

A long-exposure photograph of a highway at night, showing vibrant light trails from cars. The trails are primarily red and orange, curving into the distance. The road surface and lane markings are visible in the foreground.

Improve Rating Accuracy and Segmentation for Commercial Lines auto policies

Let's start with what we should know...

Does UBI improve the way we segment, rate & price?

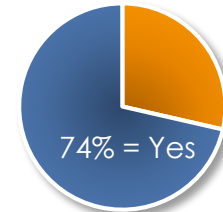
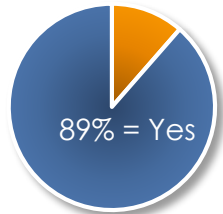
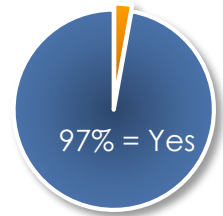
Segmentation: Automated and continuous monitoring provides predictions of risk profile changes that frequently expose non-obvious segmentation opportunities for pricing precision.

Rate & Price: Adopting UBI requires risk transfer pricing reflecting today's ROE challenge and a new sophistication in class rating. UBI benefits increase when product features embrace a philosophy of continuous underwriting to enable new value-added services and improve retention as client profiles change.

What has the insurance industry asked for from UBI?

From 35 carriers interviewed, the top 3 requests are:

- ✓ A standardized, affordable data set, normalized by class & territory
- ✓ A trusted “Safe Driving” score, the equivalent of a credit-based insurance score
- ✓ A transparent, portable customer view of the data for self-monitoring



n=35

Profitably underwriting with real time data

Hi value to
risk transfer

**Business Optimization & Pricing
Precision**

**Rate Making and Market
Expansion Decisions**

**Predictive Analytics &
Knowledge Creation**

Clearinghouse

*Scalable Data Access
Normalization, Security
and Standardization*

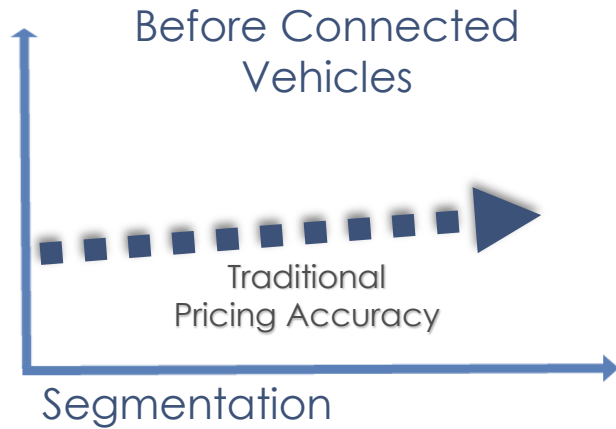
Data Source

Not essential for risk transfer,
nor valuable underwriting activities

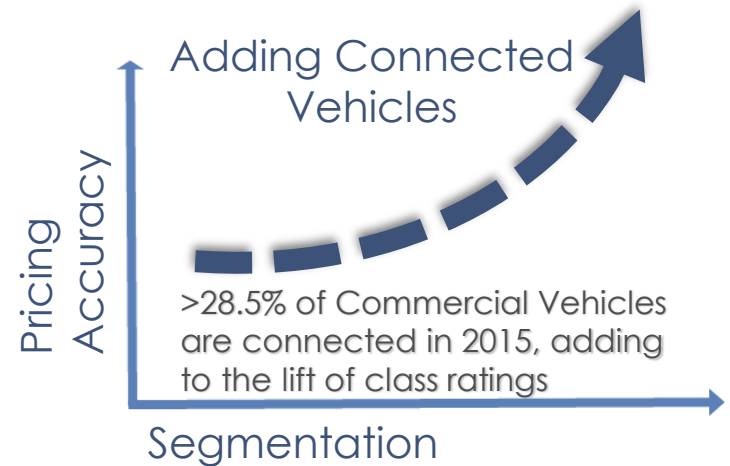
Telematics Service Providers (TSPs)
(>54 OEM and Aftermarket sources)

Over 7 Million devices and portable sensors

Are data quantity, pricing accuracy and speed at odds?

