How Will Predictive Modeling Change the P/C Industry Over the Next 5-10 Years

CAS Annual Meeting

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Agenda

The Future of Predictive Modeling

Who uses it today

Current and potential uses

Why change will occur

Key new variables

Who Uses Predictive Modeling

> The large insurers are already heavily invested

> Medium sized insurers are a mixed bag

> Small insurers employ others to help them

> > Some need expertise

> > Most lack data

Users within Companies

- Not just for Actuarial anymore

- Product Managers

- Underwriting

- Marketing

- Claims

- Sales

- Human resources

- Some companies have formed skilled predictive modeling departments
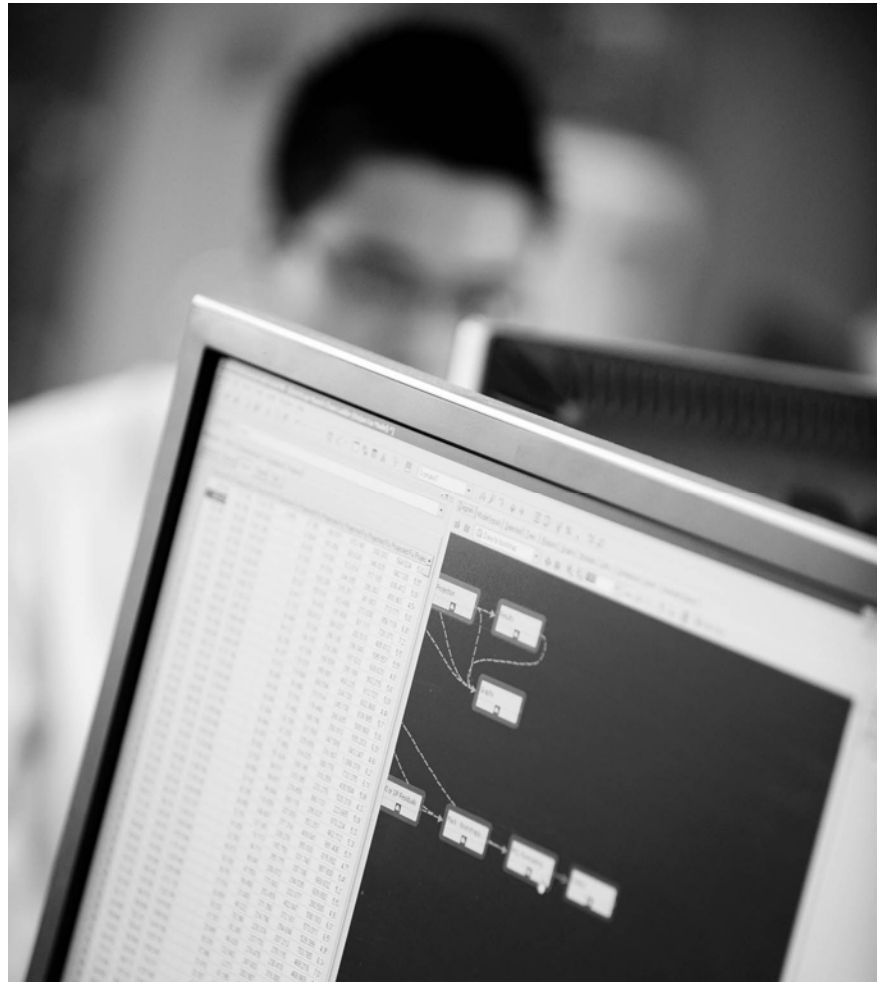
How Predictive Modeling Is Used

- ❯ **Most commonly used**
  - ❯ Rate relativities
  - ❯ Underwriting scores
- ❯ **Occasionally used**
  - ❯ Elasticity models
  - ❯ Optimized pricing
  - ❯ Claim fraud models
  - ❯ New territories
  - ❯ Vehicle symbols

- ❯ **Could be employed**
  - ❯ Reserve estimates
  - ❯ Response Models
  - ❯ Marketing buys
  - ❯ Rate indications
  - ❯ Agency and claims metrics
  - ❯ Variable expense loads
 - ❯ Mortgage-backed securities

