PERSONALIZATION, PROPORTIONALITY, AND PRIVACY: THE CONSTITUTIONAL LEGITIMACY OF TELEMATICS INSURANCE IN INDIA

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ABSTRACT

Usage-based insurance (UBI), otherwise known as telematics insurance, is a form of structural change with reference to the underwriting of auto insurance. Instead of using the traditional demographic factors to personalise the premiums, the insurers broadly use on-board diagnostics, smartphone sensors, and embedded vehicle systems to gather detailed real-time data relating to behaviour and location. Earlier empirical studies show that telematics, in fact, improves actuarial precision, encourages safer driving, and may drastically lower accident rates. However, the same architecture leads to ongoing behavioural surveillance, which in turn raises serious concerns with discrimination, algorithmic transparency, data ownership, privacy, and regulatory oversight. This article conducts a thorough doctrinal analysis of telematics insurance with a significant stress on the Indian scenario. Firstly, the article focuses on various concepts and international discussions underpinning telematics insurance, followed by the constitutional principles relating to telematics as set up in Justice K.S. Puttaswamy vs. Union of India; the laws made by the Digital Personal Data Protection Act 2023 (DPDP Act) and the rules that must be followed by the Insurance Regulatory and Development Authority of India (IRDAI). Lastly, the article recommends the establishment of a comprehensive framework based on proportionality, privacy by design, algorithmic accountability, and shields against competition. The article contends that telematics insurance is neither per se unconstitutional nor inherently advantageous. In India, its legitimacy rests on compliance with constitutional proportionality, statutory fiduciary responsibilities, and sector-specific regulatory protections that harmonise road safety with informational autonomy.

 Keywords: Digital Personal Data Protection Act 2023 (DPDP Act), Insurance Regulatory and Development Authority of India (IRDAI), Proportionality, Telematics insurance, Usagebased insurance (UBI)

1. INTRODUCTION

The introduction of telematics insurance, otherwise known as Usage-based insurance (UBI) in the insurance industry, has led to a transition from demographic proxy-based pricing to behaviour-based risk assessment, which marks a substantial shift in the underwriting of auto insurance. The insurers gather real-time data on speed, braking patterns, mileage, and location using onboard diagnostics, smartphone apps, and embedded vehicle systems, so as to calculate customised premiums.

Global empirical studies highlight the fact that telematics thus improves actuarial precision and encourages safer driving. However, the technology also permits continuous behavioural and location tracking, which raises significant concerns about privacy. In India, these concerns must be examined through the lens of the principle laid down in Justice K S Puttaswamy v. Union of India, that is, privacy is a fundamental right, together with the statutory safeguards under the Digital Personal Data Protection Act 2023.

This paper critically evaluates the pros and cons of telematics insurance from both global and Indian perspectives and lastly proposes a proportionate regulatory framework that will balance innovation, growth, safety, and informational autonomy.

2. LITERATURE REVIEW

Omri Ben- Shahar, in his article, *Privacy Protection, At What Cost?* (2023) criticised the regulatory resistance to telematics insurance by contending that the privacy-driven restrictions bring with them social costs in the form of limiting accident reduction and pricing efficiency. The author, through his empirical study, firmly established that measurable safety and welfare gains of the telematics system outweigh the largely speculative privacy harms.

Nele Stroobants & Caroline Van Schoubroeck, in their article entitled-*Telematics Insurance: Legal Concerns and Challenges in the EU Insurance Market* (2021), explore whether the insurers can lawfully collect and process data relating to behavioural driving under the GDPR and further assess the potential for indirect discrimination arising from behavioural profiling. The study highlights the fact that, though telematics enables individualised pricing, it simultaneously raises complex regulatory and ethical challenges, which require careful legal calibration.

Ian Weng Chan, Spark C. Tseung, Andrei L. Badescu & X. Sheldon Lin, in their article- *Data Mining of Telematics Data: Unveiling Hidden Patterns in Driving Behaviour* (2025), found strong associations between large speed transitions, harsh braking, nighttime driving and increased claim frequency, and also identified the behavioural learning effects over the long run through innovative methodologies.

Leah Chan Grinvald & Ofer Tur-Sinai, in their article entitled- *Smart Cars, Telematics and Repair* (2021), examined the competition and consumer protection implications of telematicsbased vehicles, arguing that the right to repair ecosystem has been severely threatened because of the manufacturers' control over telematics-generated data. They have concluded their article by advocating for a multi-front regulatory response, including consumer protection and intellectual property rights enforcement.

3. CONCEPTUAL FOUNDATIONS OF TELEMATICS INSURANCE

3.1. MEANING AND OPERATIONAL STRUCTURE

Telematics insurance, otherwise known as Usage-Based Insurance (UBI), relies on telecommunications and informatics technologies to monitor driving behaviour and adjust motor insurance premiums accordingly.[1] Unlike the traditional underwriting models, which majorly rely upon static demographic variables such as age, gender, and vehicle type and location, the telematics systems rely upon dynamic behavioural data such as speed transitions, acceleration patterns, braking intensity, mileage, and the route histories.[2]

The telematics system operates through three major technologies, such as onboard diagnostics devices (OBD), smartphone-based applications, and embedded vehicle telematics. These advancements help the insurers to examine the actual driving conduct through high-frequency time series data.[3] Such a technological advancement showcases a transition from proxy-based underwriting towards behaviour-based risk assessment.

