TECHNICAL APPENDIX

December 2006

HIGHWAY LOSS
DATA INSTITUTE

Contents

Contents (cont'd)

Introduction

The Highway Loss Data Institute (HLDI) is a nonprofit, public service organization that gathers, processes, and publishes insurance data on the human and economic losses resulting from owning and operating motor vehicles, especially the ways such losses vary among different kinds of vehicles.

This *Technical Appendix* defines terms and classifications used in HLDI reports. It also explains the weighting and standardization employed in computing HLDI results. Although all information in this *Appendix* is current as of publication, different weights, reporting thresholds, and methods may be used in future HLDI reports to reflect changes in the data.

Source Data

HLDI collects private passenger vehicle automobile insurance coverage and loss data. Standard and nonstandard risk data are included but not assigned risk. Commercial and fleet data also are excluded. Only payments for damage to insured vehicles are included; monies recovered by companies from either salvage for wrecked vehicles or through the subrogation process are excluded.

Companies that Supply Data

HLDI receives automobile claims and coverage information from the following companies:

AIG
Allstate Insurance Group
American Family Mutual Insurance
American National Property and Casualty
Auto Club Group
California State Automobile Association
Chubb Group of Insurance Companies
Erie Insurance Group
Farmers Insurance Group of Companies
The GEICO Group
GMAC Insurance
The Hartford
High Point Insurance Group
Kentucky Farm Bureau
Liberty Mutual
Massachusetts AIB
Nationwide Insurance
The Progressive Corporation
Safeco
St. Paul Travelers
State Farm Insurance Companies
Tennessee Farmers Mutual Insurance Co.
USAA

HLDI receives motorcyle claims and coverage information from the following companies:

AIG
American Family Mutual Insurance
American National Property and Casualty
Auto Club Group
California State Automobile Association
Chubb Group of Insurance Companies
Erie Insurance Group
Farmers Insurance Group of Companies
The GEICO Group
The Hartford
Liberty Mutual
Massachusetts AIB
Nationwide Insurance
State Farm Insurance Companies
Tennessee Farmers Mutual Insurance Co.

Vehicle Model Years Collected by Coverage

HLDI collects coverage and loss data for the 10 most recent model years for the following coverages:

- Bodily injury liability coverage
- Collision coverage
- Comprehensive coverage
- Medical payment coverage
- Personal injury protection coverage
- Property damage liability coverage

Insurance Policy Data

Insurance policy data, as distinct from claim data, describe the characteristics of an insured vehicle including its make, series, and scope of its insurance coverage. Policy data reported to HLDI include the following basic information:

- Type of coverage
- Vehicle identification number (VIN)
- Deductible amount
- Policy limits
- Rated driver characteristics including driver age and gender
- Date and nature of relevant changes in coverage
- Geographic garaging location

Insurance Claim Data

Insurance claim data report the characteristics of an insured vehicle for which a claim is made, the initiation of the claim, and/or the corresponding payment. Claim data reported to HLDI include the following basic information:

- Type of coverage
- Payment type
- Vehicle identification number (VIN)
- Loss date
- Loss payment amount

The dollar amounts reported represent loss payments made to, or on behalf of, the policyholder.

Vehicle Description and Identification

The vehicle identification numbers (VINs) of all new passenger vehicles sold in the United States are individually unique numbers that contain, in coded form, detailed information about vehicle make, series, and other distinguishing characteristics.

The specific vehicle types for which results are presented in HLDI reports are derived from the VINs of the individual passenger vehicles.

Only data with valid VINs are used for reports. Each VIN is decoded into a set of specific vehicle characteristics. For the purposes of most HLDI reports, the vehicle characteristics of primary concern are make, series, vehicle size class, and vehicle body style. The use of VINs also permits analyses of other very specific vehicle characteristics such as engine type and horsepower or type of occupant restraint.

