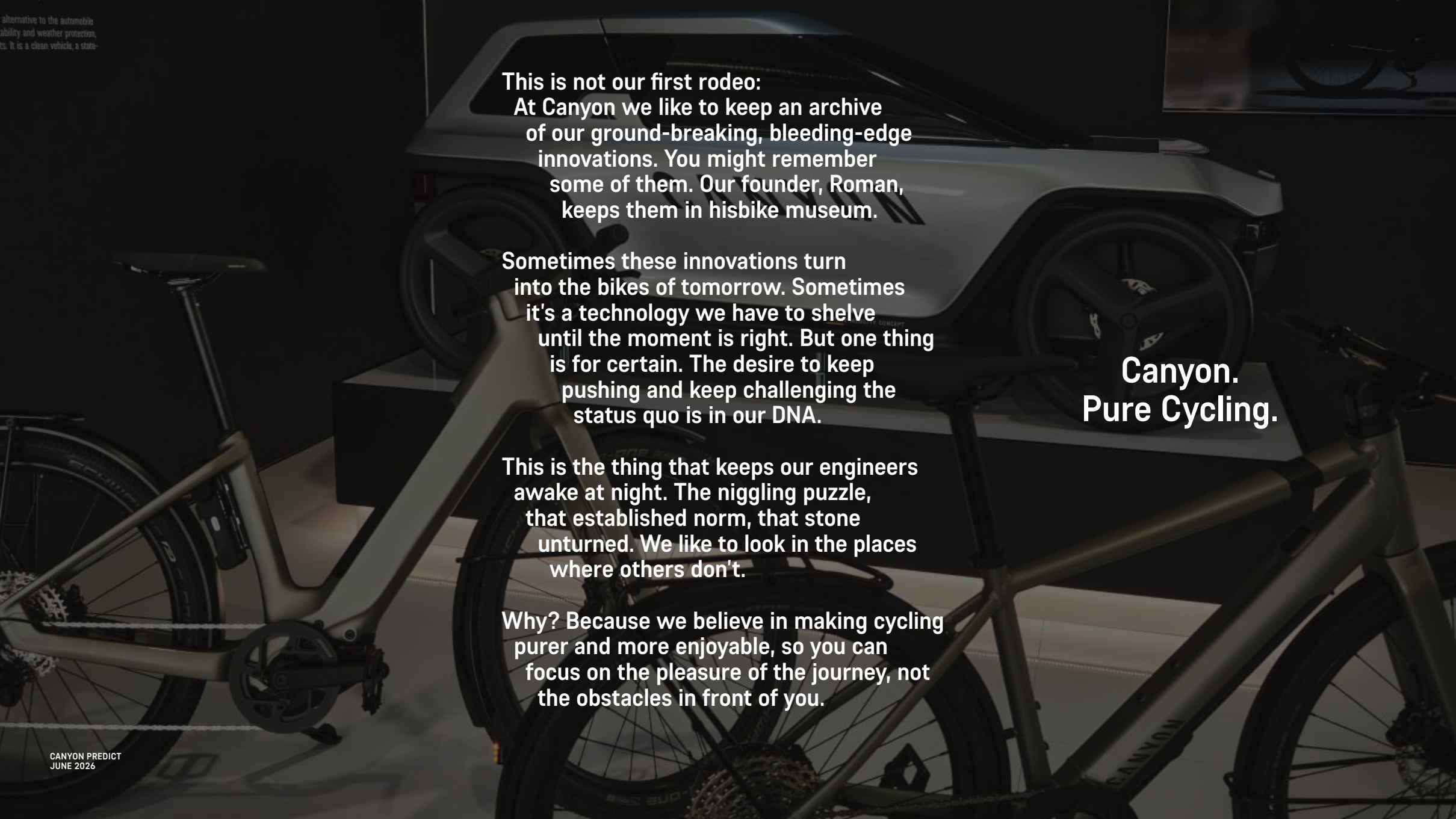
Canyon
Predict



This is not our first rodeo:
At Canyon we like to keep an archive
of our ground-breaking, bleeding-edge
innovations. You might remember
some of them. Our founder, Roman,
keeps them in hisbike museum.

Sometimes these innovations turn
into the bikes of tomorrow. Sometimes
it's a technology we have to shelve
until the moment is right. But one thing
is for certain. The desire to keep
pushing and keep challenging the
status quo is in our DNA.

This is the thing that keeps our engineers
awake at night. The niggling puzzle,
that established norm, that stone
unturned. We like to look in the places
where others don't.

Why? Because we believe in making cycling
purer and more enjoyable, so you can
focus on the pleasure of the journey, not
the obstacles in front of you.

Canyon.
Pure Cycling.

CANYON PREDICT
JUNE 2026

Let's start with some facts around road safety for people who ride bikes.

Multiple studies, representing public sentiment across Europe and North America, clearly indicate that safety concerns are one of the leading barriers that prevent people from cycling – whether that's commuting by bike or cycling for sport.

