

# PRIUS View



## Next Generation Prius—take a look!



To see more pictures  
of the 2004 Prius go to  
[www.priusview.com](http://www.priusview.com)

Prototype shown. Production vehicle may vary.

How would you describe the 2004 Prius?...It certainly looks like a Prius, but there's something else going on. It's sleeker and stronger, and the first Toyota product featuring the advanced Hybrid Synergy Drive. Are we seeing the evolution of a species in progress? Prius was the world's first mass-produced hybrid car, so after five years, it's time for an update. What we have is the the next great step forward in hybrid vehicle design...and a new Prius logo! **PRIUS**

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### 2004 Prius



**How can I  
get one?!!**

The 2004 Prius will be available at Toyota dealers later this year. We promise it will be worth the wait! Toyota will be making more announcements about Prius during the spring and summer, so for the latest announcements, sign up at:

**(No longer current)**

### How is it different ?

- **More power**
- **Bigger/more interior room**
- **New high-tech amenities**
- **Liftback design with folding rear seats**
- **Improved handling and performance**

**"When** are we going to see a new Prius?"

**"What's** next for Prius?"

**"How** about a bigger and faster Prius—*without* sacrificing mileage and super-low emissions, of course."

**T**hese are questions *Prius View* readers have asked in the past year. Until now, we've had to bite our tongue rather than share our excitement about what's next for Prius because, well...Toyota has to keep the best news under wraps until the right moment.

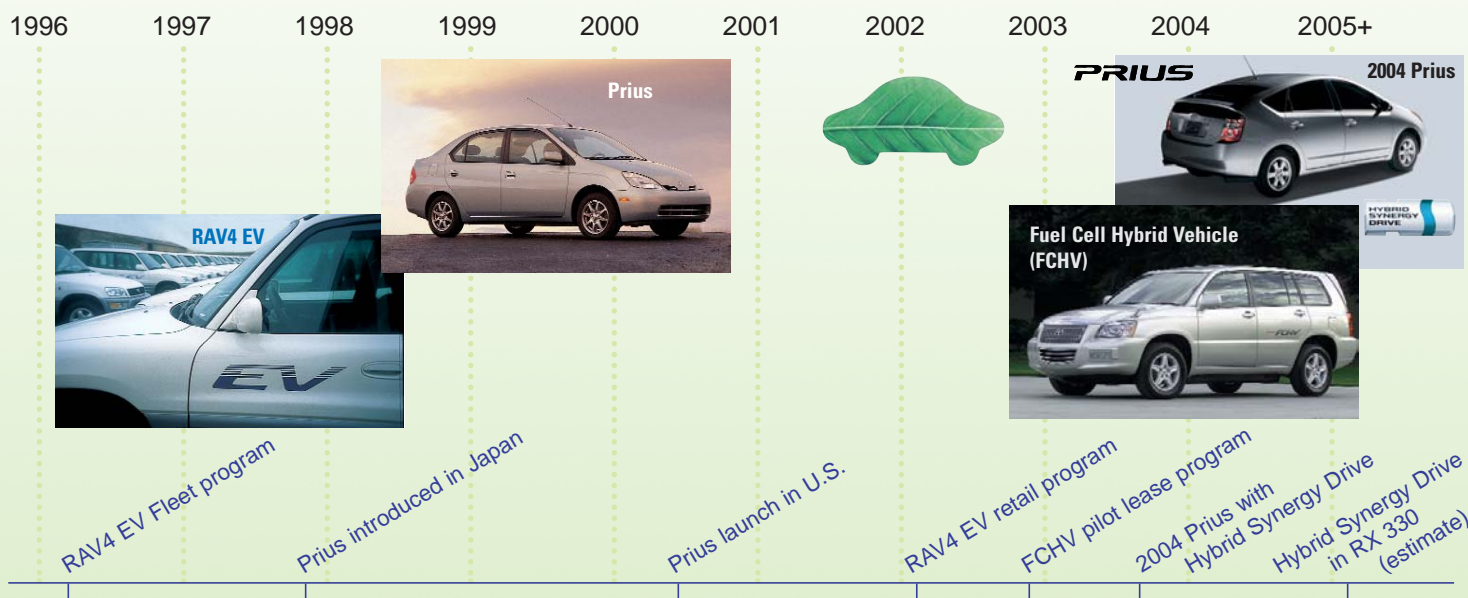
But now it's time to pull back the curtain, at least part of the way. *Prius View* is proud to give you a look at the Next Generation Prius!

**Faster and more powerful.** You've asked for it. Should we be surprised that Prius' powerplant has improved in its second generation? It's the first appearance of Toyota's new Hybrid Synergy Drive! (See page 4.)

