

HackAP Hackathon - Road Transportation and Logistics Problems

Problems statements below are provided by PBL Transport.

- 1. Cost-Effective Pneumatic/Electric Wheel Changing System for Commercial Vehicles: Develop an affordable and efficient wheel changing system for trucks and trailers (light to heavy commercial vehicles) with the following specifications:
 - > Total wheel changing time: Less than 30 minutes
 - Minimal training required for operation
 - Compatible with various commercial vehicle classes (as per Parivahan website <u>https://parivahan.gov.in/parivahan/</u> and manufacturer specifications)
 - Cost-effective solution compared to existing options
- 2. Advanced Tyre Pressure Management System (TPMS) for Indian Commercial Vehicles: Create an affordable TPMS solution tailored for the Indian market, addressing the following requirements:
 - Compatibility with tube tyres (prevalent in the Indian market)
 - Monitoring capability for all tyres on a vehicle (beyond the current 6-tyre limit)
 - > Automatic air-filling mechanism
 - Real-time puncture alerts
 - > Data portability through cloud services
 - Cost-effective compared to existing solutions (e.g., BPW Airsave)

3. Hands-Free "See-What-I-See" Smart Glasses for Remote Expert Consultation:

Design cost-effective smart glasses for the transportation and logistics industry with the following features:

- > Hands-free operation for user convenience
- Real-time video streaming capability
- Interface for remote expert viewing and interaction
- > Durable design suitable for field use
- Cost-effective alternative to using mobile phone cameras



- **4. Comprehensive Diesel Theft Monitoring and Alarm System:** Develop an advanced diesel theft prevention system for commercial vehicles, incorporating:
 - > Accurate diesel theft sensing mechanism
 - Real-time theft alerts to relevant parties
 - Integrated camera for capturing photographic evidence
 - Generate a report with collected evidence which can be FIR (First Information Report) ready.
 - Integration capability with existing vehicle GPS/data modems (if available)
- 5. Streamlined App for Customer Premises Entry and Exit Management: Create a user-friendly application to facilitate smooth entry and exit of commercial vehicles at customer premises:
 - > Pre-approval system for vehicles at origin and destination locations
 - > Automatic document validation
 - > Integration with existing gate management systems
 - > Expedited entry and exit process
 - > Customizable for various types of loads, depots, and delivery locations
- 6. On-Demand Roadside Legal and Insurance Services Platform: Design a platform to connect transportation professionals with legal and insurance services:
 - > On-demand access to lawyers specializing in transportation issues
 - > Location-based matching for incidents
 - > Bidding system for legal services with quick acceptance process
 - > Secure escrow payment system to ensure confidence for all parties



7. Developing a Portable Safety Device (Helmet) for MEWPs:

Background: Mobile Elevated Work Platforms (MEWPs) are essential tools in various industries for working at height. However, they pose significant safety risks, particularly the danger of overhead crushing incidents, which have been on the rise.

Design and develop a portable, safety device (Helmet) for MEWP operators that:

- > Alerts users to overhead hazards and potential entrapment risks
- > Is wearable and not attached to the MEWP
- > Works universally across different MEWP brands and models
- > Provides both visual and audible warnings
- > Is cost-effective compared to MEWP-installed alternatives
- > Must not interfere with existing MEWP operations or controls
- > Should be intuitive to use with minimal training required
- > Must comply with relevant safety standards and regulations
- Attachment mechanism for standard safety helmets will be an added advantage.