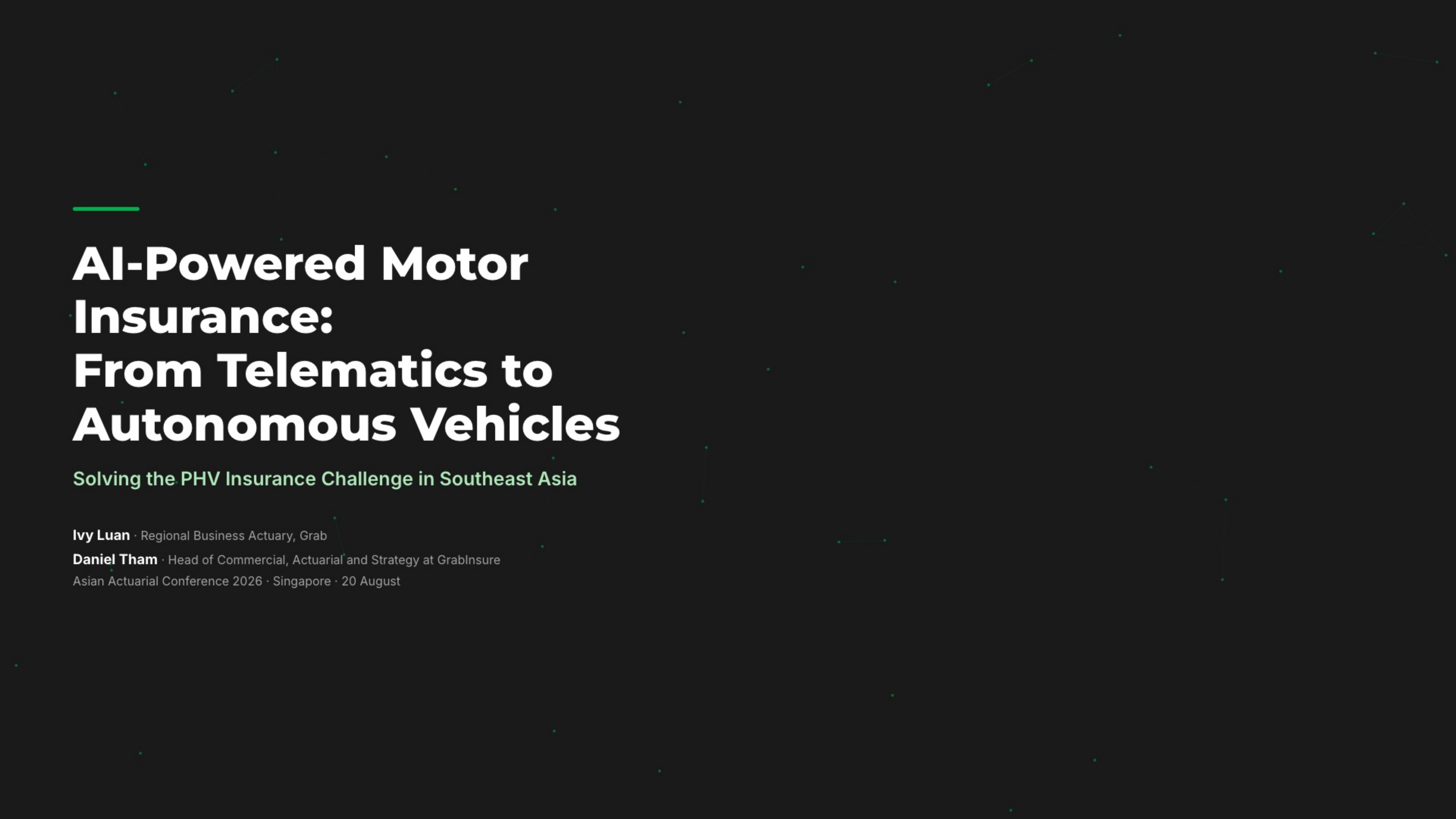


The background features a dark navy blue field with intricate, thin green line art. These lines form a network of interconnected points and small geometric shapes, resembling a stylized constellation or a digital circuit board. The lines are scattered across the entire frame, with some forming larger, more complex structures and others being simple, isolated strokes.