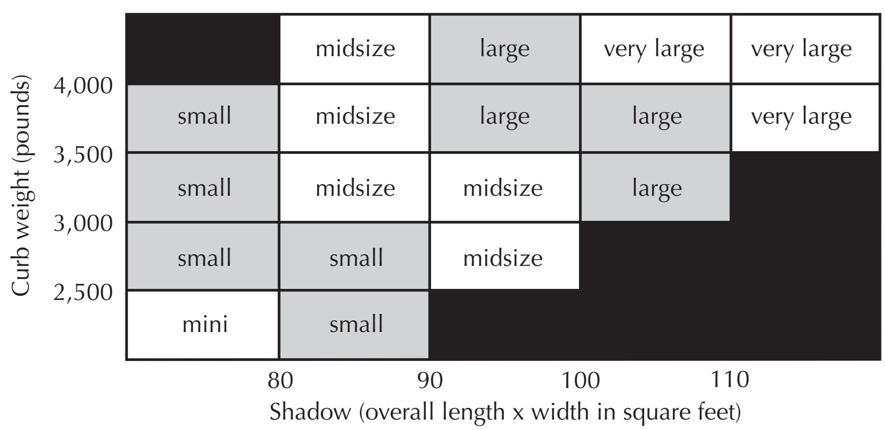
Vehicle Classifications

Passenger Cars

Passenger cars are grouped in six major classes: regular two-door models, regular four-door models, station wagons, minivans, sports models and luxury models. Station wagons typically have four doors, a rear hatch and four pillars. Sports models include two-seaters and cars with significant high-performance features. Luxury models include relatively expensive cars not classified as sports models. (For 2007 models, the luxury threshold guideline is a price-to-curb-weight ratio exceeding 9.0).

Passenger cars are divided into five size categories based on vehicle shadow (overall length times width) and curb weight, as shown in the diagram. For example, the 2006 Ford Fusion four-door has a shadow of 95.4 square feet (overall length of 190.2 inches times width of 72.2 inches divided by 144) and a curb weight of 3,101 pounds, so it is classified as midsize.

Passenger Car Size Classes



There are some exceptions. Some vehicles are placed in different size categories than their shadows and curb weights would indicate to better group the vehicles with their market class competitors. Vehicles that do not fall into a defined category are handled on a case-by-case basis. Vehicles with curb weights or shadows equal to size classification threshold values are classified in the smaller size category. For example, if a vehicle has a shadow of 100 square feet and a curb weight of 3,500 pounds, then it is classified as midsize.

Pickups

Pickups are cargo-carrying vehicles, usually on a truck chassis, with an enclosed cab and a separate open cargo area. The open cargo area generally is a box with raised sides and a tailgate that opens. Pickups are divided into three size classes based on curb weight and carrying capacity. When different models (i.e., two-wheel drive, four-wheel drive) of the same vehicle series span size groups, all the models may be categorized into the same size class regardless of their weights. Vehicles also may be placed in different size classes than their weights would indicate to better group the vehicles with their market class competitors.

- Small — curb weight 4,000 pounds or less (e.g., Ford Ranger)
- Large — curb weight more than 4,000 pounds and carrying capacity of 1/2 ton (e.g., Ford F-150)
- Very Large — curb weight more than 4,000 pounds and carrying capacity of 3/4 or 1 ton (e.g., Ford F-250)

SUVs

SUVs typically are built on heavy-duty chassis capable of off-road use, although many new generation utility vehicles are built on passenger car platforms. They are of conventional front-engine construction. The passenger areas, and the great majority of cargo areas, are integral with the driver area. However, some SUVs have an external cargo bed. Some SUVs are equipped with soft or removable tops. Frequently these vehicles are equipped with four-wheel drive.

SUVs are divided into five size categories. The smallest and largest categories (Mini and Very Large) are based on curb weight and vehicle shadow. The other three categories are based simply on curb weight. The categories are further divided into regular and luxury, where luxury contains the higher priced vehicles. (For 2007 models, the luxury threshold guideline is a price-to-curb-weight ratio exceeding 8.0). When different models (i.e., two-wheel drive, four-wheel drive) of the same vehicle series span size groups, all the models may be categorized into the same size class regardless of their weights. Vehicles also may be placed in a different size than their weights would indicate to better group the vehicles with their market class competitors.

- Mini—curb weight 3,000 pounds or less and a shadow less than 75 square feet
- Small—curb weight between 3,001 and 3,750 pounds
- Midsize—curb weight between 3,751 and 4,750 pounds
- Large—curb weight between 4,751 and 5,750 pounds
- Very Large—curb weight more than 5,751 pounds or a shadow more than 115 square feet

Cargo/Passenger Vans

Cargo/passenger vans are fully enclosed vehicles with either no hood or a very short hood and an engine placed at least 50 percent behind the windshield. The driver's position is well forward, within the front 25 percent of the wheelbase. These vehicles, designed primarily for cargo transport, are equipped with a cargo access door on the right side and rear door(s). The cargo area is not separated from the passenger area; both are enclosed under the same roof. Some versions of these vans are equipped with additional seats in the cargo area and usually have additional side windows as well. There are no size classes for vans; all are considered large.

