

# Roadlite:0N

# V2X



CANYON ROADLITE:ON V2X  
JUNE 2026

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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](http://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.**

**Vehicle-to-Everything (V2X) technology is already making cars safer by enabling real-time, wireless communication between vehicles, infrastructure, and pedestrians.**

**V2X helps drivers detect hazards early, avoid collisions, and reduces the risk of blind spots. V2X can make a significant impact for cyclists too.**

**According to the U.S. Department of Transportation,  
V2X could help prevent up to 80% of non-impaired  
crashes involving drivers in the United States.**

**([source.nts.gov](https://www.nts.gov))**

TAKE ROAD SAFETY INTO YOUR HANDS:  
BUILDING MOMENTUM FOR V2X

Current estimates indicate that between two and three million cars on European roads are equipped with V2X technology. Automotive brands (most notably the Volkswagen) are incorporating this technology in their product offerings.

But for V2X to truly have a large-scale positive impact, the technology needs greater adoption within the cycling industry.

As it stands, the bike industry has not kept pace with the auto industry.

We're hoping that, by showcasing this technology, we can inspire other cycling brands to embrace V2X. The more bicycle and automobile manufacturers who adopt this technology, the safer our streets can become.



Volkswagen have been integrating V2X technology into their vehicles for several years. The information is broadcast, meaning that Canyon V2X bicycles can already "see" compatible VW vehicles today. However, the feature for VW vehicles to visualise bikes is not yet in series-production – any demonstrations or visualisations, such as the image above, are part of a pre-development project.

TAKE ROAD SAFETY INTO YOUR HANDS:  
CANYON ROADLITE:ON V2X

First introduced by Canyon in 2023, the concept of V2X (or "vehicle-to-everything") allows for bikes and equipped cars, or other compatible infrastructure, to detect each other without direct visual contact, such as before entering intersections.

Now, three years on, Canyon has integrated V2X technology into 'ready to produce' versions of its Roadlite:ON CF bike. This high-performance, urban e-bike demonstrates how premium carbon frames can seamlessly house active safety systems without added bulk or aesthetic compromise.

A fast-approaching car from the right, obscured by a wall? A vibration in the right grip warns you instantly.

Simple, intuitive, effective, and a core feature of the Canyon Roadlite:ON V2X concept bike.

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INITIAL V2X PROTOTYPES



Launching with Canyon's new Roadlite:ON CF, the V2X concept also comes with an additional plug-and-play radar.

Equipped cars can detect the bike even without direct visual contact, such as before entering intersections, and display its position to the driver.

Cyclists receive clear, non-intrusive haptic or wearable feedback, and the rear light flashes when the radar identifies an approaching vehicle.

The system can also interact with compatible city infrastructure, enabling functions such as bicycle-specific green waves.



TAKE ROAD SAFETY INTO YOUR HANDS:  
CANYON ROADLITE:ON V2X

The Canyon Roadlite:ON V2X will be the first bicycle to fully implement the latest automotive connectivity standard: V2X – ready to ride.

We are encouraging other brands to add this technology to their own bikes.

The greater the number of V2X-equipped bikes on the road, the safer our streets will become.

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**"Mobility is only as safe as the most vulnerable user. With the Roadlite:ON V2X, we approached V2X from the cyclist's perspective, tackling the challenges of achieving high positioning accuracy and reliable communication with components compact enough to fit on a bicycle frame."**

**"With this technology bicycles can speak too, and with it we are proactively contributing to cooperative mobility for the safety of all road users."**

**"The Roadlite:ON V2X is an invitation to every user or stakeholder on shared roads (including automobile manufacturers, infrastructure operators and city planners) to accelerate the implementation of use cases that protect vulnerable road users, and cyclists in particular."**

**„We are demonstrating that we are ready to innovate and rise to the challenge of making the multinational Vision Zero movement a reality."**

**DR. VICTOR CASAS MELO / DESIGN ENGINEER, CANYON**



### **Built around the Roadlite:ON**

A carbon frame and fork with a Bosch compact hub motor allows for a more streamlined body position.

### **Connected**

Future-ready with the latest V2X technology, now compatible with millions of production cars on our roads.

### **Safety**

Dynamic braking lights and vibrating grips to improve safety.

### **Simplicity**

Singlespeed with a Gates belt drive means no oily chains and no external gears.

### **Canyon Characteristics**

Sporty identity with iconic top tube kink

### **Style as you like**

Equip with fenders, rack, range extender, bottle mount and kickstand

FUNCTIONALITY:  
V2X

Canyon has pioneered the first fully-integrated, production-ready V2X system capable of connecting with millions of the latest vehicles.

With a V2X co-pilot board nestled in the downtube and the V2X / GPS antenna in the head tube, the Roadlite:ON sends signals so in-vehicle screen displays alert drivers to the presence of V2X bikes.

Additionally, haptic sensations or smart device pop-ups (bike computer, phone, watch, etc) can alert riders to the presence of traffic.

