The next generation of Nextbase dashcams are enabled with powerful behaviour prediction and computer vision software to make driving safer, more secure and easier than ever.

HUMANISING AUTONOMY

Powering the world's first smart dashcam for safety-conscious drivers

Case Study

NEXTBASE

The problem

Recklessness, distraction and driver or pedestrian error are consistently cited among the top causes of fatal and near-fatal road accidents in the UK. Failure to look for approaching vehicles properly is the most frequently reported factor in road accidents, contributing to a third of all reported incidents. Misjudging a vulnerable road user's (VRU) path or speed came second, accounting for 20 percent of reported accidents.

"It happens to everyone: a mirror glance too short; a pedestrian misunderstanding; finding ourselves focusing on our next meeting instead of the road ahead. Near misses happen in a split second," says Maya Pindeus, **CEO and co-founder of Humanising Autonomy.**

Further, with car insurance companies tightening requirements and guidelines on damage claims for vehicle owners, there is an increasing need to be able to provide detailed evidence and information on who was present at the time of an incident, what exactly happened and where.

AI Dashcams are an easy and insurance-friendly way to improve driver awareness, prevent accidents and provide evidence for claims.

About Nextbase

Since launching in 2012, Nextbase has consistently innovated dashcam technology and is now the world's leading brand in its sector. Its award-winning line of products have received critical acclaim for their high-quality video, the introduction of key new features and simplicity of use.

Ahead of the global rollout of its new generation of smart dashcams, Nextbase knew that road safety and advanced driver-assistance systems (ADAS) functionality would be at the core of its product offering. However, having ADAS functionality alone does not always guarantee an improvement in road safety, nor does it directly correlate to a smooth driver experience. In fact, the addition of certain ADAS safety features can actually lead to distrust in the technology – for example, if a driver was alerted every few minutes due to "phantom" objects near their vehicle.

To bring its vision of the next-generation dashcam to life, Nextbase sought a software partner who would deliver on three core areas:
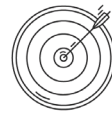
1.
Accuracy in detecting incidents and risks
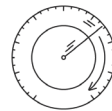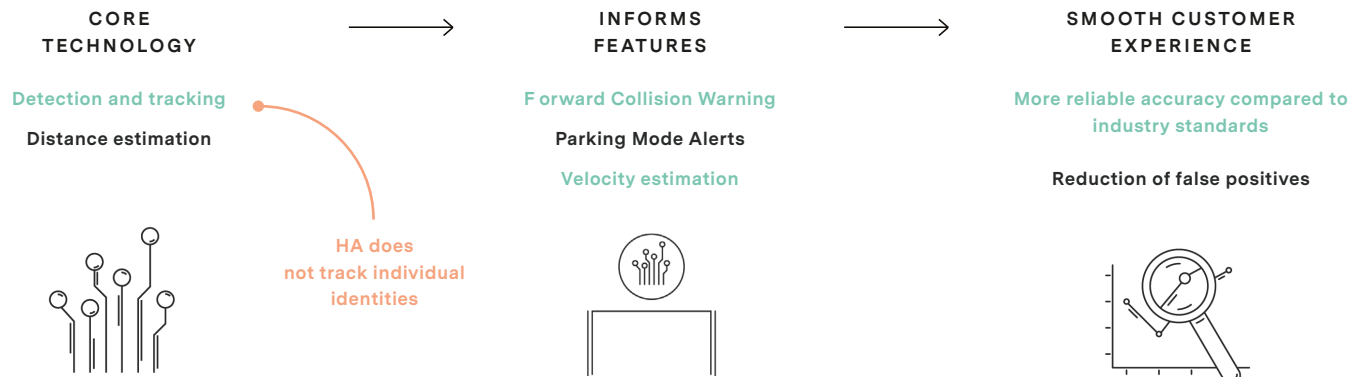
2.
Providing real-time, actionable alerts

3.
Ensuring the product is always simple to use

In this case study, you'll find out why Nextbase selected Humanising Autonomy (HA) as its technology partner, and how they are working together to develop the world's first smart dashcam for today's safety-conscious, digitally savvy drivers.

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How Behaviour AI Enables Swift and Safe Response

Enabled through Edge and Cloud platforms, Humanising Autonomy's software is designed to provide accurate, reliable and trustworthy detection, as well as distance and speed estimation of VRUs and vehicles to inform features such as Forward Collision Warning and Parking Mode Alerts.

