

# DESIGN OF EMERGENCY AMBULANCE FOR AGENCY AREAS

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**Abstract :** In daily life we can observe the difficulties of carrying the patients, physically challenged people in public places like airports, railway stations, bus stands, hospitals, college campuses etc. This project is an attempt made to ease the task of transportation of patients, and physically challenged persons in agency/tribal areas with sloppy & narrow roads. The purpose of the project is to show that it is possible and relatively simple, to build a multipurpose attachment to the two-wheeler vehicle. Designing and modeling a concept vehicle which can carry patients even in narrow space with good stability. To prepared some drawings in hit & trial method and finally decided to prepare an additional attachment which contains an additional seat to the 2-wheeled vehicles. We drafted the final drawing using 'AUTO CAD' software. This Bike carrier is a concept attachment which is attached to the 2-wheeled vehicles. The attachment is designed to be made with mild steel sheets and cast-iron pipes to make it lighter. The vehicle is designed to carry patients and physically challenged people easily. We hope that this design can become very efficient, cost-effective, and one day mass-produced.

**Index Terms – Patient carrying vehicle, emergency ambulance, trailer vehicle.**

## I. INTRODUCTION

In daily life we can observe the difficulties of carrying the patients, old people, physically challenged in public places like airports, railway stations, bus stands, hospitals, college campuses etc. To aid such people we decided to a fabrication project to ease the task of carrying them. The final object should not be a simple motorized wheel chair or trolley car. It must be a concept attachment to the two-wheeler vehicles. For this we had drawn so many drawings and finalized an attachment model for a two-wheeler.

### 1.1 Patient Carrying Vehicle:

Patient carrying vehicle is a vehicle used in remote rural areas to convey wiped out or harmed individuals to the close-by healing facilities. In earlier days bicycle ambulances are used to carry patients from rural areas to hospitals. But bicycle ambulances are not well suited for emergency transport. The majority of the population lives in villages or homes within the mountainous and hilly regions. This creates a much more complex problem, as reaching medical service centers with the resources to address emergency cases are distant for a majority of the population. Unlike bicycle ambulances, there are currently less emergency transportation options that incorporate a motorcycle. These motorcycle ambulances are more expensive than their bicycle ambulance counterparts, but are more adept to transport heavier loads through terrains.

### 1.2 Types of Bike attachments for Ambulance Carrying Vehicle:

Attachment links to the back, similar to a trailer bed or wagon. Person's orientation can vary facing towards or away from the bike. This attachment is helpful for the driver because it is easiest to control the movement of the motorcycle, as the ambulance is in line with the direction of the motorcycle.



Figure 1 Back attachment

## II. DESIGN

### 2.1 Design Requirements for Bike Ambulance

The design requirements are important for systematically evaluate improvements to existing bike ambulances. This also allowed us to formalize criteria for emergency transport systems based upon our need finding results and prior research.

The requirements are as follows:

- Easily cleanable/hygienic
- Vibrations minimized
- Balanced Horizontal movements/effects from turns, brakes, and acceleration
- Protection from environmental elements (e.g. weather, motorcycle exhaust)
- Patient privacy
- There is space for driver, patient, and additional passenger
- Light weight design (to promote fuel efficiency)
- Capital cost is affordable
- Durable materials and design
- Comfortable interior design (seat, additional materials)
- No sharp edges, points, or hazardous components
- Safe connection mechanisms

### 2.2 Design of Side Attachment:

To maintain accuracy in designing the side attachment is designed in AUTOCAD - 2016 software.