The system is powered by a long-lasting Bosch e-bike battery, providing reserve V2X power even if the battery capacity for the motor is empty.

The hardware comes from leading V2X brand Nfiniity while Vector provided support with testing tools and 3D simulations.



FUNCTIONALITY:  
RADAR

The radar system is intended to alert drivers of a rider's intended actions and warn them if they are too close. It is designed a modular system where a light and a radar can be used separately or combined. The light is powered by the bike's battery. The radar can be connected to the light or directly to the battery.

When the radar and the light are connected, the combined safety function works as follows:

- The rear light can operate at regular intensity, increase in brightness, or blink, all within StVZO\* limits.
- When the rear light detects braking, it will become brighter.
- The radar detects and calculates the normal braking distance and the emergency braking distance of vehicles behind the bike, plus a buffer.

- The radar tells the rear light to become brighter when the relative distance between a car and the bicycle falls below the car's normal braking distance, and begins to blink when that distance falls below the emergency braking distance plus a buffer.

This approach seeks to address regulatory concerns about blinking lights on bicycles as a distraction, while still alerting drivers that they are too close and need to either slow down or start the overtaking manoeuvre, keeping the mandatory side distance.

\*StVZO, or Straßenverkehrs-Zulassungs-Ordnung, refers to the German Road Traffic Licensing Regulations which ensure that vehicles, bicycles, and their components meet safety standards to protect all road users.



**01** What modifications were needed to the frame to allow for the V2X module?

A cutout was made on the head tube to accommodate both the GPS (GNSS) and V2X antennas. Positioning the GNSS antenna is the critical part, since high accuracy is required – the system needs to determine whether the bicycle is on the left, right, or directly in front of an approaching vehicle.

**02** Do you see the system being used on other bikes within Canyon's range?

Yes. We deliberately took on the challenge of integrating V2X into the lightest and slimmest urban bike in our range. By solving it there first, it becomes significantly easier to expand to other platforms that have more available space.

**03** Is there any risk of interference or data drop-outs from the radar system or the V2X system?

The hardware is robust and proven through countless hours of field studies

but we would always recommend to proceed with caution and use your eyes and ears as the primary method of checking for cars.

**04** When do you see this rolling out to the public?

There are new cars with this technology on European streets today – in Germany, Car2X is standard on the Volkswagen ID.7 and available as an option on the Golf and the all-new electric ID. Polo, for example – and pilot projects are underway involving buses and city infrastructure. The real question is when V2X use cases specifically focused on cyclist protection will emerge. Without more bikes equipped with V2X, there is less incentive for car OEMs to prioritize that use case. Canyon is helping to create that catalyst.

**05** Which cities are trialling compatible V2X infrastructure (e.g. traffic light 'green waves')?

In the Netherlands: Utrecht, Amsterdam and Helmond. In Germany, Frankfurt, Kassel, Dresden and Ludwigsburg.

**06** Is this a follow-on from the work you did in 2023 with Autotalks?

Yes, we are still working with Autotalks – they deliver the V2X module. Their contribution was essential in the early stages, when everything in V2X was designed around cars. Thanks to Autotalks we were able to build our first prototypes.

**07** Why are you trialling this technology with the Volkswagen over other car manufacturers?

They are the front-runner car OEM in V2X adoption and deployment.

**08** What is the additional weight?

Approximately 180 grams for the V2X unit, 30 grams for the radar and 230 grams for the vibration-function grips.

**09** Who are the likely early adopters?

There is already a Coalition for Connected Cycling Safety with over 40 organisations working to expand V2X on bicycles – in-

cluding Bosch, DEKRA, Gazelle, VW, Audi, Autotalks, ZIV Trek, among others.

**10** What testing was carried out? Extensive field testing to improve positioning accuracy, plus thermal and CPU load testing of the processor. We also had strong support from Vector Informatik and their CANoe-Car2X tool, which allowed us to evaluate the protocol stack, signal-to-noise ratio, and multiple real-world scenarios.

**11** Is the connection from V2X module to grips wired or wireless?

Wired.

**12** Does the e-bike battery power the system and if so how much drain does it add compared to a standard Roadlite:ON?

Yes. The V2X system is powered by the main battery. It requires less than 3W – comparable to a front light – representing roughly less than 1% of total battery capacity.

**13 What is the 360° proximity range?**

At least 150m from behind and over 300m from the front, depending on the conditions of the environment.

**14 V2X vs. Canyon Predict new intelligence safety system – competition or coexistence?**

They're complementary, not competing. 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.

**15 Is this all Canyon in-house, or a third-party development?**

It will be a Canyon product developed with a coalition of strong partners such as Nfiniti, Vector and Autotalks.

**16 What communication "language" do we use and do all cars support that (e.g. is it radio, and is it supported by VW's Wi-Fi-based standard and the mobile network-based C-V2X standard)?**

The physical layer is DRSC (direct short-range communication) and C-V2X. It supports standard messages such as CAMs (ETSI EN 302 637-2) and DENMs (ETSI TS 103 831).

**CANYON**