CORE TECHNOLOGY → **INFORMS FEATURES** → **SMOOTH CUSTOMER EXPERIENCE**

Detection and tracking

Distance estimation

HA does not track individual identities

Forward Collision Warning

Parking Mode Alerts

Velocity estimation

More reliable accuracy compared to industry standards

Reduction of false positives

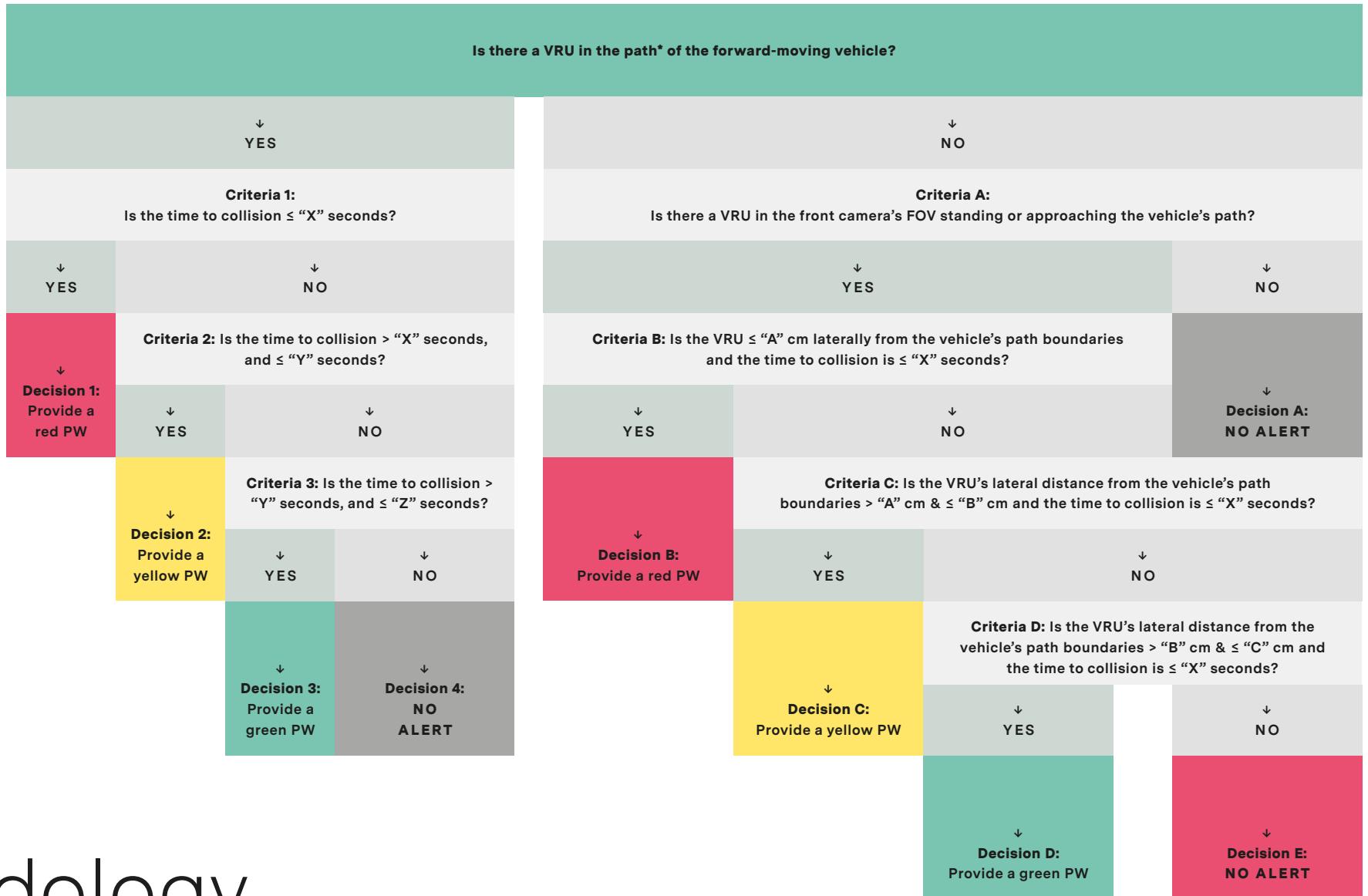|	Forward Collision Warning (FCW)	Velocity Estimation	Parking Mode Alerts
WHAT IS IT?	Our technology sends a real-time alert to the driver when a forward collision with a vehicle or VRU is imminent.	Our software extracts the velocity of other road users from our dashcam footage.	Our technology helps detect whether something is happening to the vehicle while it is parked.
TOP LINE BENEFITS	→ Real-time alerts give drivers added support and security for accident prevention → High performance provided, runs on low-power chips → Results in a reduction in false positive alerts and a reduction in irrelevant video transfers to the customer	→ Velocity estimation is a metric used by insurance companies for accident reporting. → Results in a reduction in false positive alerts and a reduction in irrelevant video transfers to the customer	→ Results in a reduction in false positive alerts and a reduction in irrelevant video transfers to the customer → High performance provided, runs on low-power chips
HOW DOES IT WORK?	Using the raw video input from the dashcam, the chip in the dashcam runs HA models to extract the time to collision and distance of VRUs. Euro NCAP logic then determines the type of alert to the driver, which can be visual or auditory.	When a user has an accident, this function is automatically - or manually - triggered to upload video clips onto Nextbase's cloud, which are then processed by HA's software to accurately determine the speed of each vehicle or VRUs present.	When an intrusion is detected, or your vehicle is hit, this function is automatically triggered to upload video clips onto Nextbase's cloud, which are then processed by HA's software to accurately identify who or what was present at the time.
EDGE OR CLOUD?	Edge	Cloud	Edge and Cloud
PERFORMANCE OUTPUT	HA's software can detect people up to 80 metres away, while driving up to 40 m/ph.	HA's technology can reliably estimate speed within a 2.5 m/ph range under normal driving conditions	HA's software can provide up to 150% more accurate detection than competitors.