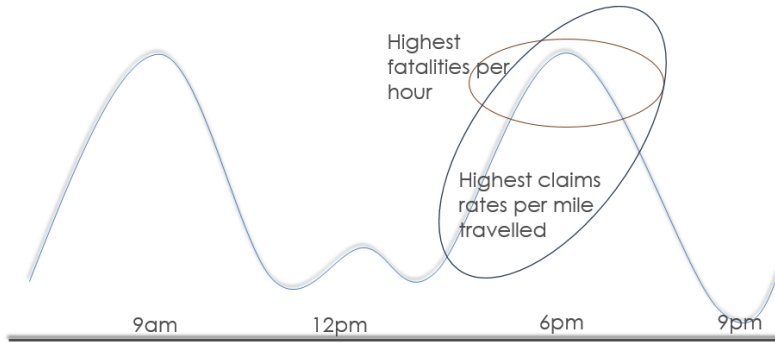


Due to the heterogeneous nature of Commercial Auto, rating accuracy didn't improve much despite very sophisticated models



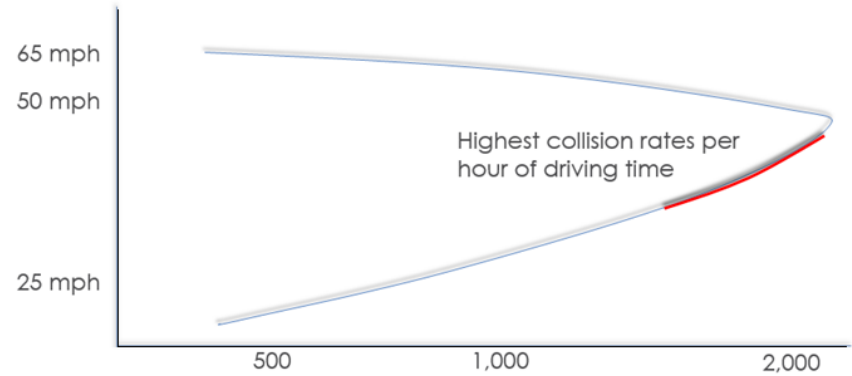
Segmentation and data from more & more vehicles **improves** pricing accuracy and underwriting capacity

Can we expect every Underwriter to be a domain expert?



Capacity per lane per hour

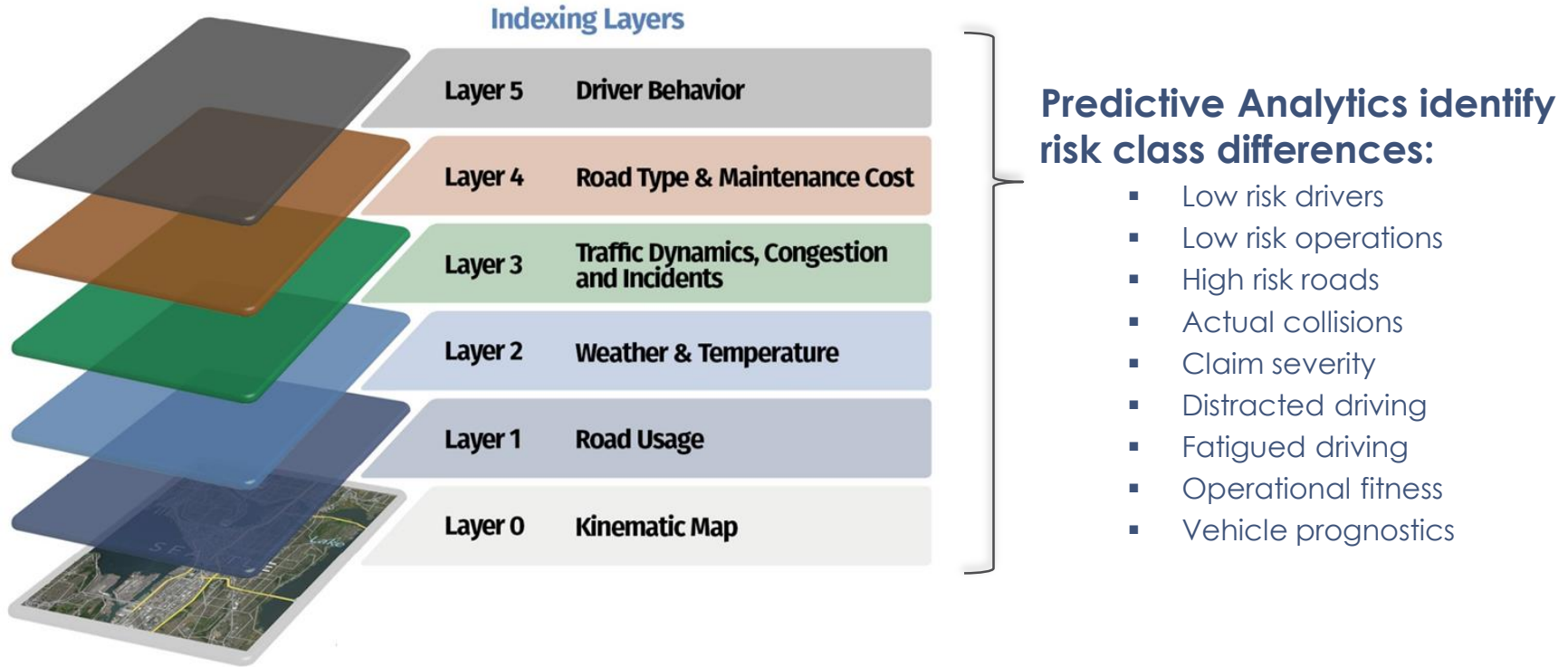
Road capacity both temporal and non-linear with speed



