



**ING. AUTOMOTRIZ**

**Trabajo integración Curricular previa a  
la obtención del título de Ingeniería en  
Mecánica Automotriz**

**AUTORES:**

Pablo Xavier Luna Torres

Matías Gabriel Calvachi Jacome

**TUTOR:**

Ing. Pablo Fernando Ante Sánchez

Análisis del sobredimensionamiento de carrocerías en la eficiencia de frenado de buses de la revisión técnica vehicular del cantón Mejía estudio analítico con base en registros 2023-2024 para orientar mejoras de seguridad vial

## **Abstract.**

**Introduction:** Public transportation in Ecuador is an essential pillar of mobility; however, it faces a technical and safety problem: the over-dimensioning of bus bodies. This practice consists of building structures that exceed the mass recommended by the chassis manufacturer, which, according to statistics, is when the front axle exceeds 55,623 N and the rear axle 51,573 N. This excess weight directly affects braking efficiency, increases stopping distance, and accelerates wear on mechanical components, thus raising the risk of traffic accidents.

**Methodology:** The research was developed with a quantitative and comparative approach, based on the records corresponding to the years 2023–2024 and the first quarter of the year 2025 of the Vehicle Technical Inspection (RTV) of the Mejía canton with an estimated population of 101,894 people, based on national and international technical standards NTE INEN 1323:2009, NTE INEN 2349:2003 and NTE INEN ISO/IEC 17020:2013, in addition variables such as the distribution of loads per axle, the overall and per wheel braking efficiency, as well as the failure rate in the brake test were analyzed. **Results:** Oversized vehicle bodies increase vehicle mass by 10–25%, reducing braking efficiency by up to 30%, increasing technical failure rates (>60%) and the risk to passengers. **Conclusions:** The study showed that the buses exceed the maximum authorized chassis weight by more than 10%, distorting the load distribution with very marked technical deficiencies.

**Keywords:** Oversized vehicle body, Braking efficiency, Road safety, Public transport, Vehicle technical inspection, Category M2 y M3.