

# Visions of Nuclear-Powered Cars Captivated Cold War America, but the Technology Never Really Worked

From the Ford Nucleon to the Studebaker-Packard Astral, these vehicles failed to progress past the prototype stage in the 1950s and 1960s



A nuclear-powered car lined with lead and other materials to protect its passengers from radiation would weigh at least 50 tons—more than 25 times as heavy as the average vehicle.



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Car buyers today have their pick of gasoline-powered, electric and hybrid vehicles. But if some 1950s visionaries had their way, another option would be available in dealer showrooms: nuclear.

In the late 1950s and early 1960s, at the height of the United States' quest for peaceful uses for atomic energy, several major carmakers rolled out prototypes for nuclear-powered automobiles. Foremost among them were the Ford Nucleon and Seattle-ite XXI and the Studebaker-Packard Astral.

In theory, nuclear-powered cars could run for thousands of miles without refueling, and some could even fly. But several problems remained. For one, nobody had developed a nuclear power plant small enough to fit into a car. For another, scientists calculated that an automobile with enough lead and other materials to shield the driver and passengers from radiation would weigh at least 50 tons, making it more than 25 times as heavy as the average vehicle. There was also the question of what to do with the nuclear waste.

These issues were never resolved, and the world quickly moved on. Still, the surviving prototypes offer a tantalizing glimpse of what might have been.



A woman poses next to a full-size model of the Studebaker-Packard Astral. Studebaker National Museum

# The rise of the Astral and the Ford Nucleon

By the 1950s, the idea of nuclear-powered automobiles would have been familiar to science fiction and comic book fans. “Automobiles,” as they were sometimes called, had appeared in pulp sci-fi magazines as early as 1928. DC Comics’ *Boy Commandos* series introduced one in a 1949 issue, calling it “the fastest machine on land, on sea and in the air.” Tom Swift Jr., a fictional teenager who succeeded his father in a popular series of books for young readers, also got a “triphilian atomicar,” though he had to wait until 1962 for it.

Meanwhile, real-life carmakers were starting to tease the public with their visions of Atomic Age wonders. Within the first three months of 1958, two were already making headlines.

First out of the box was the Astral, which made its local debut at the South Bend Arts Center in Indiana in January 1958. That April, it went on display at the International Automobile Show in New York City.

The Astral was a full-size mock-up of a car that was designed to balance on a single wheel stabilized by a gyroscope—when, that is, it wasn’t flying through the skies or sailing the seas. Though the prototype lacked a motor, the Astral was reportedly meant to run on atomic energy, either from its own nuclear engine or power beamed to it from another source, says Kyle Sater, the curator at the Studebaker National Museum in South Bend.

Additionally, the vehicle was supposed to generate a forcefield around itself to prevent collisions, providing some reassurance to anyone worried that a fender bender might end in a mushroom cloud.

While it never got off the ground (or onto the road), the Astral made the rounds at car shows and dealerships before eventually winding up at the Studebaker National Museum, where it resides today. As Sater says, visitors often remark on its unmistakable resemblance to the flying car from “The Jetsons.”

Probably the most publicized nuclear concept car of its day was the Ford Nucleon, which the Detroit automaker unveiled in February 1958. *Newsweek* wondered if it could be “The Atomic Car of the Future?”



A three-eighths scale model of the Ford Nucleon The Vox Agency

Rather than a full-size prototype of the car, Ford produced a three-eighths scale model. While the Nucleon was designed to be 200 inches long, or close to 17 feet, the prototype was just 75 inches long, or a bit over 6 feet.

The rear of the car, behind the passenger compartment, would have contained what Ford promotional materials described as a “power capsule” with a radioactive core. After traveling 5,000 miles, the core could be recharged at a special charging station, which its designers envisioned “as largely replacing the present-day service station,” according to a company brochure.

