



Special Feature

The Camry Challenge

—Simultaneous Worldwide Start-Up—

The new-model Camry made its much-anticipated debut at Detroit's North American International Auto Show in January 2006. However, the new Camry marks more than just another model change. Remodeled for the first time in four and a half years, the Camry is a mainstay of Toyota's worldwide business, and its launch heralded the start of a revolution at Toyota. In this section, we look at the challenges we faced and innovations we made in the development of the new Camry.

More than 10 Million Units Shipped Worldwide

With vehicle sales in approximately 170 countries and regions, we aim to build cars that are the first choice of customers the world over. The foundation of these efforts to popularize the Toyota brand and secure earnings worldwide consists of our three global models—the Corolla, Camry, and Yaris (Vitz in Japan)—and the IMV series. Of those models, the Corolla has become the Toyota brand’s signature model, with shipments of more than 30 million vehicles since its 1966 launch. In addition, sales of our third global model, the Yaris, have grown rapidly since its debut in 1999.

Meanwhile, 1980 saw the birth of the Camry as a front engine rear drive vehicle, the Celica Camry. In 1982, we introduced a front engine front drive (FF) layout and began exporting the Camry as a high-end FF sedan. Since then, the Camry has earned the unequivocal endorsement of customers in more than 100 countries and regions, including the United States, Canada, Australia, Europe, the Middle East, and Asia. In September 2005, Camry sales passed the 10-million-vehicle milestone. Moreover, in eight of the past nine years the Camry has claimed the prestigious title of best-selling passenger car in the United States.

The Camry is a key accelerator of Toyota’s global operations, and we have steadily expanded production of the model around the world.



Note: Different from fiscal year figures

The New Camry's Mission

**Pursuit of Global Best,
Local Best**

**Realization of Worldwide
Simultaneous Production Start-Up**

The New Camry's Mission

The Challenge—Simultaneous Worldwide Start-Up

“Global best, local best”—these commitments rule the development of Toyota’s mainstay global models. By “global best” we mean building cars with common value worldwide while pursuing the world’s highest levels of quality and performance. The global best concept is fundamental to the Toyota mind-set. We want to give superior quality and outstanding cost performance to customers buying Toyota vehicles throughout the world.

On the other hand, “local best” expresses a commitment to accurately reflecting the needs and values of customers in different regions. Toyota enhances the value of its core global models by marrying its commitments to being global best and local best, and this approach was pivotal in the development of the new Camry. We took on the double challenge of building a car that incorporates common international value and local needs.

Further, we set ourselves the additional task of achieving a simultaneous worldwide start-up of production for the new Camry. Conventionally, plants in Japan had production up and running before overseas plants came onstream in stages over a period of a year or more. For the new Camry, we sought to shorten that time lag and initiate production at almost the same time around the world. Not only does simultaneous start-up significantly heighten development and production efficiency, it enables us to offer customers worldwide the latest Camry as an “in-season” car.

Product Development Approach I

An Unexpected Comment from a Camry Driver

At the beginning of 2002, chief engineer (CE) Kenichiro Fuse was entrusted with the development of the new Camry. Failure was not an option because of the model’s importance in the rollout of Toyota’s worldwide operations. The first thing our CE did was visit customers. Although the Camry is the best-selling passenger car in the United States, he felt the

The New Camry Production Bases



The Camry Challenge —Simultaneous Worldwide Start-Up—

Solidarity Was the Cornerstone of Team Camry's Success



Kenichiro Fuse

Chief Engineer, Product Development Group, Toyota Motor Corporation

The Camry—one of Toyota's flagship global models—claims the largest share of the U.S. passenger car market. So for me, taking on the development of the new Camry was a very big challenge. What's more, for this project, not only did we have to develop a car that would win even stronger customer endorsement, we had a special mission—to launch its production simultaneously around the world. When we began, I found the prospect of simultaneously working with multiple production bases worldwide a little daunting. However, once the project was under way my doubts vanished. All of the things I thought might be obstacles, such as tight schedules, the unprecedented nature of the project, national differences, language barriers, and so on, in fact gelled the development team together. Every day, we made further progress with the project and gathered increasing momentum. Another thing that helped was the friendly rivalry among the bases of different countries. By tackling the project and learning from each other's experience, we were able to produce results beyond expectations. For me, working on this project amid the camaraderie of Team Camry, which became like family, was a fantastic experience.

development team needed to know how customers on the ground actually use and rate the Camry. With that in mind, Kenichiro Fuse sent a team from Japan to the United States to survey 32 families in six cities. However, the makeup of this team was unusual because he wanted the whole Camry development team to see firsthand how the market saw the Camry. Accordingly, in addition to marketing and product planning specialists, the team also included technical specialists, such as designers and product assessors.

