



The transformation of the insurance industry and road safety by driver safety behavior telematics

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Together with:

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Background

- Despite substantial progress in improving road safety during the last decade, the aim of halving road traffic fatalities by 2020 **has not been achieved**
- The UN has set a **new goal** to halve traffic injuries and fatalities by 2030, highlighting the need to reduce risk factors affecting the probability of getting involved in a crash
- In contemporary motorized societies, **human factors** remain overwhelmingly responsible for road crash occurrence
- Urged by considerable technological developments, insurers have integrated telematics to their operations to develop an array of **Usage-Based-Insurance (UBI)** schemes



Objective and Goals

Objective

- An examination of how **driving telematics** provide actionable findings that can influence insurance policies

Goals

- An overview of relevant **technological advancements** and integration practices of telematics
- A more in-depth examination of the tangible **benefits of telematics** and driver feedback in road safety will be discussed
- **Future directions**, challenges, and limitations facing the transformation of the insurance industry



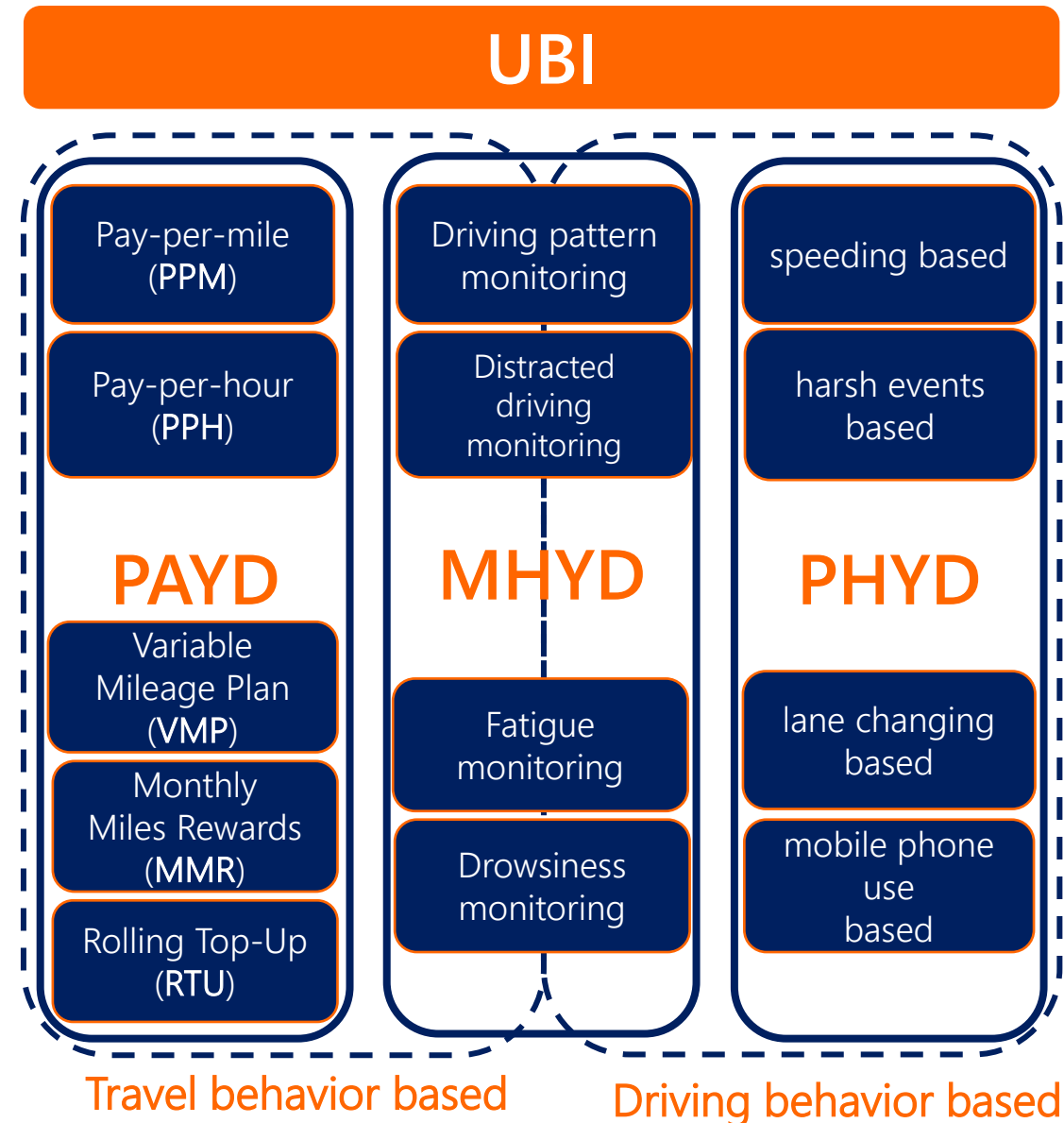
Technological Advancements

- Although plenty of telematics based services are possible with today's 4G LTE networks, the **5G networks** support new types of information with respect to telematics
- Telematics companies have spearheaded the development of **direct communication capabilities**, including:
 - Vehicle-to-Vehicle (V2V),
 - Vehicle-to-Infrastructure (V2I)
 - Vehicle-to-Everything (V2X)
- Regardless of the type of communication, **omnipresent connectivity** seems to play the most significant role in automation
- The **integration of V2V and V2I** communications with telematics solutions provides promising results considering road safety and society in general



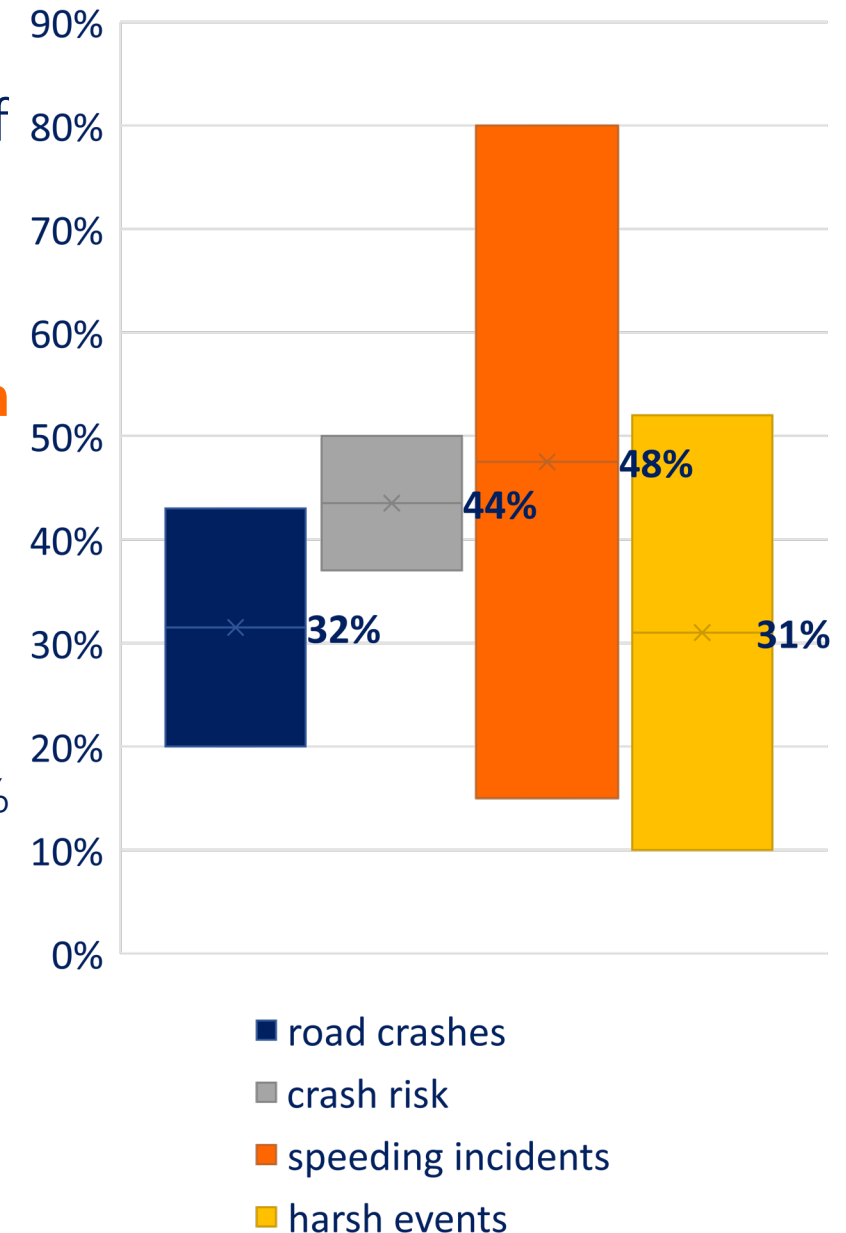
Telematics Integration in Insurance Practices

