ONCAM C-SERIES
TECHNOLOGY FOCUS

MULTI-MODE

CREATE YOUR VIEW

ONCAM

INTRODUCTION

When it comes to 360-degree surveillance, the Oncam C-Series ticks a lot of boxes. The C-Series is compact, and its powerful Qualcomm Technologies powered SoC allows it to stream at market leading frame rates while delivering compelling technologies like TrueDetail HDR, StreamLite+ compression and Advanced Light Management.

Building on our decades of expertise in panoramic imaging we envisaged turning the C-Series into so much more than a 360-degree camera, thanks to advanced onboard "edge" dewarping, available with **Multi-Mode**.

With Multi-Mode, you can chose to stream up to 4 different views simultaneously from the following ones:

- **Fisheye**: the standard 360-degree fisheye view, ideal for total situational awareness.

- **Panoramic+**: a 5:2 pre-dewarped panoramic view ideal for wall-mounted cameras, that uses the center of the fisheye sensor to generate a true 180-degree image. When installed at an angle, tools like Angle Compensation Technology (ATC) and Scene Offset allow the image to be optimized to provide an even more natural representation of the scene.

- **Corridor+**: a split 2-way corridor view from a ceiling mounted camera, Corridor+ allows you to watch both directions of a 360-image at the same time, with no blind spots, so that objects can move seamlessly from one view to the other.

- **T Corridor+**: a 3-way junction view from a ceiling mounted camera, T Corridor+ allows you to see in all three directions at the same time, with no blind spots even when objects move from one view to the other. As with Corridor+. T Corridor+ views benefit from Scene Offset to center the view.

- **VCam:** a user defined dewarped view of a specific chosen area of the fisheye image, where users can decide which specific area of the scene is of interest and focus on it.

Multi-Mode enables you to record everything that happens within a scene thanks to the 360-degree coverage from the fisheye stream, but at the same time, it makes it possible to conveniently set up other specific views for ease of use. For example, the 360-degree view can be used for retrospective investigation, while the different dewarped views can be displayed on the screen of a control room for more natural live viewing. The flexibility doesn't end there: you run streams at different frame rates, deciding which streams to watch or record at which frame rate.

Multi-Mode makes C-Series even more versatile. A camera solution that can be tailored to your needs based on your own particular use case. It can be a 360-degree camera, or a panoramic one, or even both at the same time with the ability to show different views on different streams. It can also run one stream up to 60 fps or multiple streams simultaneously up to 30 fps and be installed inside or out.

Let's now take a look at each view in more detail.

PANORAMIC+

Trying to get a great panoramic image from a surveillance camera can prove difficult, often depending on the type of camera being used and your needs:

- Multi sensor cameras can generate a panoramic image by combining the images from each sensor. However, this can lead to several issues, from stitching, to alignment and light imbalances, or it can can even have blind spots – especially under the camera when mounted in ceiling mode. They tend to provide a higher overall resolution but are much larger units and aren't always suitable for indoor installations where aesthetics or size may be important.

- Conventional lens cameras can generate panoramic images, but rarely cover a full 180-degree field of view, leaving blind spots on the edges of the image.

- Fisheye cameras can cover a 180-degree field of view, don't suffer from the issues mentioned above, and give best results when wall mounted. Unfortunately, they can still cause problems with orientation and distortion if the camera is not mounted at head height, as the camera needs to be tilted, which could cause unnatural looking images.

Panoramic+ solves the issues of standard fisheye cameras and offers a compelling solution for true 180-degree wall mount panoramas without suffering from stitching, alignment, light balance or blind spots.

Panoramic+ images are a true edge-to-edge dewarped view of the original fisheye image taken from the center of the scene with an extended vertical field of view and a super-wide aspect ratio of 5:2.

Image 1: native 360-degree illustration from a wall mounted camera

Image 2: Panoramic+ illustration enhanced with Angle Compensation Technology and Scene Offset

Often, for security reasons and to avoid tampering, surveillance cameras need to be mounted at a height. To make sure that the camera is looking in the right area, it needs to be tilted downwards, causing two types of panoramic distortion:

- The horizon appears curved, and vertical lines are not parallel. Oncam's **Angle Compensation Technology (ACT)** solves these issues by aligning vertical lines and flattening the horizon.

- If the center of the camera is not pointing at what is most important in the scene. **Scene Offset** allows for the image to be electronically adjusted to tilt the panorama and focus on what matters most, making sure nothing is missed.