Hourly vehicles per lane

Driver error (distraction & fatigue) cause 95% collisions to have a non-normal distribution

A Solution = a contextual index to segment “at risk” driving

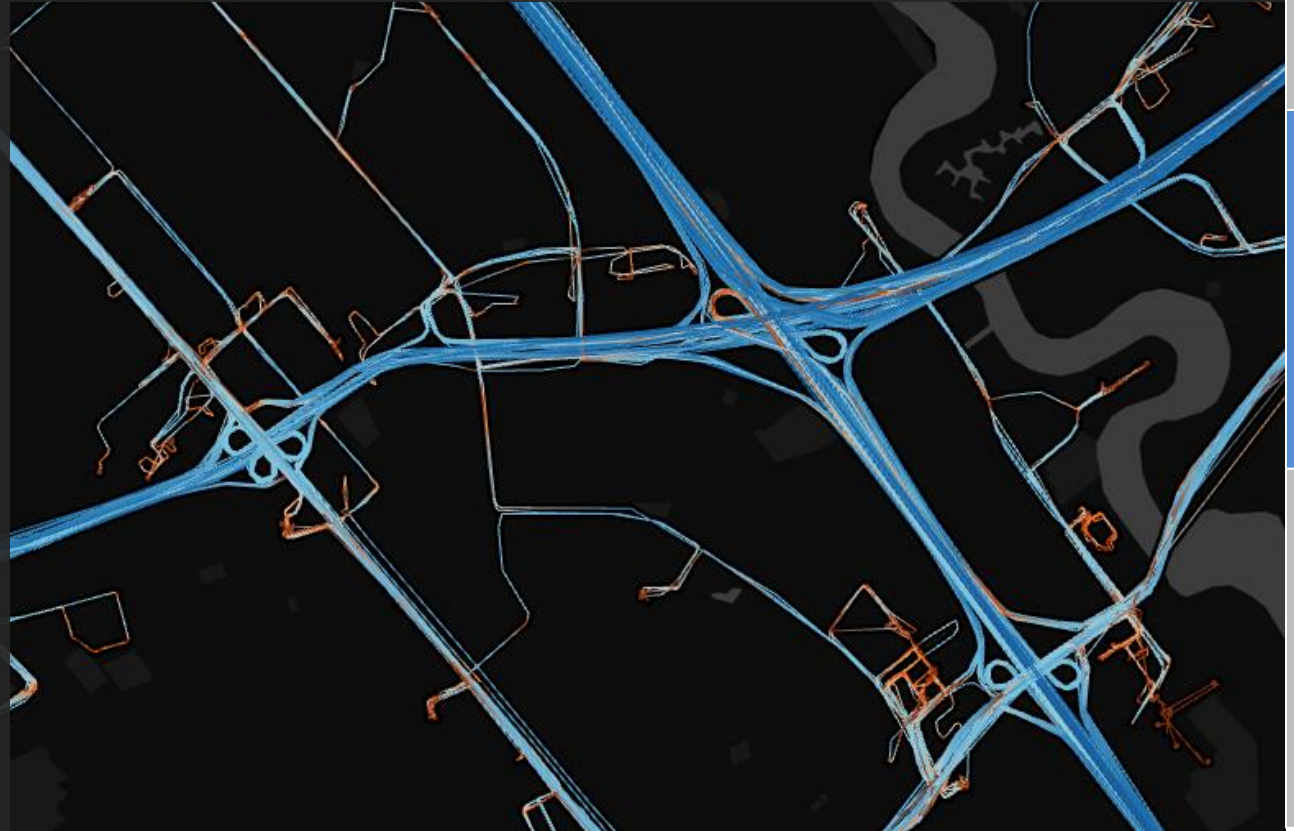






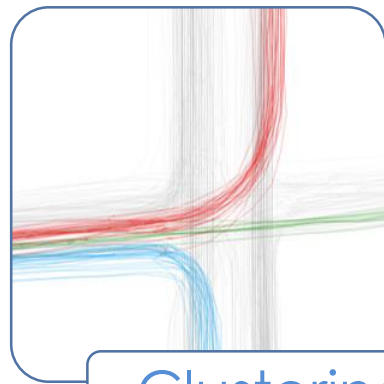
We Build “Maps” from Vehicle Data

- Kinematic attributes
- Driver Behavior
- Sample variation
- Rich data



How the Maps Are Made

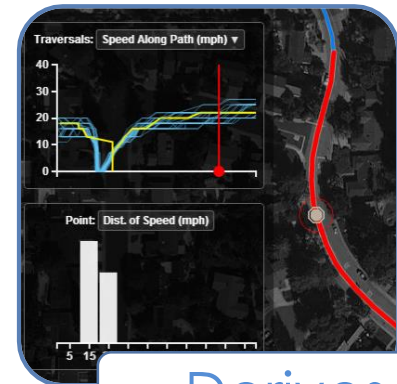
- Big Data... crowdsourced from vehicle probes
- Data combined from many sources into a single reference model.
 - More data than available to individual entities.



