Business Plan for MANTHRA-X

Pioneering Precision – The Future of Autonomous Mobility

1. Executive Summary

MANTHRA-X is an intelligent support system for Level 3 autonomous vehicles, integrating object detection, real-time collision avoidance, ethical decision-making, driver monitoring, and in-cabin threat detection. By fusing AI, deep learning, and edge computing, MANTHRA-X addresses critical gaps in existing AV systems, offering a safety-first, ethically aware, and driver-inclusive experience.

Key Features:

- Real-time object detection and motion prediction

- Hybrid Deep Q-Network (DQN) + PID collision avoidance

- Ethical decision-making framework (k-value adaptable)

- Driver attention and cognitive state monitoring

- Multi-modal in-cabin threat detection (visual + audio)

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2. Business Description

Company Name: ManthraX Mobility Systems Pvt Ltd
Founded by: Akalanka P.A.A, Ganepola G.A.N.B, Athukorala W.A.A.D.D.T, Dissanayaka D.M.M.I.T
Headquarters: Colombo, Sri Lanka
Industry: Automotive AI and Autonomous Vehicle Systems
Product Stage: Advanced prototype (Tested in CARLA simulation)

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3. Market Analysis

Industry Overview

The autonomous vehicle (AV) market is expected to grow to over **$900 billion by 2035**, driven by demand for safe, intelligent mobility. Level 3 autonomy is the key transition stage where human oversight is still critical.

Target Market

- Automotive OEMs and Tier-1 suppliers

- Fleet operators and logistics companies

- Government and smart city initiatives

- R&D and academic institutions

Market Need

Most AV systems lack real-time ethical reasoning, driver integration, and in-cabin intelligence. MANTHRA-X solves this with a fully integrated, modular platform designed for both commercial and consumer AV applications.

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4. Competitive Analysis

Feature	Tesla FSD	Waymo	Aurora	MANTHRA-X
Object & Motion Prediction	✓	✓	✓	✓
Ethical Decision Engine	✗	✗	✗	✓
In-Cabin Threat Detection	✗	✗	✗	✓
Driver Cognitive Monitoring	Partial	✗	✗	✓
Real-Time Mobile Alerts	✗	✗	✗	✓

Competitive Advantage: MANTHRA-X combines safety, ethics, and human-centric design in a single real-time system.

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5. Product & Technology

Key Technologies:

- **YOLOv5** for object detection

- **CNN + GNN + Transformer** for motion prediction

- **DQN + PID Controller** for hybrid decision-making

- **MediaPipe & mobile app** for gaze and distraction monitoring

- **MobileNetV2** and audio CNN for in-cabin threat recognition

Platform: Edge-based (Raspberry Pi, Jetson Nano), compatible with mobile (Flutter), and cloud-sync enabled.

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6. Marketing and Sales Strategy

Go-To-Market Strategy:

- **B2B partnerships** with automotive OEMs

- **Pilot integrations** with smart city and fleet companies

- **Academic licensing** to universities and R&D labs

Marketing Channels:

- Industry expos (e.g., CES, Auto AI Europe)

- Partnerships with AV startups and accelerator programs

- Open-source SDK to drive community adoption

Revenue Streams:

- Licensing (OEMs and Tier-1 suppliers)

- SaaS Model for updates, analytics, and alerting

- Custom integration services

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7. Operations Plan

- **Year 1**: Finalize product, real-world pilot with 2 AV companies

- **Year 2**: Scale team, initiate commercial rollouts in Asia

- **Year 3**: Expand into Europe and North America

Key Partnerships:

- SLIIT (academic research)

- CARLA (simulation validation)

- Potential: Dialog Axiata (IoT alert integration), Toyota Lanka (OEM pilot)

8. Management Team

- **CTO – Akalanka P.A.A**: Deep learning & perception systems

- **CEO – Ganepola G.A.N.B**: Strategic management & commercialization

- **Lead AI Engineer – Athukorala W.A.A.D.D.T**: DRL & ethical systems

- **Head of Product – Dissanayaka D.M.M.I.T**: Driver monitoring & in-cabin AI

Advisory Board includes Mr. Samadhi Rathnayake and Dr. Lakmini Abeywardhana.

9. Financial Plan

Estimated Budget:

Expense	Year 1 (USD)
R&D and Prototyping	$45,000
Hardware & Equipment	$20,000
Licensing/Cloud/Hosting	$10,000
Marketing & Outreach	$15,000
Legal/Patent Filing	$5,000
Total	**$95,000**

Revenue Projections (3-Year Forecast):

Year	Revenue (USD)	Profit Margin
Y1	$0 (R&D Phase)	-
Y2	$150,000	30%
Y3	$500,000	45%

10. Funding Requirements

We seek **$100,000 in seed funding** to:

- Finalize product development

- Conduct real-world pilot deployments

- File for intellectual property

- Expand the technical and business team

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11. Risk Analysis

Technical Risk: Delays in edge optimization or model generalization
Mitigation: Modular design for incremental testing and fallback to PID control

Market Risk: AV regulation delays
Mitigation: Parallel deployment as safety enhancement for semi-autonomous vehicles

Privacy Concerns: In-cabin data collection
Mitigation: Local edge processing and GDPR-compliant data handling

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12. Appendices

- Prototype results from CARLA

- Model accuracy tables (YOLOv5, DQN, GNN)

- Driver monitoring UI screenshots

- Ethical DQN reward function graphs