- In the UK's National Travel Attitudes Study (NTAS) Wave 9 (2023), 48% of respondents said safety concerns were the main reason they never ride a bicycle (source: GOV.UK.).
- In Germany's 2025 Cycling Monitor, 41% of adults and young people said they did not feel safe in road traffic, with the main reasons being drivers' lack of consideration, traffic pressure, and high motor vehicle speeds (source: www.bmv.de).
- Within the United States, fewer than 1% of trips are made by bicycle – with fear for personal safety being the primary reason residents in the USA choose cars over bikes.

Rider-safety concerns, in short, are a cross-cutting issue around the world. Perhaps more shocking than that though is the number of riders killed or seriously injured each year.

- Over the past decade, the number of cyclists killed in road accidents in Germany has increased by 20%, whereas the number of car occupants killed has fallen by 35% (source: Statistisches Bundesamt).
- According to the German Federal Statistical Office (Destatis), one in six (16.4%) people killed in German road traffic in 2025 was a cyclist. Compared to 2015, the increase is 20.6%.
- The European Traffic Safety Council reported that 1,926 cyclists were killed on EU roads in 2024. Cyclists now account for 10% of all road deaths in the EU. Police-reported serious injuries among cyclists increased by 12% between 2014–2024 and 65% of cyclist deaths in the EU result from collisions with motor vehicles.

Over the past decade cars have become inherently safer and motorist deaths have fallen.

In that same period, bicycles have not seen any significant safety improvements and the number of cyclists killed or seriously injured is rising.

While technology has made driving a car safer than ever before, riding a bike has become more dangerous than ever before.

Yet with the technology available, surely bicycle safety improvements are more than possible.

"This isn't the 1960s, there is now more understanding of duty of care around riders. The sport would be a better place if we focused more on protecting riders."

ADAM BECKETT / NEWS EDITOR, CYCLING WEEKLY

Our engineers have been working on this problem for a while. They've seen that there are technological solutions available – radars for example – that operate reactively, detecting vehicles at close range to provide alerts. But these leave a short reaction times for riders to react, potentially leaving them exposed in traffic.

As beneficial as a radar is, it does not cover the complete environment of the rider and depends heavily on the rider's own cognition to interpret the full situation.

But with on-device intelligence, real-time object detection, tracking, trajectory prediction and context-aware risk assessment we can take a huge step in traffic safety.

Beyond this is the technical hardware to make such a system work. Advanced features currently being discussed often depend on cloud connectivity, introducing delays in data transmission, reliability issues in low-signal areas, and privacy concerns. These systems also ignore the rider's own dynamics such as speed, steering, and stability, and treat the bike as passive, while also lacking any form of intervention, remaining limited to alerts rather than taking protective action to enhance rider safety.

At Canyon we couldn't
let this go unexamined.

We asked ourselves what we could do to address this problem and reduce conflicts on our streets.

Over the coming pages you'll see how we addressed the problem of safety and at the same time, doubled down on the quest for greater performance and more enjoyable rides. Our solution is called Canyon Predict.

To keep the joy of Pure Cycling.

Canyon Predict:
See what you don't see.

When you can't change
how people use technology,
change the technology.

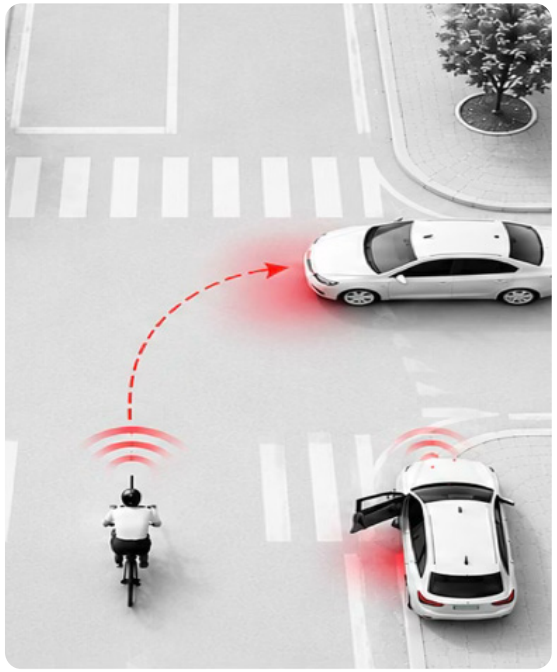
Stressful Riding

Every time you ride, you're multitasking – watching cars, avoiding hazards, etc. What aren't you doing? Enjoying your ride to the fullest.

Pure Cycling

Through the use of smart technology we are simplifying your riding experience. No more distractions. No more multitasking. Pure cycling.

