

The elegance of nature's designs. In the 1990s, Japan's high-speed trains had an excellent safety record while moving large numbers of commuters. Unfortunately, when entering tunnels, they generated atmospheric pressure waves that reached tunnel exits at the speed of sound producing large booms heard over 1,000 feet away. The rail line executives wanted trains operating at faster speeds but increasing the traveling speed of the existing trains increased the sonic booms at tunnels. An engineer working on a solution recalled from his birdwatching experiences that kingfishers (birds that dive at high speed) enter water with hardly a splash. The bird's bill shape, he speculated, was the reason for its efficiency entering water. Its upper and lower beaks are triangular in cross section and curved where the triangles meet at the sides. The engineer and his team researched and tested several different nose designs, including the Kingfisher' beak shape. They found that this shape was by far the most efficient in decreasing sound. In 1997 the new electric train was put into service. With its newly designed nose, it travels 185 miles per hour reducing travel time between cities by 20%, uses less power, and is significantly quieter.



All About Birds

https://www.allaboutbirds.org/guide/Belted_Kingfisher/id



Credit: D A J Fossett