

Product Design Specification-Rough Draft
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Project: Child Passenger Safety Seat (Child Seat)

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Function: The goal of this project is to develop a safe method of transporting children in ambulances that allows the EMT's to recline the child from the sitting position (cot) to the lying position when the child seat is strapped on a stretcher.

Client Requirements:

The child safety seat:

1. Must be compatible with current stretchers;
2. Must secure a child (12-60lbs) in the event of an accident;
3. Must not restrict the EMT's ability to care for the child;
4. Must be cost-efficient (maximum cost: \$1000.00?) and user-friendly;
5. Must be collapsible, or at least no larger than current seats;
6. Must be reclinable from 90 to 180 degrees;
7. Must be easily sterilized and not cause any contamination.

Design requirements:

1. Physical and Operational Characteristics

- a. *Performance requirements:* The safety seat should secure a child from 12-60 lbs. during normal ambulance transport and in the event of an accident. The seat should also recline from upright (90 degrees) to reclined (180 degrees) position.
- b. *Safety:* The seat must not provide any physical or mental harm to the user. It must not interfere with work of the EMT. In the event of an accident, the seat should protect the occupant and stay secured to the stretcher.
- c. *Life in Service:* The safety seat should be rigid enough to endure at least 2 years of normal service, yet in the event of an accident the seat may deform and may need to be replaced. .

- d. *Shelf Life:* The shelf life will differ depending on how the seat is constructed and how much it costs. However, the life and the durability of the child seat must be maximized to the best of the ability.
- e. *Operating Environment:* The seat will be either stored in an ambulance or in a hospital. The seat will need to sustain and function properly in various temperatures (0-45° C). The seat should not be flammable.
- f. *Ergonomics:* The seat should comfortably secure a child in the specified weight and height range. The mechanism of reclining the seat should also be intuitive and not require a great deal of force and special training.
- g. *Size:* The seat should be compatible with current stretchers and should collapse to fit in the cupboard on an ambulance. Further, the seat should fall in the weight ranges of the current automobile child seats.
- h. *Weight:* The seat must not weigh more than 25 Kg and must be easily carried.
- i. *Materials:* The device can be made of any material (i.e. plastic) as long as it is durable and does not cause any physical harm to the user and the operator.
- j. *Appearance, Color, form, shape:* The device must not be bulky and can be of any shape or color as long as it aesthetically appealing and compatible with current stretchers.

2. Production Characteristics:

- a. *Quantity:* Only one seat is needed for the prototype and testing purposes but millions are needed for ambulances all across the world.
- b. *Target Product Cost:* Depending on the functions of the device and materials it is made of, it can cost up to \$1000.00. Since we will be modifying a pre-built child seat, it will cost significant less than the money allotted.

3. Miscellaneous

- a. *Standards and Specifications:* The seat will be in direct contact with humans; therefore, it will need to be successfully tested on dummies and other similar models before it can be approved for children. Furthermore, it needs to fit the current Emergency Vehicle Safety guidelines set by hospitals and National Highway Transport Safety organization.
- b. *Competition:* No such type of models (described in the function section) exist in the market. However, there are thousands of companies that make automobile child seats which are closest to what our client is looking for. However, the current child seats still need to be modified in order to meet our client's needs.