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GEO-INTEL LAB

DHAAL

Transportation and
Infrastructure

Pilot District
Vizianagaram, Andhra Pradesh

**Geospatial
Innovation Accelerator**
IIT Tirupati Navavishkar I-Hub Foundation (IITTNiF)

Technology Summary

DHAAL (Dynamic Heavy Accident Avoidance & Locator System) is an AI powered smart dashcam designed for two-wheelers. It integrates an HD wide-angle camera, ToF sensors, GPS, and accelerometers to monitor the environment and riding behavior in real time.

The system detects hazards such as potholes, sudden stops, or potential collisions and provides instant alerts to the rider through a connected smartphone app. Simultaneously, it records incidents, logs GPS data, and contributes to a cloud-based road quality map to improve infrastructure and rider safety.

By combining edge AI with mobile-based processing, DHAAL offers advanced safety features at a cost affordable to everyday riders.

Technology
Readiness Level

4

Value Proposition:

For Riders (B2C)

- o Get real-time alerts about potholes, waterlogged roads, diversions, and accident prone stretches.
- o Access a live road intelligence map that improves navigation and saves time.
 - o Receive hazard warnings and ride insights through a free app, with the option to upgrade to the DHAAL dashcam for full AI-powered protection.
- o The AI dashcam automatically records accidents and provides visual evidence for insurance or police reports.
- o Designed to make safe riding affordable and practical — no premium hardware or subscriptions required.

For OEMs / Mobility Companies (B2B)

- o Integrate DHAAL as a smart safety and navigation layer into bikes or fleet apps.
 - o Access rider behaviour and road condition analytics to improve operations, maintenance, and risk profiling.
- o Improve customer trust and brand differentiation by offering AI-backed safety features without increasing hardware cost.
- o Enable data-driven decisions for predictive servicing, warranty reduction, and insurance tie-ups.

For Insurance Companies

- o Access authentic, time-stamped accident footage and telemetry to verify claims instantly.
- o Reduce false claims and fraud through sensor-backed data validation.
 - o Offer discounted premiums to riders who use DHAAL, promoting safer riding behaviour.
- o Improve operational efficiency by automating claim verification and settlement.

For Government / Civic Bodies

- o Access aggregated, anonymized road data identifying potholes, blocked routes, and waterlogged zones in real time.
- o Use DHAAL data to prioritize road maintenance and reduce accidents caused by poor infrastructure.
- o Support Smart City safety programs with continuously updated road data.
- o Enable automated feedback loops from citizens through crowd-sourced road intelligence rather than manual reporting.

Market Potential / Deployment Plan:

Market Opportunity

- o Commercial Two-Wheeler Fleet: India's commercial two-wheeler fleet is projected to reach 11 million units by FY 2025, growing at a CAGR of 21.8% from FY 2020
- o Delivery Riders: The gig economy in India, currently 7.7 million strong, is expected to expand to over 23 million by 2029-30
- o Insurance Market: The Indian insurance industry is experiencing rapid growth, with a projected CAGR of 12.6% from 2025 to 2034

Deployment Strategy

- o Phase 1 (0-6 months): Deploy DHAAL sensors for free to selected delivery and bike-taxi riders in Delhi NCR, Vizianagaram to collect road-quality data.
- o Phase 2 (6-12 months): Launch the DHAAL mobile app with a freemium model, offering live road alerts and premium features.
- o Phase 3 (12-18 months): Upsell the AI dashcam hardware via the app; partner with insurance companies for faster claims and premium incentives.
- o Phase 4 (18+ months): Scale nationwide, embed in OEMs/fleet programs, and license aggregated road data to civic bodies.

Applications:

Individual Riders

- o Receive real-time alerts for potholes, blocked roads, and waterlogged areas.
 - o Automatic recording of accidents with location and time-stamped evidence for insurance or legal purposes.
- o Access ride analytics and safety insights through the freemium app.
- o Upgrade to the AI dashcam for on-device hazard detection and smart recording modes.

Commercial Fleets / Delivery & Ride Platforms

- o Monitor driver behaviour and route safety to reduce accidents and operational risks.
- o Real-time updates on road blockages and hazards to optimize delivery routes.
- o Verified accident footage for fleet insurance claims and liability reduction.
- o Integration with fleet management systems for performance analytics.

Government / Civic Authorities

- o Aggregated data on road conditions, blocked routes, and waterlogging to guide maintenance.
- o Identify accident-prone or poorly maintained areas for infrastructure planning.
- o Support Smart City programs with continuous, ground-level road intelligence.

Insurance Companies

- o Access verified accident and hazard data to speed up claims and reduce false claims.
- o Develop dynamic risk profiles and premium models based on real rider and road data.
- o Reduce claim processing costs and improve operational efficiency.

Environmental / Social Impact:

Social Impact

- o Reduced Road Accidents: Real-time hazard detection and accident alerts improve rider safety and lower accident rates.
- o Faster Emergency Response: Location-tagged accident data helps emergency services reach victims more quickly.
- o Insurance Efficiency: Verified accident evidence reduces false claims and speeds up claim settlements, benefiting riders and insurers.
- o Community Awareness: Aggregated road hazard data empowers riders and local communities to avoid unsafe areas.

Environmental Impact

- o Optimized Routes: Live road intelligence on blocked or waterlogged roads reduces unnecessary detours, cutting fuel consumption and emissions.
- o Infrastructure Feedback: Aggregated road-quality data allows authorities to prioritize repairs, reducing repeated road damage and maintenance cycles.
- o Urban Traffic Flow: By identifying problem areas, DHAAL contributes to smoother traffic management, indirectly reducing congestion-related pollution.

Contribution to Sustainable Development Goals (SDGs):

SDG 3, 8, 11, 13