Optimized Pricing

➤ Significant new use

➤ Integration of loss cost and elasticity models

➤ Optimize growth and/or profit

➤ Result is an optimal set of individualized rates

➤ Fit new rating plan to optimal rate set

Change Is Inevitable

- Competitive pressure

- Faster processors

- Enhanced software

- Additional talent

- Expanded sources of data

- New technology

Key New Variables

- Homeowners rates by peril

- Homeowners rating by building characteristics

- Vehicle history

- Usage based auto insurance
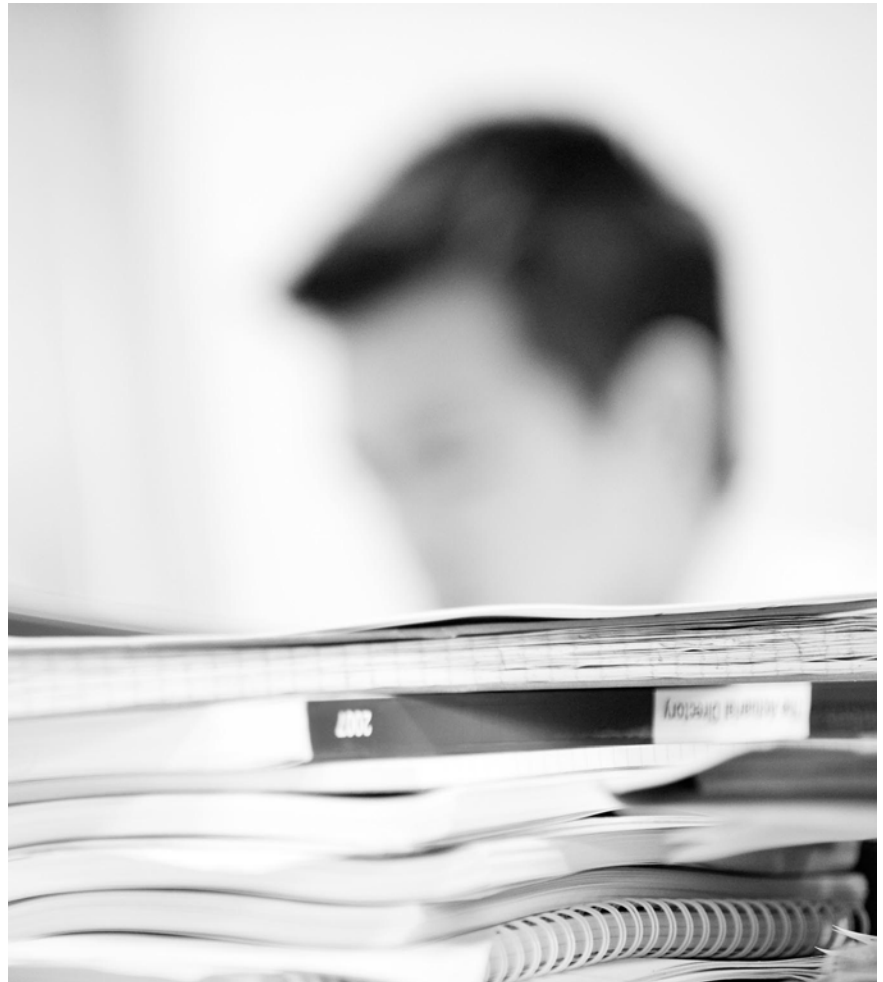
# Homeowners Rates by Peril

Homeowners Rating by Peril

› Some companies are now using By-Peril Rating for Homeowners

› Inadequate Information Technology a major hurdle

› Most large and middle sized companies incorporate multivariate analysis

› Numerous new rating variables, and combinations of rating variables introduced

FireSafe® Risk Score

FireSafe® Data Elements by
Explore Information Services
        (over 40 elements in total)

> Driving Distance

> Total Personnel (including Full Time &
  Part Time)

