Commercial Auto Product Management Opportunities Using Predictive Modeling

Robert J. Walling, FCAS, MAAA

October 6, 2008

2008 CAS Predictive Modeling Seminar

San Diego, CA

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E&S/SPECIALTY MARKET REPORT: COMMERCIAL AUTO & TRUCKING

ROAD WARRIORS

Premiums Head South, Buyers' Market Emerges For Truckers

Carriers try to stay in the driver's seat with predictive modeling and targeted pricing

National Underwriter, July 16, 2007

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Why Commercial Auto?

- Many Rating Plan Factors
- Best Exposure Data
- Most External Data Opportunities
  - SIC
  - VIN
  - MVR
  - Credit
- Parallels/Lessons from Personal Auto
- **Best Opportunity for Biggest Improvement**

Commercial Auto Background

- Trucks, Tractors, and Trailers rating based on:
  - Primary rating factors based on
    - Size (Gross Vehicle or Cargo Weight)
    - Use (Service, Retail, Commercial)
    - Radius of Operations (<50 miles, 50-200, > 200)
  - Secondary Factors by Industry
  - Fleet vs. Non-Fleet (5 or more powered units)
  - Physical Damage by Age and Original Cost New

5. NON-FLEET PRIMARY CLASSIFICATIONS - RATING FACTORS AND STATISTICAL CODES

Size Class	Business Use Class		Radius Class: Local, Up to 50 Miles — Liability	Local, Up to 50 Miles — Phys. Dam.	Intermediate, 51 to 200 Miles — Liability	Intermediate, 51 to 200 Miles — Phys. Dam.	Long Distance, Over 200 Miles — Liability	Long Distance, Over 200 Miles — Phys. Dam.
Light Trucks (0 - 10,000 lbs. G.V.W.)	Service	Factor	1.00	1.00	1.05	1.05	1.15	1.10
		Code	011- -	011- -	010- -	010- -	013- -	013- -
	Retail	Factor	1.60	1.20	1.60	1.30	1.70	1.65
		Code	021- -	021- -	021- -	020- -	023- -	023- -
	Commercial	Factor	1.30	1.15	1.40	1.25	1.60	1.70
		Code	031- -	031- -	030- -	030- -	033- -	033- -
							Zone Rated	
Medium Trucks (10,001 - 20,000 lbs. G.V.W.)	Service	Factor	1.05	0.85	1.10	0.95	0.95	0.95
		Code	211- -	211- -	210- -	210- -	213- -	213- -
	Retail	Factor	1.65	1.00	1.65	1.00	0.95	0.95
		Code	221- -	221- -	220- -	220- -	223- -	223- -
	Commercial	Factor	1.35	0.95	1.35	0.95	0.95	0.95
		Code	231- -	231- -	230- -	230- -	233- -	233- -
Heavy Trucks (20,001 - 45,000 lbs. G.V.W.)	Service	Factor	1.10	0.75	1.20	0.80	1.00	1.00
		Code	311- -	311- -	310- -	310- -	313- -	313- -
	Retail	Factor	1.70	1.15	1.70	1.25	1.00	1.00
		Code	321- -	321- -	320- -	320- -	323- -	323- -
	Commercial	Factor	1.80	1.00	2.00	1.10	1.00	1.00
		Code	331- -	331- -	330- -	330- -	333- -	333- -

Example Secondary Factors

Classification	Secondary Factor	Code
a. Building Commercial	-0.05	– – – 81
b. Building Private Dwellings	-0.05	– – – 82
c. Electrical, Plumbing, Masonry, Plastering and Other Repair or Service	-0.05	– – – 83
d. Excavating	-0.05	– – – 84
e. Street and Road	-0.05	– – – 85
f. All Other	-0.05	– – – 89
Not Otherwise Specified Secondary Factors		
a. Logging and Lumbering	0.00	– – – 91
b. All Other	0.00	– – – 99

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Commercial Auto Background

- Private Passenger Type (PPT) rating based on:
  - Liability on territory and limit only
  - Physical Damage by Age and Original Cost New (Not Symbol!)
  - Only Limited Driver Rating

Example PPT Factors

Operator Experience Factor	
No operator licensed less than 5 years	0.75
Operator licensed less than 5 years not owner or principal operator	1.40
Owner or principal operator licensed less than 5 years	2.00

Use Factor	
Not driven to work or school	0.00
To or from work less than 15 miles	0.15
To or from work 15 or more miles	0.25

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Commercial Auto Class Problems

- Primary Class Factors Hard to Verify
  - Weight
  - Radius
  - Use
- Secondary Factors Useless & Unused
- Better Groupings Exist (ICC, SIC)
- Fleet Definition not Scientific or Uniform
- Tainted Industry Relativities (GIGO)
- Physical Damage Rated on Age & Cost New
  - Rarely Verified
  - No Symbol Rating

Other Commercial Auto Issues

- Trucks vs. Cars Rating
- No Reflection of Personal Use
- **No Rating of Drivers/MVRs**
  - Driver Age
  - Violations
  - Accidents
  - Driver Restrictions
- No Insured Characteristics in Rating
- **SEVERE** Adverse Selection vs. Personal Auto

Commercial Auto Pricing Today

- Tiered LCMs
  - By Statutory Company
  - By Vehicle Type and Coverage
  - By Territory
- Some Independent PCFs and SCFs
- Some SIC and Package Mods
- Premium Discounts
- Simplified Experience Rating

Key Trends

KEY TRENDS

What's Happening In The Market?

