

# PREGGERS SEATBELT V 2.0

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## ABSTRACT

This product design presents a new approach and design in enhancing safety for pregnant mothers when they are driving a car or as a passenger in the car through the innovation of the safety seatbelt for them that is called as PREGGERS seatbelt. The product emphasized on cost saving, easy and time efficient during fixing works or installation. The idea behind this innovative creation is nevertheless innovating from an existing 3-point safety belt that caused discomfort to pregnant mothers (either as a driver or as a passenger) to a modern 5-point safety belt that could provide improved safety measures and at the same time providing better comfort to them. This product also is created to reduce or minimize the rate of traffic fatalities and or injuries (i.e. death, miscarriage and etc.) to the pregnant mothers, let say, if they were involved in a traffic crash. The benefits of this product are to warrants the concept of comfort and portability which mean the product is very easy to setup (no sweat) to any type of available vehicles or any types of car seat in the market and at the same time, design of the seatbelt can make the pregnant women feel comfortable and give protection to the them and the baby in the womb whenever they using it.

**Keywords:** seatbelt, pregnant, safety, preppers, design

## 1. INTRODUCTION

There is a lack of solution or invention of seatbelt meant for pregnant mothers, especially in Malaysia. The lack of immediate response and research has left this problem unsolved. Hence, no action can be taken by RTD to penalize pregnant mothers for not wearing seatbelt. More than that, Malaysia legislation does not strictly implement “seat belt” as a mandatory for pregnant women (refer to the exemption as mentioned in: Application of Seat Belts by Jabatan Pengangkutan Jalan Malaysia). When these pregnant mothers are not buckling up, they have a higher risk of being exposed to traffic fatalities and/or injuries that will harm the mother and the baby in the womb.

Wearing a seatbelt reduces the risk of a fatal injury up to 50% and 75% for the front seat occupants and rear seat occupants respectively [10]. Prior to this research done by WHO, in the late 90’s, safety belt or seatbelt was effective in preventing fatalities but not so much in preventing injuries [2]. This research has also highlighted that though wearing a seatbelt could reduce the risk, its effectiveness is abridged when the severity of the crash escalates. In a similar context in Malaysia, the importance of seatbelts and child safety seat in protecting the users from the force of a sudden road collision/crash was also highlighted [11]. Furthermore, wearing a seatbelt has shown to significantly reduce the risk of being thrown out of the vehicle in the event of a crash [10].

In these days and age, female drivers are not rare, nor is it uncommon for pregnant mothers to be behind the wheel. Though the risk of something adverse happening due to mishap is high in any situation for these pregnant mothers, yet the leading cause of loss of lives or traumatic injuries for these pregnant mothers (either to themselves or their fetus or both) is road traffic accidents [1]. Numerous number of

studies has been done looking at: the safety of pregnant drivers [1,5,8], the health risk involved when pregnant mothers are driving [3,9], the effect and impact of road traffic crashes to the pregnant occupant (either driver or passenger) and her fetus [4,6-9] as well as reporting the incidence, risks, and characteristics of pregnant women in road collisions [7-8]. Even though these mothers knew that not buckling up is a physical peril but a substantial amount of them still choose not to wear a seatbelt [5]. They have noted that most of the pregnant mothers who choose not to buckle up their seatbelt believed that wearing one would harm (/or kill) the baby in the womb (should there be a sudden mishap on the road) and it is safer for the fetus if the mother did not wear a seatbelt when she is driving. However, this notion has no scientific evidence to support it. On the contrary to this belief, wearing a seatbelt while driving is proven to be safer for these pregnant mothers. Some of these past researchers have highlighted the impact of motor vehicle collision to pregnant women drivers (at several stages of pregnancy) while wearing or not wearing a seatbelt. Findings on a study stated that seatbelt should be encouraged to be used as it protects pregnant women drivers during various types of accidents as opposed to not wearing one and risk increases significantly in pregnant woman and her fetus when no seatbelt is worn [1], implying that the restraint system plays an important role to the safety of the pregnant women drivers and the fetus. However, its role in providing protection may vary according to the stages of pregnancy. To sum it up, both studies stressed that buckling up is still safer than not buckling up for these pregnant women. There are flaws in the current seatbelt design for this type of drivers (i.e. it is considered as uncomfortable, it lacks safety measures for them when they alter the position of the strap using a strap stopper, the strap restraining the body is not ergonomic and causes discomfort, and the strap exerts pressure on the womb of pregnant women) [5].