During the survey, an unexpected comment from one Camry driver was a real eye opener for the members of the development team, "the Camry really is a great car but it is not exciting." In other words, the reliability that we had built up through successive models had also inadvertently created a negative image. That comment motivated Mr. Fuse and his development team to engineer a completely new Camry.

Product Development Approach II

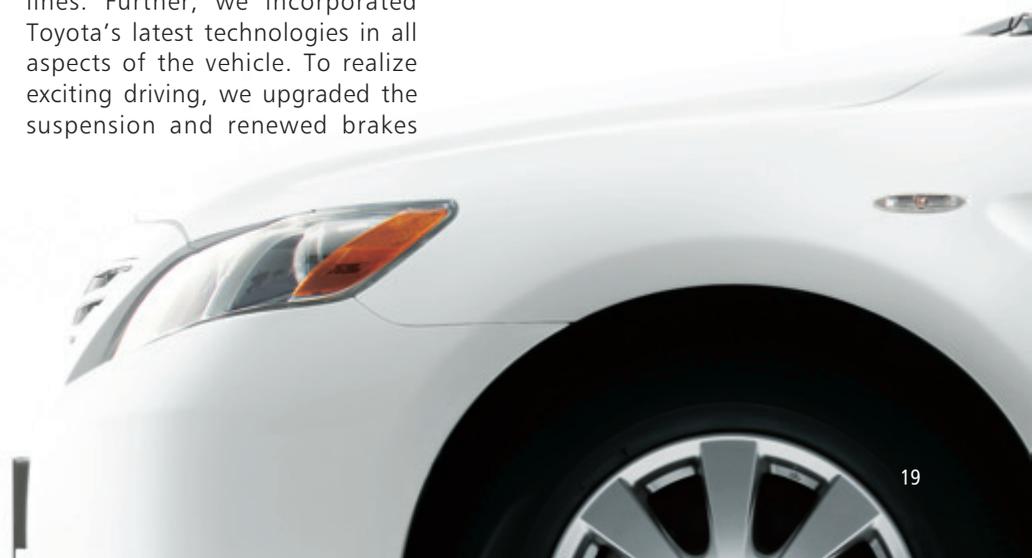
Rejuvenation Is the Key Word

Vehicle-planning discussions for the new Camry began in fall 2002. We debated the development key word based on the theme of making the Camry a new global benchmark for mid-size sedans. Given all the gloomy news about economic slumps, natural disasters, and so on in society today, we decided we wanted to give people's lives a shot of youthful vigor. As a result, we chose the design theme of "rejuvenation."

In styling—a major determinant of a car's image—we went for an Athletic & Modern look. At a glance, drivers get a feeling of youthful excitement from the taut futuristic lines. Further, we incorporated Toyota's latest technologies in all aspects of the vehicle. To realize exciting driving, we upgraded the suspension and renewed brakes



Visiting a customer in the United States
We visited 32 Camry-owning families in six U.S. cities to hear firsthand their evaluations of the Camry and how they use it.



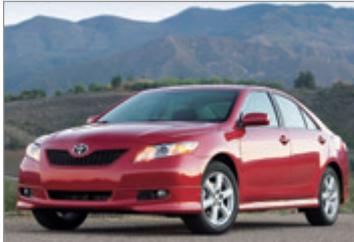
The Quest for a Challenging and Exciting Vehicle



Andrew Coetzee

Vice President, Product Planning Department, Toyota Motor Sales, U.S.A., Inc.

My job was to reflect feedback from U.S. Camry drivers and our dealers in the development process of the new-model Camry. The Camry is an outstanding vehicle, much-loved by many customers in the States. However, there were many issues that we had to overcome to further evolve the Camry. We worked to make the Camry more than simply a highly useful car. We aimed to reinvent it as a more exciting car that customers would feel truly passionate about. For example, we introduced a passion to the Camry through a bold redesign of the basic body proportions, a visually and dynamically expressive SE grade.