Among the highlights in the commercial auto and trucking market cited by those placing such risks:

- **BUYERS' MARKET**–with prices falling for most risks despite the countervailing trends noted below.
- **LOOKING AHEAD**–with carriers increasingly using predictive modeling to more aggressively price better risks.
- **TAKING NEXT EXIT**–with a number of carriers getting out of a line of business that they could not write profitably.
- **BETTER SAFE THAN SORRY**–with carriers more proactive in loss prevention and mitigation to help truckers become more safety conscious.
- **MARKET PURGE**–with a considerable drop over the past five years in the 100-plus carriers that used to write truck insurance.

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Enhancing the Current Class Plan

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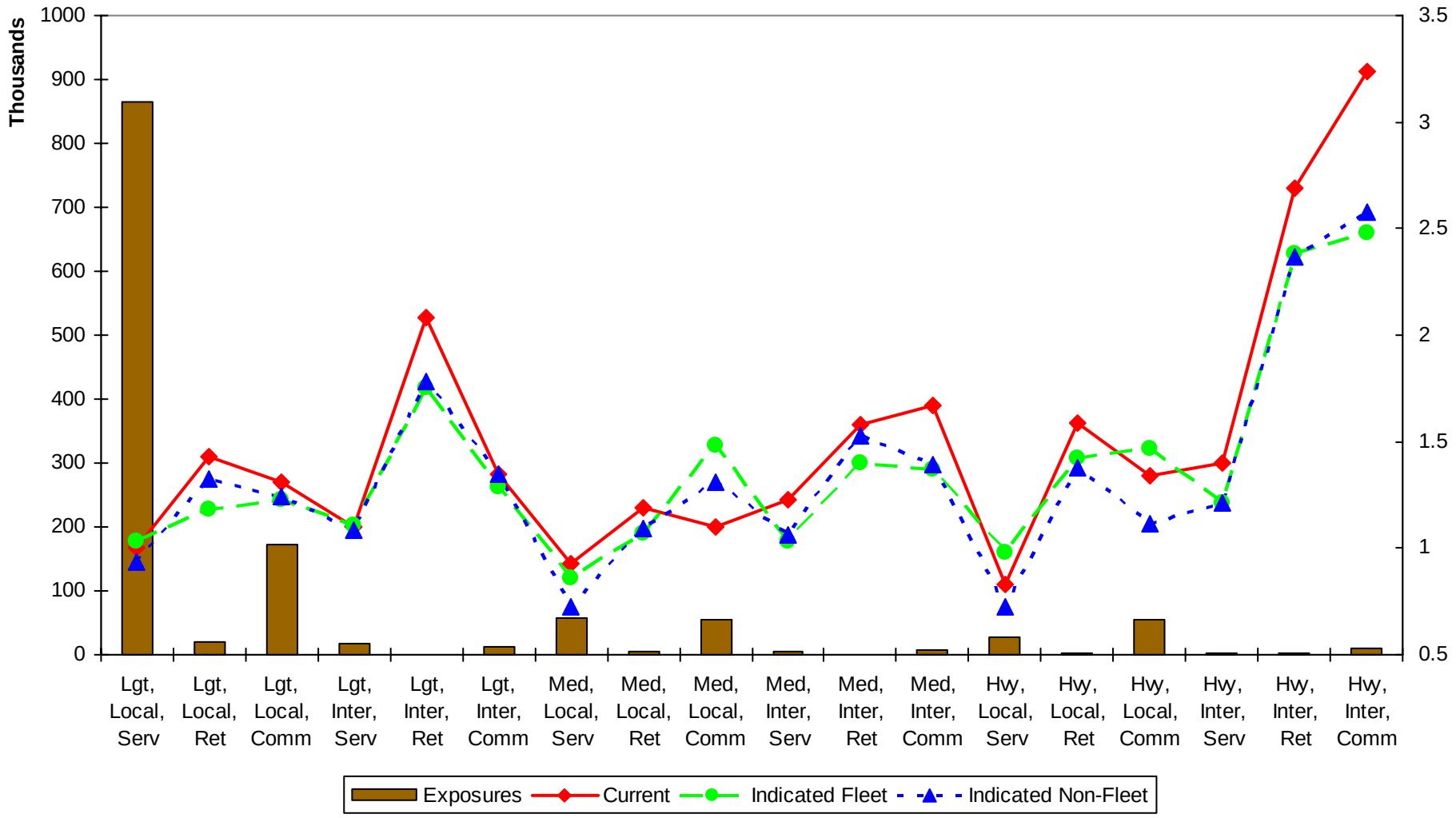
Potential Enhancements to the Current Rating Plan