Thus, to address these issues, the objectives of this study is to design a modern seatbelt with improved safety features and provide comfort to the pregnant women; to reduce the rate of fatal injury (death, miscarriage and etc) of pregnant mothers if they involved in car crash; to increase comfort and ease movement for the pregnant women while driving or as a front passenger and give portable fixture which can be applied to any vehicles.

## 2. MATERIAL AND METHOD

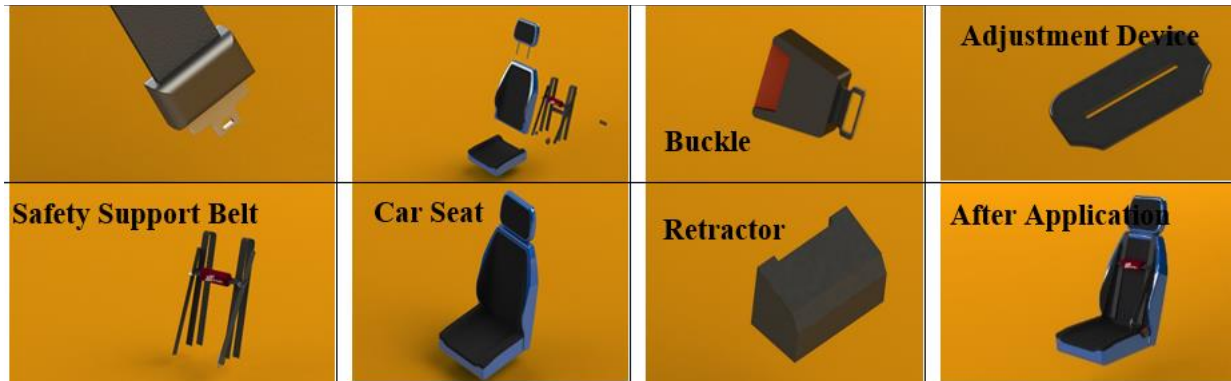
The project scope in designing this modern seatbelt can be divided into three (3) key areas, first refer to the design itself that focuses on comfort, ergonomic and enhanced safety features; second, the portable features that can be applied in any vehicle and lastly, ergonomic structure.

Thus, the comparison after designed the new improvised seatbelt with existing seatbelt is as follow:

Table 1. Before and After Application (Original vs. Preggers Seatbelt)

Original Seatbelt	Preggers Seatbelt
Three-point safety seatbelt.	Five-point safety seatbelt.
Seat belt Design: Across the mother's womb.	No more!
Retractor that made difficult for the pregnant women to adjust the sitting position.	Come with two retractors that ease the pregnant women to adjust the sitting position.

The technical design and components used in this project can be illustrated as follows:



**Figure 1.**

### **3. CONCLUSION**

Car accidents among pregnant mothers that can sometimes kill the fetus cannot be totally prevented but it can be avoided or minimized through protective equipment with enhanced features of seatbelt. Hence, a new approach is needed to overcome this issue by implementing new seatbelt designs for the passengers like the Preggers Belt. With the support system that designed to improve durability during the collision, the installation of the product also easy, time efficient and cost saving, the design that can make the pregnant mothers feel comfortable and at the same time give protection to them and the baby in the womb and the portable and adjustable product can ease the fixing works and can be placed to any type of car seat, Preggers seatbelt can be considered as practical seatbelt design for improving the safety levels of pregnant women during their destination journey and can also be applied in other transportation modes such as buses or other public transport.

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