> Ladder Trucks

> Tanker Trucks

> Pumper Trucks

> Type of Department

> Maintenance Back-Up Power

> 911 or Similar System

FireSafe® Risk Score
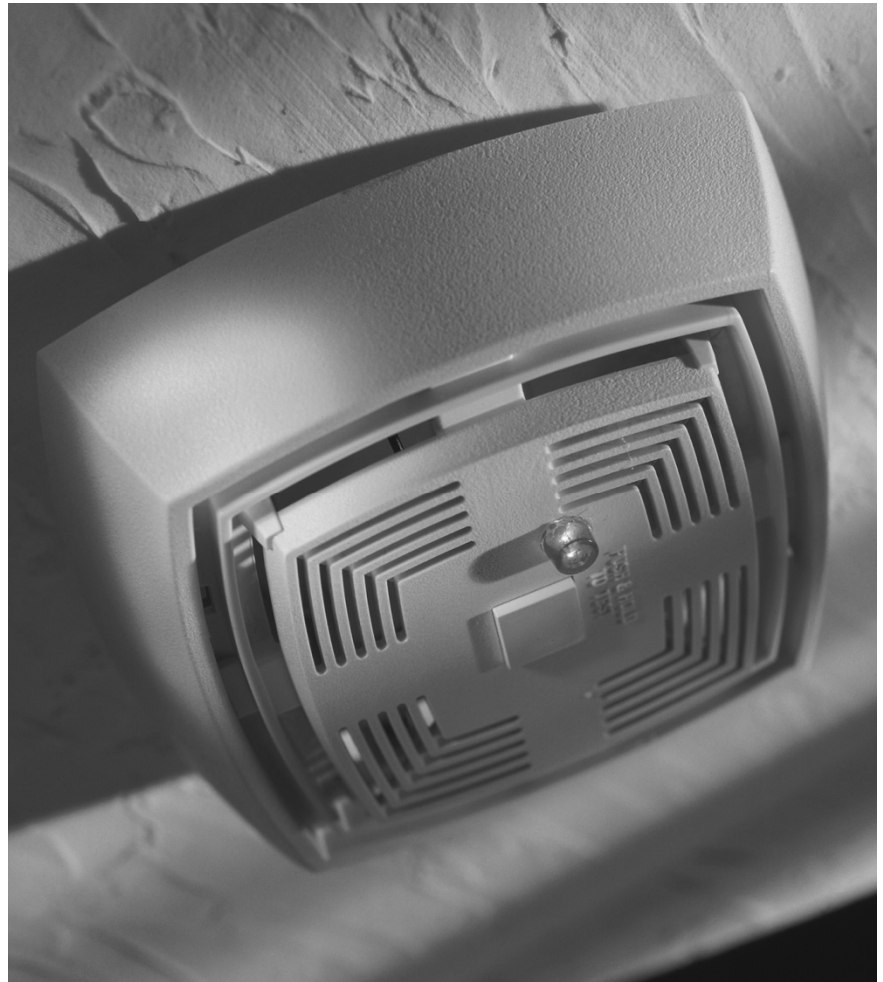
Benefit

- Indicated spread for fire peril is significant—approximately 300%

- It is <u>not</u> a surrogate for protection class

- Validating model with third company information

- Fire station and risk characteristics provide another way of segmenting risk and predicting loss

Usage Based Auto Insurance

Levels of monitoring

> **How far?** Simple mileage rating

> **How?** Driving behavior

> **Where?** Location data with GPS

> **Who?** Driver specific

How far?

Mileage rating

❯ Self reported mileage

❯ Self reported odometer reading

❯ Verified odometer

❯ On-board device with manual transmission

❯ On-board device with cellular

How?

> Speed

> Braking

> Acceleration

> Time of day

> Day of week

> Cornering

Where?

Location data with GPS

› Mapping latitude/longitude

› Speed relative to speed limits

› Traffic congestion

› Road type

› Population density

› Weather

Who?