- ICC Weight Classes
- Rethink “Fleet” Factors
  - Number of Vehicles/Drivers
- SIC-based Use and Secondary Factors
- Different Radii or Annual Mileage
- New Territory Definitions
- Package Modification Factors

BI/PD Class Factors



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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)

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Usage-Based Rating?

- Add UCC filing here

Indicated SIC Relativities

SIC 3	Description	Exposure	On-Balance Relativity
171X	Plumbing/HVAC	37,542	0.950
173X	Electrical Contractors	36,629	0.920
175X	Carpentry	32,404	0.973
179X	Misc. Contractors	23,829	1.058
27XX	Printing/Publishing	16,005	1.050
35XX (o/t 357)	Industrial Machinery	19,753	0.940
507X	Hardware Wholesaler	10,866	0.852
514X	Grocery Wholesaler	16,486	1.09
571X	Home Furnishings	11,795	0.975
581X	Restaurants	12,239	0.921
59XX	Misc. Retail	38,818	0.907
64XX	Insurance Agents	13,209	1.031
65XX	Real Estate	30,856	1.030
721X	Laundry/Dry Cleaning	13,341	1.25
734X	Building Services	19,012	1.08
737X	Computer Services	16,663	1.03
76XX	Misc. Repair Services	15,425	0.95
80XX	Health Services	18,607	0.927
87XX	Eng. & Mgt. Services	80,160	1.068