ACCESSORIES MATTER

When panoramic cameras are mounted at a height, to make sure all of the scene below is captured fully, the cameras will require physical tilting. To provide extra flexibility in Panoramic+ installations, we've designed specific accessories for the C-Series that can help tilt the camera to the desired angle:

- **Indoor Panoramic+ Tilt Mount**: a discreet wall mount which allows the camera to be tilted downwards between 20° and 45°

- **Outdoor Panoramic+ Tilt Bracket**: a sturdy 1 1/2 NPT compatible pendant mount bracket that allows the camera to be tilted at any angle between 0° and 90° and can be used either with a wall arm or mounted directly on a wall. The Outdoor Panoramic+ Rain Guard is also available to give extra protection from the elements,

With these specific accessories the Oncam C-Series is optimised for both ceiling and wall mount applications, in both 360- and 180-degree panoramic views.

THE BENEFITS

- Compelling solution for wall mounted panoramic installations, with Panoramic+ views and accessories for both indoor and outdoor tilted mounting
- True edge-to-edge 180-degree image from a single sensor camera, with no blind spots, stitching, alignment or light issues
- The 5:2 Panoramic+ stream provides a perfect balance between image quality and bandwidth efficiency, enhanced by the C-Series platform and ACT and Scene Offset

THE USE CASES

- Enhanced wide view on passing traffic and possibly at people's faces because of the wall mounting (e.g., till area in a shop, corridor, desk area in a hotel lobby)
- Perimeter protection (wall of a building, fence etc)

CORRIDOR+

Imagine wanting to monitor two sides of a narrow scene without any blind spots.

You could try to achieve it with two cameras, but this won't give you a complete view, and certainly not one that is synced.

Corridor+ is a dewarped split two-way corridor view, with which you can see two perfect halves from the whole corridor image side-by-side, allowing you to monitor both directions of the scene at the same time. With no gap in between those two images, objects and individuals will move seamlessly from one dewarped view to the other,
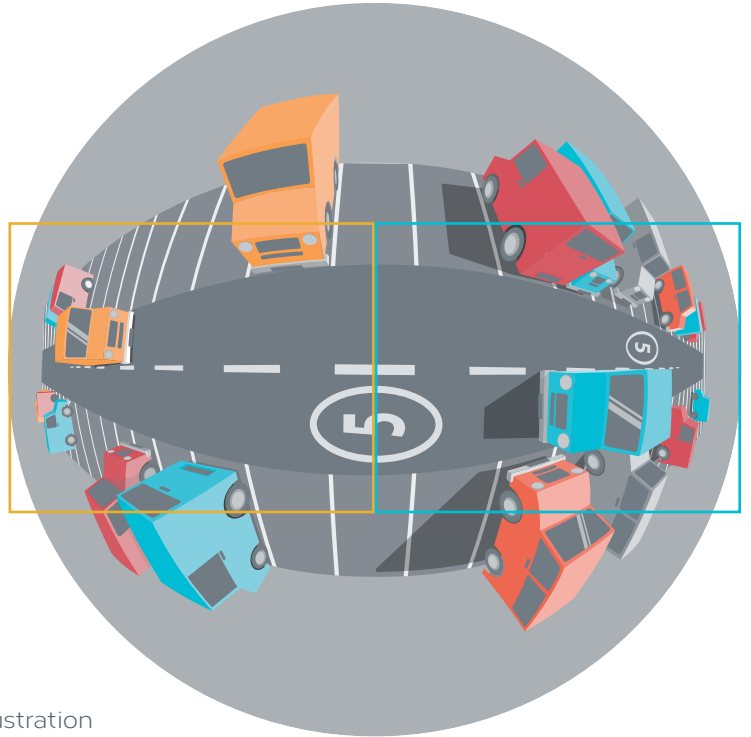
Image 3: Native fisheye illustration