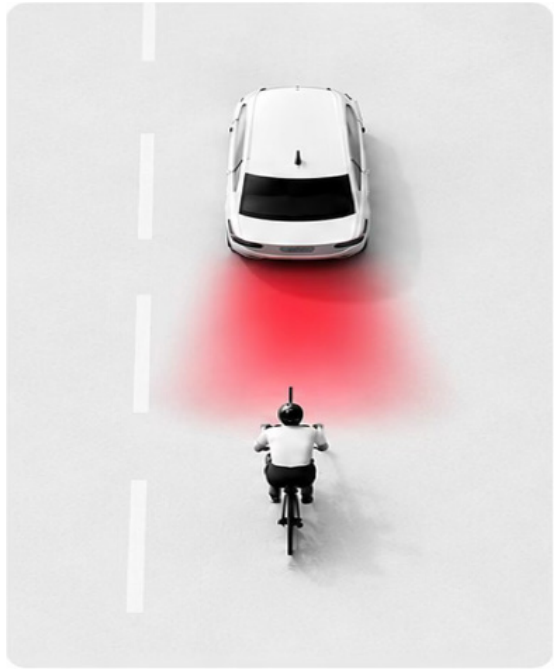
CONSIDER THE
FOUR SCENARIOS



DRIVERS UNAWARE
OF YOUR PRESENCE

Car doors opening suddenly or drivers turning into you because they don't see you.

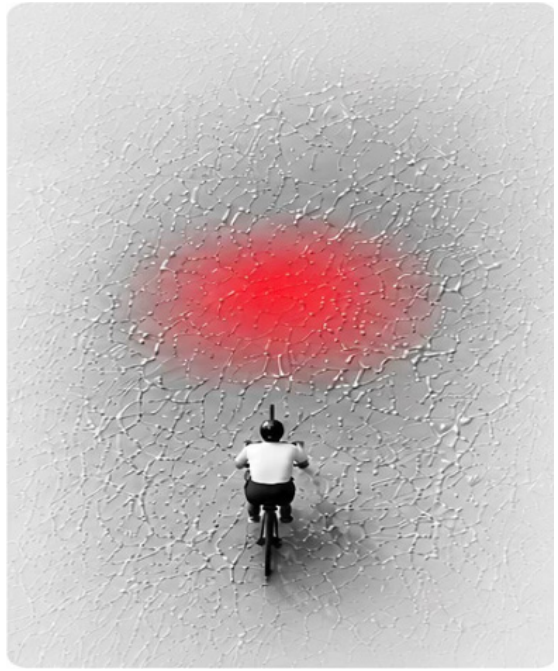
What if your bike could analyse and predict all the risks around you?



UNSAFE DISTANCE
FROM CARS

Drivers suddenly braking in front of you or approaching you from behind at unsafe speeds.

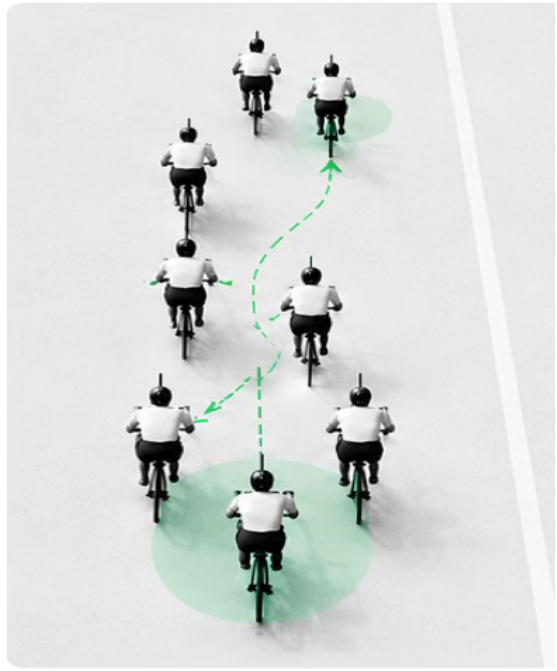
The first step in staying safe, is staying a safe distance from risks. What if your bike could help you do that?



UNSAFE ROAD SURFACES

Motorists aren't the only potential threat. Broken asphalt, gravel, or wet and slick roads – all of these conditions pose safety risks.

What if your bike could see those risks before you do and inform you?



CHAOS IN THE PACK

There's safety in numbers but accidents occur when cyclists are too close or when one unexpectedly swerves or hits the brakes.

What if your bike could help each rider find their perfect place in the pack – at all times and at any speed?

Our solution is an Edge AI-enabled intelligent safety system that transforms bicycle safety from reactive to predictive by continuously perceiving the full environment, understanding context and anticipating hazards in real time.

It combines 360° multi-modal sensing (camera + radar + distributed sensors) with on-device AI processing to eliminate blind spots and remove internet dependency, enabling instant, privacy-preserving decision-making.

Through the fusion of data from various on-bike sensors and integration of rider dynamics such as speed, steering, and stability, the system builds a holistic situational model that goes beyond surrounding traffic.

It then predicts future trajectories of both the rider and nearby objects, assigns risk scores, and communicates them through intuitive multi-modal feedback including directional lights, haptics, and display guidance.

In critical situations, the rider can intervene through adaptive hardware, such as remotely adjusting the seatpost to improve rider stability, ultimately enhancing control, and significantly lowering the likelihood and severity of accidents.