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SIC Relativities

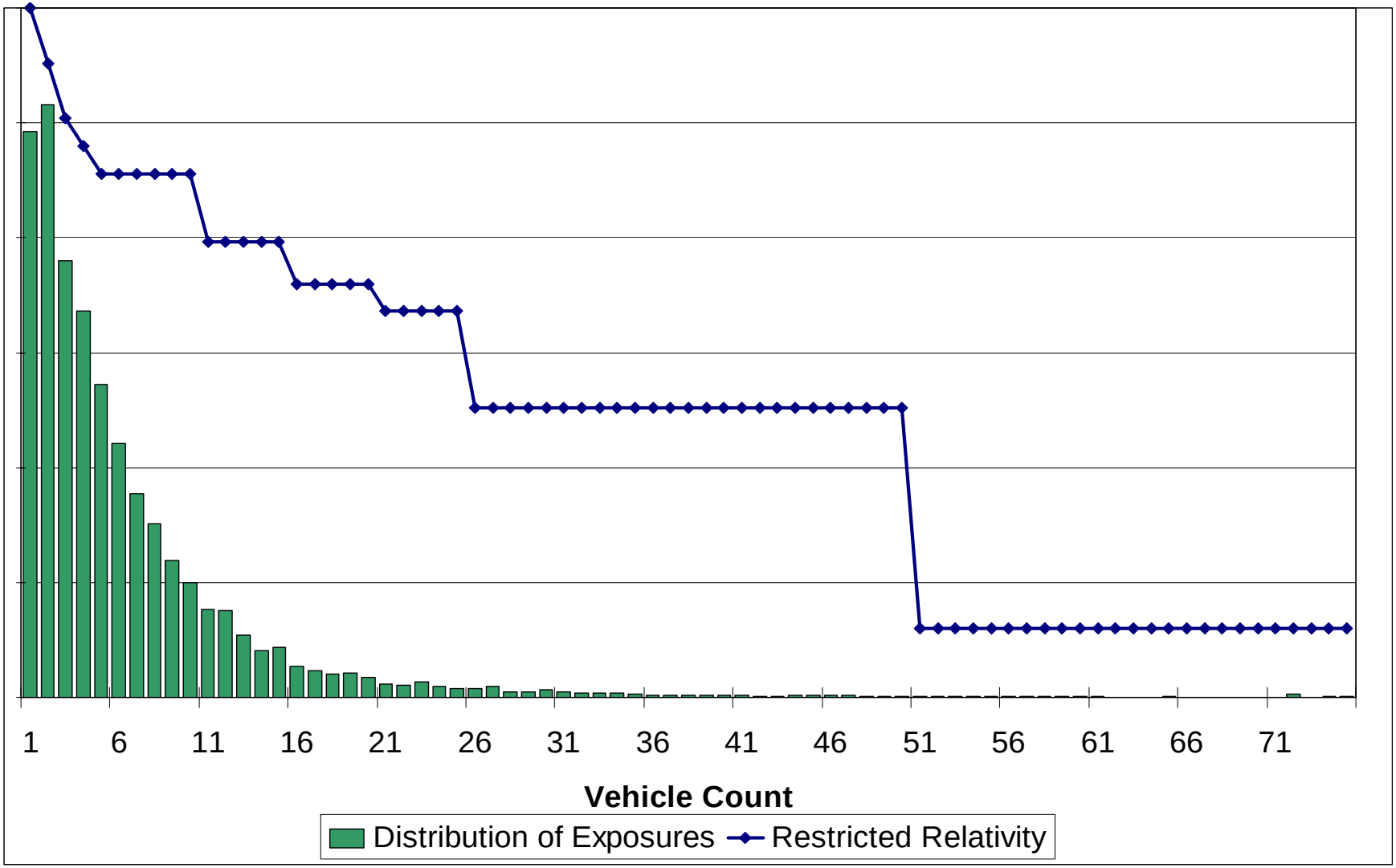
SIC Rating Factors

SIC	Factors	Descriptions
0742	0.85	Veterinary Services
0782	1.10	Lawn and Garden
1711	1.05	Plumbing, Heating, Air Conditioning
1731	0.95	Electrical Work
1742	0.85	Plastering, Drywall and Installation
1743	1.10	Terrazzo, Tile, Marble, Mosaic Work
1761	0.85	Roofing, Siding and Sheet Metal
2759	0.90	Commercial Printing
5261	0.85	Retail Nurseries and Garden Stores
5531	0.85	Auto and Home Supply Stores
5712	1.10	Furniture Stores
6512	0.90	Non Residential Building Operators
6512A	0.90	Real Estate: Offices
6512B	0.90	Real Estate: Retail Centers
6512C	0.90	Real Estate: Industrial Parks
6512D	0.90	Real Estate: Warehouse

Cargo/Trailer Combinations

- Flatbed
  - Steel
  - Pipe
  - Building Materials
  - Other
- Dry Van
  - Carpet/Garment
  - Food
  - Alcohol/Tobacco
  - Moving & Storage
  - Less Than Trailer Load (LTL)
  - Other
- Tanker
  - Food Grade
  - Petroleum Products
  - Chemical
  - Haz Mat
- Refrigerated Box
  - Produce
  - Seafood
  - Alcohol/Tobacco
  - Other

Impact of Number of Vehicles



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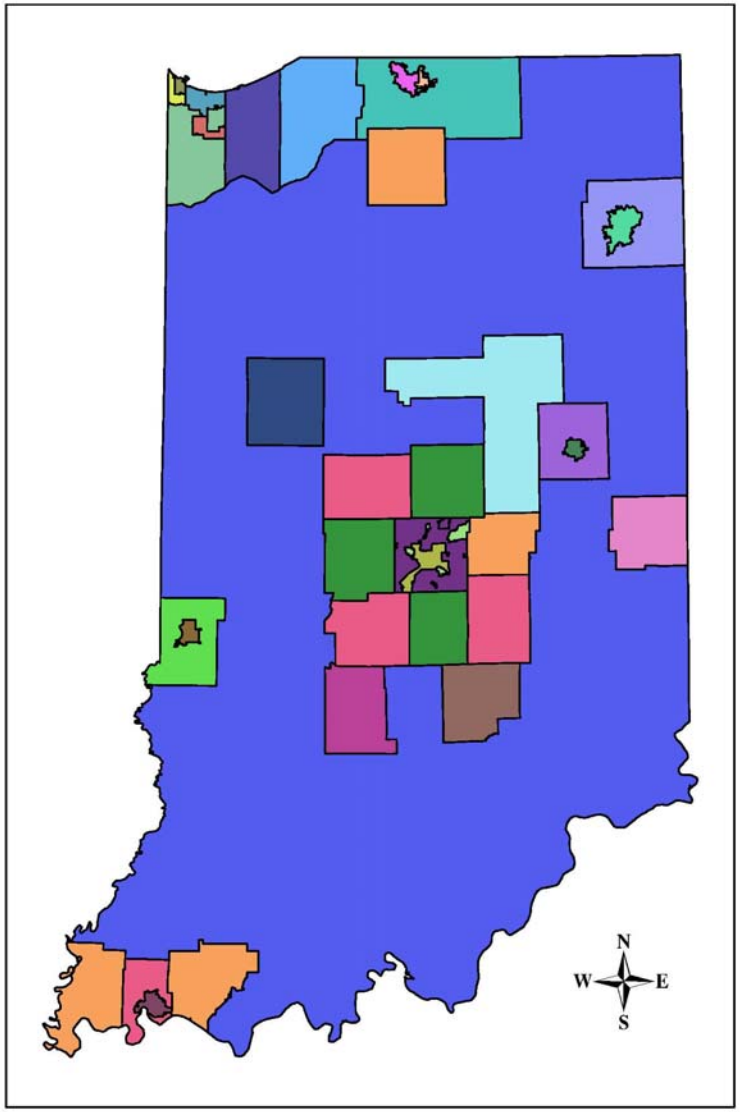
Territory Refinement



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Package Discounts

★G. PACKAGE DISCOUNTS

The following discounts apply to Commercial Auto premium when written in conjunction with the following Businessowners products.