Clustering
Probe Data



Forms
Topology



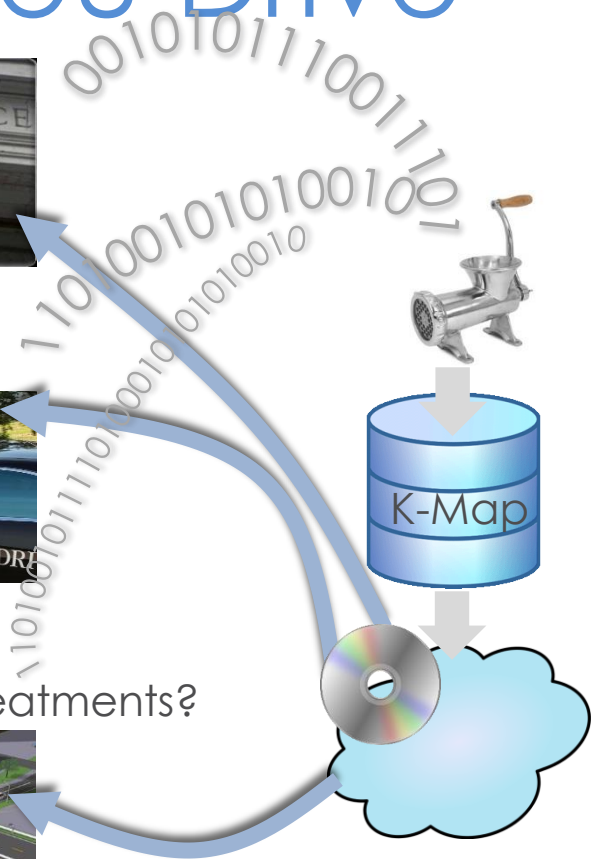
Derives
Kinematics

The Kinematic Map

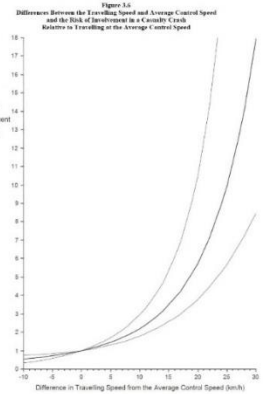
- Reference Trajectories
 - Road-network, **AS DRIVEN** (with deviations)
 - Geometry *and* kinematic attributes- speed & acceleration (reference trajectories)
 - Modulated by vehicle and environmental factors
 - Include other sensor data
 - (weather, camera, radar, lidar, comms, GNSS...)
- Real-time and long term risk assessment
 - Evaluation reference model
 - Many parameters for proprietary optimization

Users Assess “How You Drive”

- Insurance
 - Peer based risk assessment.
- Automotive OEMs
 - For safety
 - Intervention/take control?
 - What will another car do?
 - For automation
 - What do people do here?
- Roadway Managers
 - How do drivers respond to various road treatments?
 - Map support for vehicles (I2V)