- The **traditional charging policy** of auto insurance companies, which is a fixed price, has been regarded as unfair and inadequate
- The **idea of UBI** is that a driver's behavior is monitored directly using telematics, allowing insurance companies to align driving behaviors with premium rates
- Depending on the variety of driving data availability and the usage level of telematics, UBI can have **several variants**
 - Pay-As-You-Drive (**PAYD**)
the parameters that affect the insurance charging is the driven distance or time (hours, days)
 - Pay-How-You-Drive (**PHYD**)
uses the motivation for safer driving for charging calculation based on the driver behavior
 - Manage-How-You-Drive (**MHYD**)
drivers are provided with a real-time data so that drivers can manage and moderate their driving



Road Safety Benefits

- There is **little research** on the quantification of the influence of telematics on road safety in terms of before/after feedback provision to drivers
- After a thorough literature review regarding the **quantification of the impact** of telematics on road safety, the following key findings were observed:
 - 7 studies determined **road crash reductions** varying from 20 %-43%
 - 3 studies determined **crash risk reductions** varying from 37 %-50%
 - 7 studies determined **speeding incident reductions** varying from 15%-80%
 - 6 studies determined **harsh event reductions** varying from 10 %-52%
- Also, **network level studies** have been developed to proactively assess road safety using harsh driving events



Telematics Lessons

- Certain interesting lessons from conventional post-trip interventions may be worth taking into account as **guidelines** for the design of more efficient and longer-lasting telematics interventions
- Although exposure to post-trip feedback and warnings had a positive effect on driver behavior and road safety, if **follow-up efforts** were not made, neither of the impacts was sustained over time
- **Multi-stage provision of feedback** (e.g. visual warnings, gamification, coaching, penalties or rewards) can improve driver behavior and reduce crash occurrence



Future Directions

- Provision of specialized UBI schemes per **road user** category (e.g. truck, taxi, PTW, e-scooters, etc.)
- Regarding **road environments**, more holistic approaches should be considered (e.g. shared space roads)
- Connected vehicles may introduce new **unexpected road users** (e.g. people with mobility or visibility impairments), which will require further refinement of insurance frameworks
- UBI will need to consistently prove its reliability to cover **larger market shares** across countries that may be unprepared or unwilling to adopt it



Open Issues

- The question of who is assigned **responsibility in a crash** where a fully automated vehicle is at fault remains open
- The thorough investigation of the effectiveness of telematics-driven post-trip interventions, and how they may be **optimized** for maximum net impacts
- UBI telematics systems may require **'cold start' inputs** for new users or for when an intervention or road safety measure is being implemented for the first time in their road network, but previous knowledge may exist
- **Feasible transferability** methods need to be set in place for effective UBI



Challenges & Limitations

- The insurance industry faces challenges in **balancing** safety monitoring and privacy concerns
- GDPR limits the unhindered **use of AI**, which could be used to detect violations but may go against the core legislative purposes
- Insurers are accountable for shielding consumers from adverse effects of **GDPR breaches**, including potential hacking by malicious third-party hackers
- Telematics-based research is **prone to bias**, and studies have used different data sources and recording tools
- The effectiveness of different **sensors** for driver telematics remains to be explored, with exteroceptive sensors showing considerable untapped potential but each sensor type having its own feasibility issues



Conclusions

- The **vehicle insurance industry** is undergoing vast transformations driven by advances and innovation in driver telematics
- Telematics have aided in the gradual but constant **shift towards UBI** opening new research venues in road safety
- Driver feedback provided by telematics has been found to **encourage safer driving behaviors**, leading to a reduction in road crashes, crash risk and surrogate safety incidents
- The insurance industry will have to carefully balance between efficient monitoring, algorithmic methods, and data protection regulations, ultimately solving the 'transferability vs individualization' dilemma to deliver **holistic and competitive insurance products**





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