Wholesale Distribution Industry	15.0%
Artisan Contractor Industry	5.0
Restaurants	5.0
Retail and Service Industry	5.0
Habitational	5.0
Commercial Real Estate	5.0
Manufacturing Industry Businessowners Policy	5.0
Auto Service and Repair	5.0

The following discounts apply to Commercial Auto Premium when written in conjunction with the following Sentinel Program:

Wholesale Distribution Industry	15.0%

"…and now for something completely different…"

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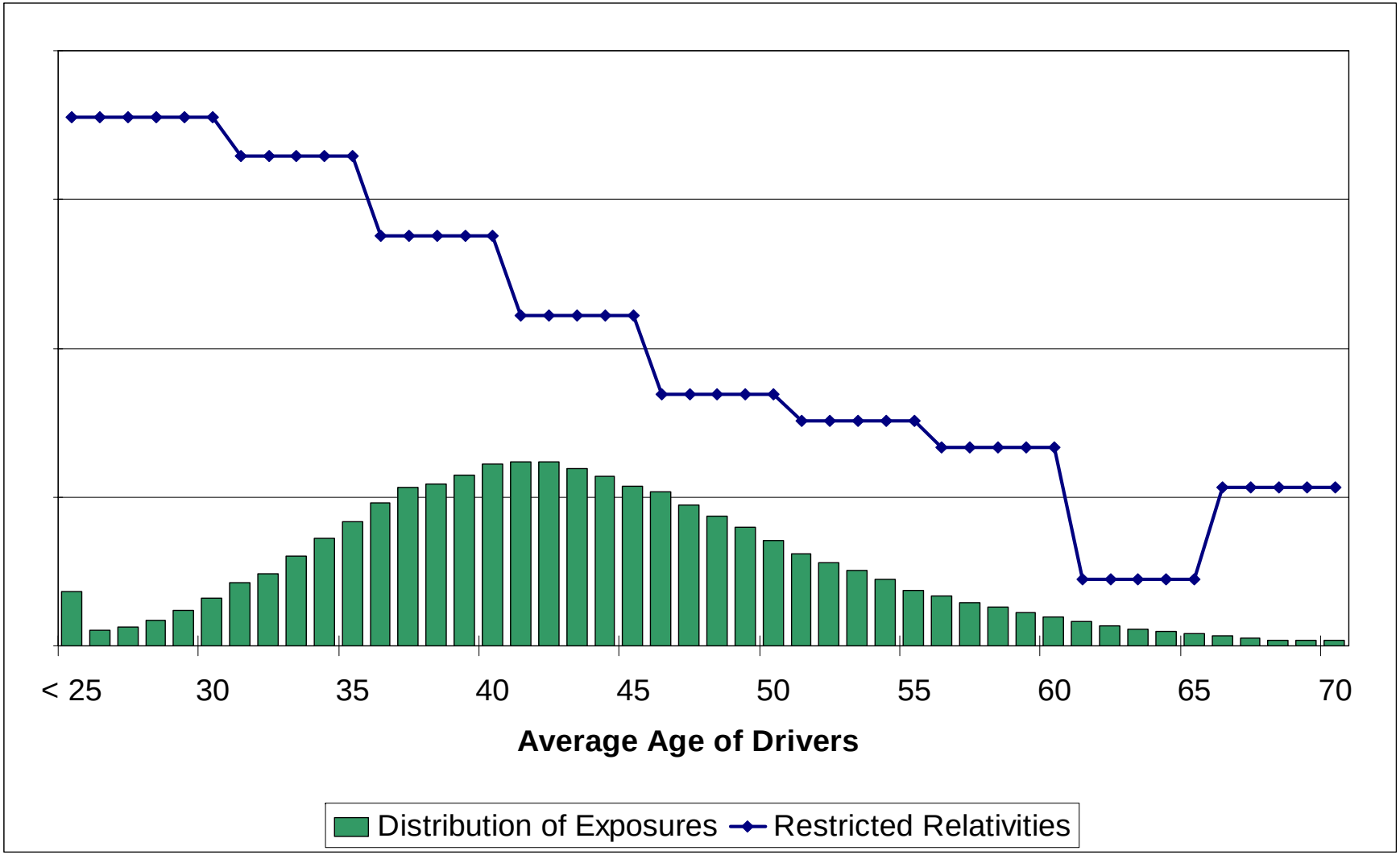
Additional Commercial Auto Solutions