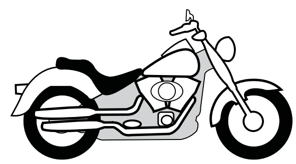
Motorcycle Classifications

Street Legal Motorcycle

Street legal motorcycles are grouped into nine different classes: cruiser, chopper, dual purpose, sport, super sport, unclad sport, standard, touring, and scooters. There also is a sidecar class. Sidecars can be attached to one or more of the street legal motorcycles and subsequently are exposed to the same hazards inherent in operating motorcycles. Although most motorcycles are designed with the same fundamental components — chassis incorporating two wheels, engine, handle bars, and open riding position — there still are unique design and operation queues that distinguish the intended riding purpose and performance expectations.

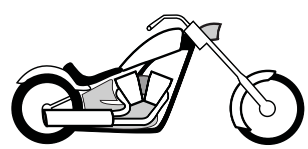
The method used to assign motorcycles to classes includes factors such as riding ergonomics, riding position, body style, features, usability, and driving dynamics. The following classes are the variations of street legal motorcycles.

Cruiser



Cruiser motorcycles mimic the style of earlier American motorcycles from the 1930s to the early 1960s, such as those made by Harley-Davidson and Indian. Although cruisers have benefited from advances in metallurgy and technology, the basic design is still very similar to early motorcycles. They generally are identified as having a classic look. The riding position places the feet forward and the hands up, with the spine erect or leaning back slightly. This position allows greater long-distance comfort with some compromise of control. Some cruisers may have limited performance and turning ability because of a low-slung design and therefore are not intended for sport riding. Cruisers can be used with a sidecar.

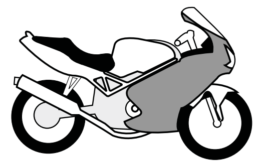
Chopper



Chopper-style or extended-fork motorcycles are closely related to cruisers, with the exception of an extended wheelbase that results from the typically longer front fork configuration. The extended wheelbase tends to reduce maneuverability. Choppers generally are highly customized with higher relative costs. As the term “chopper” implies, the motorcycle is derived by chopping off or removing parts from a typical cruiser with the intent of reducing weight or bulk for the sake of speed. Its reduced maneuverability typically is further exaggerated by a wider rear tire that assists in acceleration.

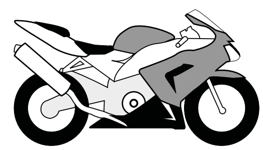
The decreased maneuverability can be directly attributed to the increased rake and trail created by the extended forks. Rake is the angle of the steering head measured in degrees from a line 90 degrees to the ground. Trail is the distance defined by the vertical line from the axle to ground and the intersection of the centerline of the steering neck and ground. Normal trail ranges from 2 to 4 inches, which allows the motorcycle to handle easily at both high and low speeds. If the trail is more than 4 inches, the motorcycle is less responsive to rider input at high speeds and will be difficult to balance at lower speeds or on winding roads.

Sport



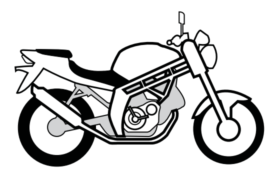
Sport motorcycles have a wide range of engine displacements. They differ from cruisers in that they are smaller, lighter, and have extensive body paneling and fairing covers. Some sport motorcycles are capable of having side bags or a rear trunk attached to provide touring ability. These motorcycles are closely related to super sport motorcycles. Their riding position is less aggressive and their power-to-weight ratios are lower than sport/super sport motorcycles, making them more user friendly. Sport motorcycles are capable of high speeds compared with most vehicles but do not offer the acceleration, stability, and handling of super sport motorcycles. Sport motorcycles generally are not considered racing-specification motorcycles by their manufacturers. They are not designed for use with a sidecar.

Super Sport



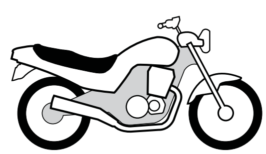
Super sport motorcycles are considered consumer versions of the motorcycles used by factory racing teams and typically use racing specifications as benchmarks in design. Measures are taken to reduce weight and increase power, thus making these motorcycles quick in acceleration, nimble in handling, and capable of high speeds. Like sport motorcycles, super sport motorcycles have extensive body paneling and fairing coverings. The riding position is tight and forward leaning to assist in aerodynamics and rider control. They are not designed for use with a sidecar.