Above: The reborn Camry sports sleek lines, upgraded driving performance, and outstanding safety and environmental performance. Below: By introducing the hybrid model in the United States, we increased the attractiveness of the new Camry.

while adding a new V6 engine and a newly developed six-speed automatic transmission for overseas models. We also used a vehicle body with a Multi-load-path construction* that dissipates the energy of side collisions. Regarding environmental technology, we introduced the Camry Hybrid in the United States, where the Camry has its strongest sales.

Thanks to such customer-centered product development, the new Camry is selling briskly. However, before reaching that stage we had to clear a major hurdle. We had to discover how to make the Camry an even more desirable car.

* Multi-load-path construction: not only the side members but also the roof, front seat frames and center cross member have been reinforced, compared to previous models, thus increasing the side strength to reduce the amount of cabin deformation.

Simultaneous Worldwide Start-Up I

Team Camry Enters the Fray

Toyota has an *Obeya*, or large-room, system that dates back to its early days. When developing a new vehicle,

managers responsible for decision making in a range of departments, such as design and production engineering, gather in one place and create task teams. We created a framework for the new Camry project that enabled coordination between a global *Obeya*, located at the head office development hub in Toyota City, Aichi Prefecture, and local *Obeya*, established at production bases in the United States, Australia, and Asia. Then, Team Camry began grappling in earnest with the difficult task of realizing the simultaneous worldwide start-up of production.

The challenge was to orchestrate the system without any hitches. CE Fuse recalls, "Fostering a common vision for the new Camry and strictly maintaining timely information sharing were vital. And, the best way to do that was through face-to-face communication." At least every three months, managers from production bases around the world gathered in Japan to share issues and report on progress at Milestone Meetings. Also, Mr. Fuse visited local development teams to communicate his vision as CE, making more than 20

The Camry Challenge —Simultaneous Worldwide Start-Up—

trips to North America alone. Further, Team Camry used the high-speed communication of meeting minutes to promote daily information sharing. In fact, the meeting minutes were sometimes handwritten because Team Camry made a point of rapidly conveying topics debated in the global *Obeya* to bases around the world. This swiftness enabled global decision making and engendered a sense of unity that underpinned the work of Team Camry.

Simultaneous Worldwide Start-Up II

Preparation of Master Technical Drawings

For an international project, we gave ourselves a very short period to real-

ize high-quality vehicle manufacturing. The secret to meeting that tough schedule was the team's effort to build a highly finished performance confirmation vehicle (CV) based on a set of master technical drawings. Normally, the first step in the development process is to build a prototype vehicle using test components. If any glitches come to light, the design is changed. A CV is then built using actual components. This method extends the development period and leads to complacency. But, if from the outset a set of master technical drawings can be established that will not require subsequent design changes, there is no need to build a prototype vehicle. While this type of development without prototype vehicles is not unusual at

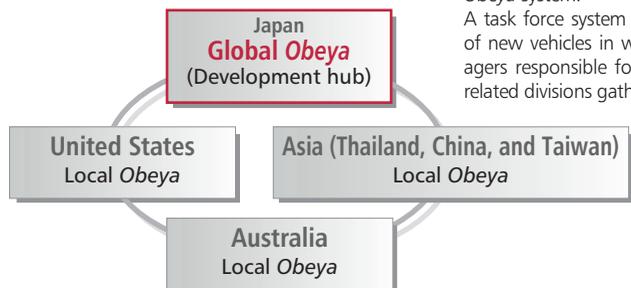


Members of the local *Obeya* at our Australian plant
Constant contact with the development hub at the global *Obeya* in Japan enabled simultaneous development.



The express communication of meeting minutes played a large part in the global sharing of information. The left side of the minutes outlines the content of meetings in Japanese, with an English translation on the right side. After meetings, the global *Obeya* immediately distributed the minutes to various production bases.

Development System for the New Camry



Obeya system:

A task force system for the development of new vehicles in which all of the managers responsible for decision making in related divisions gather in one place.

The Key to Success in a Global Project



John Bell

Chief Engineer, Product Office, Toyota Motor Corporation Australia Ltd. (TMCA)

As the leader of the Camry project at the plant in Australia, I was heavily involved in coordination with Toyota's head office from the start of development, visiting Japan frequently. It was the first time that I had played a part in a project to simultaneously develop one vehicle, the Camry, using an international production platform. The project presented numerous challenges, including digital assembly* and production preparation based on globally common technical drawings. Nevertheless, the project went smoothly thanks to international teamwork and our shared commitment to the Toyota Way.

