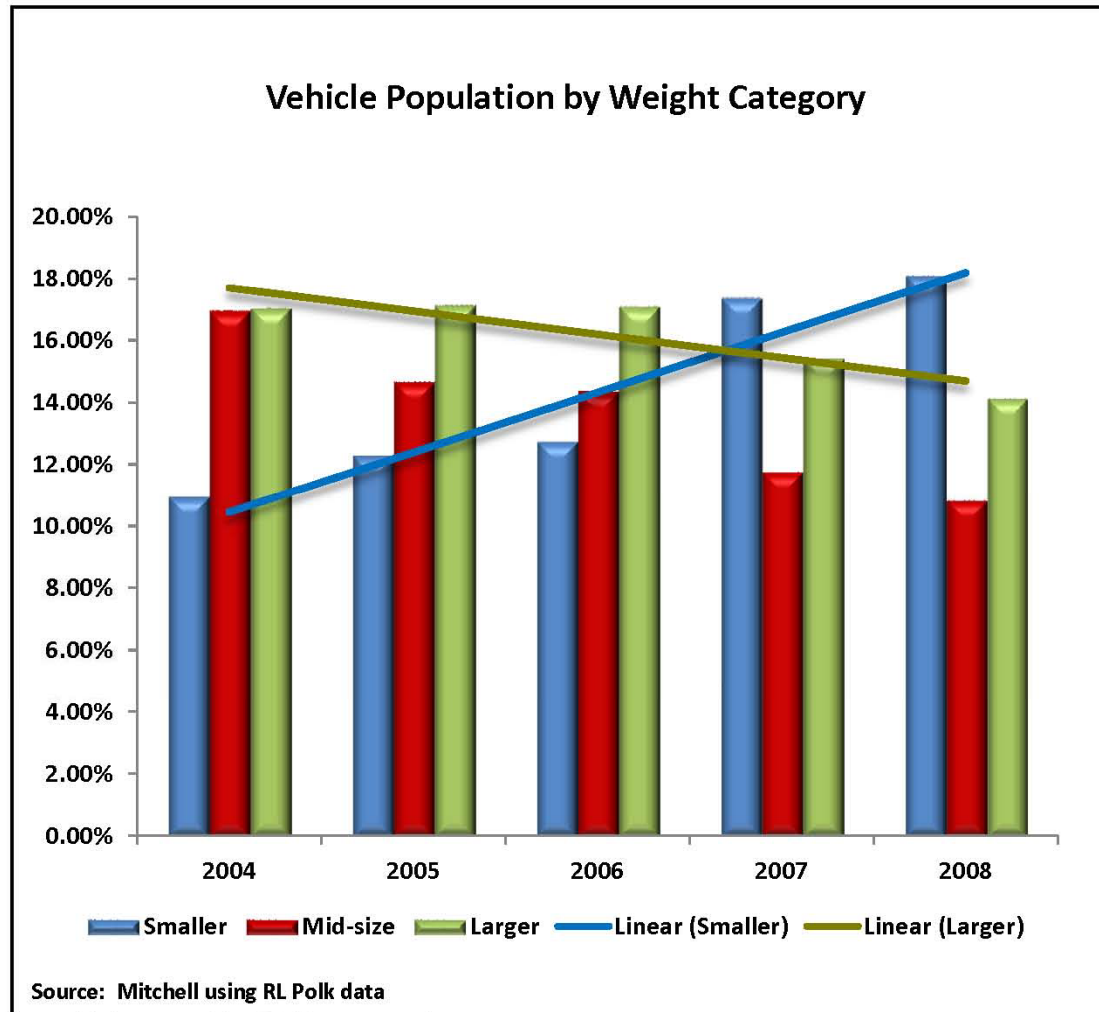
Chevrolet Sonic



Ford Fiesta

Trends Towards Lighter Vehicle Persists

Vehicle Size Mix

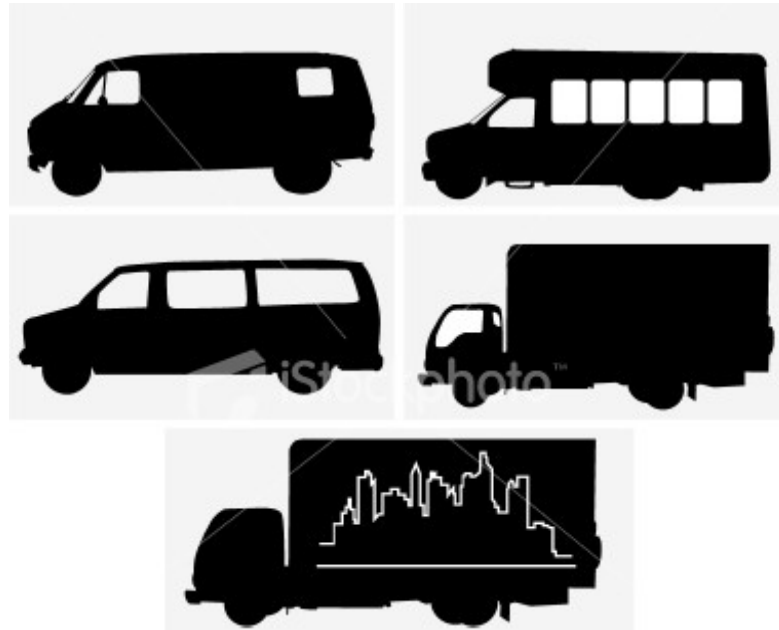


- From 2006 to 2007, smaller cars passed larger vehicles in numbers on the road
- Mid-size and heavier vehicle steadily decrease since 2006
- SUV's are only 7.9% of 2010 new vehicle sales
- Small cars are getting more options

Commercial Auto Applications

- VIN decoding works as well in CA as PPA
 - Truck VINs define their ICC weight class (which is more detailed than ISO weight classes)
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 - Private passenger types (cars) are not typically symbol rated in CA and either can be or the vehicle characteristics can be used to create a simplified symbol system.
 - Many of the characteristics that PPA VIN decoding returns are also available and valuable for CA (passive restraints, antilock breaks, engine size, model year)
 - However, VIN only contains information about the truck as it left the assembly line and many features are added post production

