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Analysis of dynamic behavior and safety of baby carriages in public transportation buses

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Abstract

Issues concerning the use of baby carriages in public buses are still pendant of international legislation that could contribute to unify provisions around accessibility and safety on this type of transportation. There is actually a lack of knowledge around the dynamic behavior and forces involved in the movement of baby carriages when on board in public transportation services. This paper focuses on an analysis of the forces transmitted to the baby carriages and their behavior during normal operation and critical maneuvers by public buses. The article presents partially the results obtained from a research project conducted by the Institute of Design and Manufacturing (IDF) of the Universitat PolitÃcnica de ValÃncia (Spain) in cooperation with the Institute for Automobile Research (INSIA) of the Universidad PolitÃcnica de Madrid (Spain). The aim was to establish the technical requirements for accessibility and safety of baby carriages (US) or prams (UK) in public buses that could help national and international

community to develop standards and provisions on this type of people mobility.

A series of tests with different types of baby carriages were carried out in public transportation buses in closed tracks and open roads to simulate the behavior of critical maneuvers in urban traffic. From an analysis of the testing results it was possible to identify situations where restraint systems should be used, as well as the safest orientation and location within a bus for baby carriages, and enabled the development of a *Code of Good Practice*TM for bus operators, users, and baby carriage manufacturers. Furthermore, the analysis of the dynamic forces allowed the development of a new restraint device for securing carriages inside the vehicleTMs passenger compartment.

Highlights

- ° Establishment of requirements to get access and safety of baby carriages in buses.
- ° Work will contribute to unify provisions for developing future international policy.
- ° Identified safest areas of bus for locating unfolded baby carriages during trip.
- ° New *Code of Good Practice* for bus operators, users and carriageTMs manufacturers.
- ° Developed new restraint system for secure baby carriages inside a public bus.



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Keywords

Baby carriages; Stroller; Accessibility; Safety; Dynamic behavior; Public transport

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