* Digital assembly refers to the use of digital engineering to conduct assembly trials using a virtual vehicle.



With the aim of realizing development without a prototype vehicle, highly finished technical drawings were created through collaboration among the design department, the production department, suppliers, and other departments at Design Review Meetings.



Digital engineering, using simulation technology for the creation of virtual vehicles, played a crucial role in orchestrating the development of the new Camry at multiple sites around the world.

Toyota, attempting to do so on such a large-scale global project was unheard of.

The Design Review Meeting was the prime mover in the creation of the set of master technical drawings. Team Camry threw out the commonplace idea that preparing technical drawings is the job of the design department. The drawings were the product of know-how from a range of operational functions. Our production and purchasing departments took part in the Design Review Meetings and were fully involved in creating the drawings. As a result, spurred by the pressure of knowing design changes were not allowed after the completion of the drawings, Team Camry created high-quality actual components with almost no defects and was able to build a very highly finished CV in a short period. Having completed the CV, the Team Camry members felt success was within reach.

Simultaneous Worldwide Start-Up III

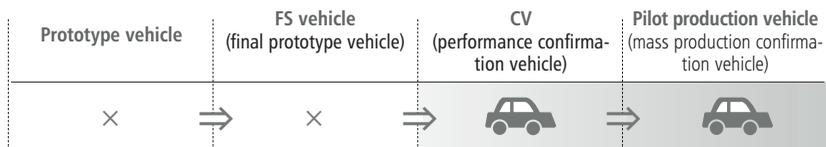
One Component, One Drawing

In conjunction with the preparation of master technical drawings, Team Camry took on another challenge: the strict limitation of every component to one drawing. In some cases, different plants had different drawings for the same component. The disparities had come about because of adaptations to differing production equipment and methods among plants and suppliers. However, such diversity was an obstacle to the establishment of universal quality and the enhancement of productivity. Only having one drawing for each component makes it easier to achieve uniform quality and synchronize operations internationally.

A one-sided attempt to squeeze each component into a single blueprint

Development Stages of the New Camry

New model developed without a prototype vehicle



Limiting Each Component to a Single Drawing



Hidekazu Otowa

General Manager, Body Engineering Division 1, Toyota Development Center 1, Toyota Motor Corporation

Common technical drawings for each component were a precondition for the realization of a simultaneous worldwide production start-up. My task was to prepare a single set of design technical drawings for a high-quality vehicle body that brought together and reflected the different production requirements of plants in different regions. To achieve that, I not only visited Toyota plants the world over, I went to local suppliers to explain the design concept and the importance of having a single master technical drawing for each component of the new-model Camry. In the development process, we worked to solve problems rapidly through the sharing of all types of information, doing our utmost to avoid design changes in the final stages. There was some trial and error, but our successful creation of a high-quality car gives me the greatest satisfaction.

The Camry Challenge —Simultaneous Worldwide Start-Up—

Consolidating the Requests of Various Plants into a Single Set of Drawings



Noriaki Ikari

Project General Manager, Global Production Center (GPC), Toyota Motor Corporation

My job was to examine the technical drawings from the standpoint of manufacturing and establish production preparation that was suited to mass production and that would proceed smoothly. Previously, plants in Japan and the U.S., which started production ahead of other plants, examined most of the technical drawings and test vehicles. As a result, the requests of plants starting production later could not be incorporated, which often led to difficulties. For this project, however, from the initial design stages team members gathered at the Global Production Center and took advantage of digital assembly to include the requests of various plants in a single set of technical drawings. Unifying the requests of all of the plants and hammering out a consensus took a lot of time and energy. However, it made a major contribution to the achievement of a simultaneous worldwide production start-up by stimulating communication among plants and enabling trouble-free production preparation.

would have been counterproductive. The technical drawings needed the backing of production managers at plants and suppliers around the world. By having these managers take part in the Design Review Meetings, we enabled lively discussion about production methods, and this allowed the team to resolve the problems at the design stage and to incorporate changes into the technical drawings. Through this global process, Team Camry summarized all of the feedback from the production side into a “single voice.” It is not an exaggeration to say that the achievement of simultaneous start-up and uniform quality worldwide would have been impossible without the frontloading and resolution of all kinds of quality risks and production engineering issues at the design and technical drawing stages.