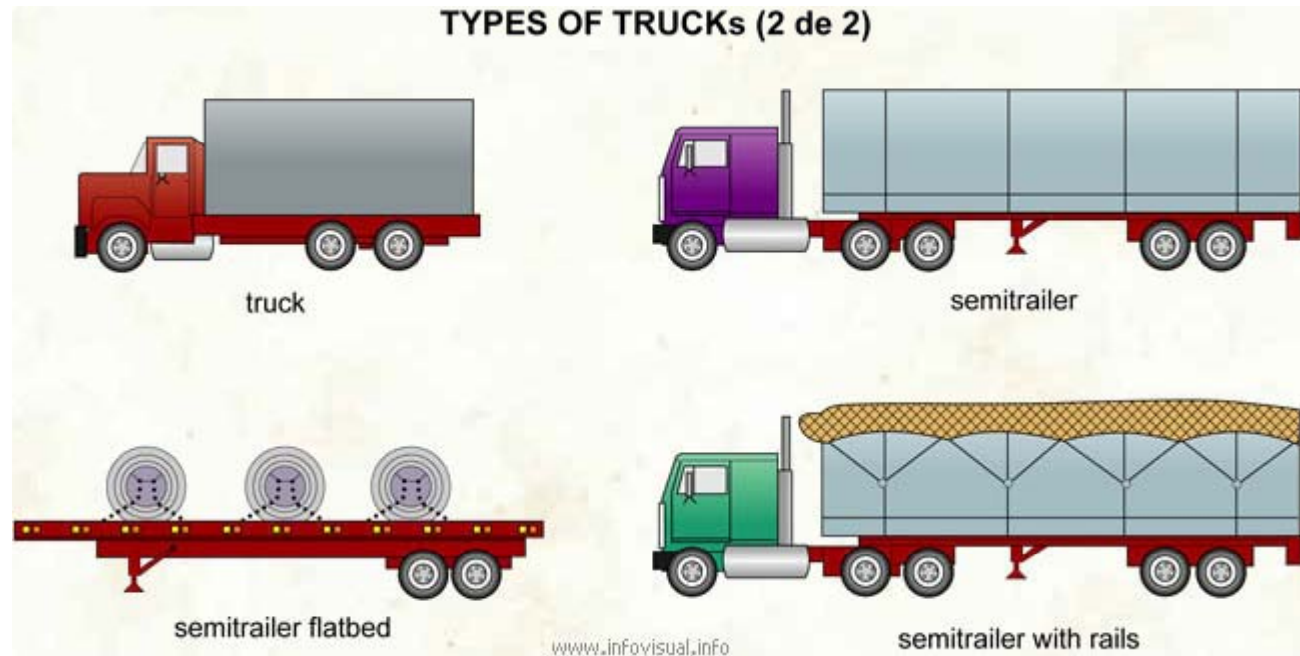
Not All Trucks are the Same



Commercial Auto Applications

- The type of container on a truck (aka body type) also matters (refrigerator, dump, flatbed, box, tanker, cranes and specialize equipment (e.g. scaffolding for ladders etc.))
- The type of container on a trailer also matters (refrigerator, low boy, flatbed, box, tanker) as does what kind of cargo you're hauling (coiled steel, chemicals, grain, perishables, less than trailer load (LTL), sand and gravel, moving and storage)

Types of Loads



Commercial Auto Applications

- Mileage information is typically not available/verifiable unless the insured is engaged in for hire trucking, however, Standard Industrial Classification (SIC) codes can be a strong indicator of mileage/vehicle use. For example, contractors normally drive to the jobsite while wholesalers tend to drive routes to retailers all day and florists make deliveries.

Commercial Auto Applications

- Personal use is also a key factor (pickup trucks and company cars with a cooler full of beer at a softball field on Thursday night are a real and difficult risk). Unfortunately, it is hard to verify until after a claim, especially on small risk where a fenced garaging location may not be verified due to policy size.

Vehicle Weight

- ISO's class plan has four vehicle weight classes: Light, Medium, Heavy and Extra-Heavy.
- Alternatively, the Interstate Commerce Commission (ICC) developed eight weight classes that do a much better job of grouping similar vehicles that are readily verifiable using VINs.

ICC Weight Classes

Truck Class Definitions



Commercial Light Duty Trucks - Examples: Minivan, Utility Van, Multi-Purpose, Pickup, Mini-Bus, Step Van.

Where the Gross Vehicle Weight is:

Class 1 (Gvw 0 - 6000)

Class 2 (Gvw 6001 - 10000)

Class 3 (Gvw 10001 - 14000)



Medium Duty Trucks - Examples: City Delivery, Large Walk-in, Bucket, Landscaping.

Where the Gross Vehicle Weight is:

Class 4 (Gvw 14001 - 16000)

Class 5 (Gvw 16001 - 19500)

Class 6 (Gvw 19501 - 26000)



Heavy Duty Trucks - Examples: Refuse, Tow, City Bus, Furniture, Conventional, COE, Fuel, Fire Engine, Refrigerated, Dump, Cement.

Where the Gross Vehicle Weight is:

Class 7 (Gvw 26001 - 33001)

Class 8 (Gvw 33001 - 150000)

Vehicle Weight

- This verifiable approach to vehicle weight also addresses popular misconceptions regarding specific vehicle types.
- The most common misperception is that all pick-up trucks are “Light.” Most large pickup trucks have gross vehicle weights well in excess of the “Light” limit of 10,000 pounds.

National Underwriter – July, 2007

- “From a physical damage perspective, new designs in trucks to reduce their weight and streamline them for fuel efficiency have led to more damage to the vehicle in lower speed collisions.
- Where a steel bumper used to protect the tractor with minimal front-end damage, now an entire engine hood must be replaced with engine parts, which are now protected”

Thank You for Your Attention

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