Empirical evidence from actuarial research establishes the predictive value of telematics data. Large speed transitions, harsh braking events, and nighttime driving are directly proportional

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[1] Jing Qi et al., *Telematics in Insurance: Challenges and Limitations*, 13 IEEE Access 147449, 147450–52 (2025).
[2] Id. at 147451–52.
[3] Id.

to increased claim frequency.[4] Such findings support the actuarial argument that telematics enhances the accuracy of risk classification far better than the traditional underwriting models.

3.2. BEHAVIOURAL MODIFICATION AND PUBLIC SAFETY

Telematics is not just about prediction; it also incorporates behavioural aspects. Insurers frequently provide real-time feedback and behavioural scores to the drivers, which were purposefully designed to incentivise safer practices. The telematics-based insurance models often incorporate the managed how-you-drive mechanisms that encourage behavioural corrective steps.[5]

Usage-based insurance has been argued to carry the potential to reduce fatal accidents by nearly one-third by adopting safer driving habits.[6] If such an argument stands strong, such reductions suggest that telematics does possess substantial public safety value, especially in jurisdictions with high road fatality rates. However, these actuarial and safety benefits cannot obscure the underlying normative concerns.

3.3. LEGAL AND ETHICAL DEBATES

Scholarly discourse surrounding telematics insurance reveals a conflict between innovation and privacy. Data protection, discrimination, and transparency have been identified as the major legal challenges in telematics underwriting.[7] Moreover, emphasis has been laid upon the mandatory compliance of automated profiling mechanisms with strict data processing principles and fairness requirements.[8]

The concern over ownership of data is also great. Though the customers generate behavioural data, they lack control over its storage, processing, and secondary uses.[9] Thus, the asymmetry between insurers and policyholders leads to structural vulnerability.

Moreover, telematics intersects with competition law, highlighting the risk that the vehicle

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[4] Ian Weng Chan et al., Data Mining of Telematics Data, 29 N. Am. Actuarial J. 275, 276–78 (2025).
[5] Qi et al., supra note 1, at 147454–55.
[6] Omri Ben-Shahar, Privacy Protection, At What Cost?, 15 J. Legal Analysis 129, 130–31 (2023).
[7] Nele Stroobants & Caroline Van Schoubroeck, Telematics Insurance, 13 Eur. J. Com. Cont. L. 51, 55–58 (2021).
[8] Jeffrey Amankwah & Caroline Van Schoubroeck, Fraud Detection in Motor Insurance, 12 Int'l Data Priv. L. 220, 223–25 (2022).
[9] Tzameret H. Rubin et al., Big Data and Data Ownership Rights, 13 J. Info. Tech. Teaching Cases 82, 83–85 (2023).

manufacturers may monopolise access to telematics and thereby limit independent repair and insurance markets.[10]

From an ethical perspective, concerns have been raised about excessive personalisation, which may undermine the collective nature of insurance pooling.[11] Historically, insurance is based on solidarity; hyper-individualisation may fragment that model.

4. TELEMATICS INSURANCE IN THE INDIAN LEGAL FRAMEWORK

4.1. MOTOR INSURANCE AND REGULATORY CONTEXT

In India, motor insurance is primarily governed by the Motor Vehicles Act 1988, the Insurance Act 1938, and the regulations issued by the Insurance Regulatory and Development Authority of India (IRDAI).

IRDAI has shown its approval for the use of telematics products through sandbox initiatives. However, India currently lacks comprehensive and binding guidelines that will govern telematics underwriting. Since third-party motor insurance is compulsory in India, telematics must be treated not merely as a private contract, but as a practice embedded within the statutory obligations.

4.2. CONSTITUTIONAL PRIVACY AND PROPORTIONALITY

In Justice K.S. Puttaswamy versus Union of India, the Supreme Court recognised privacy as a fundamental right under Articles 14, 19, and 21 of the Constitution.[12] The Supreme Court advocated for a proportionality test requiring legality, legitimate aim, necessity, and proportionality in the strict sense.

Though telematics insurance is primarily implemented by the private insurers, the statutory frameworks governing such practices must abide by the constitutional framework. Continuous GPS tracking directly impacts information autonomy. If telematics becomes binding from an economic perspective by providing substantial premium reductions only through surveillance,

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[10] Leah Chan Grinvald & Ofer Tur-Sinai, Smart Cars, Telematics and Repair, 54 U. Mich. J.L. Reform 283, 299–302 (2021).

[11] Arthur Charpentier & Xavier Vamparys, Artificial Intelligence and Personalization of Insurance, Big Data & Soc'y 1, 3–6 (2025).

