Over the next decade Ford is planning vehicle weight reductions ranging from 250 to 750 pounds that will help it meet stringent fuel economy targets without compromising vehicle safety or durability.

Using ultra-high-strength steel is one way Ford has reduced mass in its latest offerings. Upcoming models also use lighter-weight aluminum and magnesium in place of steel for additional weight savings.

Lightweight and down-gauged material applications help enable the use of smaller, more fuel-efficient powertrains – such as Ford’s new EcoBoost™ V6, which provides the power of a normally aspirated V8 with V6 fuel economy.

Ford Motor Company uses a number of ultra-high-strength steels (UHSS) in select structural areas on several of its current models, including the Ford Taurus, Transit Connect, Flex, Mustang, F-150, Focus, Fiesta and Lincoln MKS.

The 2011 Fiesta, makes extensive use of UHSS, including boron steel – one of the strongest weldable materials. The high yield and tensile strengths of these materials allow engineers to design parts that are lighter and stronger than ordinary steel, which means they help protect vehicle occupants and enable fuel economy improvement.

Benefits of ultra-high-strength steel

- **High strength** – Various steels included in the UHSS family are up to four times harder than normal high-strength steel, making them much stronger and stiffer.
- **Light weight** – UHSS can be formed in pieces that can be up to 10 to 15 percent thinner than normal steel without sacrificing strength, which enables weight reduction and improved fuel economy.
- **Shape-ability** – UHSS can be formed into complex shapes that can be welded into structural areas such as pillars and bumpers.

Ford researchers are looking at the possibility of using more dual-phase and boron steels in roof rails, front rails, rocker panels and crossmembers. The 2011 Fiesta uses more boron steel components in its roof pillars.

The use of high-strength steels, such as high-strength low-alloy, dual-phase and boron steel has helped Ford perform well in crash tests, earning its vehicles more U.S. government five-star safety ratings than any other brand, and more Top Safety Picks from the Insurance Institute for Highway Safety than any other automaker.

All Ford vehicles use boron steel in their door intrusion beams, which helps protect occupants in side-impact collisions. In North America the following vehicles also use ultra-high-strength steel in areas that are critical to occupant protection, including:

- Ford Fiesta (A-pillar)
- Ford Taurus, F-Series Crew Cab and Lincoln MKS (B-pillar)
- Ford Focus and Mustang (bumper)
- Ford Transit Connect (front crossmember)

The 2011 Fiesta uses more boron steel components in its roof pillars.

Boron serves an array of household and industrial uses, ranging from the ordinary (detergents, insecticides, enamel and glass) to the extraordinary (pyrotechnics, rocket fuel, nuclear reactors).

The element also is used to strengthen aerospace structures and sporting goods such as golf clubs and fishing rods.