- Driver Rating
  - Age
  - Restrictions
- Private Passenger Type Vehicle Characteristics/Symbols
- Underwriting Scorecards (Credit, Owners, etc.)
- Safety Devices
- Loss Control Survey Information

Impact of Average Driver Age



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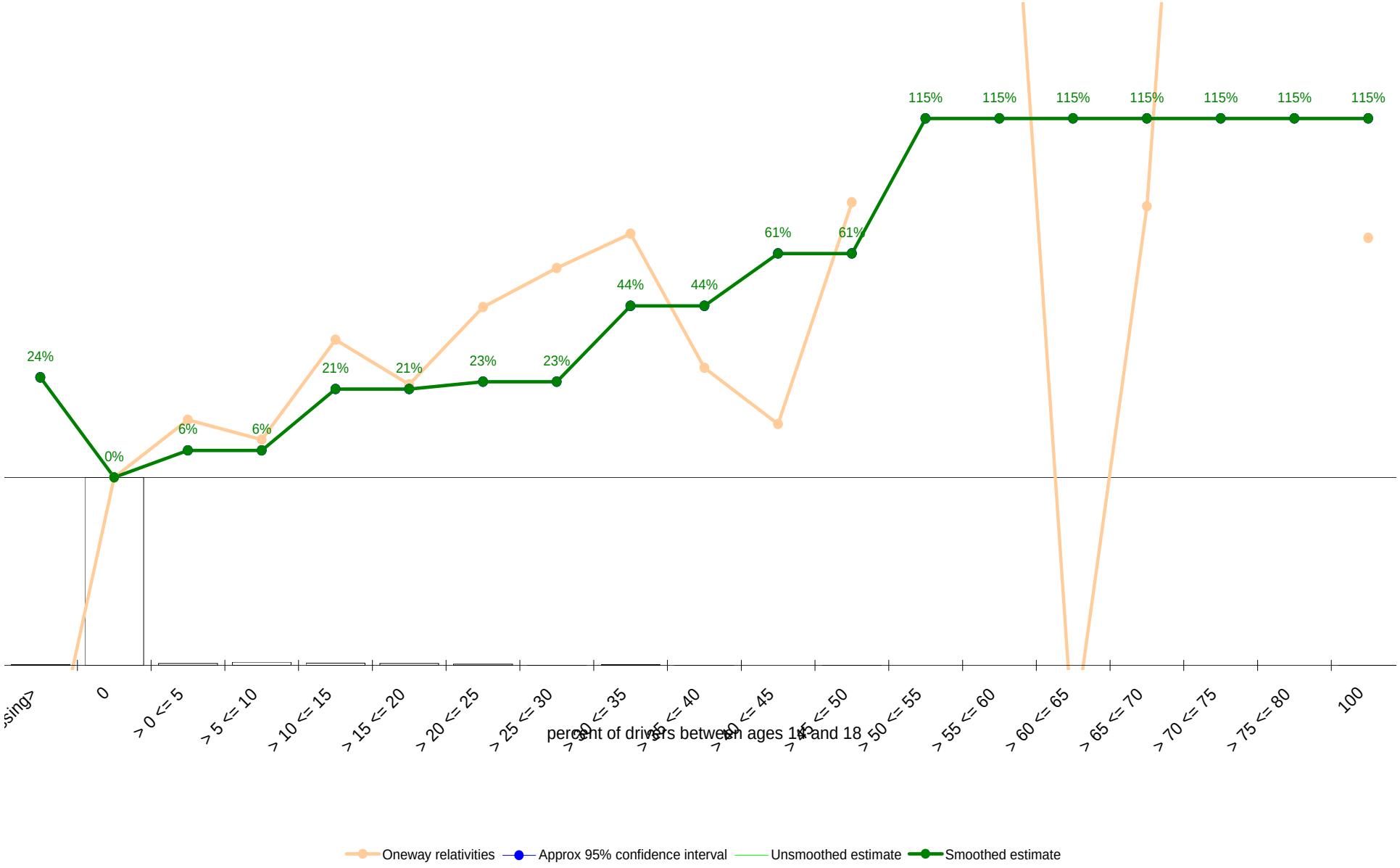
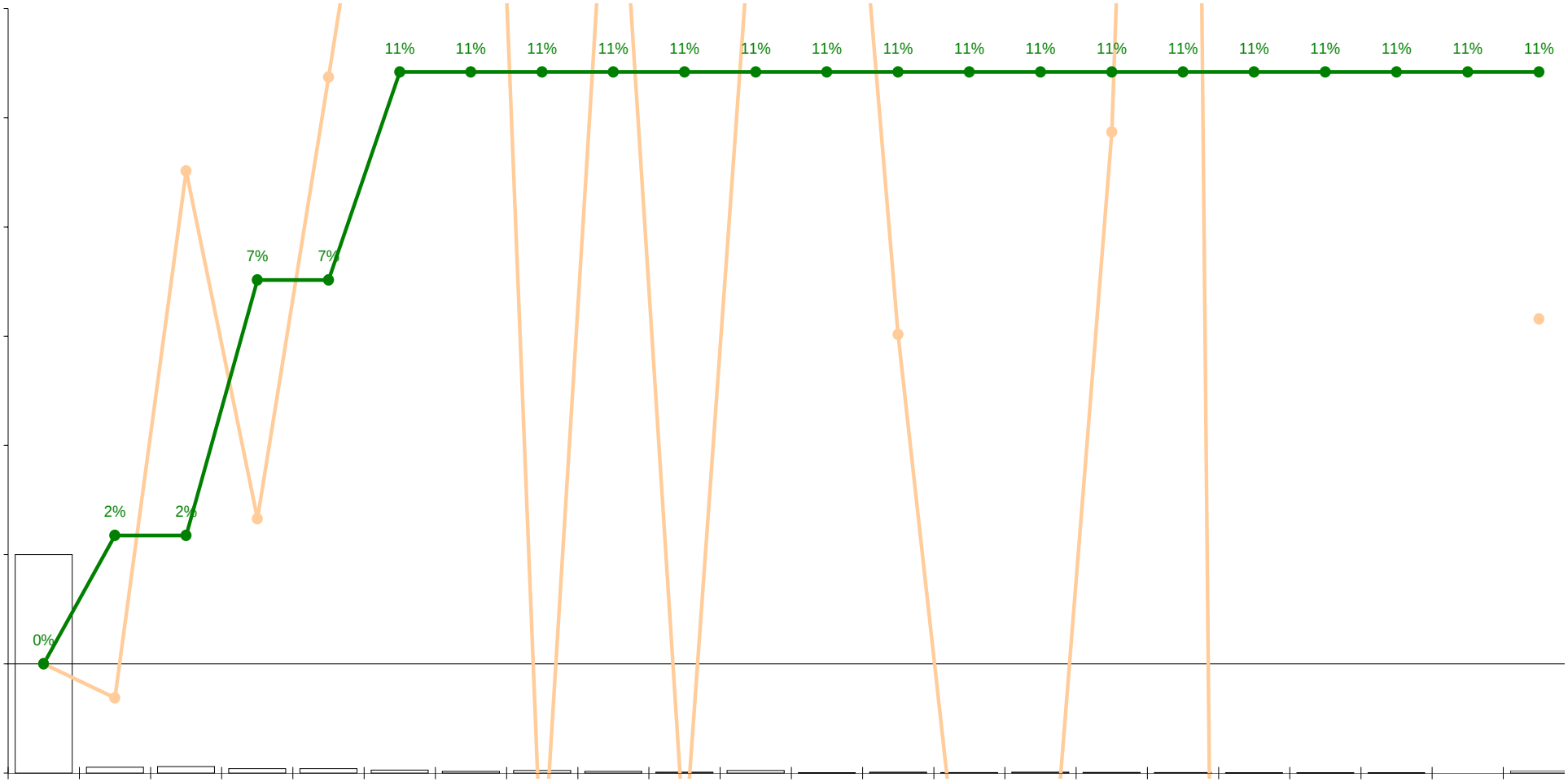
Youthful Driver Surcharges



