

# 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

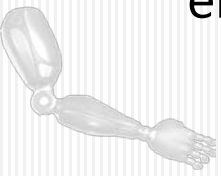
- \* Indian passenger vehicle market grew at a CAGR of 6.2% (2013-19)
- \* Addition of around **3.3 million vehicles** per year in India
- \* Around **36 million** standard **vehicles** will be available for retro-fitting to autonomous mode in India
  - \* Assuming an average car usage of 11 years
- \* 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

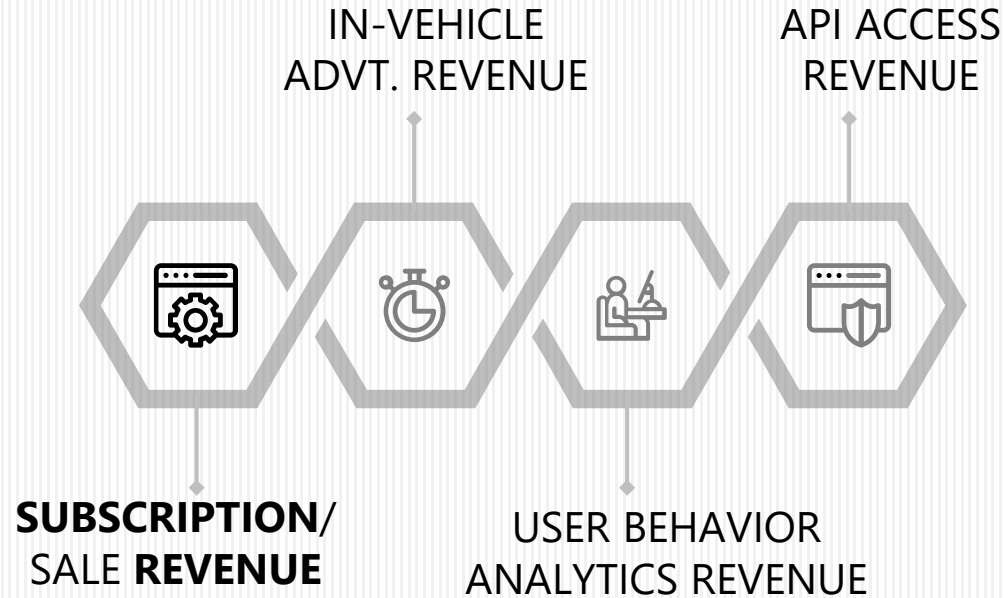
We will work on an **autonomous robot** placed in the vehicle, that **drives vehicles** using the human operable controls in the vehicle.

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.



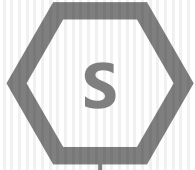
# BUSINESS MODEL



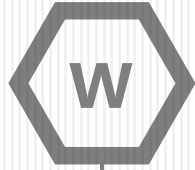
\*Break-even: 33,500 subscribers for 10 years



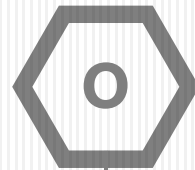
# SWOT ANALYSIS



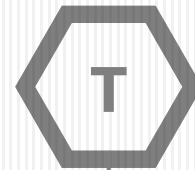
Seasoned  
engineering  
talent



Limitations of  
technology  
progress



No autonomy  
solutions for  
regular vehicles



Unknown  
Govt. policies

# 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@tvs motor.com  
+91-74110-72448