Unclad Sport



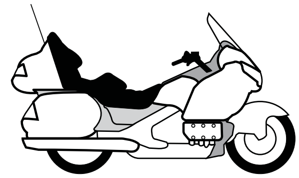
Unclad sport motorcycles are retro in styling and are a relatively new market niche. Commonly referred to as "naked" or "hooligan" motorcycles, unclad sport motorcycles are derivatives of sport/super sport motorcycles in design and performance. However, they do not have full body panels or fairings typically found on sport/super sport motorcycles. Compared with sport motorcycles, unclad sport motorcycles generally have lower horsepower and a less aggressive riding position, making them more user friendly and suitable for everyday riding. Some serve as beginner motorcycles whereas others are as powerful and agile as super sport motorcycles and are targeted at premium customers (e.g., Ducati and Aprilia).

Standard



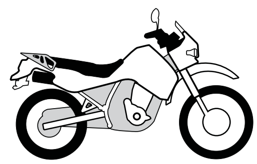
Standard motorcycles generally are considered to be beginner motorcycles. Their designs are basic and generally do not utilize technological advances in chassis and engine design. Many standard motorcycles are generic enough to remain in production for 10 years or more without redesign. Riding positions typically are upright and similar to that of a cruiser and the power-to-weight ratios generally are low resulting in a user friendly motorcycle.

Touring



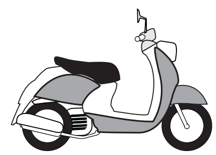
Touring motorcycles are characterized by large engines, wind protection for the rider (using a fairing or windscreen), high-capacity fuel tanks (for extended riding distances), the ability to carry luggage (using side bags and/or a topbox mounted toward the rear) and a comfortable riding position. Although any motorcycle can be equipped and used for touring, specialized touring motorcycles such as the Honda Goldwing are designed for this purpose. Touring motorcycles generally are equipped with high-displacement/high-torque engines for traversing hills while carrying a passenger and luggage. They also incorporate many technological advances such as ABS, audio systems, and other features (such as a reverse gear or cruise control) not typically found on motorcycles.

Dual Purpose



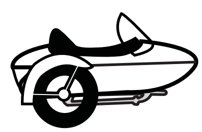
Dual purpose motorcycles are very similar to off-road motorcycles with the exception of being street legal. They generally have larger displacement engines and greater suspension travel than off-road motorcycles, along with more comfortable riding seats and positions. Dual purpose motorcycles are equipped with road-ready features such as turn signals and brake lights for street riding. They also use four-stroke engines for compliance with emissions requirements.

Scooter



Scooters are similar to motorcycles and are designed to be ridden on public roads. They are characterized by smaller wheels, automatic transmissions, small engines, and a step-through configuration allowing the rider to ride with both feet on a running board and knees together. However, larger scooters with engine displacements greater than 250 cc are becoming more popular. The Honda Silver Wing, Honda Reflex, and Suzuki Burgman are examples of the increasing displacements and highway-capable scooters.

Sidecar

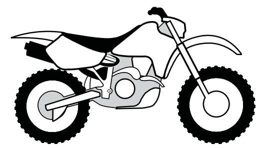


A sidecar is a wheeled passenger carrier that can be attached to the side of a motorcycle. They typically are used in conjunction with a cruiser or touring motorcycle, but recently sidecars are being developed for scooters. A sidecar is not motorized.

Off-Road Vehicles

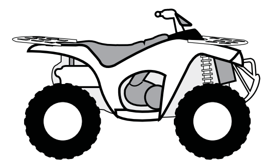
In addition to street legal motorcycles, manufacturers produce similarly powered vehicles that serve off-road purposes and are not intended for use on public roads. These vehicles are grouped into four distinct classes based on their physical design and intent.

Off-Road Motorcycle



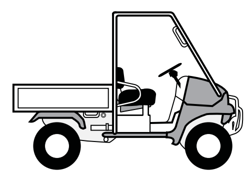
Off-road motorcycles generally are light weight with small displacement engines. The suspension travel is longer than for a typical motorcycle, with a higher ground clearance. Their construction is rugged, simple and without bodywork and fairings. Tires typically are knobby for off-road tractability because the motorcycles are designed to be ridden through rough and muddy terrain. Many off-road motorcycles are produced strictly for recreational or competitive use and are not street legal. Generally, they are equipped with two-stroke engines.