Impact of Driver Restrictions



CA Scorecard Example

Accidents per Driver

Accidents/ Driver	Score Points
0%	40
Up to 20%	25
21-40%	15
40-80%	10
More than 80%	0

Moving Violations per Drive

Moving Violations/ Driver	Score Points
Up to 20%	75
21-40%	50
41-60%	25
More than 60%	0

Credit Score

Credit Score	Score Points
A	75
M	20
NS	40
S	125
U	0

Average Driver Age

Average Driver Age	Score Points
25 & Under	50
26-30	35
31-35	20
36-40	40
41-45	60
46-50	75
51-55	85
56-60	90
61-65	95
66-70	100
70 & over	0

Number of Vehicles

# of Vehicles	Score Points
0-4	0
5-10	25
11-15	30
16-20	40
21-25	45
26-50	80
Over 50	125

MVR No-Hits per Driver

MVRs w/ "No Hit"/ Total Drivers	Score Points
0%	35
Up to 10%	15
More than 10%	0

CA Scorecard Example

Total Points	Relativity
751-800	0.50
700-750	0.60
651-700	0.75
600-650	0.84
551-600	0.92
500-550	1.00
451-500	1.20
400-550	1.35
351-400	1.50
300-350	1.70
251-300	2.00
200-250	2.25

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Impact of Loss Prevention Devices

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Third party logistics company selects DriveCam to help ensure customer quality
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DriveCam increases operator and passenger safety, reduces insurance costs

Predict and prevent risky driving behaviors and save lives with DriveCam.
Risky driving is a global problem resulting in needless accidents, serious injuries and deaths each year. The statistics are staggering: Crash costs of a half-trillion USD, 1.2 million fatalities and 50 million injuries worldwide.