Ford acknowledged that a car like the Nucleon wasn't a realistic prospect in 1958 but said it had been “designed on the assumption that the present bulkiness and weight of nuclear reactors and attendant shielding will someday be reduced.”

Held in the collections of the Henry Ford Museum of American Innovation in Dearborn, Michigan, the Nucleon prototype is currently on loan to the Atomic Museum, a Smithsonian Affiliate in Las Vegas.

## The end of the era of nuclear-powered cars

The U.S. was not alone in its efforts to race into the age of atomic cars. Also in 1958, a French automaker released a prototype for the Arbel Symétric, a car intended to run on nuclear waste. Russia claimed to have invented a nuclear-powered vehicle as early as 1955, but as the American magazine Car and Driver reported, “Coming from a nation that modestly

admits to having invented everything ... this failed to create the excitement it might have.”

In 1962, Ford announced its second foray into a nuclear future, showing off the Seattle-ite XXI at that year’s Seattle World’s Fair, where it became a star attraction. The streamlined two-seater had six wheels (four in the front and two in the back) and was slated to be powered by either “fuel cells or a compact nuclear device,” a Ford promotional brochure said.

Like the Nucleon before it, the Seattle-ite existed only as a three-eighths scale model, making it another concept car that was more concept than actual car. Ford readily admitted as much: “A styling experiment like Seattle-ite XXI, with its many forward-looking features, could lead to exciting new concepts of automobile styling, comfort and safety,” the brochure noted.

The Seattle-ite marked the end of the 20th century’s brief flirtation with nuclear-powered cars. The technology to produce a working one simply didn’t exist.

At the same time, however, Cold War engineers and designers had been drawing on government funding to experiment with alternative modes of transportation, in some cases more successfully. The first nuclear submarine, the USS Nautilus, was commissioned in 1954. The first nuclear-powered aircraft carrier, the USS Enterprise, followed in 1961. A nuclear-powered civilian cargo ship, the Savannah, was launched in 1959 and spent much of the 1960s visiting ports in the U.S. and around the world to promote the government’s Atoms for Peace program. Other experiments that never got far off the drawing board included nuclear-powered airplanes, passenger ships and dirigibles.



The rear of the Ford Nucleon would have contained what promotional materials described as a “power capsule” with a radioactive core. [The Vox Agency](#)

Even the humble elevator might have gotten a nuclear makeover if Frank Lloyd Wright had succeeded in his plans. In 1956, the architect proposed installing 76 of them in a mile-high skyscraper he envisioned for downtown Chicago—one of the many Wright projects that never came to fruition.

## The future of nuclear cars

More than 60 years have passed since the world gave up on cars with a nuclear reactor under the hood. Are we any closer today to seeing one of these futuristic marvels in our neighbors’ driveways?

Sadly, or maybe happily, depending on your point of view, most experts think not.

While fitting a reactor core into a car or truck might be feasible today, the weight of the surrounding shielding remains an unsurmountable problem, says Jacopo Buongiorno, director of the Center for Advanced Nuclear Energy Systems at the Massachusetts Institute of Technology. What's more, the nuclear scientist and engineer adds, a "nuclear-powered car would probably cost 100 times as much" as a conventional one.

Even so, atomic energy could play a role in tomorrow's automobiles, albeit indirectly. For one thing, nuclear power currently accounts for about 20 percent of the electricity generated in the U.S., meaning it already supplies a sizable share of the power that's used to recharge electric cars.

Nuclear power could also aid in the production of cleaner fuels, for example by generating electricity to split water into oxygen and hydrogen. That hydrogen could power fuel cells, which would, in turn, provide electricity for car engines. Finally, electricity produced through nuclear power could be used to create a synthetic fuel much like gasoline or diesel. By combining hydrogen and carbon dioxide drawn from the earth's atmosphere or from seawater, this process could be net carbon neutral.

In other words, we might all be driving nuclear-powered cars someday—just not the kind our 1950s forebears imagined.