All-Terrain Vehicle



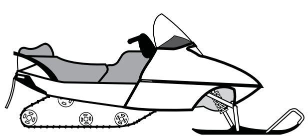
All-terrain vehicles (ATVs) are designed with four wheels and may not be ridden on public roads. There are variations in vehicle designs to allow off-road sport riding or serve utilitarian purposes. Engine displacements tend to be low, but some engines share the same advanced designs as street legal motorcycles. ATVs generally accommodate one rider and are operated with the use of motorcycle-like controls including handle bars. Newer designs include automatic transmissions, electric shifters, GPS navigation systems, and larger engine displacements.

Utility Vehicle



Similar to ATVs, utility vehicles are designed with four wheels and typical motorcycle engines. Utility vehicles differ in that the steering mechanism incorporates a steering wheel rather than handle bars. The passenger capacity of utility vehicles differs from other off-road motorcycles in that they use a bench seat design to accommodate more than one occupant. Although utility vehicles generally do not possess many ATV attributes, they do offer off-road ability with unrivaled cargo capacity.

Snowmobile



Snowmobiles are similar to motorcycles but are intended to be ridden on terrain covered by a layer of snow or ice. The basic design provides an open riding position, handle bar steering control, and motorcycle-like engine configuration. Instead of a front wheel to control vehicle direction, two ski-like sleds pivot with the direction of the handle bars. Propulsion is provided by tank-like treads in lieu of a rear tire. Snowmobiles are not intended to be ridden on public roads.

Measures of Loss

Exposure

Exposure in insured vehicle years is computed for each individual vehicle from the coverage data. The total number of insured vehicle years for each vehicle series then is obtained by accumulating the exposure for all of the individual vehicles in that series.

Claim Frequency

Both reserved and paid claims for an individual vehicle are matched with the corresponding coverage data to ensure the claim occurred within a period of insurance coverage for that vehicle. When multiple claims are made for the same crash, they are treated as a single claim in the calculation of claim frequency. Only claims with positive total payment amounts are used. Collision, property damage liability, and comprehensive claim frequencies are based on only paid claims, whereas injury claim frequencies are based on both paid and reserved claims. For collision and property damage liability coverages, claim frequencies are expressed as the number of claims per 100 insured vehicle years. For injury and comprehensive coverages, claim frequencies are expressed as the number of claims per 1,000 insured vehicle years because these claims occur much less frequently than those under collision and property damage liability coverages.

Average Loss Payment per Claim

The paid claim dollar amounts for each vehicle series are summed and divided by the number of paid claims to produce the average loss payment per claim for that series. Claims settled without payment are excluded from the computations. When multiple claims and/or multiple payments are made for the same crash, they are treated as a single claim and/or single payment in the calculation of average loss payment per claim

Average Loss Payment per Insured Vehicle Year

The average loss payment per insured vehicle year for each vehicle series is obtained by multiplying the claim frequency per 100 insured vehicle years (1,000 insured vehicle years for injury and comprehensive results) by the average loss payment per claim and dividing the result by 100 (1,000 for injury and comprehensive results).

COMPUTING RESULTS

THRESHOLD FOR REPORTING RESULTS

The measure of sample size for HLDI results is insured vehicle years of exposure. In general, the targeted minimum reliability standard for presentation of HLDI frequency results is that the estimated value falls within ± 20 percent of the true value 90 percent of the time. More reliable results are obtained for models with larger amounts of exposure.

For presentation of results, an individual vehicle series must have at least 100 claims or exposure of at least:

COVERAGE	REPORTING THRESHOLD (INSURED VEHICLE YEARS)
Bodily Injury Liability	10,000
Collision	1,000
Medical Payment	8,000
Personal Injury Protection	5,000
Property Damage Liability	3,000
Total Comprehensive	1,000
Glass	2,000
Noncrash Fire	20,000
Other Comprehensive	2,000
Theft	20,000

Personal Injury Protection (PIP) and Medical Payment (MedPay) results also are presented for claims exceeding specified dollar amounts and are published according to the following table:

	REPORTING THRESHOLD (INSURED VEHICLE YEARS)	
INJURY LOSSES	PIP	MEDPAY
All	5,000	8,000
> $500	9,000	10,000
> $1,000	10,000	12,000
> $2,000	12,000	15,000

Standardization

It is well known that loss experience can vary substantially in relation to certain nonvehicle factors, two of which are the deductible amount of the coverage and the operator age group; both claim frequency and average loss payments vary with these factors. In the case of operator age group, youthful operators generally have higher insurance losses than older drivers. This difference, if not taken into consideration, would be sufficient to bias the results when comparing vehicles with different proportions of youthful operators.