Rating Accuracy



- Classic Indicators of Risk

- Speed

- Absolute speed comparison
- “Link level” speed comparison

Point speed comparisons

- Braking

- Threshold counts
- Sensor dependent

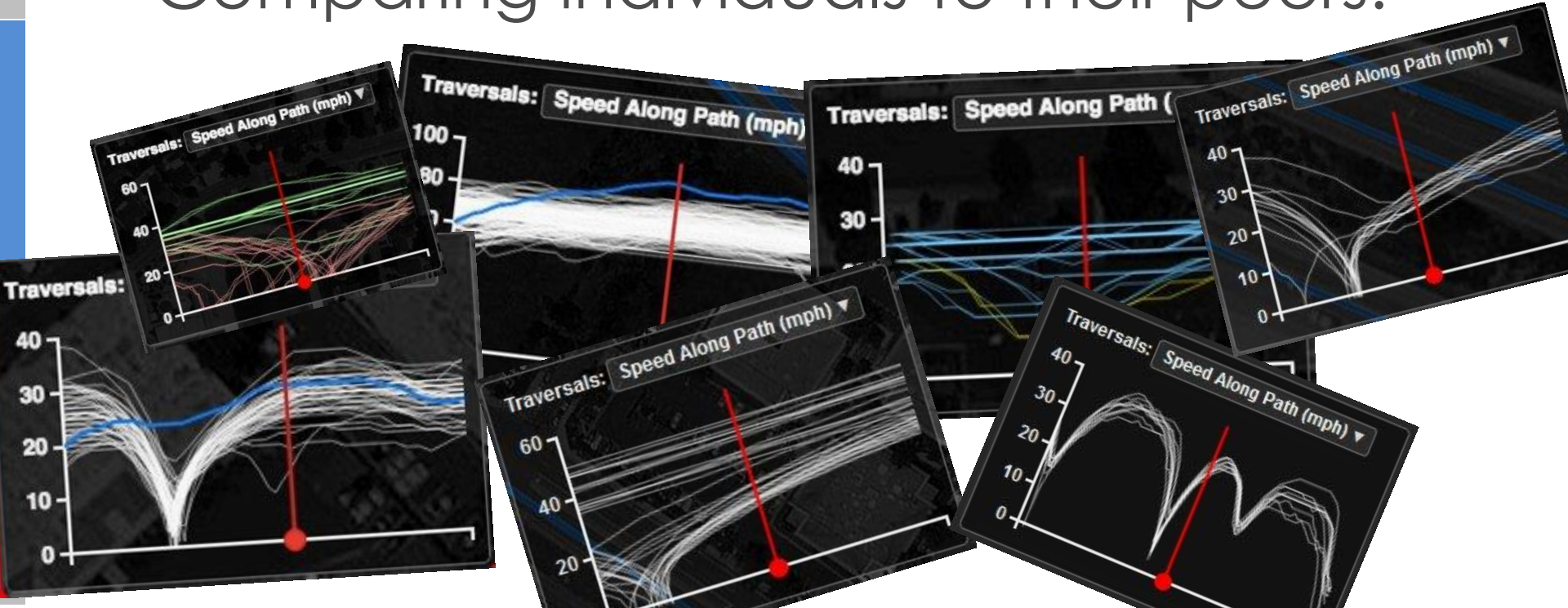
Normalized by location

- Acceleration...

CONTEXT

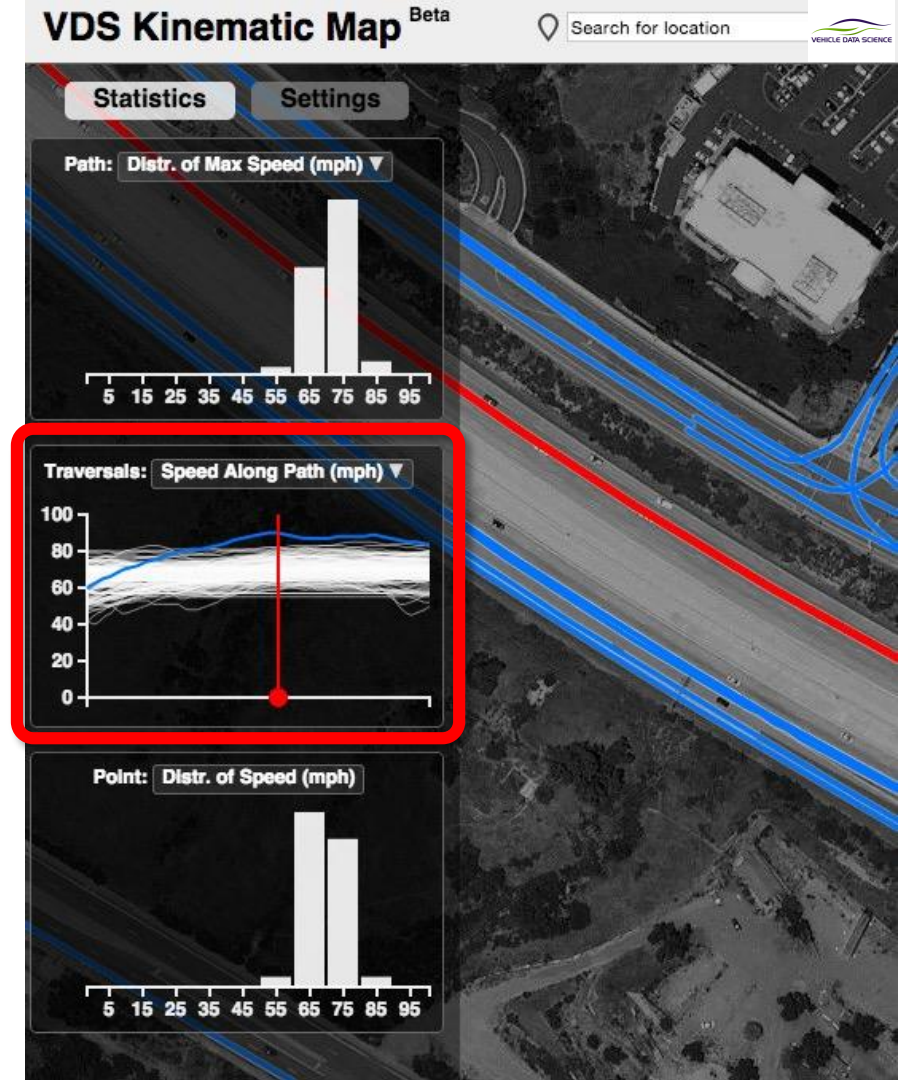
Detailed Kinematic Analytics

- Comparing individuals to their peers.



