

INNOVATION INSIDE

Ford's Programmable Vehicle Model design tool delivers optimum comfort and capability to every Ford interior.



While a vehicle's exterior styling may be what gets the heart pumping, the interior is where we live.

A study by the University of California at Berkeley found that the national daily average time that consumers spend driving a car is 101 minutes — that equates to more than 50 hours a month.

Ford Motor Company understands the need for comfortable, well-designed interiors. For example, its internal research has shown that 82 percent of Ford Five Hundred and Mercury Montego customers view interior styling and comfort as “very important” or “extremely important” in making the purchase decision.

To optimize interior comfort, convenience and ergonomics, Ford uses a new tool called the Programmable Vehicle Model (PVM). It's a patent-pending mechanical device that lets engineers instantly shape a car's full-size interior and look at options for placing seats and controls. This is done at the beginning of a car's development with an eye toward safety, comfort and space.

Previously, an interior design team would build a stationary, three-dimensional “buck” (often made out of wood and metal) from engineering drawings to look at dimensions. Each round of design changes would require another buck be built, adding time and cost to the development program.

This PVM works similar to the 3-D buck except it allows larger surfaces, such as roof sections, door panels and instrument panels, to be moved in and out with the help of hydraulics. Once the dimensions are established, data can be transferred from the device to a computer.

“Our team uses this model to set and confirm interior design options in a real-world environment,” says Gary Boes, Ford chief nameplate engineer. “Adjustments can be made very quickly, allowing the team to test for many more variations, fine-tuning the interior package. As a result, we can better serve the consumer and answer tough questions like: ‘Is the headroom sufficient? Is there enough distance between the first- and second-row seats?’ ”

More than 50 interior points are evaluated during development. Proper design of such matters as seating position, head clearance, steering wheel angle, door and seat surface characteristics, features (running boards, grab handles) and even visibility can make or break the sale of a car, and affect drivers' long-term satisfaction with their vehicles.

“A clear benefit of this new technology is that it truly provides the engineer with an objective point of view,” says Boes. “We can literally step inside a mechanical device that simulates a new vehicle design and make sure the design fits the needs of Ford drivers.”

Recently, engineers on a future car were determining if a headliner design allowed enough headroom for a third-row occupant. The team enlisted the help of about 40 coworkers to serve as test subjects.

“We put 40 different people through the PVM in less than two hours,” says Boes, “and collected a lot of data in a very short period of time.”

