

# DIVERSIFIED

• P R O D U C T •

## DEVELOPMENT

Project Profile - TerraHawk M.U.S.T.

### Diversified Product Development helps design and produce new mobile surveillance vehicle.

#### Idea:

In the desolate regions of southern Texas, many hunters have adapted their trucks to the wide-open terrain of the area. To do so, some have installed a raised deck in their truck beds, basically creating a mobile deer stand. Though this system has given area hunters a heightened advantage, it also sparked another idea for a completely different application.

Observing the benefits of the hunting vehicles, border patrol officials realized this system could also be used to see illegal immigrants crossing the border. In fact, some officials actually began asking to borrow the trucks so they could monitor this activity. After witnessing this demand for such mobile surveillance equipment, John Spence and Tom James identified the border patrol's need for a more specialized vehicle and teamed up to form TerraHawk, LLC.

#### Solution:

Although the partners lacked extensive knowledge of the manufacturing process, they had the mechanical know-how to build a prototype, which was appropriately named the Mobile Utility Surveillance Tower (M.U.S.T.).

Because this surveillance vehicle would often be used on rugged terrain, TerraHawk started with the chassis of a heavy-duty, four-wheel-drive van. Then, behind the driver's seat, Spence and James installed a hydraulic scissor lift, which raised a climate-controlled surveillance capsule to an eye-level height more than 25 feet off the ground. To make the unit more stable, they also added electro-hydraulic stabilizers with a self-leveling feature.

However, the prototype wasn't perfect. An engineer's help was needed to improve the scissor lift and stabilizers, meet industry standards, determine proper components, and set up production. At this point, TerraHawk



**Client:** TerraHawk, LLC

**Location:** Dallas, TX

**Website:** [terrahawkllc.com](http://terrahawkllc.com)

**Product:** M.U.S.T. (Mobile Utility Surveillance Tower)

**Product Description:**  
A full-sized van outfitted with a hydraulic surveillance tower and stabilization system.

#### Diversified Services Provided:

- Product design
- Component selection
- Calculations
- Conformance to industry standards
- Prototype testing
- Documentation
- Purchasing
- Inventory
- Cost monitoring
- Production space
- Manpower for preproduction units
- Providing information for product manuals
- Patent advice

recognized the need for outside assistance, and one of its vendors recommended Diversified Product Development, a full-service design firm. Because Diversified had a wide range of experience working with mobile equipment and aerial lifts, the company was the right fit to help take the M.U.S.T. from prototype to production.

Initially, Diversified was asked to design a new specialized scissor lift for the vehicle, but after evaluating several options, the company recommended a more cost-effective approach. Rather than coming up with a new design from scratch, Diversified specified components from an existing aerial lift manufacturer to be used in the surveillance vehicle. By choosing this method, TerraHawk could save a significant amount of money while taking advantage of field-proven components.

Besides coming up with a solution for the scissor lift, Diversified also improved the vehicle's self-leveling system. This involved altering the existing setup with more durable components, as well as reducing the number of hoses and electrical connections to produce a cleaner overall package.

The next challenge was to ensure the design met industry standards. Because the M.U.S.T. was a unique product, no real standards existed yet. Diversified compared and contrasted similar ANSI/SIA standards in order to determine a unique set of requirements to which the unit should adhere.

After the product design was completed, TerraHawk needed to set up production of the M.U.S.T. Because the company did not have the capabilities to produce it in-house, Diversified put together a solution to manufacture the units at its own facility.

In the pre-production stage, Diversified created documentation and made a bill of materials for the product. Also, the company determined which parts to weld or fabricate at its production facility and which parts to bid to vendors. Prep and paint specifications were then established based on TerraHawk's requirements. Finally, all information was loaded into Diversified's MRP software, and a batch production system was set up to make 10 M.U.S.T. units at a time.

As production continues, Diversified still acts as an extension of TerraHawk's business as other needs arise. Since setting up the manufacturing process, Diversified has also helped in the patent application process by brainstorming and reviewing the patent application.

"Diversified provided us with the engineering experience and manpower necessary to take our M.U.S.T. vehicle from prototype to production," said John Spence, TerraHawk, LLC. "Diversified went above and beyond to ensure our vehicle is the best in the industry."



Diversified's industry experience was an ideal fit for TerraHawk's M.U.S.T. project.



Diversified improved the M.U.S.T. vehicle's stabilizer system.

**"Diversified went above and beyond to ensure our vehicle is the best in the industry."**

John Spence, TerraHawk, LLC.

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Diversified Product Development provides a full offering of design services for every step in the product development process – from concept to production. The company manages projects of every size and specializes in the mobile, construction, oil field, mining, utility and equipment sectors.