
आईएसपीआरएल
ISPRL
Road Safety
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DRIVER BEHAVIOUR

Over Speeding : R**educes reaction time** and **increases the severity of crashes.**

Distracted Driving: Use of **mobile phones**, **eating**, **Chatting** or other distractions diverts attention from the road.

Fatigue: Drowsy driving impairs judgment and reaction times. This could be due to lack of sleep or excessive hours of driving (No standby driver during long runs)

Impaired Driving: Alcohol or drug use significantly increases the risk of accidents.

Aggressive Driving: Tailgating, abrupt lane changes, Overtaking from wrong side and road rage increase collision risks. (Mental health ?)

Reluctance in use of Seat Belt Use: Failure to use seat belts amplifies injury risks in crashes.

Health Issues : Weak Eyesight , High B.P. , Mental health issues

Improper Driving habits : Improper use of Dipper in night / direction Indicators

ROAD INFRASTRUCTURE

Inadequate Road width : Single land Roads

Road Design: Poorly designed intersections, sharp curves, Non-standard narrow roads, poorly designed medians / View breakers and road curbs in hilly terrain / river crossings can increase accident likelihood. (**Design / Construction audits by 3rd party**)

Road Surface Conditions: Potholes, loose gravel, and slippery surfaces from rain or ice contribute to accidents.

Signage and Lighting: Insufficient signage, faded road markings, and inadequate street lighting **make navigation difficult.**

Pedestrian , 2 wheelers and Cyclist Facilities: Lack of dedicated lanes or crossings increases risks for vulnerable road users. 2 wheeler dedicated lanes is a good idea !

Traffic Congestion: Crowded roads can lead to erratic driver behaviour and rear-end collisions.

VEHICLE CONDITIONS

Brake and Tyre Performance: Worn-out brakes or tires reduce stopping power and traction, especially in adverse weather conditions like rains and snow .

Mechanical Failures: Faulty engines, steering systems, or suspension increase the risk of accidents. (Timely servicing)

Lighting Systems: Malfunctioning headlights, taillights, Fog lights or indicators reduce visibility and communication between drivers on the Road .

Safety Features: Absence or malfunction of airbags, anti-lock braking systems (ABS), or electronic stability control heightens risks during crashes.

Technologies like GPS tracking , Telematics and AI-pwered Fleet management

Technologies like GPS tracking, telematics, and AI-powered fleet management can significantly enhance safety by addressing key risks associated with driver behaviour, vehicle conditions, and operational inefficiencies.

1**. GPS Tracking**

Real-Time Location Monitoring: Helps fleet managers track vehicles in real time, ensuring drivers follow designated routes and avoid unsafe short cuts / hazardous areas.

Geofencing: Alerts managers when vehicles enter or leave predefined zones, enhancing security and ensuring compliance with route plans.

Emergency Response: Provides precise location data in case of accidents, enabling faster assistance and reducing response times.

Technologies like GPS tracking , Telematics and AI-pwered Fleet management

2. Telematics :

The word “telematics” is a blend of two terms: “telecommunication” and “informatics.” Telecommunication is the exchange of information using technology. Informatics refers to the use of computers to gather and analyze data and manage real-world systems.

Technologies : The internet, GPS, and Machine-to-Machine communication (M2M). The field of vehicle telematics also includes wireless safety communications, GPS navigation, integrated hands-free cell phones, and automatic driving assistance systems.

Telematics

Applications / Benefits :

Safety — Increasing safety with in-vehicle driver coaching, risk and driver behaviour reporting, collision notifications and reconstruction, and the ability to locate a stolen vehicle

Fleet Optimization — Streamlining vehicle maintenance with predictive maintenance abilities and remote diagnostics, and fuel management by tracking idling and other fuel-guzzling habits

Compliance — Electronic logging and Hours of Service, IFTA reporting (U.S.A.), and vehicle inspections

Integration — Combining other software systems with telematics such as onboard camera technology and even building new applications

Telematics

Applications / Benefits :

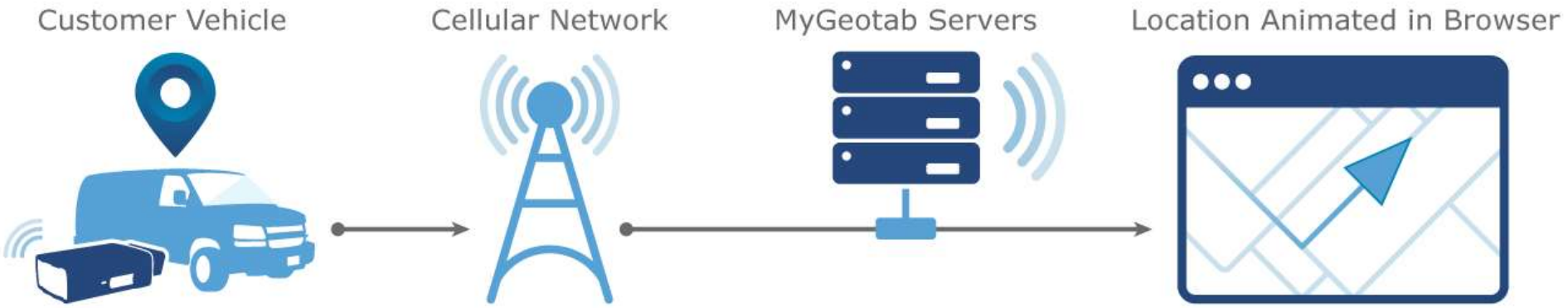
Sustainability — Reducing the fleet's environmental impact and carbon emissions, plus managing electric vehicles

Driver Behaviour Monitoring: Tracks metrics like speed, braking patterns, sharp turns, and idle times. This data allows for identifying and coaching risky drivers.