> Driver login

> On-board cameras
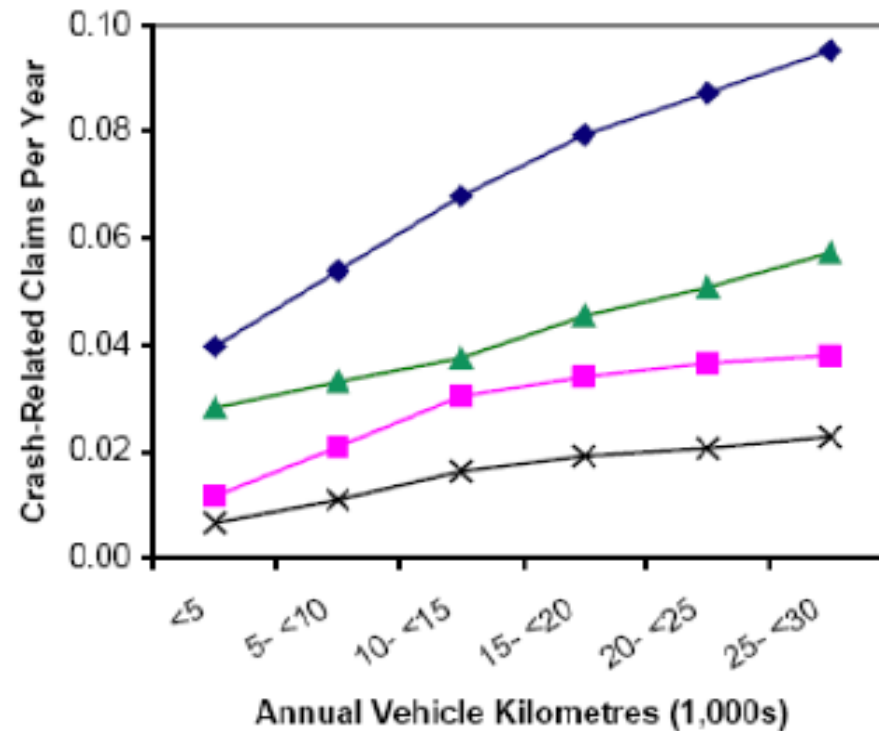
> Retinal scan

> Driver "fingerprint"
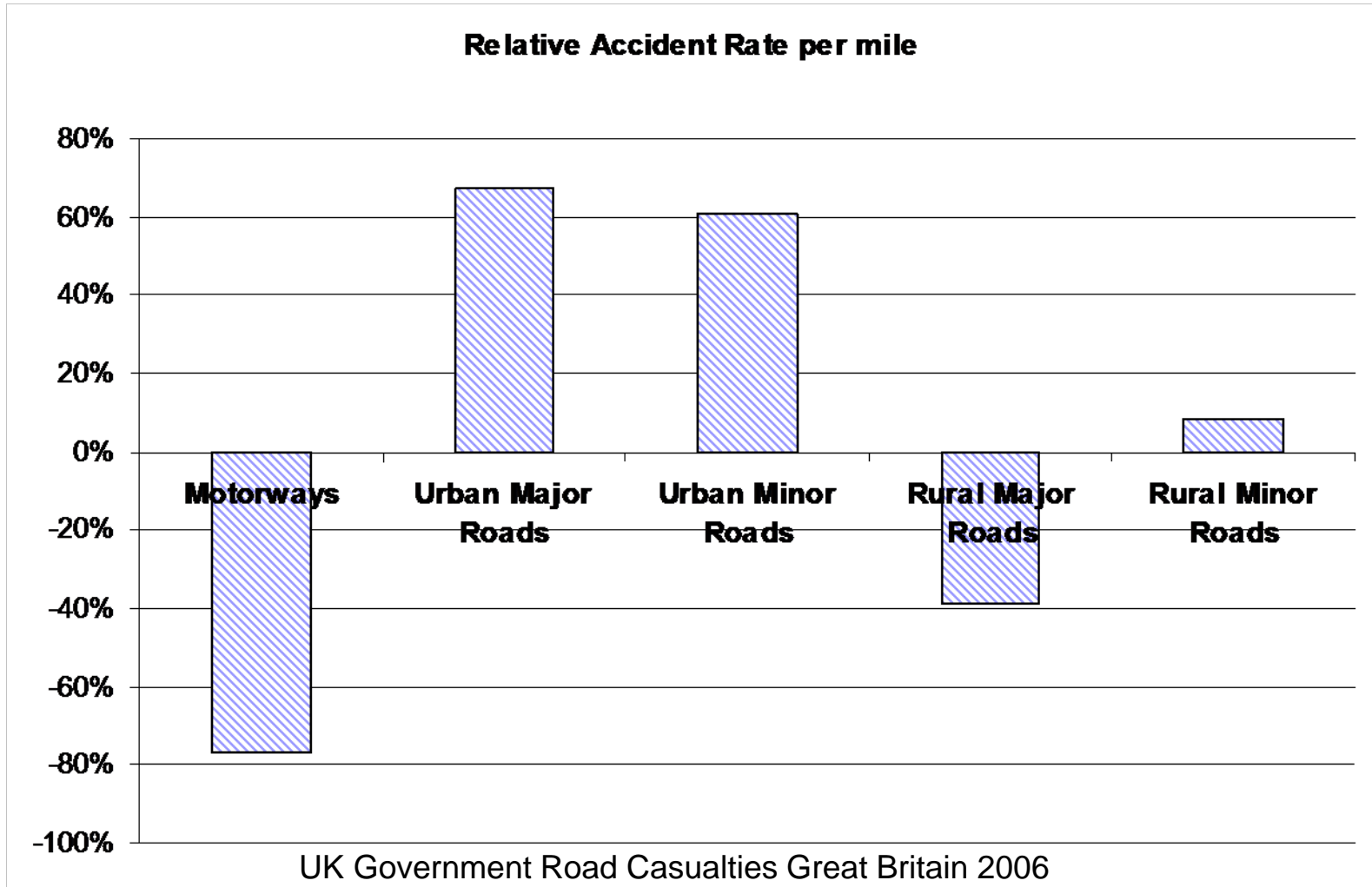
HOW IMPORTANT IS IT?

Crashes per Vehicle tend to increase with annual mileage

Crash Rates by Annual Vehicle Mileage

Distanced-Based Vehicle Insurance Feasibility, Costs, and Benefits:
Comprehensive Technical Report, Todd Litman, 2004.

Frequency by Road Type

Relative Accident Rate per mile

UK Government Road Casualties Great Britain 2006

Q&A

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