AI-Powered Motor Insurance: From Telematics to Autonomous Vehicles

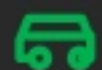
Solving the PHV Insurance Challenge in Southeast Asia

Ivy Luan · Regional Business Actuary, Grab

Daniel Tham · Head of Commercial, Actuarial and Strategy at GrabInsure

Asian Actuarial Conference 2026 · Singapore · 20 August

Millions of drivers, **no insurance built for them**



Unique risk profile

- 30,000–50,000 km per year
- Dense urban driving
- Passenger-carrying liability
- Professional drivers



The insurance gap

- Priced like personal auto
- Coverage often refused
- Unaffordable premiums
- Millions underserved



The SEA environment

- Rapid urbanisation
- Mixed traffic conditions
- Tropical weather exposure
- Diverse regulatory regimes

How do we build insurance that fits millions of PHV drivers across diverse SEA markets?

Why traditional pricing fails — and what a platform changes

Traditional pricing challenges

- Diverse driver populations
- Varying usage patterns
- Limited claims history
- Regulatory complexity across markets

Platform advantages

- Every trip observed
- Real-time behavioural data
- 6 insurance markets, millions of drivers
- Continuous measurement

"We don't ask about risk — we observe it directly"

Platform data enables smarter underwriting



Rich behavioural signals

- GPS, speed, braking
- Every trip recorded
- Continuous observation



Precise exposure

- Actual kilometres driven
- Time of day, routes
- No self-reporting



Quality signals

- Passenger ratings
- Platform tenure
- Engagement patterns



Regional scale

- Millions of drivers
- 6 insurance markets
- Pattern recognition at scale

"Traditional insurers ask. We observe — directly, continuously, at scale."

From static to dynamic pricing



Traditional insurance

- Annual assessment
- Static premium
- Self-reported data
- A 12-month bet



Telematics-based

- Continuous monitoring
- Dynamic pricing
- Real measurements
- Real-time updates

From "pay to drive" to "pay for how you drive"

Telematics isn't new — the infrastructure finally is

We knew it mattered — but...

2005



- **Hardware:** OBD-II dongle + SD card
- **Transfer:** Drive to office, plug in, wait...
- **Processing:** Excel pivot tables
- **Latency:** 2-4 weeks from trip to insight
- **Result:** Data stale before pricing

The platform way

2025



- **Hardware:** Driver's smartphone
- **Transfer:** Automatic via 4G/5G
- **Processing:** Cloud ML pipelines
- **Latency:** Minutes, not weeks
- **Result:** Fresh, actionable data

Actuaries always knew driving behavior = risk — we just couldn't measure it at scale until now

Pop quiz: How big is the data?

How much raw telematics data does **ONE driver** generate in **ONE week**?

(GPS + accelerometer + gyroscope at 10 Hz, ~40 hrs driving)

A
5 MB
"A few photos"

B
20 MB
"A short video"

C
50 MB
"A podcast"

D
100 MB
"HD trailer"

NONE OF THE ABOVE
~150–200 MB
880 bytes/sec × 40 hours

 1 driver × 1 week
~200 MB

 Singapore PHV × 1 week
~2 TB

 SEA region × 1 month
Petabytes

This is why Grab is a tech company:

- **Cloud-native** — S3, not local hard drives
- **Real-time streaming** — not monthly batch uploads
- **ML pipelines** — not Excel pivot tables
- **10 Hz sampling** — industry-grade fidelity

At this scale, you don't "analyse data" — you build systems that learn

What the sensors **actually** see

**GPS**
10 Hz

- **Speed** — speeding events
- **Routes** — risk corridors
- **Time** — night, rush hour
- **Distance** — exact km

Risk: "Accident alley" routes

**Accelerometer**
X, Y, Z @ 10 Hz

- **X** — lateral (cornering)
- **Y** — longitudinal (braking)
- **Z** — vertical (road quality)

Risk: Harsh brake >0.4g

**Gyroscope**
Roll, pitch, yaw

- **Roll** — turn stability
- **Pitch** — hill driving
- **Yaw** — lane switching

Risk: Erratic yaw = weaving

**The combination tells the full story**
GPS "where" + Accel "how hard" + Gyro "how stable" = **driving fingerprint**
~1,440 data points/sec

Real risk signals — what the data reveals

Two drivers, same route, same car. Different risk.

A

Driver A — "Smooth Operator"
4.9 stars · 3 years on platform

0.2

harsh brakes/100km

2%

speeding time

0.15g

cornering

B

Driver B — "Aggressive Ace"
4.3 stars · 8 months on platform

4.8

harsh brakes/100km

18%

speeding time

0.38g

cornering

Traditional: Both pay same. **Telematics:** Risk-appropriate pricing.