The overall goal of the system is to transform bicycle safety from reactive to predictive by enhancing the rider's awareness of the complete environment, significantly reducing reaction time to potential hazards, and providing intelligent, context-aware insights rather than simple alerts.

By integrating real-time perception with rider dynamics, the system also aims to improve stability and control in critical situations, while ultimately minimizing both the likelihood and severity of accidents through timely guidance and interventions.

"Road cycling needs a safety revolution. We are transforming safety from being reactive to predictive."

MAZEN JRAB / IOT HARDWARE LEAD, CANYON

The system is designed to provide these main functions:

360° Awareness

YOUR BIKE SEES WHAT YOU DON'T SEE.

Tyre Pressure

CRITICAL WARNINGS

Bike Swarm

COMMUNITY AND GROUP INTELLIGENCE

Aero Coach

ONBOARD WINDTUNNEL (CONSIDERED FOR FUTURE, BUT NOT PART OF THE INITIAL DESIGN PHASE.)

THE FUTURE OF ROAD CYCLING:
INTELLIGENT SYSTEM ARCHITECTURE

CANYON PREDICT
JUNE 2026

More than simply a bike: This may look like a bike you've seen before – two wheels, two triangles, sleek aero-optimized carbon chassis – but on the inside it's unlike anything you've seen before. Dare we say it's like nothing that's ever existed before.

This bikes sees what you can't see and it does that while also being a World Tour-calibre performance machine.

Who said safety is boring?

360° Multi-Modal Perception System

Full situational awareness by fusing both a camera and radar system together to provide proximity information.

Sensor Fusion and Bike State Awareness

Advanced fusion algorithms integrate sensor data with rider dynamics such as speed, steering angle, and stability to create a complete situational model.

Safety Intervention

In critical situations, the rider can adjust the bike's geometry by lowering the seatpost to improve stability and control.

Rider Feedback Interfaces

Directional LEDs, haptic feedback, and on-bike displays deliver intuitive, real-time alerts that communicate threat direction, severity, and recommended actions.