Speeding

- Aggressive driver
- $>3 \sigma$ speed
- Short duration



Stop Sign

- Running stop very clear.
- Run by “custom”?
- Hard braking?



Patterns

- Slowing
 - By time of day
 - (In front of school)
- Hypothesis: not slowing indicates risk.



Using History to Teach



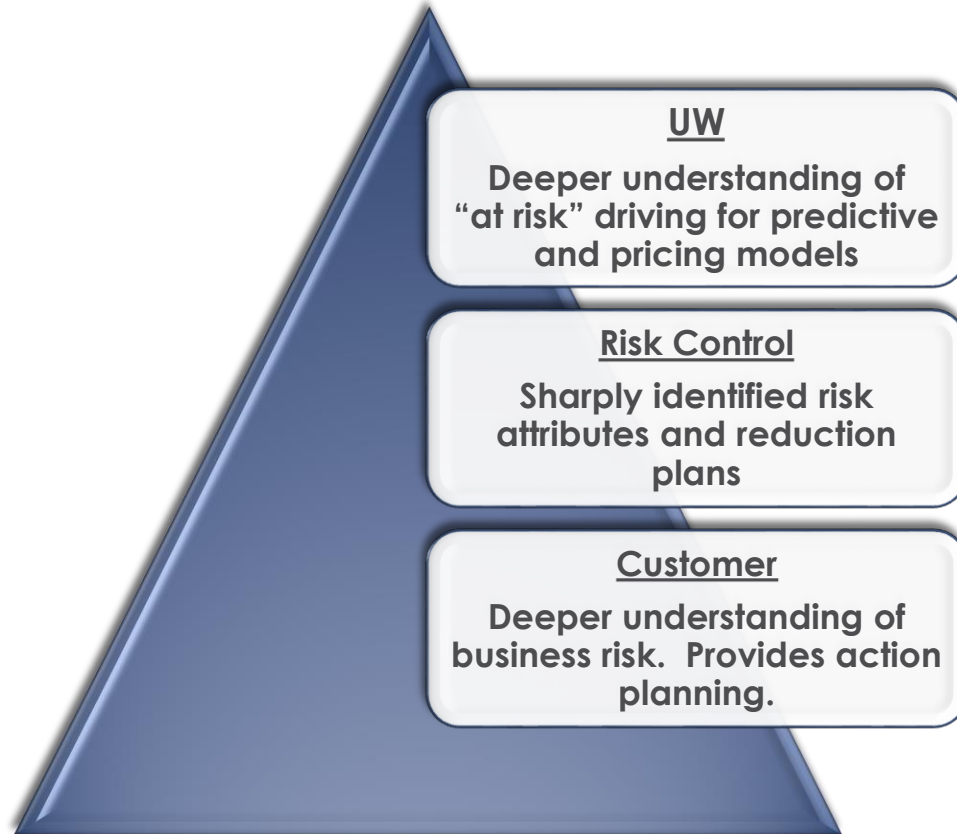
Avoid
“everybody
does that”
excuse.

The details
are what
separate the
experts from
the novices.