For collision and comprehensive coverages, results obtained from the two deductible categories (less than $500 and greater than or equal to $500) also vary. For example, average loss payments for the higher deductibles are greater than those for the lower deductibles. Again, if compared vehicles have different proportions of lower deductible coverages, this difference, if not taken into consideration, would be sufficient to bias the comparison. Property damage liability and injury coverages do not have deductibles.

To minimize any biases in comparisons of results that could arise because of differences attributable to variations in deductible amounts and operator age groups, collision and comprehensive results are first adjusted, or standardized, to equalize the effects of these two nonvehicle factors. In this procedure, a weighted average of the actual results for each combination of deductible amount and operator age group is computed using the standardization weights shown in the tables below. Because the same weights are always used, the effects due to the nonvehicle factors are present in equal amounts in the standardized results. Therefore, to the extent that age distributions within each operator age group and deductible distributions within each deductible group do not vary substantially for different vehicles, these effects no longer bias comparisons of results. Standardization of property damage and injury results takes place in exactly the same manner using only the combined operator age weights (there is no deductible).

The standardization procedure employed is widely used in health statistics (e.g., see *Statistical Methods in Medical Research* by P. Armitage, New York: Wiley, 1971). The basic principle is the introduction of a selected population with a standard distribution across the combinations of deductible amount and operator age group as represented by the standardization weights in the tables. The current and historical standardization weights are listed in Appendix A (collision) and Appendix B (comprehensive).

Standardization Weights — Collision Coverages			
	Operator Age Group		
Deductible Category	Youthful Operator	No Youthful Operator	Combined
< \$500	0.03	0.30	0.33
≥ \$500	0.07	0.60	0.67
Combined	0.10	0.90	1.00

Standardization Weights — Comprehensive Coverages			
	Operator Age Group		
Deductible Category	Youthful Operator	No Youthful Operator	Combined
< \$500	0.03	0.35	0.38
≥ \$500	0.07	0.55	0.62
Combined	0.10	0.90	1.00

Standardization Weights — Property Damage Liability, Personal Injury Protection, Bodily Injury Liability, and Medical Payment Coverages			
	Operator Age Group		
Deductible Category	Youthful Operator	No Youthful Operator	Combined
None	0.1	0.9	1.0

Standardized Claim Frequency (CF)

$$\text{Std. CF} = \sum_{ij} (\text{weight}_{ij})(\text{cf}_{ij})$$

where,

weight_{ij} = weight for age i and deductible j

cf_{ij} = claim frequency for age i and deductible j

Standardized Average Loss Payment per Claim (ALP)

$$\text{Std. ALP} = \left[\sum_{ij} (\text{weight}_{ij})(\text{cf}_{ij})(\text{alp}_{ij})\right] / \left[\sum_{ij} (\text{weight}_{ij})(\text{cf}_{ij})\right]$$

where,

weight_{ij} = weight for age i and deductible j

cf_{ij} = claim frequency for age i and deductible j

alp_{ij} = average loss payment per claim for age i and deductible j

Standardized Average Loss Payment per Insured Vehicle Year

The standardized average loss payment per insured vehicle year is obtained by multiplying the standardized claim frequency by the standardized average loss payment and dividing by 100 in the case of collision and property damage liability coverages and 1,000 for comprehensive and injury coverages.

Example of Computing Standardized Results (Collision – 2005 Honda Accord 4dr)

	Youthful Low Deductible	Youthful High Deductible	Non-Youthful Low Deductible	Non-Youthful High Deductible
Exposure (insured vehicle years)	920	3,232	17,664	34,847
Number of Claims	107	345	1,657	2,342
Paid Dollars	$354,360	$1,599,574	$4,377,883	$8,686,435
Claim Frequency = [(claims/exposure) x 100]	11.63	10.68	9.38	6.72
Average Loss Payment per Claim = (dollars/claims)	$3,312	$4,636	$2,642	$3,709
Weight	0.03	0.07	0.30	0.60

Using the above data, the standardized claim frequency is:

$$(0.03)(11.63) + (0.07)(10.68) + (0.30)(9.38) + (0.60)(6.72) = 7.94 \text{ claims per 100 insured vehicle years}$$

The standardized average loss payment per claim is:

$$\frac{(0.03)(11.63)(\$3,312) + (0.07)(10.68)(\$4,636) + (0.30)(9.38)(\$2,642) + (0.60)(6.72)(\$3,709)}{(0.03)(11.63) + (0.07)(10.68) + (0.30)(9.38) + (0.60)(6.72)} = \$3,402$$

The standardized average loss payment per insured vehicle year is:

$$(7.94)(\$3,402) / 100 = \$270 \text{ per insured vehicle year}$$

Relative Results

Most HLDI results are presented in relative terms where 100 corresponds to the average result for all passenger vehicles. Using relative values facilitates determining if a result is better or worse than average and by how much. Relative results are computed by dividing the vehicle series result by the all-passenger-vehicle result and then multiplying by 100.