**Bigger.** But just a *bit* bigger. Closer to the size of a Camry. Toyota is adding room without losing sight of the soul of Prius: driving with a lighter footprint on planet Earth.

**GREAT mileage with PZEV emissions.** Perhaps the best news is that even though the 2004 Prius is larger and more powerful, it will still get outstanding mileage. The 2004 Prius should also earn an even better emission rating: the new California partial zero-emission vehicle (PZEV) designation. Bigger does not always have to mean less green!

## Milestones in market-ready Toyota electric, hybrid, and fuel cell vehicles, 1996–2005



## Prius and the evolution of hybrid vehicles: Where Toyota is heading

It's hard to believe that Prius has already reached its fifth anniversary! Yes, Prius was first introduced in December 1997 in Japan, where it became an immediate hit. A North American version of Prius followed with more power and other refinements, reaching U.S. shores less than three years later, in mid-2000.

Just as in Japan, Prius quickly resonated with U.S. buyers. It gained a passionate following, with sales outpacing projections. By the end of the first quarter of 2003, more than 45,000 Prius had been bought in the U.S., with worldwide sales topping 110,000. This figure is far above the total of all other manufacturers' hybrid vehicle sales combined!

After five years of Prius, it's time for a step ahead: the 2004 Prius. Here, we are looking at Prius in the context of its importance to Toyota's development of hybrid vehicles.

### Recent history

Prius was the second major Toyota advanced technology vehicle introduced in the 1990s, following the 1996 debut of RAV4 EV, Toyota's all-electric SUV. The RAV4 EV was an important milestone. It brought to market a fully integrated

all-electric motor, drivetrain, control system, and advanced battery pack in a major manufacturer's production vehicle.

Prius followed RAV4 EV by a couple of years and represents another step forward in the electrification of the mass-produced automobile. It uses some of the same technology as RAV4 EV, but joined a gasoline engine with an electric motor for greater range and to serve the needs of a broader customer base.

### Future hybrid developments

Looking at the future, Toyota is planning a substantial expansion of research, development, and production of hybrid vehicles. Toyota's Hybrid Synergy Drive is the successor to the Toyota Hybrid System used in the original Prius. It's the key to bringing hybrid drivetrains to a wider number of vehicles of different sizes, shapes, and types. The 2004 Prius will be the first Toyota model with Hybrid Synergy Drive, reflecting its improved power and efficiency.

Hybrid Synergy Drive can be easily adapted to a broad range of vehicles. Different size motors and engines can be combined to favor either fuel economy, power, or both. Toyota has set a worldwide

goal of putting 300,000 hybrid vehicles on the road annually by mid-decade, and Hybrid Synergy Drive is a centerpiece of this effort. For more details on Hybrid Synergy Drive, see page 4.

### Fuel cell hybrids

Toyota's fuel cell vehicle program will also benefit from the pioneering steps taken by Prius. Current plans are for Toyota fuel cell vehicles to be hybrids—that is, they will run on battery power in addition to the energy generated by an "auxiliary power unit," or APU.

In the Prius, the gasoline engine is the APU, while in a Toyota FCHV (Fuel Cell Hybrid Vehicle) the fuel cell is the APU. Although the two vehicles have different APUs, some of the control algorithms, battery systems, and more in the FCHV can be traced to Prius. Toyota recently leased its first production-ready FCHVs in the U.S., but it will be some years before Toyota might offer FCVHs to consumers.

If Toyota meets its worldwide goals, hybrid vehicles will be bought in large enough numbers that they may no longer be considered "alternative." People will recognize that Prius helped to begin a revolutionary trend in cleaner transportation.

## Prius-owning professor wins in enviro rally; builds hybrids with students

**R**obert Strattan bought one of the first Prius hybrid cars sold in the state of Oklahoma. However, he was not new to hybrid vehicles, and had been designing and building them for several years as a professor of electrical engineering at the University of Tulsa.

“Having created hybrids myself, I recognized how advanced the Prius drivetrain architecture was, so I had to have one,” says Strattan. “It has far surpassed my expectations.” One of his greatest joys is educating others about HEVs. “Several friends have already purchased Prius or are considering buying one. I also speak to engineering and public discussion groups about developments in automotive design and the future of hybrids.”

Professor Strattan taught at the University for 30 years and for 12 years has served as a faculty advisor to the University’s hybrid electric vehicle (HEV) project, called Hurricane Motor Works. Each year, about 15 undergraduate engineering students design and build HEVs for academic credit or extracurricular experience. In 1998, the project completed its Tulsa Paradyne, a

Geo Metro conversion with an automatic transmission, 1.0 liter engine, and 30-hp electric motor. Like Prius, it has the capacity to run in all-electric, all-engine, or mixed mode. This year, the car is being replaced with a new HEV with a 5-speed manual transmission and an aerodynamic body style, with the goal of achieving 65 mpg.