Example technology logic
flowchart for Forward
Collision Warning (FCW)
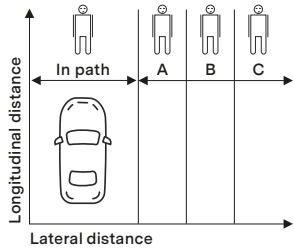
Humanising Autonomy combines strategic and customer-centric product design, proven engineering methodologies, and one of the largest proprietary data sets of human behaviour to develop and continuously validate its product suite. This rare combination results in technology that only gets better, smarter and more relevant with use.

Longitudinal distance
Lateral distance
In path | A | B | C

Is there a VRU in the path* of the forward-moving vehicle?

YES

Criteria 1:
Is the time to collision ≤ "X" seconds?

YES | **NO**

Decision 1: Provide a red PW

Criteria 2: Is the time to collision > "X" seconds, and ≤ "Y" seconds?

YES | **NO**

Decision 2: Provide a yellow PW

Criteria 3: Is the time to collision > "Y" seconds, and ≤ "Z" seconds?

YES | **NO**

Decision 3: Provide a green PW | **Decision 4:** NO ALERT

NO

Criteria A:
Is there a VRU in the front camera's FOV standing or approaching the vehicle's path?

YES | **NO**

Criteria B: Is the VRU ≤ "A" cm laterally from the vehicle's path boundaries and the time to collision is ≤ "X" seconds?

YES | **NO**

Decision A: NO ALERT

Decision B: Provide a red PW

Criteria C: Is the VRU's lateral distance from the vehicle's path boundaries > "A" cm & ≤ "B" cm and the time to collision is ≤ "X" seconds?

YES | **NO**

Decision C: Provide a yellow PW

Criteria D: Is the VRU's lateral distance from the vehicle's path boundaries > "B" cm & ≤ "C" cm and the time to collision is ≤ "X" seconds?

YES | **NO**

Decision D: Provide a green PW | **Decision E:** NO ALERT

Methodology

Hardware and System Deployment

Ambarella

The Semi-conductor

The Edge portion of this technology is run on Ambarella CV22 and CV28M chips through one forward-facing camera at full HD resolution and 30 frame per second (f/ps).

Both a part of the CVflow® family, the CV22 and CV28M camera system on chip (SoC) combine advanced image processing, high-resolution video encoding, and CVflow computer vision processing in a single, low-power design. **ambarella.com**

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The Technology

The core HA Models used in this project are Detection and Tracking.

The Forward Collision Warning system covered in this case study is already in use today and is part of a project that will be installed in 150,000+ commercial vehicles over the next two years. **humanisingautonomy.com**

NEXTBASE

The Product

The Nextbase IQ dashcam will be available in late 2022 globally.

Nextbase is a market leader in connected car technology and driving intelligence. Founded in the UK in 1999, the company has 22 years' experience of manufacturing in-car devices, with a our sole focus on driver wellbeing and safety. They are the largest smart Dash Cam brand in the world and hold over 80% of the UK market by volume. **nextbase.com**

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At-a-glance

Dashcam producer Nextbase and behaviour AI tech firm Humanising Autonomy bring pioneering ADAS perception to the world's first smart dashcam.

"Together, we're introducing a truly unique product to the dashcam market – one that makes our roads for everyone and speaks to our mission to be every driver's guardian, offering protection and backup to drivers and their families in the vehicle and on the road."

————— **Richard Browning**,
Chief sales and marketing officer, Nextbase

Why it's important:

Powerful features developed for autonomous driving – at an affordable price point.
Powerful and accurate ADAS that's available direct to the consumer at an accessible price, regardless of the vehicle they are driving.

Wide-scale safety.
This added security and driver support will lead to a wider and faster spread of road and driver safety measures that will keep roads safer and more pleasant to use.

What this means for consumers

Nextbase IQ Dashcam launching three products globally in late 2022

These next-generation smart dashcams include HA's safety enhancement technology, with features such as smart tracking of objects, speed and distance detection of other vehicles.

Products feature a video resolution up to 4K, with three camera views

Each Smart dashcam has forward-facing and inward-facing cameras to protect front and passengers, as well as the option of a rear window camera to protect the back of the vehicle.

Contact Humanising Autonomy today to find out more about Behaviour AI, and what this technology can unlock in your company. Custom demos available on request.

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