Example of Computing Relative Results:

2005 model year Honda Accord 4dr collision claim frequency = 7.94

2005 model year all-passenger-vehicle collision claim frequency = 6.88

Relative claim frequency for 2005 Honda Accord = (7.94 / 6.88) x 100 = 115

Model Year Aggregation

The relative loss experience of particular vehicles does not change substantially from model year to model year provided the basic design of the vehicle and the type of occupant restraint system remain essentially unchanged. To provide information on as many vehicles as possible, data for the most current three model years are combined for those vehicles with essentially unchanged designs. Individual model year results also are reported for collision, comprehensive, property damage liability, and theft.

Although a vehicle's design may remain essentially unchanged, its size class may differ over the aggregated model years due to slight changes in length or weight. When this occurs, exposure and losses for all model years are included in the size class of the most current model year. For example, if a vehicle was classified as small for model years 2003-04 and midsize for model year 2005, then its 2003-05 model year combined result would be considered midsize.

Claim frequency. The aggregated model year relative claim frequency (ARCF) for each vehicle series (i) is obtained by weighting the relative claim frequency for each model year (j) by the applicable exposure for each model year; that is,

$$(ARCF)_i = [\sum_j (exp_{ij})(rcf_{ij})] / [\sum_j (exp_{ij})]$$

where,

exp_{ij} = exposure for vehicle i for model year j

rcf_{ij} = relative claim frequency for vehicle i for model year j

Example: (note: in actual calculations values are not rounded prior to aggregation)

Result = [(501,399)(120) + (265,601)(118) + (56,662)(115)] /
(501,399 + 265,601 + 56,662) = 119

	2003	2004	2005
Exposure (exp)	501,399	265,601	56,662
Relative claim frequency (rcf)	120	118	115

Average loss payment per claim. The aggregated model year relative average loss payment per claim (ARALP) for each vehicle series (i) is obtained by weighting the relative average loss payment per claim for each model year (j) by the applicable number of paid claims for each model year; that is,

$$(ARALP)_i = [\sum_j (npclm_{ij})(ralp_{ij})] / [\sum_j (npclm_{ij})]$$

where,

$npclm_{ij}$ = number of paid claims for vehicle i for model year j

$ralp_{ij}$ = relative average loss payment per claim for vehicle i for model year j

Example:

	2003	2004	2005
Number of paid claims (npclm)	40,601	21,340	4,451
Relative average loss payment per claim (ralp)	83	83	86

Result = [(40,601)(83) + (21,340)(83) + (4,451)(86)] /
(40,601 + 21,340 + 4,451) = 83

Average loss payment per insured vehicle year. The aggregated model year relative average loss payment per insured vehicle year (ARALPPIVY) for each vehicle series (i) is obtained by taking the product of the aggregated relative claim frequency (ARCF) and the aggregated relative average loss payment per claim (ARALP) and dividing by 100; that is,

$$(ARALPPIVY)_i = [(ARCF_i)(ARALP_i)] / 100$$

Example:

Result = [(119)(83)] / 100 = 99

Glossary

Average Loss Payment per Claim — total of all loss payments made for the claims for a group of vehicles divided by the number of claims paid

Average Loss Payment per Insured Vehicle Year — for a group of vehicles, the product of claim frequency and average loss payment per claim, expressed as dollars per insured vehicle year; note that this definition differs from the commonly used insurance term, pure premium, but yields similar results

Claim Frequency — number of claims for a group of vehicles divided by the exposure for that group; expressed as claims per 100 or 1,000 insured vehicle years

Bodily Injury (BI) Liability Coverage — coverage under which people insure against injury losses to other people when the insured vehicle's driver is at fault.