The Tulsa University team and Professor Strattan enter their cars in the Tour de Sol, the world’s largest event for sustainable transportation. It is a multi-state road rally and testing competition that measures fuel economy, greenhouse emissions, reliability, performance, and range.

Professor Strattan’s Prius won first prize in the Production HEV category in 2002. He says, “It was the only Prius entered in the category, and I encourage other Prius owners to join in. It’s fun, and those of us who own a Prius should share our knowledge.” Toyota is a sponsor of the Tour de Sol, which is conducted by the Northeast Sustainable Energy Association (NESEA). Go to [www.nesea.org](http://www.nesea.org) for Tour de Sol information.



Tour de Sol snapshots, from left: Prius at the starting line; performance testing; public viewing in Washington, D.C.; Professor Stratton.



## NEWS BRIEFS—Prius and Toyota fuel cell hybrid vehicles

### Los Angeles buys Prius

Toyota has delivered 130 Prius hybrid cars to the city of Los Angeles for use by municipal agencies, following an original order of 23 units in 2002. Toyota will provide training for the city’s service technicians on hybrid vehicle operation and maintenance. The city plans to acquire additional Prius hybrids in the future.

### Prius earns engineering recognition

*IEEE Spectrum*, a publication of the Institute of Electrical and Electronics Engineers, has selected Prius as the only hybrid vehicle in its “top ten most technically sophisticated cars list for 2003.”

### Prius shuttles celebs at Stones enviro concert

In February, Toyota provided Prius hybrid cars for celebrity guest transportation at a Natural Resources Defense Council (NRDC)-sponsored Rolling Stones concert at Staples Center in Los Angeles. The event kicked off a campaign to “turn up the heat” on political and business leaders to begin delivering climate change solutions.

### Toyota fuel cell hybrid vehicles

Toyota has delivered its first two market-ready FCHV hydrogen fuel cell vehicles and helped establish a hydrogen fuel cell “community” to provide fuel for the vehicles. The certified zero-emission vehicles—called the Toyota FCHV—will be used in day-to-day driving by the University of California, Irvine and the University of California, Davis. Toyota will follow up with two more FCHVs for each campus in 2003, for a total of six vehicles. FCHV utilizes a modified five-passenger Toyota Highlander SUV platform and features a 90-kW Toyota-developed fuel cell stack, four 5,000-psi hydrogen fuel tanks, and a 109-hp electric motor. It is capable of traveling 180 miles before refueling.

In addition, Toyota is working to set up a fuel cell community with the University, the South Coast Air Quality Management Board, the California Air Resources Board, and businesses to establish a network of six fueling stations within six months, including one at Toyota’s national headquarters in Torrance, California. This project’s goal is to create a “hydrogen highway” to link the northern and southern portions of the state.

# HYBRID

## Hybrid Synergy Drive—the next big step in Toyota hybrid power

In January, Toyota announced a major innovation in hybrid systems at the North American International Auto Show in Detroit, Michigan.

Toyota Motor Corporation President Fujio Cho said, "After years of research and investment, Toyota has a breakthrough powertrain system that will take the world to a new, higher level of hybrid technology... a premium powerplant we are calling the Toyota Hybrid Synergy Drive."



This photo composite illustrates the placement of some of the Hybrid Synergy Drive components in an all-wheel drive Lexus RX 330. A V6 engine and electric motor are under the hood; another electric motor powers the rear wheels.

that will be offered with optional Hybrid Synergy Drive in about two years. It is expected to be the first luxury hybrid vehicle on the market.

The first Hybrid Synergy Drive vehicle will be the 2004 Prius with front-wheel drive and a 4-cylinder engine.

It will have more power than the the original Prius and will operate at higher voltage for improved efficiency. The 2004 Prius' drivetrain architecture will take a big

Hybrid Synergy Drive is a concept of flexible and modular hybrid design that can be adapted to a variety of vehicle types, sizes, and uses—from utility to high performance. On display at the Detroit auto show was a SU-HV (sport utility hybrid vehicle) concept, featuring a V6 gasoline engine along with electric motors driving

both the front and rear wheels. It illustrates the potential to deliver V8 power with the fuel economy of a compact car and lower emissions than any standard SUV on the road today. The SU-HV gives a preview of the Lexus RX 330



step forward—keeping some original Prius components, but making distinct changes and improvements in others.

### The upcoming Lexus RX 330 with optional Hybrid Synergy Drive—V8 power with a V6 engine:

- More compact
- Better mileage
- Ultra-low emissions
- Lighter weight



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We welcome reader comments on *PRIUS VIEW*. Please e-mail them to [prius@oberhand.com](mailto:prius@oberhand.com)

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