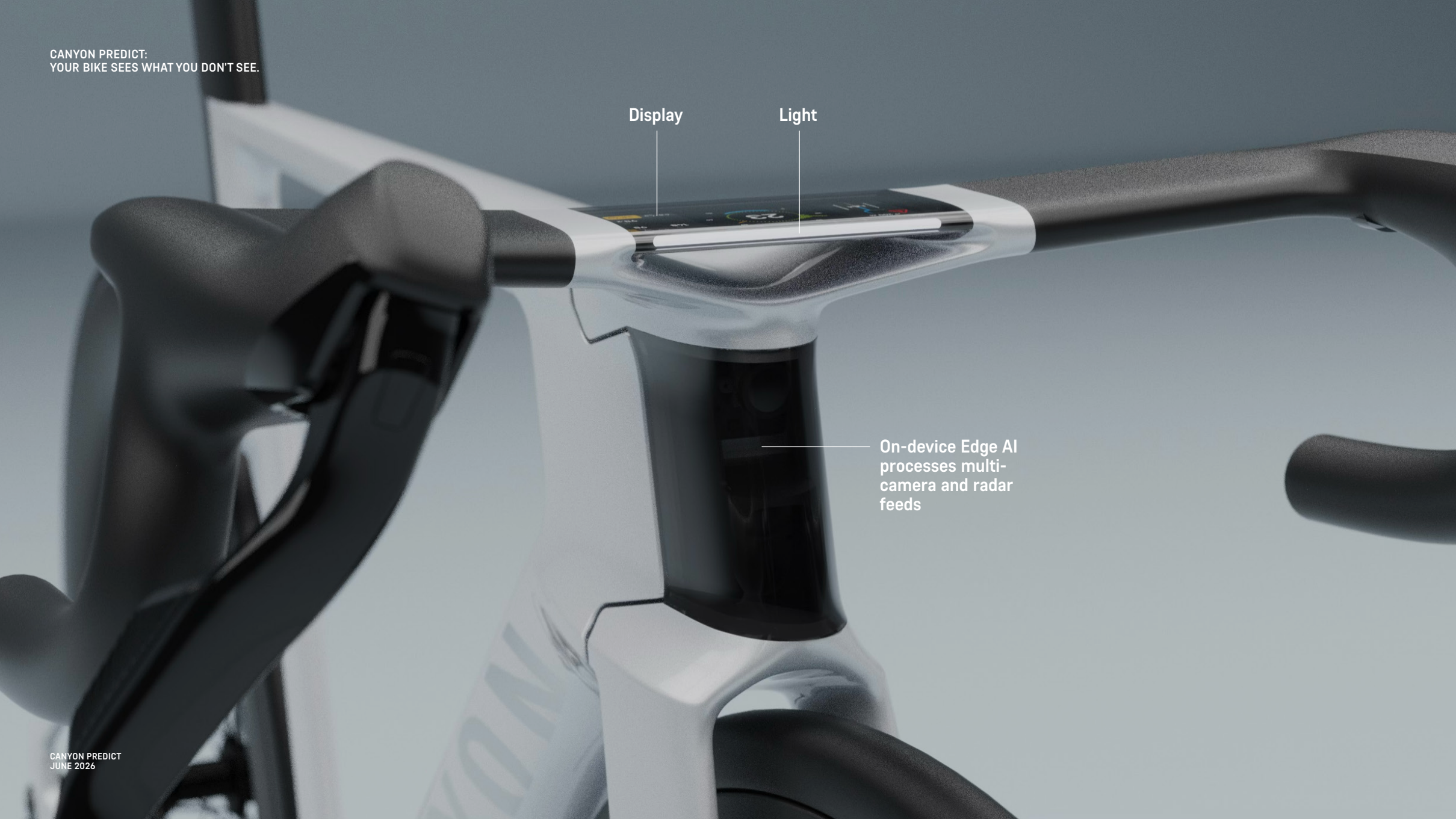
Predictive Risk Assessment Engine

The system goes beyond detection by predicting potential hazards.

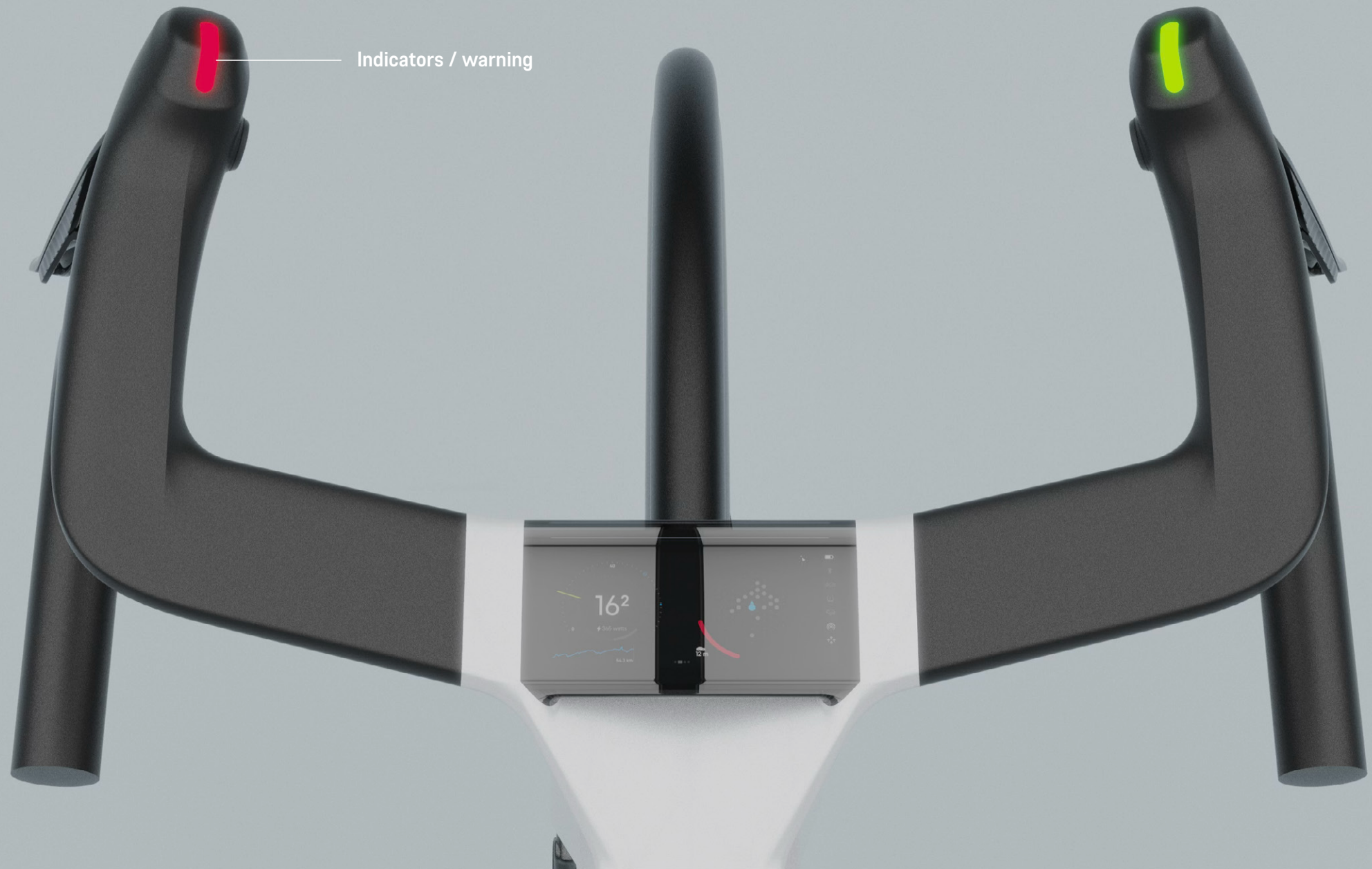
Edge AI Processing

The cognitive core runs what's known as a multistage-AI pipeline without the need for internet connectivity.

