

SAFE BUS TRANSPORT FOR KIDS



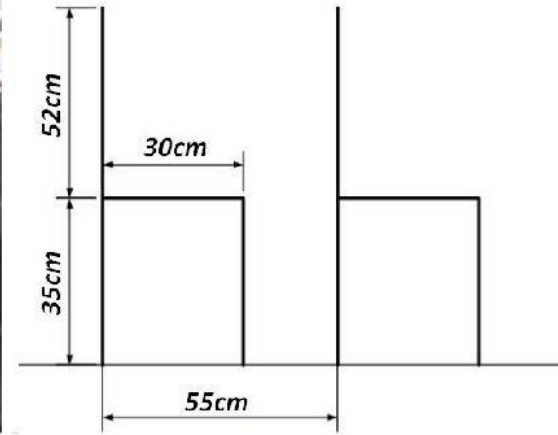


Since 2007 in Uruguay every passenger in a vehicle have to wear seatbelts.

In 2008 TEU (School bus Union) got in contact with Gonzalo Rodriguez Memorial Foundation (GRMF) for an advice.

School buses are a private service.

INSIDE THE VEHICLES

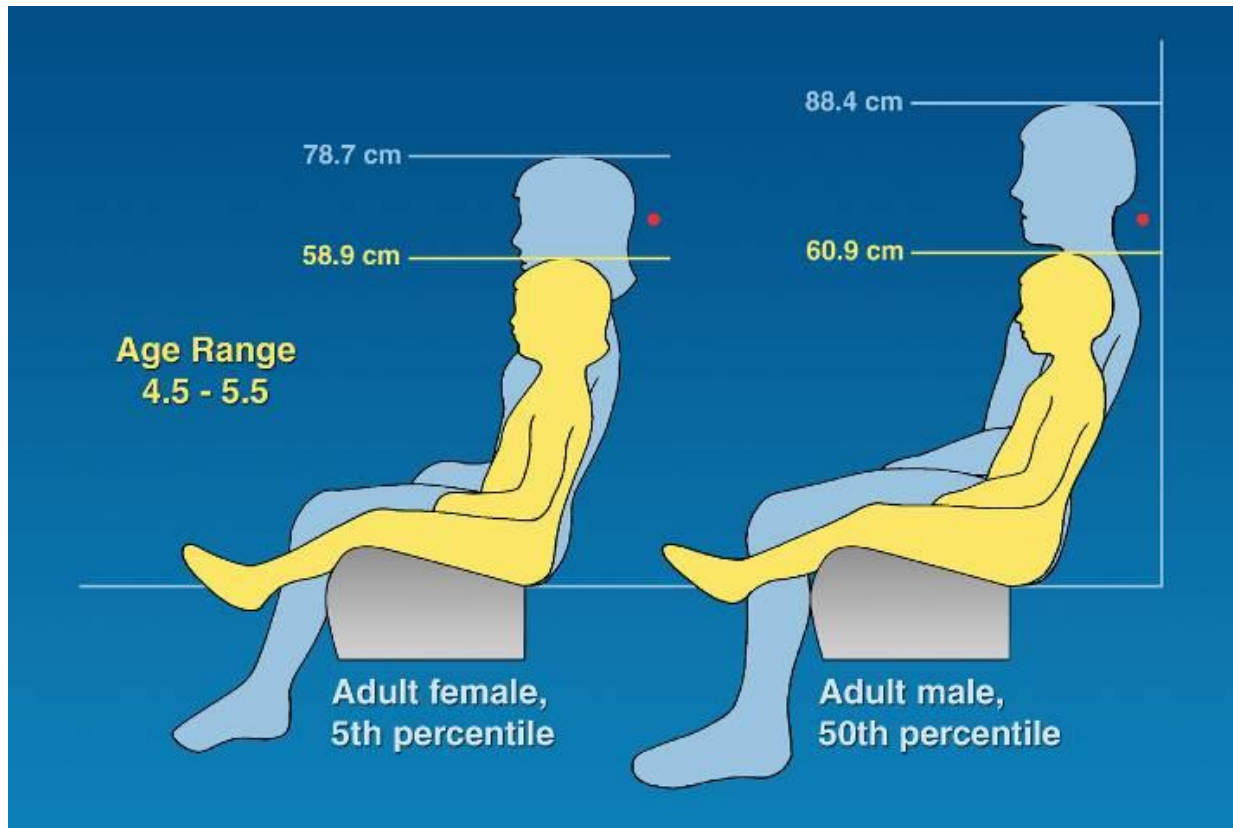


We warned that the seats in the vehicles were not capable of being adapted for seatbelts.

The seats themselves pose a major risk with sharp edges and weak legs.

GRMF scanned the market for a feasible and safe solution.