Collision Coverage — coverage under which people insure their own vehicle against loss caused by collision

Comprehensive Coverage — coverage under which people insure their own vehicles against physical damage or loss not caused by collision

Deductible Amount — portion of loss cost borne by the policyholder

Exposure — time interval an individual vehicle is insured; exposure for a group of vehicles expressed in units of insured vehicle years

First-Party Coverage — insurance coverage under which policy-holders collect compensation for losses from their own insurer regardless of fault

Loss Payment — portion of loss cost borne by the insurer; in general, total loss cost minus deductible amount

Medical Payment (MedPay) Coverage — coverage under which people insure against injury losses to themselves, others riding in the vehicle, and pedestrians struck by the vehicle, without regard to who was at fault. This coverage is sold in states with traditional tort liability laws

No-Fault Auto Insurance — insurance plan under which medical expenses and lost income resulting from a crash are collected from the insured's own insurance policy without regard to who was at fault in the crash

Nonstandard Risk Coverage — coverage under which the policyholder is rated as a higher-than-standard risk due to driving record, insured vehicle, or other factors

Operator Age Group — factor that distinguishes vehicles with a youthful rated driver from vehicles without a youthful rated driver (see youthful operator)

Passenger Vehicles— Motor vehicles used for carrying passengers, including all passenger cars, SUVs, light pickups, and vans (including 15 passenger vans). Pickups with a carrying capacity of greater than one ton are excluded. Also excluded are motorcycles, buses, large trucks, and chassis cabs.

Personal Injury Protection (PIP) Coverage — first-party no-fault coverage under which an insurer pays, within specified limits, the medical, hospital, and other expenses of the insured, others in the vehicle, and pedestrians hit. This coverage is sold in states that have enacted no-fault laws.

Property Damage (PD) Liability Coverage — coverage under which people insure against loss caused by their vehicles to the property of others

Rated Driver — driver who, for insurance purposes, is considered to represent the greatest loss potential for the insured vehicle

Glossary (cont'd)

Standard Risk Coverage — coverage under which the policyholder is rated as an average or better-than-average risk due to driving record, insured vehicle, or other factors

Youthful Operator — depending on rated driver data reported, either males and females younger than 25 years or males younger then 25 years and unmarried females younger than 25 years.

Appendix A Collision Standardization Weights

Standardization			Report Range	Model Years
Deductible	Youthful Operator	No Youthful Operator		
<$500	0.03	0.30	R-05	2003 thru 2005
>=$500	0.07	0.60		
Deductible	Youthful Operator	No Youthful Operator		
<=$250	0.05	0.40	R-00 thru R-04	1998 thru 2002
>$250	0.05	0.50		
Deductible	Youthful Operator	No Youthful Operator		
<=$250	0.05	0.50	R-97 thru R-99	1995 thru 1997
>$250	0.05	0.40		
Deductible	Youthful Operator	No Youthful Operator		
<=$250	0.05	0.60	R-94 thru R-96	1992 thru 1994
>$250	0.05	0.30		
Deductible	Youthful Operator	No Youthful Operator		
<=$200	0.05	0.50	R-89 thru R-93	1987 thru 1991
>$200	0.05	0.40		
Deductible	Youthful Operator	No Youthful Operator		
<$150	0.05	0.50	R-83 thru R-88	1981 thru 1986
>=$150	0.05	0.40		
Deductible	Youthful Operator	No Youthful Operator		
<$150	0.10	0.60	R-80 thru R-82	1978 thru 1980
>=$150	0.05	0.25		
Deductible	Youthful Operator	No Youthful Operator		
=$50	0.05	0.35	R-72 thru R-79	1972 thru 1977
=$100	0.15	0.45		

* Model year is for latest results. Earlier results for that model year may be in a report with different standardization.

Appendix B Comprehensive Standardization Weights

Standardization			Report Range	Model Years
Deductible	Youthful Operator	No Youthful Operator		
<$500	0.03	0.35	T-05	2003 thru 2005
>=$500	0.07	0.55		
Deductible	Youthful Operator	No Youthful Operator		
<=$100	0.05	0.40	T-00 thru T-04	1998 thru 2002
>$100	0.05	0.50		
Deductible	Youthful Operator	No Youthful Operator		
<=$100	0.05	0.50	T-97 thru T-99	1995 thru 1997
>$100	0.05	0.40		
Deductible	Youthful Operator	No Youthful Operator		
<=$100	0.05	0.60	T-93 thru T-96	1991 thru 1994
>$100	0.05	0.30		
Deductible	Youthful Operator	No Youthful Operator		
<=$50	0.05	0.50	T-89 thru T-92	1987 thru 1990
>$50	0.05	0.40		
Deductible	Youthful Operator	No Youthful Operator		
=$0	0.05	0.50	T-83 thru T-88	1981 thru 1986
>$0	0.05	0.40		
Deductible	Youthful Operator	No Youthful Operator		
=$0	0.10	0.55	T-79 thru T-82	1979 thru 1980
>$0	0.05	0.30		

* Model year is for latest results. Earlier results for that model year may be in a report with different standardization.

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