Field of Application

This utility model relates to the field of transport engineering, automotive engineering, and the conversion of commercial buses, minibuses, and vans, specifically to systems for creating specialized mobile complexes for various functional purposes. The technology may be used to convert standard vehicles into mobile laboratories, medical complexes, food trucks, service vans, cargo-passenger vehicles, vehicles for sports and recreation, emergency rescue vehicles, funeral transport vehicles, mobile offices, and mobile workshops. This solution makes it possible to use a single base vehicle platform for different specialized tasks, ensure the safe placement of equipment, integrate engineering utilities, and subsequently reconfigure the interior space without complete disassembly of the passenger compartment.

Essence of the Utility Model

The purpose of the proposed utility model is to create a universal, safe, and technically standardized system for converting a commercial bus into a specialized mobile complex suitable for repeated changes in functional purpose. The technology is based on the use of a base load-bearing platform, a modular structural frame, a system of longitudinal and transverse standardized mounting rails, an electrical power distribution unit, a water supply and drainage unit, a ventilation and climate-control unit, an anti-vibration equipment mounting module, replaceable functional modules, and a configuration control unit. The system makes it possible to install, move, secure, remove, and reinstall functional modules in different working zones of the vehicle, connect them to standardized engineering systems, and form various configurations of the mobile complex without modifying the load-bearing structure of the body.

Main Advantages of the Utility Model:

• **Modularity and reconfiguration** — the system ensures rapid changes in the functional purpose of the vehicle without complete dismantling of the interior equipment and main engineering utilities.
• **Standardized mounting** — the longitudinal and transverse rails make it possible to install different types of equipment without individual drilling or damage to the load-bearing elements of the body.
• **Enhanced safety** — the base load-bearing platform and modular structural frame ensure uniform load distribution, while the anti-vibration module reduces impact and vibration loads on sensitive equipment.
• **Integration of engineering systems** — the technology channels of the base platform make it possible to route electrical cables, water supply and drainage lines, air ducts, and data transmission lines with provision for service access.
• **Autonomy and maintainability** — the system may include autonomous electrical power supply, water supply, drainage, ventilation, and climate control, while individual functional modules may be replaced without rebuilding the entire passenger compartment.
• **Broad field of application** — the technology is suitable for medicine, laboratory diagnostics, food service, maintenance services, emergency rescue operations, sports, tourism, mobile trade, and other fields.

Conclusions

The proposed adaptive modular system for converting commercial buses into specialized mobile complexes not only reduces design and installation time and improves the safety and reliability of equipment mounting, but also opens up new possibilities for the repeated use of a single vehicle in different functional configurations. It makes it possible to create mobile laboratories, medical complexes, food trucks, service workshops, emergency rescue vehicles, and other specialized facilities on a single

technical platform, reduce the cost of subsequent modernization, improve maintainability, and enable single-unit, small-series, and serial production of specialized vehicles.