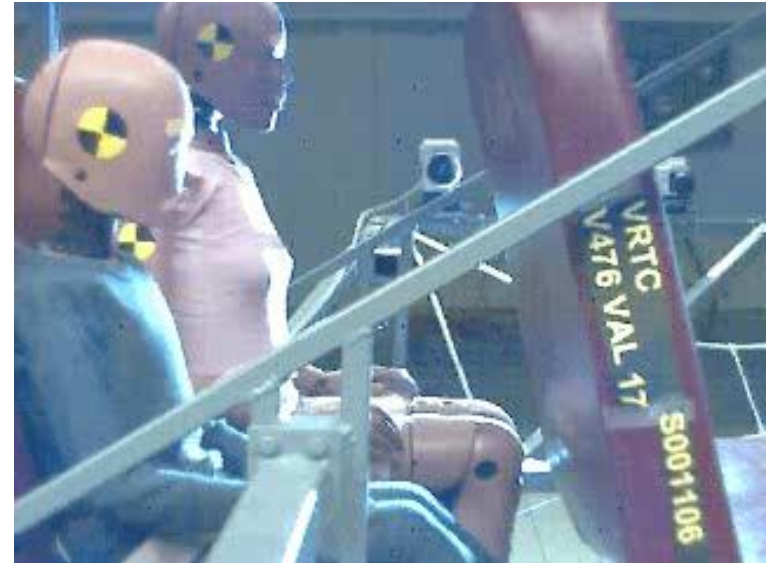
Ergonomics



Ergonomic aspects in terms of femur.

Shoulder seatbelt anchor height.

IS A 2 POINT BELTS SAFE ENOUGH?



48
Km/h

Lap belts are not a safe option due to the risk that they offer to occupants mainly children, high neck momentum, head force and deceleration, spine tension, etc.

IS A 3 POINT BELT SAFE ENOUGH?

With 3 points belts there is still a high risk for children.

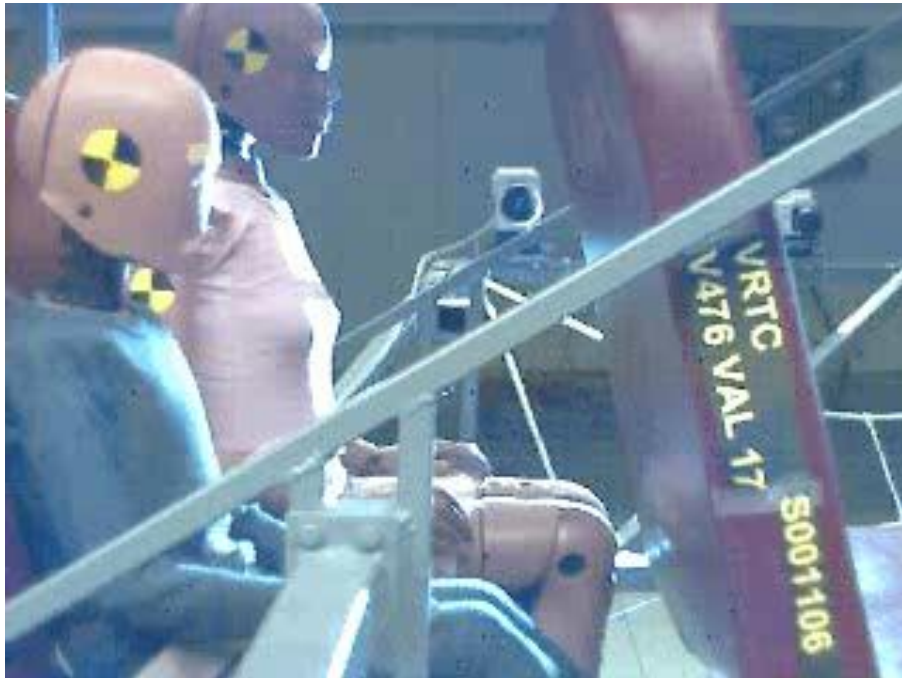


Proposed solution:



Few seat manufacturers with real knowledge about children as a passenger.

Lapbelt vs. proposed solution:



Lapbelt



3 point belt with adjustable height.

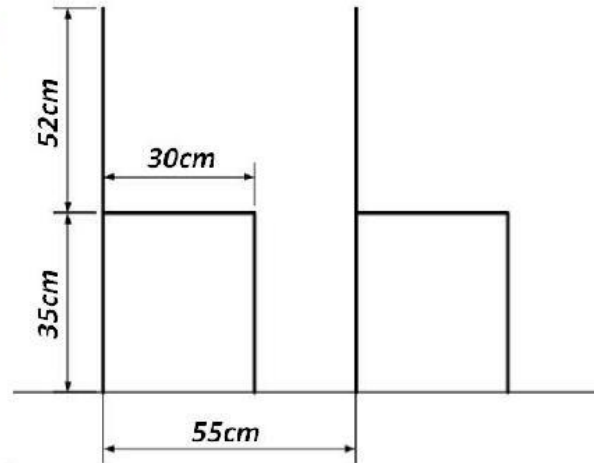
Tests in different scenarios:



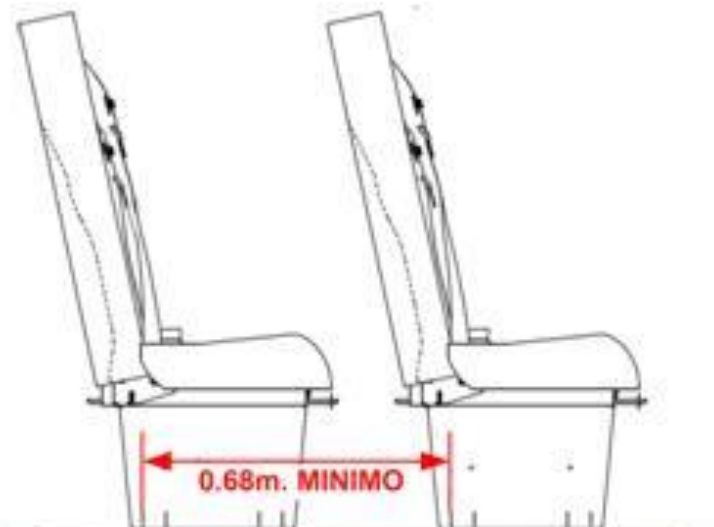
Tests show protection for rollovers as well.



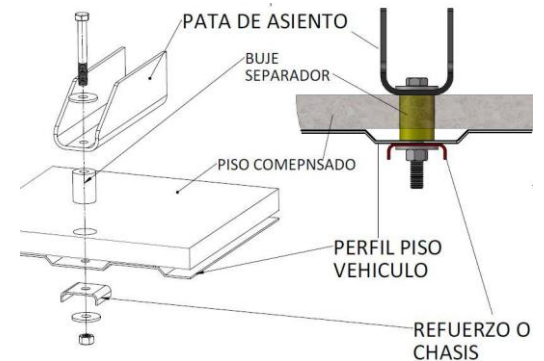
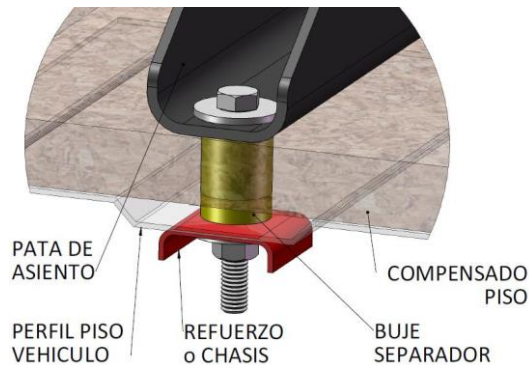
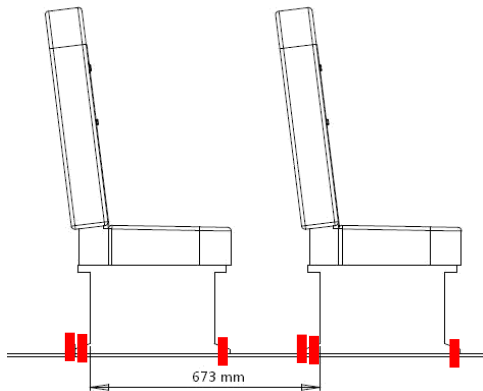
Starting point



The proposal



PROTOTYPES WERE DEVELOPED



MAIN HIGHLIGHTS

Short seat length to allow children to flex knees comfortably.

Shoulder height adjustment.

3 point belt allows CRS's installation.

ISOFIX optional.

Best option for medium and small buses.

Also consider children with physical limitations.



Status in Uruguay 2019

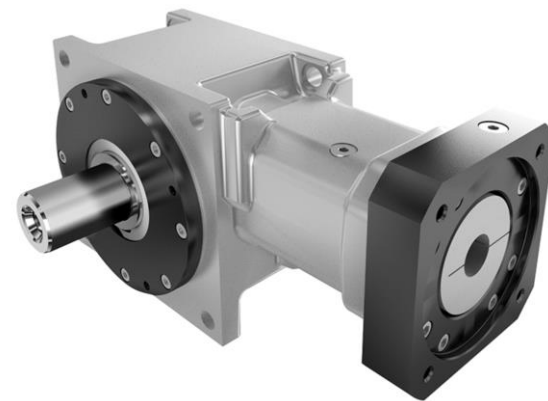
School buses with 3 point belts and CRS (when required by size) are mandatory in Montevideo, the capital city.

Questionable cheaper local copies of the proposed seat also came in the market without proof of its safety performance.



Key points to consider

- The safety issue being confronted is challenging because of different vehicles such as M2 and M3.
- Anchorages, seatbelts, seats and vehicle structure should be in the scope.
- Seats must have ISOFIX / I-size anchorages.





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