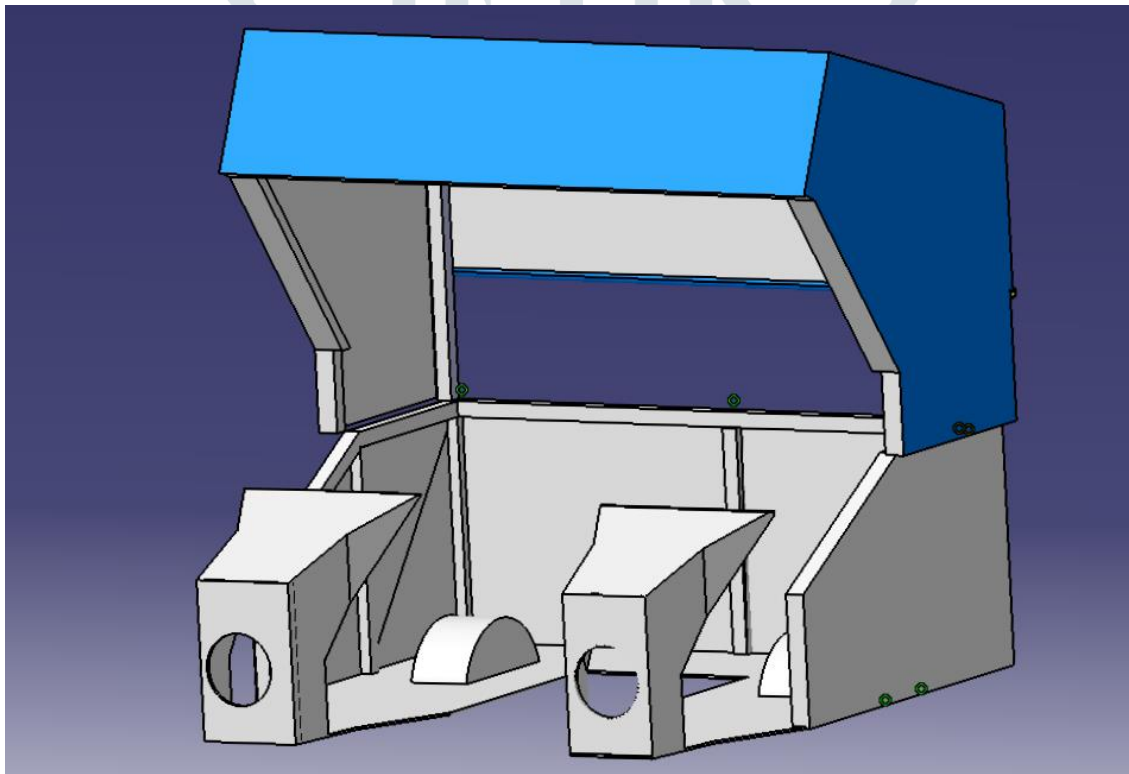


Figure 2 Isometric view drawn in catia software

### III. RESULTS AND DISCUSSION

Emergency ambulance was prepared as per the CAD design and the views are as given in the Fig 3.1