CANYON PREDICT:
YOUR BIKE SEES WHAT YOU DON'T SEE.



CANYON PREDICT
JUNE 2026


Indicators / warning
16²


User interface
controller

These six key functions elevate Canyon Predict to a true revolutionary technology:

01 Multi-Sensor Perception System

Canyon Predict gives the bicycle full situational awareness by fusing a camera and radar system together with speed, steering angle and stability information to gain a clear understanding of situations.

02 On-Bike Edge AI Processing

Spearheading the bike is its Cognitive Core – an on-bike processing unit that executes a multistage AI pipeline – breaking down the complex AI task into sequenced, ordered subtasks in a chain – combining a large vision model (LVM) with advanced tracking algorithms for real-time object detection, tracking, and decision-making without cloud dependency.

03 Predictive Risk Assessment

The system forecasts future trajectories of both the rider and surrounding objects to identify potential collisions and assign risk levels before they happen.

04 Situational Awareness and Alerts

Continuous evaluation of the environment provides the data input for relevant information to be communicated to the rider.

05 Rider Assistance and Intervention

The system provides both passive and active safety support including warnings and alerts.

Directional LEDs, haptic feedback, and on-bike displays deliver intuitive, real-time alerts that communicate threat direction, severity, and recommended actions. In critical situations, the rider can lower the bike's seatpost to improve stability and control.

06 Intelligent Hub

By integrating a multi-dimensional motion sensor in the DT Swiss wheel hub, precise information on bike motion is provided for rider assistance and information systems. It features 6D inertial measurement sensors (accelerometer and gyroscope with battery and Bluetooth LE modules) and measures longitudinal, lateral and upward movement (inc. rotation) for comfort and safety features such as emergency brake assist, active curve assist, lane keep assist.

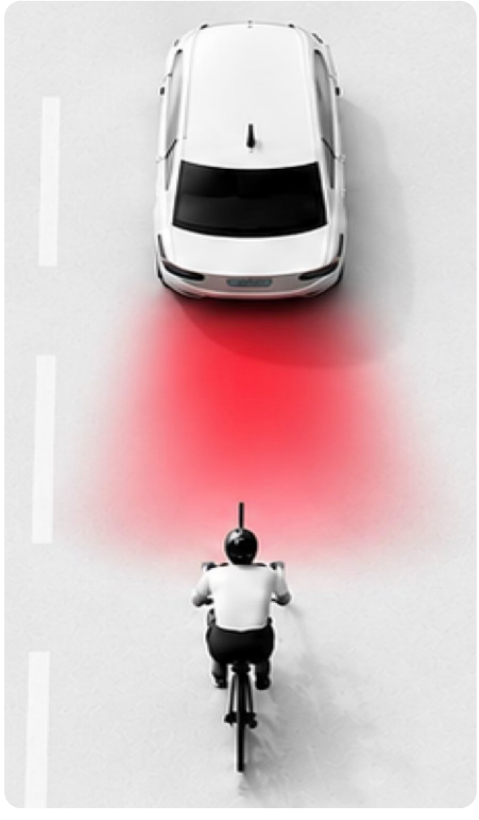
Consider once again
these four scenarios.

SCENARIO 01

Prediction Assist

SCENARIO 02

Distance Assist.

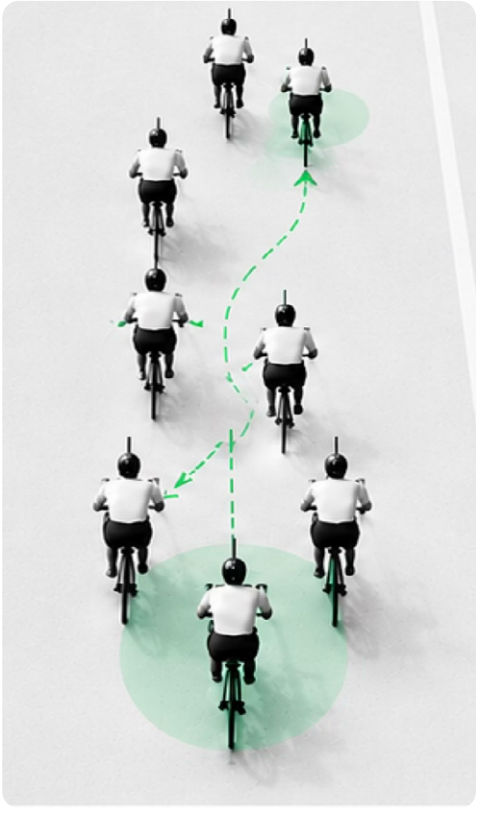


SCENARIO 03

Terrain Assist

SCENARIO 04

Group Ride Assist



SCENARIO 01

Prediction Assist

Prediction Assist provides dynamic awareness of everything around you, helping you judge movements as well as potential hazards.

