AUTONOMOUS DRIVING ROBOT

make any vehicle, autonomous

RaghuNath (RaNa)

PROBLEM

- * Autonomous vehicle development results in **expensive** product
- * Commonly implemented on vehicles with high customizations
- * Trivial vehicle issues cause the asset to stay idle; loss of revenue
- * Autonomy is possible only on designated vehicles; no flexibility

SOLUTION

- * Autonomous **driving robot** in the driver seat operates the controls
- * **Separate** from the vehicle; Can be **moved** to other vehicles
- * Has **contingency** modes to address the technology limitations

MISSION

We turn **any** standard **vehicle** into a **driver-less** vehicle, as autonomous as other expensive commercial solutions

We help **increase** the **asset utilization**, by quickly shifting our product to any other standard vehicle

WHY NOW?

- * **Social distancing** is the new normal
- * Autonomous vehicles help reduce physical contact
- * World **economy** is **down**: COVID-19
- * Expensive assets go out of commission for unrelated problems
- * Need solutions to quickly **redeploy assets**
 - * Zoomcar, Revv vehicle attachments from owners
 - * QuickRide ride sharing and paid vehicle pooling
 - * AirBnB postings and homestay portals

MARKET SIZE

- * Indian passenger vehicle market grew at a CAGR of 6.2% (2013-19)
- * Addition of around 3.3 million vehicles per year in India
- * Around **36 million** standard **vehicles** will be available for retro-fitting to autonomous mode in India
 - * Assuming an average car usage of 11 years
- * A 2% conversion rate with a US\$11,000 kit creates a market size of about **US\$ 8 billion** in India
 - * Users include **businesses** looking for better utilization of vehicles and **individual owners** choosing not to drive

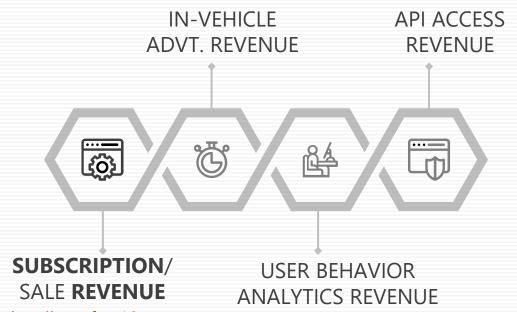
PRODUCT

We will work on an **autonomous robot** placed in the vehicle, that **drives vehicles** using the human operable controls in the vehicle.

The driving robot's actuators will be specially designed to adapt to any vehicle of similar weight category. It can be removed from the vehicle and quickly assembled in a new vehicle.

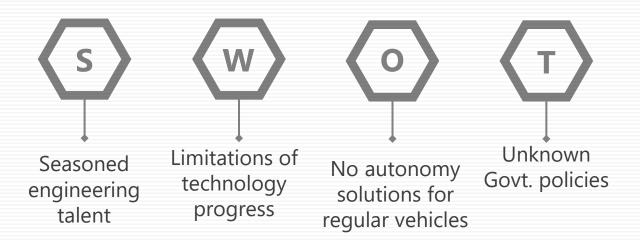
Customized deep learning models, computational resources, and advanced control systems, backed by remote assistance system will enable the **driver-less** travel.

BUSINESS MODEL



*Break-even: 33,500 subscribers for 10 years

SWOT ANALYSIS



PROPOSED TEAM

- * Selected few AEG Lead Engineers as core members
 - * I am an **IITM** B.Tech+M.Tech graduate with **14**+ years, 4 granted **patents**, and international conference **presentations**, and projects in variety of engineering fields
 - * ABS, BMS, Haptic systems, Electric motors, Optimization and Embedded Systems
 - * Projects related to **self-driving vehicle** technology
 - * computer vision and feature extraction
 - * deep learning for object classification
 - * deep learning for behavioral cloning
 - * Few more passionate and skilled members
- * Several long-term and short-term **remote contract** employees

WHY FUND THIS?

- * Multi-billion dollar revenue opportunity with high profit margins
- * Long-term business opportunity focused towards future needs
- * International market opportunities; everyone has equal chance
- * Requires high engineering effort and time for execution
- * Early starters have clear advantage



THANK YOU

RaghuNath (RaNa), AEG/TVSM ra@ieee.org raghunath@tvsmotor.com +91-74110-72448