Preventive Maintenance: Monitors vehicle health (e.g., engine performance, tire pressure) and sends alerts for maintenance, reducing the risk of mechanical failures.

Incident Analysis: Records data from crashes or near-misses, aiding in understanding causes and implementing corrective measures.

TELEMATICS-Architecture




Telematics
Productivity
Vehicle tracking
Asset tracking
Routing and dispatching
True trip miles
Geofencing
Expandability
Analytics Lab
Open APIs
System integration (Software Development Kit)
Software Add-Ins
Hardware Add-Ons
Integrations via Marketplace
Mobile Apps
Safety
Collision notifications and reconstruction
Seat belt usage
Track speeding and aggressive driving
Driver scorecards
Cameras and ADAS
Track driving in reverse
Weather hazard alerts
In-vehicle driver feedback
Risk management
Compliance
Temperature monitoring
IFTA fuel tax reporting
Electronic driver logs (ELD)
Vehicle inspection reports (DVIR)
Fleet Optimization
Predictive maintenance
Fuel management
Route optimization
Idling trends
Engine diagnostics
Digital keys
Fleet benchmarking
Sustainability
Reduce fuel consumption
Track CO2 emissions
Fleet electrification
EV Battery Degradation Tool
EV performance monitoring and reporting
Electric Vehicle Suitability Assessment (EVSA)
Temperature Tool for EV Range

Technologies like GPS tracking , Telematics and AI-pwered Fleet management

3. **AI-Powered Fleet Management :**

Predictive Analytics: Uses AI to analyze historical data and predict potential issues, such as identifying high-risk drivers or routes prone to accidents.

Collision Avoidance Systems: AI-powered systems can detect obstacles, pedestrians, or other vehicles, issuing warnings.

Driver Fatigue Detection: AI can analyse facial expressions, eye movements, or driving patterns to detect signs of drowsiness and alert drivers.

Route Optimization: AI can analyze traffic patterns, road conditions, and delivery schedules to suggest the best routes. This can help reduce fuel consumption, save time, and make deliveries on time.

Behavioural Insights: AI can monitor driver behavior to identify risky driving patterns, such as distracted driving, aggressive driving, and texting. AI-powered dash cams can help ensure drivers maintain their gaze on the road.

AI-pwered Fleet management

Predictive maintenance

AI can analyze vehicle data to predict maintenance needs, which can help reduce downtime and costly breakdowns.

Real-time traffic updates

AI can provide real-time traffic updates to help fleets adapt dynamically and avoid delays.

Weather forecasting

AI can predict weather forecasts to help fleets adapt dynamically and avoid delays.

Data management

AI can help simplify data management and identify problem areas before they become an issue.

Real-time coaching and training programs

AI can help create real-time coaching and training programs.

Implementing a stringent driver selection process for ensuring safe and reliable transportation, particularly in industries like oil and gas, where the stakes are high.

Implementing a stringent driver selection process is critical for ensuring safe and reliable transportation, especially in high-risk industries like oil and gas, where the consequences of accidents can be catastrophic.

1**. Importance of a Stringent Driver Selection Process :**

Safety: Oil and gas transportation often involves hazardous materials. Accidents can lead to environmental disasters, financial losses, and even loss of life.

Regulatory Compliance: Strict industry regulations mandate high safety standards, and employing qualified drivers helps meet these requirements.

Cost Efficiency: Reducing accidents minimizes downtime, legal liabilities, and insurance premiums.

Reputation Management: Reliable drivers reduce the risk of accidents that could harm a company reputation.

STRINGENT DRIVER SELECTION PROCESS

Key Components of a Driver Selection Process

a. **Rigorous Screening Criteria**

Valid Licenses and Certifications: Ensure drivers hold the required commercial driving licenses and are certified in handling dangerous goods.

Experience Verification: Prioritize drivers with proven experience in transporting hazardous materials or operating in challenging conditions.

Background Checks: Conduct thorough criminal, employment, and driving history checks to assess reliability and risk.

b. **Skill Assessments**

Driving Tests: Evaluate skills in handling heavy or specialized vehicles, navigating difficult terrains, and responding to emergency situations.

Hazard Perception: Test the driver's ability to anticipate and respond to potential risks on the road.

Vehicle-Specific Proficiency: Ensure familiarity with vehicles used in the fleet, including tankers or vehicles equipped with specialized safety features.

STRINGENT DRIVER SELECTION PROCESS

c. **Health and Fitness Evaluations**

Physical Fitness: Ensure drivers meet the physical requirements to operate heavy vehicles and endure long hours.

Substance Testing: Regular drug and alcohol testing to prevent impaired driving.

Mental Health Assessments: Screen for issues like fatigue, stress, or conditions that could affect focus and judgment.

d. **Behavioural and Personality Assessments**

Safety Culture Alignment: Assess the driver's attitude toward safety through interviews or psychometric testing.

Communication Skills: Evaluate their ability to report issues promptly and work collaboratively.

Decision-Making Under Pressure: Simulate high-pressure scenarios to gauge judgment and response time.


Thank you