Industry Evidence

UBI claim reduction	10-30%
Behavior improvement	20%+
Global UBI market	\$50B+

GrabInsure Across SEA

M+ trips

PB data

24/7

Same age, same car, same route — but completely different risk profiles

What works — and why it matters for the future

Today's Benefits

- Better risk segmentation
- Behavioural incentives that work
- Fairer, more accurate pricing
- Operational insights beyond claims

Honest Learnings

- Data quality varies by device/market
- Regulations differ across SEA
- Technical complexity is real
- Driver adoption takes effort

Why This Matters for AV

- **Telematics infrastructure scales to AV**
- Same sensors: GPS, accelerometer, gyroscope
- Same pipelines: cloud, ML, real-time
- Same discipline: measure behaviour, price risk

But wait... traditional pricing uses age, gender, occupation. What happens when there's no driver?

Telematics isn't just for today — it's the foundation for pricing the driverless future

Traditional pricing meets **its existential crisis**

MEET YOUR DRIVER



Level 4 Autonomous Vehicle
"Driver" = 47 million lines of code

Fill out the insurance application:

Date of Birth?
"Software v4.2.1 — compiled last Tuesday"

Gender?
"Error 404: Gender not found in neural network"

Occupation?
"Professional driver. That's literally what I am."

NCD History?
"Manufactured 3 weeks ago. Ask me in 2029."

Every traditional factor — **doesn't exist**. But driving behavior? **That's what telematics measures.**

When the driver is software, behavior **IS** the only rating factor

The AV pricing challenge — an industry-wide problem

TRADITIONAL RATING





Age



Gender



Occupation



History

AV RATING





N/A



N/A



N/A



N/A


How should actuaries price AV risk?

DATA

No claims history at launch

RISK DRIVERS

All traditional factors = N/A

CADENCE

Systems evolve faster than policies

REGULATION

Models still forming across SEA

Frameworks that start with validated priors and update as evidence emerges

A Bayesian hybrid: **three layers, one discipline**



1

A Priori Prior — external evidence

Published ADAS / safety-system effectiveness · GLM on industry benchmarks

2

A Posteriori Signal — operational experience

Operational telemetry as experience signal · severity tiers where data permits

3

Credibility Blending — Bühlmann

Optimal weight between prior and emerging experience

$$Z = \text{Exposure} / (\text{Exposure} + K)$$

A transparent structure actuaries can debate, file, and adapt — not a black box

Why it works — and what we don't know yet

Three principles

- **Start with external evidence**
Published safety-tech research supports a defensible prior while AV claims are immature
- **Learn before claims lag**
Operational signals inform adjustments while loss data is still developing
- **Blend with credibility discipline**
Bühlmann-style weighting avoids overfitting to small samples