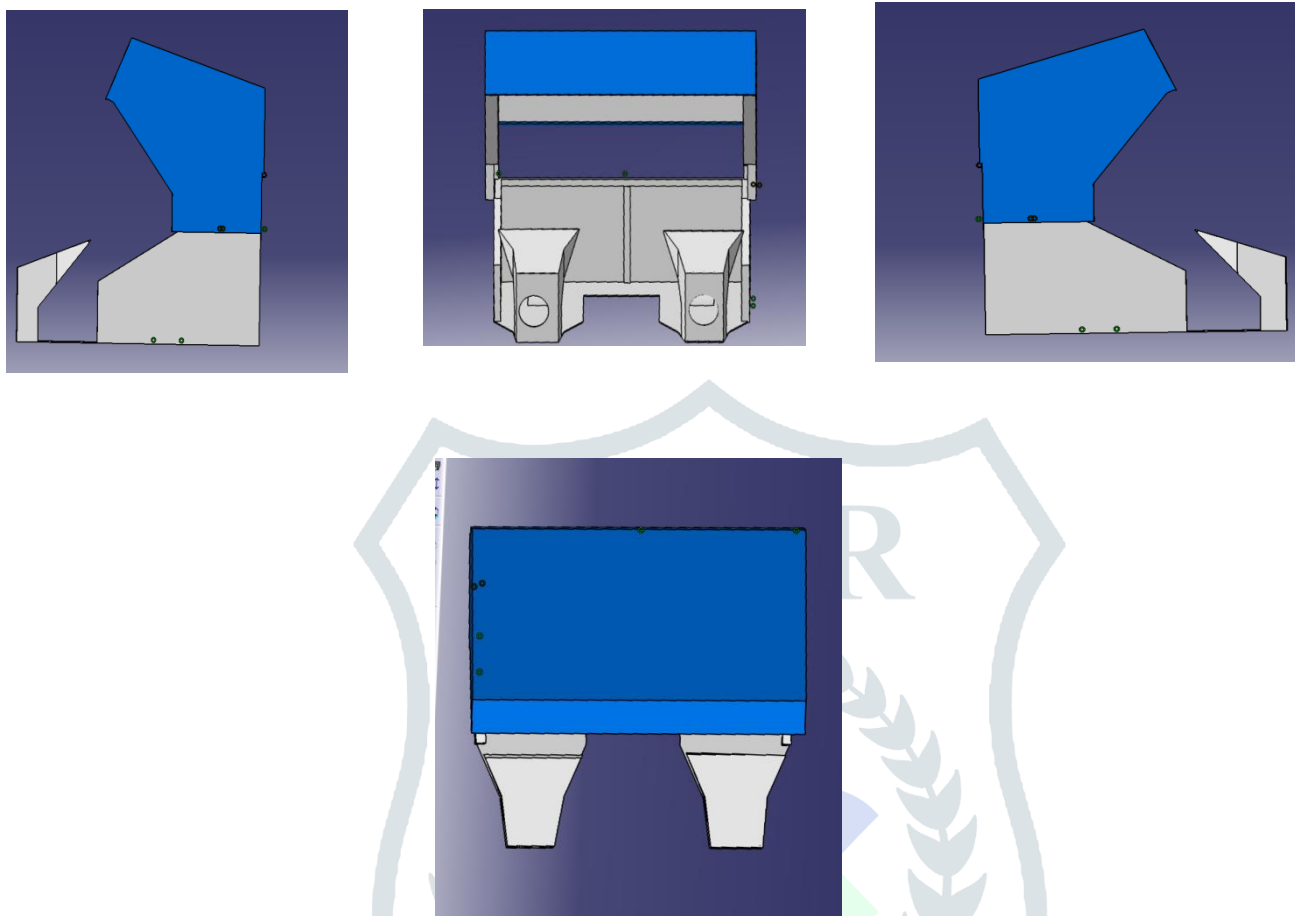


Figure 3 Final catia views

The completed vehicle is very compact (5ft \* 6.8ft) and able to carry patients easily on plain roads and hilly areas. The completed vehicle able to carry small commodities and helps physically challenged people to travel along with their family.

We have tested the vehicle with 4 persons load (including driver) and goes successful. Vehicle can pull all the load tested and reached the maximum speed of 45kmph.

1. Can carry more than one patient at a time unlike conventional ambulance which carries only person.
2. For internal transportation of goods, etc.
3. Physically challenged people travel along with their family.
4. Easy to pull heavy loads.
5. Carry patients from remote rural areas to near-by hospitals.
6. Service can be provided to the patient as soon as possible.

### IV. CONCLUSIONS

A Patient carrying vehicle is designed which can carry two members of people such as patients at agency areas and also can be used to carry physically challenged or old people with ease in public places or industries, agency areas and campuses. The utilization of U-shaped Carrier reduced the cost and weight of the vehicle and also can bear greater loads. As the vehicle is prepared with low height with better ground clearance and enough width and length provides greater stability to the vehicle. The vehicle can pull 2+1 persons easily and even it can climb short ramps. As the design is lighter and cheap to produce, the Govt. or social bodies can adopt it and prepare such vehicles to meet the public need and can decrease the death rate.

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