**Needs Interpretation and Problem Statement**

In September 2020, twin toddlers left in a hot SUV for 9 hours were found dead in South Carolina. In one year in Dubai, police rescued a total of 39 children from locked cars. In India, 4 kids suffocated to death in a parked car. These children died after being forgotten in hot cars, thus exposing them to heat stroke and carbon monoxide poisoning[[1]](#footnote-0).

The current measures in place to address this issue are minimal, such as asking caretakers to leave personal items like a purse in the backseat to avoid forgetting a child, or to simply make it a habit to check the back of your car. The FCC in the US recently permitted hot car sensors, and various car companies, such Tesla and Hyundai, are working towards installing alarm systems to detect children in cars[[2]](#footnote-1), but that technology is not yet common and only available on high-end vehicles, thus not affordable for the average consumer.

This is the reason for the clients' needs. Making an affordable and cost-effective solution to this problem, easily accessible by the average person. Below is a list of needs stated by the client and our interpretations.

| Category | Clients Statements | Interpretation |
| --- | --- | --- |
| **General functionality** | I want the device to notify caretakers on their phone that the child is in a car.  The device could also notify bystanders that a child is in the car  I also want this device to keep children/pets safe and alive while help is on the way.  I want the solution to be both an app and a hard device. | The solution must feature communications able to send alerts to mobile devices.  The solution must feature an alarm system audible from outside the vehicle, to alert bystanders  The solution must prioritize the safety of the child while assistance is en-route.  The solution must feature connectivity with a mobile device application. |
| **Design and Compatibility** | I want the device to work for an average person living in the UAE.  I want customers to be able to install the device on their own. | The solution needs to be compatible with most vehicles and smart phones.  The solution needs to be easy to install, and should operate adequately without requiring technicians, advanced tools or advanced knowledge for installation. |
| **Features** | I want the solution to measure CO levels in the car.  I want the solution to include actions to lower the temperature.  I want the device to feature a temperature sensor, but the device should work regardless of temperature conditions.  I want the device to be able to work when the car is off. | The solution needs to be able to detect potentially dangerous CO levels within the vehicle.  The solution needs to be able to lower the temperature to ensure the safety of the occupant.  The solution needs to be able to detect the temperature to determine if conditions are unsafe.  The solution needs to be able to withstand high temperatures while operating adequately.  The solution should feature a redundant, rechargeable power system to ensure continual operation. |
| **Finance and Budget** | This project has no budget.  The product needs to be affordable for the average consumer in the Middle East. | The initial prototype must cost no more than $50.00 CAD to develop.  The solution must be affordable to consumers in the UAE, as well as the rest of the Middle East. |

*Table 1: Client Statements and Interpreted Needs*

**Problem Statement:** Parents and legal guardians in the UAE require an affordable, intuitive, and easy to install device able to ensure the safety of a vehicle occupant in dangerously high temperatures and CO levels.

1. Information given by the client. [↑](#footnote-ref-0)
2. “Forgotten Baby Syndrome: What Is It and How to Avoid It.” *Carlson Law Firm*, 16 Apr. 2021, https://www.carlsonattorneys.com/news-and-update/forgotten-baby-syndrome. [↑](#footnote-ref-1)