Simultaneous Worldwide Start-Up IV

Toward Global Pilot Production

Once we used the CV to check performance and quality, the mass production trial, known as pilot production, began. Until this point, after pilot production at plants in Japan finished, overseas pilot production was carried out, making further adjustment of production lines to suit each region

unavoidable. However, this staggered system could not achieve a simultaneous start-up. Therefore, Team Camry set about creating a single, intensive global pilot production.

Representatives from the various bases gathered at the Motomachi plant in Toyota City, in Aichi Prefecture, to assemble the new Camry. The trial highlighted numerous issues. For example, it revealed that while tall workers could reach the innermost part of the engine room to attach components, shorter workers could not. Such were the types of problems that only became apparent thanks to the global pilot production. Through a process of repeated trial and error, Team Camry identified and eliminated these problems one by one. At the end of the global pilot production, the troubleshooters had an impressive haul of more than 3,000 issues resolved.

Global pilot production for mass production of the new Camry enabled the retooling of production lines in one fell swoop and near perfect start-ups in each country. The launch of production of a new model usually requires the line to shut down for a few days. However, in the United States our Kentucky plant changed over from the production of the old Camry to the new model without stopping the line.



Through exhaustive efforts to create a single technical drawing for each component, we successfully incorporated the production requirements of bases in different countries in all technical drawings. This enabled us to achieve uniform quality simultaneously around the world.



Production managers from bases worldwide gathered in Japan to undertake the global mass production trial, which we call global pilot production. Thanks to the results of that trial, we were able to move forward with production preparation for the synchronized world start-up in a single concerted push.

The Latest Camry Sets New Benchmarks in the Reduction of Global Development Costs



Mark Boire

General Manager, Production Engineering, Toyota Motor Engineering & Manufacturing North America, Inc.

In my role on the North American Cost Reduction Committee, I was responsible for overall cost reduction activities for the new-model Camry. In the past, it was difficult for the design department at Toyota's head office in Japan to "see" the costs of the North American production side. To make those costs more visible, we formed subcommittees tasked with tackling the main cost items of a particular function, such as engine, power transmission, and chassis. My mission was not only to oversee those subcommittees but also to convey the cost reduction ideas of the subcommittees to the design department at the head office and to work with the design department to realize those ideas. Our achievements will likely become the new benchmarks for cost reduction activities in our global development of vehicles.

Moreover, the line had a trouble-free start-up, reaching peak production in a very short time.

Cost Reduction Steps

Visualize Costs

To be successful, the new Camry had to surpass its predecessor in every respect, including quality and performance. In these initiatives, cost reduction activities made a major contribution. But run-of-the-mill efforts would not have taken us anywhere near the targets. Therefore, it was critical to take a more comprehensive, global approach to cost reduction activities. With that in mind, the team launched the global Cost Reduction Committee.

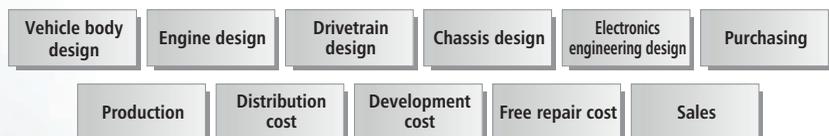
The committee's work was not confined to curbing the cost of purchased components and in-house components; rather, the committee turned its attention to all elements of cost, going as far as reviewing such

items as logistics. Further, the committee tasked regional subcommittees with tackling the main cost items of particular functions in their region. While production bases around the world moved forward with simultaneous development, we set challenging cost benchmarks based on the lowest cost among the respective regions. Needless to say, we also had to maintain high quality.

In response, we made costs "visible" through deep, painstaking analysis of cost composition. For example, we would examine an in-house component in relation to line capacity usage rates, production volume, usage with other components, production equipment depreciation, and labor costs. The cumulative effect of such unglamorous efforts was that cost targets thought of as unreachable became feasible. One of the participants in the cost reduction activities recalls, "When you set about reducing cost beyond a certain magnitude, minor adjustments are no

Global Cost Reduction Initiative

Eleven subcommittees tasked with examining cost reductions for specific cost items



The Camry Challenge —Simultaneous Worldwide Start-Up—

longer enough. It then becomes a provocative challenge; you become determined to clear that target no matter what.”