[12] Justice K.S. Puttaswamy v. Union of India, (2017) 10 S.C.C. 1, ¶ 180 (India).

the question of voluntariness and proportionality arises. The proportionality framework requires the regulators to assess whether the subtle alternatives, such as aggregated trip-level data, rather than continuous location tracking, could help in achieving the underwriting objectives.

4.3. DIGITAL PERSONAL DATA PROTECTION ACT, 2023

The Digital Personal Data Protection Act 2023 provides for a consent-based data protection regime in India. Here, telematics data, including location histories and behavioural indicators, come under the criteria of personal data because they can be used to identify people by analysing patterns in the data. Under the DPDP Act, the insurers function as data fiduciaries and are obligated to ensure lawful and informed consent, purpose limitation, data minimisation, storage limitation, and reasonable security safeguards.

However, the DPDP Act does not provide a comprehensive code of standards to regulate automated decision-making or algorithmic explainability when compared to the European Union's GDPR, Article 22.[13] This regulatory gap is extremely significant for telematics, which relies upon algorithmic profiling.

4.4. SOCIO-ECONOMIC AND INFRASTRUCTURAL CONSIDERATIONS

India's traffic conditions are quite diverse and inconsistent. Variability in infrastructure, mixed vehicle usage, and congested urban roads may result in behavioural data that reflects environmental limitations rather than individual carelessness. Telematics scoring may unfairly penalise the drivers who live in cities or have lower incomes if contextual calibration is not applied. Furthermore, the significance of consent mechanisms may be compromised by differences in digital literacy. Such structural realities must be taken into consideration by regulatory oversight.

5. POLICY RECOMMENDATIONS FOR A PROPORTIONATE INDIAN FRAMEWORK

5.1. Policy Suggestions for an Equitable Indian Structure

In India, a telematics system that is constitutionally sound must incorporate technological

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[13] Stroobants & Van Schoubroeck, supra note 7, at 60–63.

safeguards, regulatory specificity, and statutory compliance.

A. Comprehensive IRDAI Telematics Guidelines

IRDAI should issue legally binding telematics regulations that address:

1. Architecture of Consent

Granular, informed, and unbundled consent is required. Separate consent procedures should be offered by insurers for: Ongoing GPS monitoring; analytics of behaviour; durations of data retention.

To maintain voluntariness, economic coercion—where large discounts are dependent on surveillance—should be controlled.

2. Retention and Minimisation of Data

Beyond what is required for underwriting, raw GPS data shouldn't be kept. Wherever possible, continuous storage should be replaced by aggregated trip-level summaries. There should be a cap on retention periods (e.g., 12–18 months), after which anonymisation is required.

These actions are consistent with the principles of proportionality and purpose limitation.

3. Algorithmic Transparency and Accountability IRDAI
ought to require:

independent audits of third-party algorithms;

evaluations of bias detection;

Policyholders' rights to an explanation of premium adjustments; yearly evaluations of the model's impact.

Regulatory transparency is crucial because machine learning systems are inherently opaque.

B. Technological Mandates for Privacy-by-Design

Ubale shows that while maintaining high predictive accuracy, federated learning frameworks

reduce privacy leakage by 73–85%.[14] Federated architectures enable model training across distributed datasets without transferring sensitive data, as opposed to centralising raw telematics data.

IRDAI ought to require:

federated learning as and when possible, distinct strategies for privacy, encryption both in transit and at rest, the usage of edge computing to process data locally before sending it.

Moreover, the legal requirements must be supplemented by technological safeguards.

C. Interoperability and Data Portability

Telematics histories should be made accessible to the policyholders as well as transferable between the insurers.

Standardised data formats would improve competition and avoid vendor lock-in.

D. Safeguards for Competition

To stop OEM monopolisation of telematics data, IRDAI and the Competition Commission of India must work together. To prevent market foreclosure, fair data-sharing guidelines and open API access should be required.

E. Maintaining Solidarity in Insurance

The foundation of auto insurance must not be compromised by telematics personalisation. To avoid exclusionary pricing in mandatory insurance markets, premium differentials should be reasonable and capped.

6. CONCLUSION

Actuarial advancement and surveillance risk are both present in telematics insurance. Its behavioural and predictive advantages are validated by empirical research.[15] However, ongoing

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[14] Abhijit Ubale, Privacy-Preserving Federated Learning Frameworks, 6 Int'l J. AI, Data Sci. & Machine Learning 41, 44–47 (2025).
[15] Chan et al., supra note 4, at 300–03; Ben-Shahar, supra note 6, at 130–31.

behavioural monitoring raises ethical questions about solidarity and discrimination as well as constitutional privacy and statutory data protection. A foundation for balanced governance is provided by the DPDP Act, IRDAI's regulatory power, and India's constitutional jurisprudence in Puttaswamy.

Telematics is neither intrinsically good nor intrinsically bad; proportional deployment, algorithmic accountability, privacy-by-design architecture, and industry-specific regulation are some of the factors that are extremely necessary for its legitimacy.

The future of usage-based insurance in India must, therefore, be shaped by regulatory caution and constitutional integrity rather than just technological zeal.