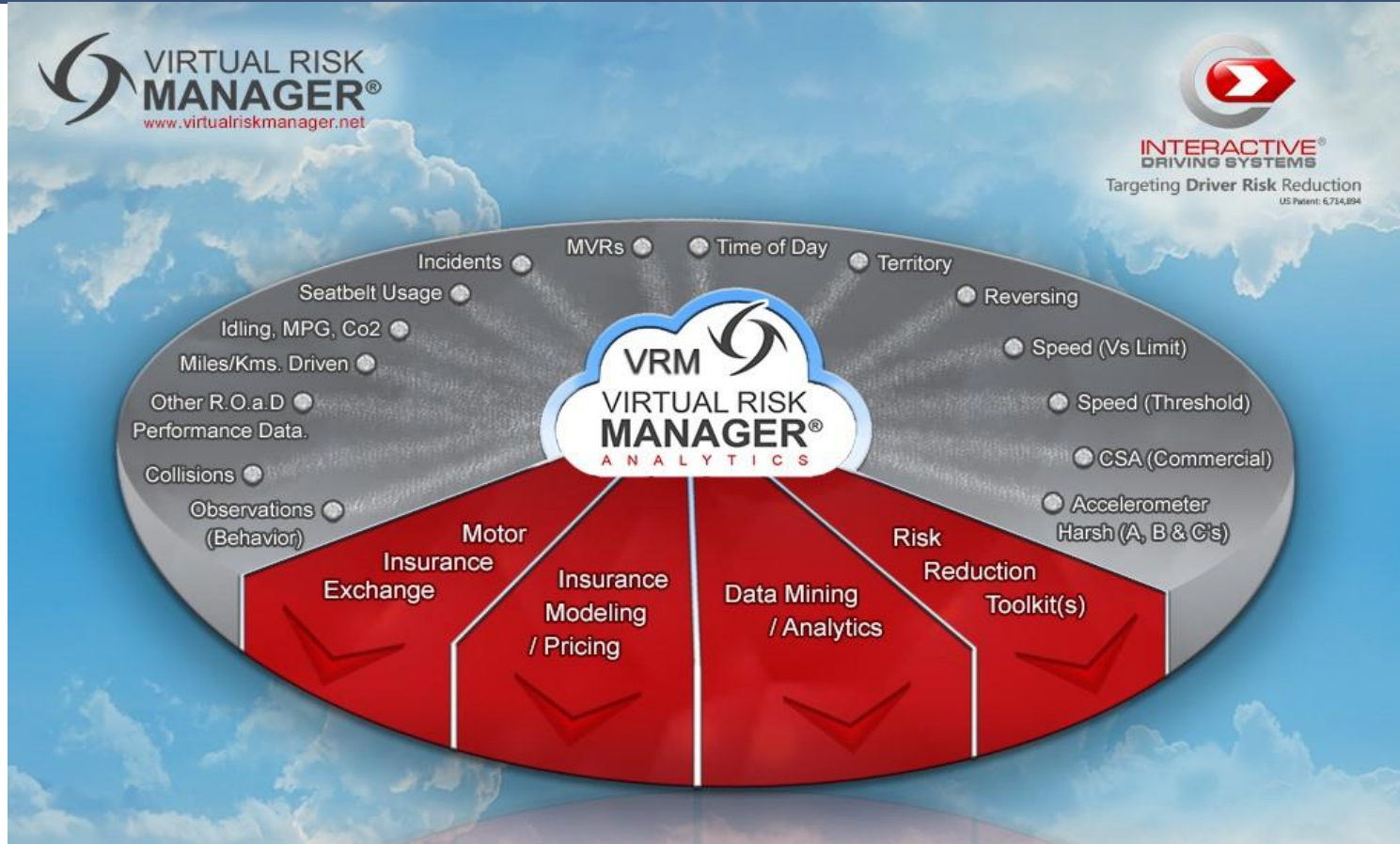
Benefits of Approach

- Normalizes behavior to peers
 - Possible to normalize over vehicles and conditions
 - Portable scoring
 - Very rich attribute set (carrier differentiation)
- Scales well
 - Less expensive data collection
 - More reliable data
 - More extensive data
 - Complements vehicle automation
- Data, processing power, algorithms are here

Analytics Contributions



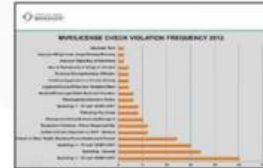
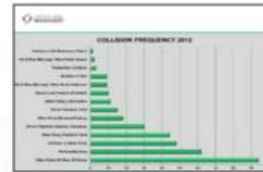
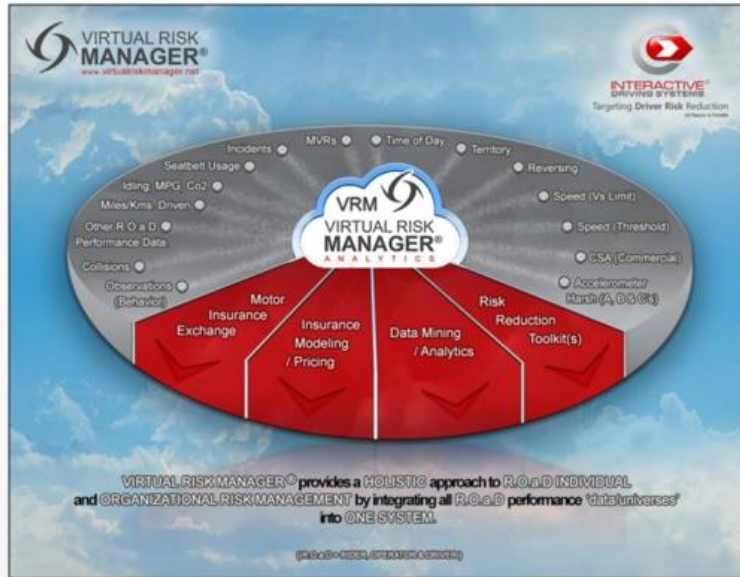
One Stop Shopping