This can help prevent incidents such as "dooring" and riders being struck because they are in a driver's "blind spot".

The Cognitive Core interprets behavioural intent rather

than only detecting objects. This helps it predict possible conflict trajectories.

The system analyses pedestrian orientation, vehicle occupancy and surrounding traffic and combines these multiple moving parts so they are considered in unison.

SCENARIO 02

Distance Assist

The Distance Assist feature makes recommendations based on safe distances including braking and safety margins.

Its primary responsibility is to prevent rear-end collisions and predict the necessary distance for safe braking action.

In traffic it works by detecting vehicle braking intention through brake-light analysis, evaluating the rider's stopping distance and tyre grip.

When the rider is behind other moving objects without brake lights (e.g. other cyclists), the camera, its proximity sensor and the tyre grip sensor still combine to provide safe braking recommendations.

The system sends escalating haptic alerts to the rider and, if no action is taken, a visual or audio collision warning is sent.

SCENARIO 03

Terrain Assist

Providing environmental and surface awareness, the Terrain Assist feature alerts the rider to low-grip surfaces, combined with the added wildcard of weather conditions and a classification of surfaces. An added feature is environmental hazard prediction, such as bollards or broken glass on the path.

The Terrain assistant's core intelligence comes from interpretating the environment as a changeable safety variable, meaning that it can analyze factors such as moisture, gravel, ice, or reflective surfaces, and adapt its response according to the calculated risk.

The rider is informed through subtle anticipatory communication and predictive traction feedback allows it to learn from the severity of the situation.

SCENARIO 04

Group Ride Assist

This specialist feature is designed for group riding with other Predict users. Relying on collective "swarm" intelligence, the system sends alerts with useful information such as riders falling behind or gaining ground, or the stability of the group's formation, synchronization and drafting efficiency.

Using the principle of a distributed intelligence system, the Group Ride assistant is designed to share braking and positioning data in real time so the group can benefit from collective awareness and cooperative communication, such as being able to better coordinate pacing and reintegration.

"I train and race on the road a lot, and there are plenty of times where data about my bike and any other safety measures about other road users would be welcome. Improving how safe you feel on the road and helping you react to changing circumstances benefits everyone. With this sort of new technology, it makes me eager to see where it can go in reality and what the next generation of bikes can deliver to the rider."

KASIA NIEWIADOMA-PHINNEY
/ TOUR DE FRANCE FEMMES WINNER,
CANYON//SRAM RACING

01 What type of battery capacity is used to power all the on-bike electronics? How long should that battery last to make it viable for consumers?

Canyon Predict has a slim battery in the downtube with a target capacity of 8 hours riding time.

02 Where is the battery for the system located? Is it replaceable?

The battery is located in the downtube. There would be a hatch for servicing the battery.

03 Does the tyre pressure only monitor for loss of pressure (e.g. punctures) or safe cornering speed and road surface too?

Yes, both applications are possible via the wheel hub sensors.

04 Can the system predict poor surfaces before you are riding on them (i.e. how quickly can the wheel sensor or the camera react?)? Can the system work with Komoot for example to predict surface type based on GPX map data?

Yes, the cameras are built to spot the upcoming surface. It can also be possible in future to work with GPX map data as an input for estimated surface type. A combination of GPX map data plus AI learning would combine map data with data from the rider's experience or the community's experience.

05 Is the wheel dynamo only to power the lights or the whole system?

The wheel dynamo is intended as a top-up power supply for the whole system.

06 Can the rider customise the bike display screen?

Yes. It will be possible to scroll through various screens and select what is displayed and what is not displayed on those screens.

07 How many cameras and radar feeds are on the bike?

The bike has four cameras providing 360° visibility, and two radars to measure the distance to the cars in front of you or behind you and their angle of arrival.

08 How much does the system weigh? Or how much should the system weigh?

All the electronics themselves are very lightweight, not more than 100 grams. The battery is likely to add 1 kg, although battery weights are decreasing quickly. The complete bike will certainly be sub-10 kg.

09 What is the benefit of the UI controllers inside the brake levers?

They can be used to control the display. The idea is that the rider should not have to take their hands off the handlebars to change the screen, making for a safer system.

10 Do the physical UI controllers inside the brake levers combine with shifting systems?

They are our own controllers. We want the function to be programmable, so they could be used to control the display but they could also connect to other electronically controllable devices such as gears.

11 What metrics are designed to be shown on screen?

Speed, watts, elevation profile, total ride distance, heart rate, RPM, tire pressure, connection to devices, proximity to other Predict users, proximity to cars, lights on or lights off, navigation, safety warnings, terrain assist, and group ride dynamics.

12 What functionality is contained within the wheels?

In the rim is a tyre pressure sensor. In the hub is a dynamo for battery power and a 6D motion sensor to generate information on bike motion for comfort and safety features such as emergency brake assist, active curve assist, lane keep assist.