The Camry’s Future

A Strong Start for the New Camry

The full remodeling of the Camry strengthened its brand power and revolutionized the way Toyota builds cars. “Despite facing numerous difficulties, Toyota and Team Camry created a car that more than lived up to their expectations,” CE Kenichiro Fuse surmises.

Sales of the new Camry made a promising start following its much-anticipated launch at the beginning of 2006. In the U.S. market, in accordance with plans, existing Camry owners welcomed the new model while the percentage of young customers among buyers jumped from 17% to 26%. These figures clearly show that Team Camry hit its mark. Customer feedback has been enthusiastic, including comments like “the V6 engine gives exciting performance,”

“the brakes are outstanding,” and “although the styling is sharp, the cabin is spacious and comfortable.”

Furthermore, May 2006 saw the long-awaited marketing of the Camry Hybrid in North America. Nothing signals Toyota’s unbending commitment to popularizing hybrids as mainstream eco cars more clearly than the development of a hybrid model of the best-selling passenger car in the United States. Realizing outstanding driving performance and the environmental performance of a compact car, the hybrid not only opens up a new future for the Camry, it will also significantly benefit the global environment. As the first hybrid to be built in the United States, it also represents a milestone for our localizing efforts.

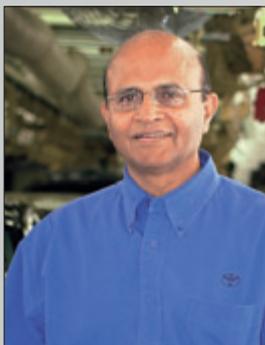


Simultaneously realizing sharp dynamic styling and a spacious comfortable cabin space, the new-model Camry continues to win high acclaim in the mainstay North American market.



May 2006 saw the unveiling of the Camry Hybrid in North America. We aim to harness the unique acceleration and unmatched environmental performance of hybrid vehicles to swell the ranks of Camry fans.

Focusing on Offering Reliable Quality



Vinnie Venugopal

General Manager, Quality Control Division, Toyota Motor Manufacturing, Kentucky, Inc. (TMMK)

Our primary role was to meet customers’ ever demanding quality expectations with the new Camry. Fundamental to this goal was the establishment of “One Voice” to Design from all manufacturing locations. For a successful Camry launch, it was imperative that all problems be addressed early in the developmental stage. We communicated early to Design, manufacturing and customer concerns that needed to be incorporated in drawings. Our Quality Engineering team checked and confirmed more than 17,000 technical related items on drawings. Late engineering changes were thus limited. This enabled us to transition from the old generation Camry to the new one without production stoppage. Lastly, our newly created Quality slogan “With Customers in Mind, Build it Right the First Time,” not only epitomizes the will of our team members, but also the dedication to meet customers’ expectations.

Wider, Deeper, Worldwide



The construction of our Russian plant in St. Petersburg is under way, with December 2007 slated for production start-up.



In May 2006, the Camry began rolling off the line at a newly constructed plant in Guangzhou, China.

In step with its accelerating worldwide development, Toyota is decisively moving forward with localization. Focusing particularly on production activities, which can make significant contributions to local economies, we are building new plants and increasing the production capacities of existing plants. The Camry typifies this trend. In May 2006, we started production of the new Camry in China at a new plant, Guangzhou Toyota Motor Co., Ltd., with an annual production capacity of 100,000 vehicles. Moreover, the construction of a new plant scheduled to come onstream in December 2007 is under way in St. Petersburg, Russia. Our aim is to entrench the Camry's standing as a global car through the development of a production network that is more deeply rooted in local communities.

For our other core global models, which are thriving in markets worldwide alongside the Camry, we are embarking on new ventures to fulfill their different missions. Adding to production in Japan and France, we began building the Yaris in Thailand from January 2006. The Yaris is already a perennial favorite in Japan and Europe. Also, we have slated the Corolla for remodeling. Because the Corolla has more model types and production bases than the Camry, development and production preparation call for measures that are even more meticulous and innovative.

Core Global Models



Corolla



Camry



Yaris



Hilux VIGO, IMV Series

The new Camry development project took on the daunting tasks of pursuing the commitments to global best, local best and achieving the simultaneous worldwide start-up of production, and the fruits of those efforts are steadily emerging. Now, as it heads for new horizons, Toyota is taking up new challenges in the global rollout of its automotive operations.