To improve results we must create a Crash Free Culture

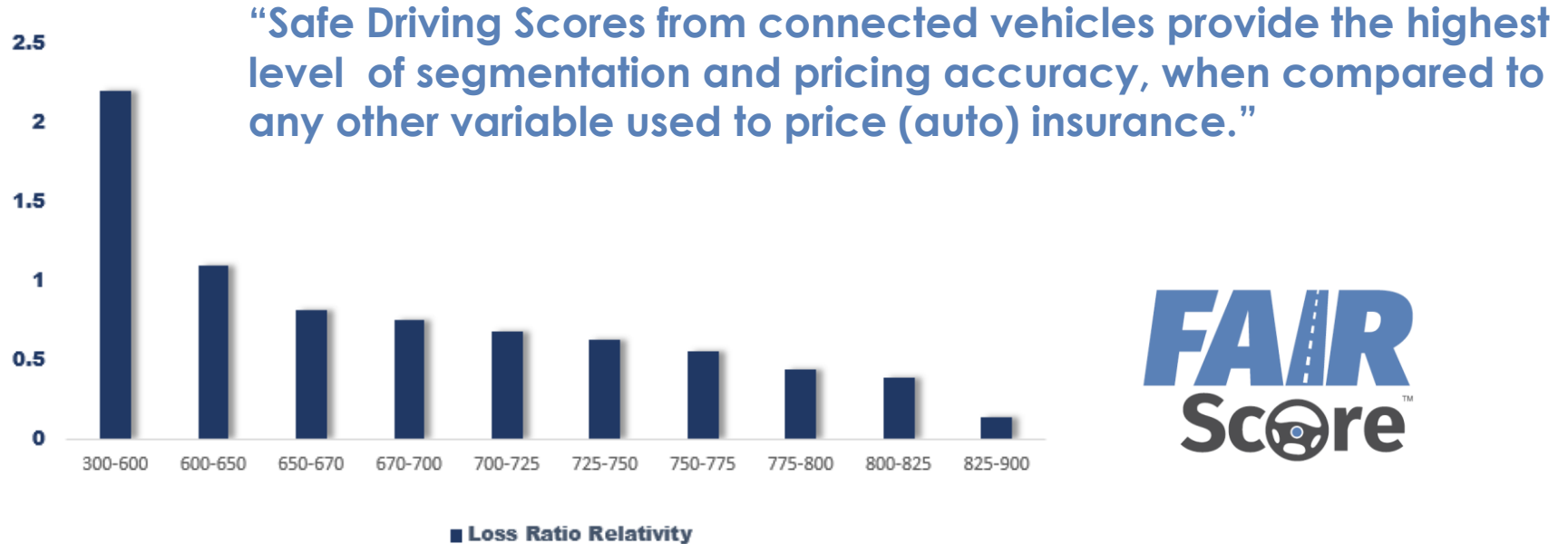


VRM ANALYTICS®: MONTHLY, QUARTERLY & ANNUAL



Monthly/Quarterly & Annual Analytics – CPMM, IPMM, IncPMM, License, Collision, Incident, Country/Division Scorecards, Monthly Leadership 'Calls to Action', Benchmarks. Global crash, incident and near miss (new 2015) reporting systems.

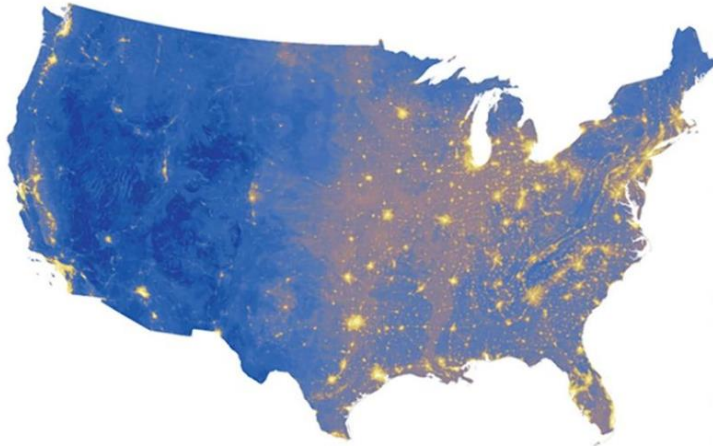
Preliminary Results - Loss Ratio Relativities



Sample: N= 3,736 entities with a combined total of 171,307 vehicles having driven >7 billion miles over a 2-year period, with 9 different telematics device data sets.

Conclusion

A spacial-temporal view of the variables already contemplated in the rating of Commercial Auto risk, combined with a Safe Driving Score, levels the playing field for segmentation and pricing accuracy.



The objectives: simplify adoption, protect privacy, increase consistency and reduce premium leakage

Thank You!

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