13 Who is the target market for this system?

We see this being something that all riders can benefit from. You can consider performance riders riding in a group. And on the other hand, you've got the solo rider riding in traffic.

14 Is the idea that it would only be a distinct model or would Canyon adapt other bike platforms in the future so that they could accept this technology?

Not only do we see this being applicable to many bikes within the Canyon range, but we see it being a universal safety platform available to other bike brands.

15 Would the display screen be touch screen or offer multi-touch functionality?

Yes although we see certain touch functions being blocked during riding for safety reasons.

16 Would the display be removable?

Yes for service reasons but not by the user. It is intended to be a seamless, smooth and integrated design.

17 You've not included bar tape on the handlebars. Is that intentional?

Yes. We see the hoods and the handlebar being seamlessly integrated with a rubberized material, allowing Canyon to control the shape of the brake/gear hoods.

18 When will this come to the market? How far are you in the development?

The current introduction is a 3D printed prototype. We have proven that the technology can be produced and can function as intended. Now we need to consider factors such as market acceptance and how technology pricing will come down but from here we estimate a market introduction could happen in approximately three years' time.

19 Canyon is also releasing a V2X system on its Urban bikes. How does this system complement the V2X introduction?

Canyon Predict shows you what your eyes can't see – it is camera and sensor based. V2X lets you see, and be seen by, other road users even when you're hidden around corners, behind buildings, or blocked by other vehicles. While it is only sensor based V2X makes you part of a connected, cooperative transportation system – one where vulnerable road users can be actively protected by both cars and infrastructure. Canyon Predict builds upon V2X principles as a future concept.

20 Is Canyon doing this whole thing internally in-house, building the whole capability to build these kind of bikes, or do you have a partner you're working with?

Technology is constantly morphing in any kind of high-performance product. We need to meet our consumers where their needs are. This technology is commensurate with meeting cyclists needs. For many years now we have been building these capabilities in-house to be both a tech company that makes bikes and a bike company that makes tech.

Interview with Fedja Delic / Head of Design, Canyon

01 How did the development of the Canyon Predict concept begin?

Our responsibility as product designers is to look far ahead, to anticipate human needs, and to create objects with a true sense of purpose.

When designing elite race bikes, it is easy to get caught up in the cycle of incremental gains, obsessing over a fraction of a watt or a saved gram. But to create something genuinely transformative, we had to lift our eyes and focus on the ultimate need: safety.

Right around that time, our founder, Roman Arnold, came to us with a piece of paper drafting his idea for a smart bike containing the newest technology.

Sometimes, the right things just come together at the right time. We had a hungry Design & Engineering team exploding with ideas and the Canyon Predict project started to grow.

02 Was there a specific moment or trigger that sparked the idea or desire to start this process?

The trigger was a moment of profound realization. We looked at how far the automotive industry has come with active safety and driver assistance, and then we looked at the bicycle. There was an enormous disconnect.

The assistance a cyclist actually needs is quite simple, yet its impact on their physical safety is monumental. When you realize that the technology already exists to protect lives, it becomes hard to believe – and frankly, hard to accept – that our industry hadn't implemented it yet.

That was the spark. It moved from being an interesting design concept to an absolute obligation.

03 Did any personal negative experiences influence the development of the concept?

At Canyon, riding and designing are completely inseparable. Everyone in our design studio rides. Because of that, every single one of us has experienced those quiet, terrifying split-seconds on the road – those near-misses that could have so easily been tragedies.

When you reflect on those moments, it does more than just make you think. It changes you. It creates a profound sense of responsibility.

Canyon Predict didn't come from an abstract market analysis or a corporate strategy. It grew out of a deeply personal, collective understanding of our own vulnerability on the road and to protect the community we are so proudly a part of.

04 What has primarily driven the development process: what is technically feasible, or what is conceptually imaginable?

Interesting question, because we often forget that we have already arrived in the future. Sometimes I look at the capabilities we are working with and feel like an actor in the science fiction movies we watched years ago. The technological leaps in recent years have been so vast that technical feasibility is no longer the true limitation. Today, almost anything is possible.

Because of that, we must always start with what is conceptually imaginable. If you only design around what is easily feasible, you are simply duplicating the present.

05 Canyon is a performance brand with its strongest foundation in road cycling. Isn't risk inherently part of the reality of every ambitious road cyclist, just as it is for a downhill mountain biker?

There is a difference between calculated risk and unpredictable vulnerability.

A downhill mountain biker is operating within a closed environment. They know the track, they can read the terrain, and they can measure the risk against their own physical skills and tactics.

On the road, that paradigm shifts completely. We are sharing our ride with open traffic, where circumstances and external variables change in a fraction of a second. When you combine that total lack of control with the high speeds of modern road cycling, the risk is no longer a conscious choice, it becomes an unpredictable threat that compromises the pure experience of cycling.

Our goal with Canyon Predict is not to remove the thrill of performance, but to eliminate the anxiety of the unknown.

ENGINEERED IN GERMANY
WWW.CANYON.COM