Open questions

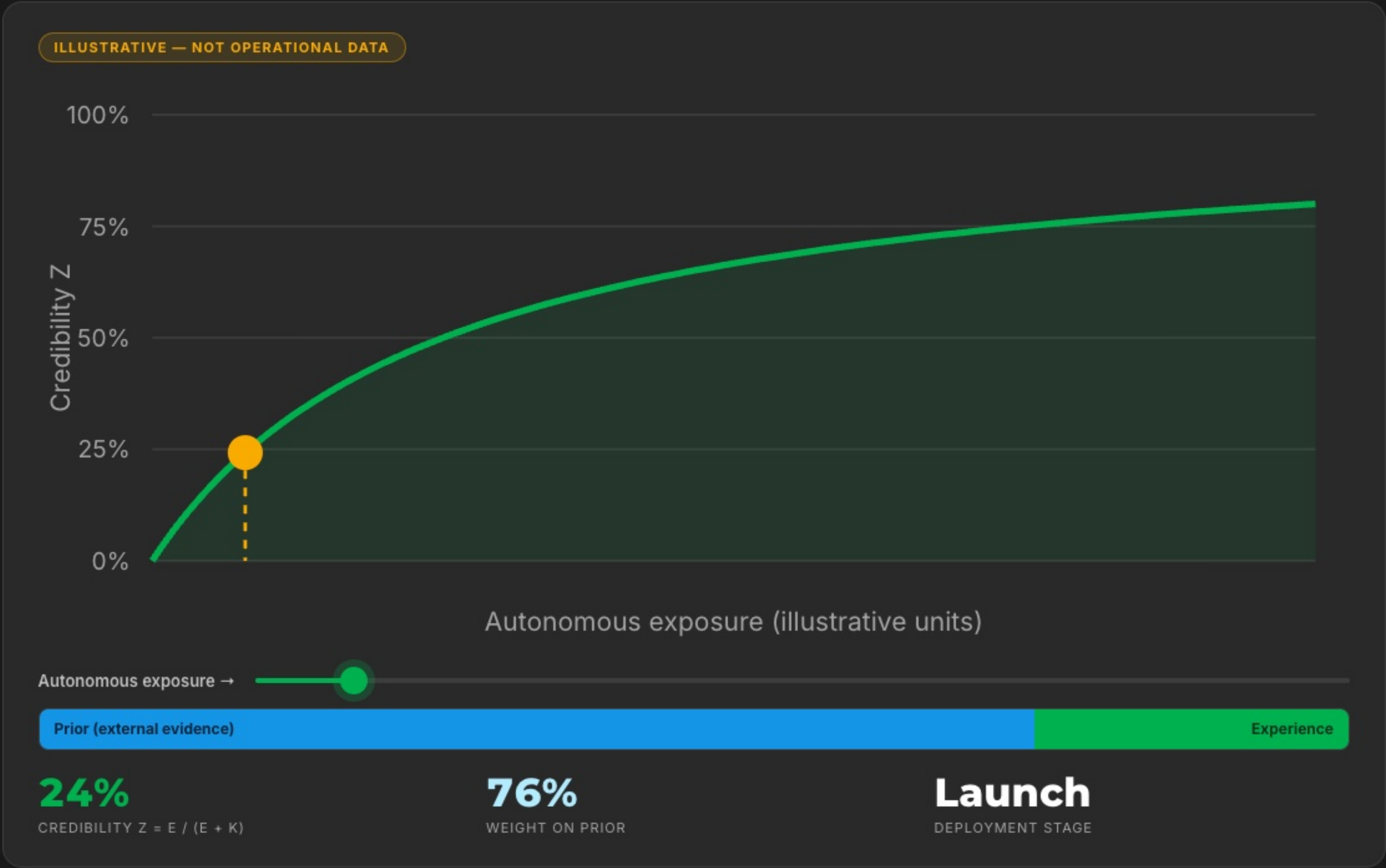
- Layer-2 signals not yet universally validated against ultimate loss
- Severity and liability allocation still evolving by market
- Regulatory treatment of dynamic pricing varies across SEA
- Pooling across fleets and operators raises governance questions

A framework for dialogue — not a claim that AV pricing is solved

How credibility should behave — live illustration

Launch	Prior-led
Early operations	Cautious blend
Regional scale	Experience gains voice
Mature fleet	Data-led, if stable

Early on, the prior should dominate — fleet-specific noise must not drive pricing. As exposure grows, experience **earns** its place in the blend.



The discipline is in the weighting — not in premature confidence from small samples

Questions worth debating today

SEA regulatory spectrum

- Singapore — proactive pilot frameworks
- Malaysia / Thailand — developing approaches
- Indonesia & others — complex, fragmented

Insurance themes

- Who is the insured risk unit — fleet, system, operator?
- How do PHV telematics lessons transfer to AV?
- Data sharing between platforms and carriers

1 When is AV experience **credible enough** to move off the prior?

2 What operational signals are **actuarially defensible** before claims mature?

3 How should **liability** be priced when humans and systems co-exist on the road?

4 Can regional **pooling** improve stability without blurring accountability?

5 What transparency do **regulators** need in emerging-tech filings?

For actuaries: cold-start pricing is a profession-wide design problem · For the market: co-design governance, not just rates

Four things to **take home**

1 PHV drivers are underserved
Millions of drivers with unique risks and real coverage gaps

2 Platforms change the data
We observe risk directly, continuously, at scale

3 AI + actuarial rigour
Modern data plus actuarial discipline yields fairer pricing

4 The path forward
Telematics is proven; AV pricing needs collaborative actuarial design

"The opportunity is to observe risk more directly — the responsibility is to price it prudently."

Thank you

Questions & Discussion

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Contact via conference organisers

Mobility insurance in SEA

Telematics

AV credibility

Regulation