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News and Events

Loss Control Survey as Scorecard Input

	Core Section	Questions	Points	# of N/A
1.	Frequency and Severity Trends	3	10	0
2.	Loss Prevention Direction	13	41	1
3.	Substance Abuse	1	4	
4.	Accident Investigation	2	6	0
5.	Claims Management	3	12	0
6.	Emergency Response	5	11	1
7.	Regulatory Compliance	14	21	6
8.	Liability	4	7	2
9.	Motor Vehicle	4	14	0
10.	Ergonomics	4	2	2
	TOTALS	53	128	12

	Supplemental Section	Applicable Sections	Questions	Points	# of N/A
A.	Construction	☒	20	50	5
B.	Distribution	☐	6		
C.	Health Care	☐	6		
D.	Quarries	☐	12		
E.	Service Companies	☐	4		
F.	Transportation	☐	7		
	TOTALS		20	50	5

$$\left(\frac{73}{\text{Total Questions (Core \& Supplemental)}} - \frac{17}{\text{\# of N/A}}\right) \times 4 = \frac{224}{\text{Maximum Points}}$$

$$\frac{178}{\text{Total Points (Core \& Supplemental)}} \Big/ \frac{224}{\text{Maximum Points}} = \frac{79}{\text{Final Score}}\ \%$$

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Key Players

The Hartford model uses traditional factors such as motor-vehicle records, prior loss history and the company's financial standing.

"Although many of these characteristics were used in underwriting in the past, multivariate analysis allows us to apply pricing in a more systematic and consistent way," he said.

MARKET UPDATE

Progressive Group Announces Enhanced Coverage For Truckers

THE PROGRESSIVE GROUP of Insurance Companies last week announced coverage enhancement options for the commercial trucking market.

Coverage enhancements that are available immediately to independent agents representing Progressive include:

- *500-mile radius on liability.*
- *Comprehensive and seasonal coverage for all vehicles.*
- *Single physical damage deductible for all covered vehicles.*

The Mayfield Village, Ohio-based carrier said that "these coverage improvements mark the beginning of an overall expansion of Progressive's truck program," promising additional "enhanced" and "customizable" commercial auto coverage options in the coming months.

For more information, independent agents can go to www.commercialauto.progressive.com.

Commercial Auto Pricing - Progressive

- Body Type
- Vehicle Use/Industry
- Detailed Weight Classes
- Detailed Territories
- Personal Use Surcharge
- Renewal Discount
- Paid in Full Discount
- More Robust Schedule Rating
  - Credit
  - Driver MVR Scoring
- Independent Experience Rating Plan

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CA Scorecard Example - Hartford

Company Rates applicable to Sentinel Insurance Company, LTD only:

Based on the following risk characteristics:

1. MVR Information
2. Average Driver Age
3. Youthful Composition
4. Length of Credit History
5. Total Number of Trades
6. Percentage of Balance Overdue of All Trades
7. Total Balance of Regular Trades
8. Number of Public Records / Collections
9. Amount of Judgment
10. Average Number of Days Balance Overdue in the Past 3 Months
11. Number of Inquiries in the Past 9 Months
12. Years in Business (when financial information is not available)
13. Industry Classification
14. Percentage of TTT Power Units
15. Prior 3-Year Loss Frequency by Size of Risks
16. Other risk-specific characteristics that are not contemplated above

use the applicable tier factor as a final step prior to rounding to determine the final rates.

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CA Scorecard Example - Hartford

Tier	Factor		Tier	Factor		Tier	Factor
1	0.40		18	0.81		35	1.66
2	0.42		19	0.85		36	1.73
3	0.43		20	0.89		37	1.81
4	0.45		21	0.92		38	1.88
5	0.47		22	0.96		39	1.96
6	0.49		23	1.00		40	2.05
7	0.51		24	1.05		41	2.13
8	0.54		25	1.09		42	2.23
9	0.56		26	1.14		43	2.32
10	0.58		27	1.19		44	2.42
11	0.61		28	1.24		45	2.52
12	0.63		29	1.29		46	2.63
13	0.66		30	1.35		47	2.74
14	0.69		31	1.40		48	2.86
15	0.72		32	1.46		49	2.98
16	0.75		33	1.53		50	3.11
17	0.78		34	1.59			

UNINSURED/UNDERINSURED MOTORISTS Factor is 1.00.

NOTICE THE LIFT!

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For More Information

About the Author

Commercial Auto Predictive Modeling: The Time Is Now

By Robert J. Walling, III, FCAS, MAAA

The time has come for commercial auto insurance to benefit from the same predictive modeling techniques and strategies that have been a boon to personal lines insurance products.

- www.pinnacleactuaries.com/pages/publications/files/Pinnacle Monograph Sep07 - Commercial Auto Predictive Modeling.pdf

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