After set-up, you can adjust both halves of the image with Scene Offset by moving them from left to right, to ensure the full width of the corridor is captured.
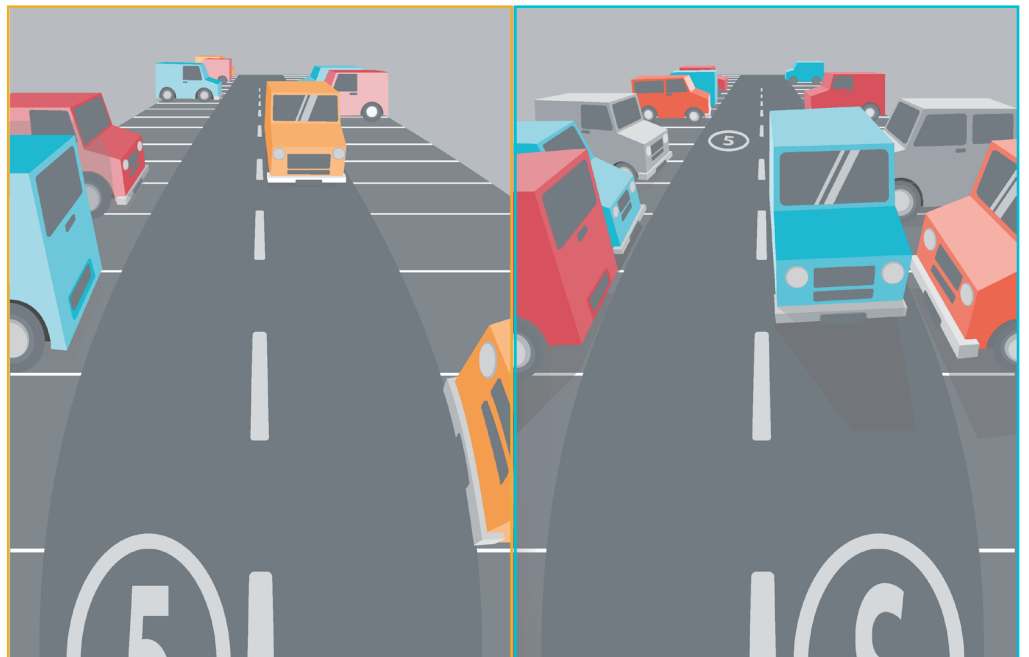
Image 4: Dewarped Corridor+ illustration

THE BENEFITS

- Nothing goes amiss: Corridor+ gives the dewarped views of two halves of a full panoramic image, guaranteeing complete coverage of a corridor with no blind spots
- Gives two natural looking views of both directions of a corridor
- Save bandwidth by focusing on what matters most

THE USE CASES

- Indoor corridors
- Shopping center aisle
- Server farms
- Street surveillance

How do you monitor a space when you want to focus on three specific directions and have a complete view of all of them simultaneously?

In these cases, camera placement becomes critical: you'd have to place multiple overlapping cameras in multiple directions to ensure no blind spots.

Afar more elegant solution is to use a ceiling mounted 360-degree camera with a three-way corridor view like **T Corridor+**.

T Corridor+ focuses on three directions of the scene without leaving any gaps or blind spots, and individuals or objects are captured seamlessy as they pass between the three different views.
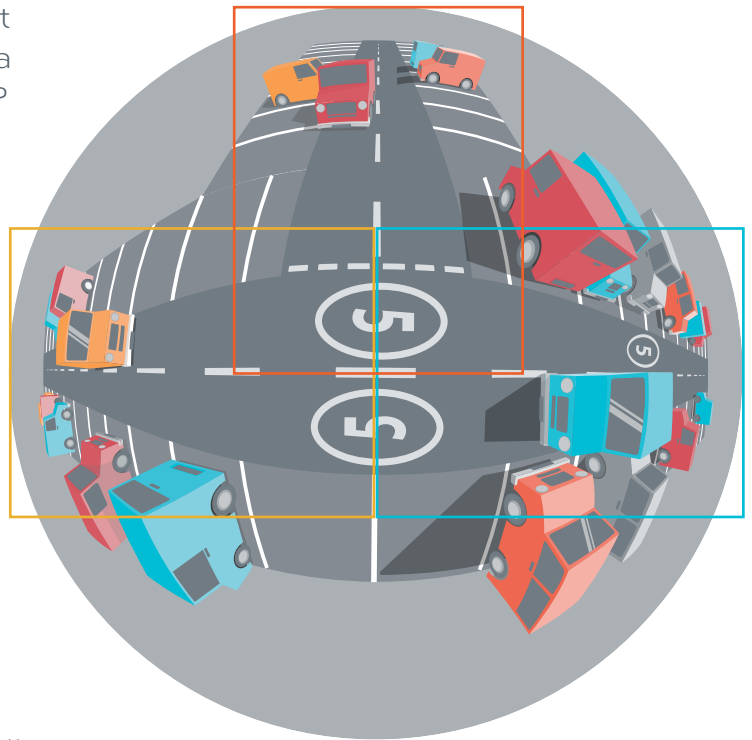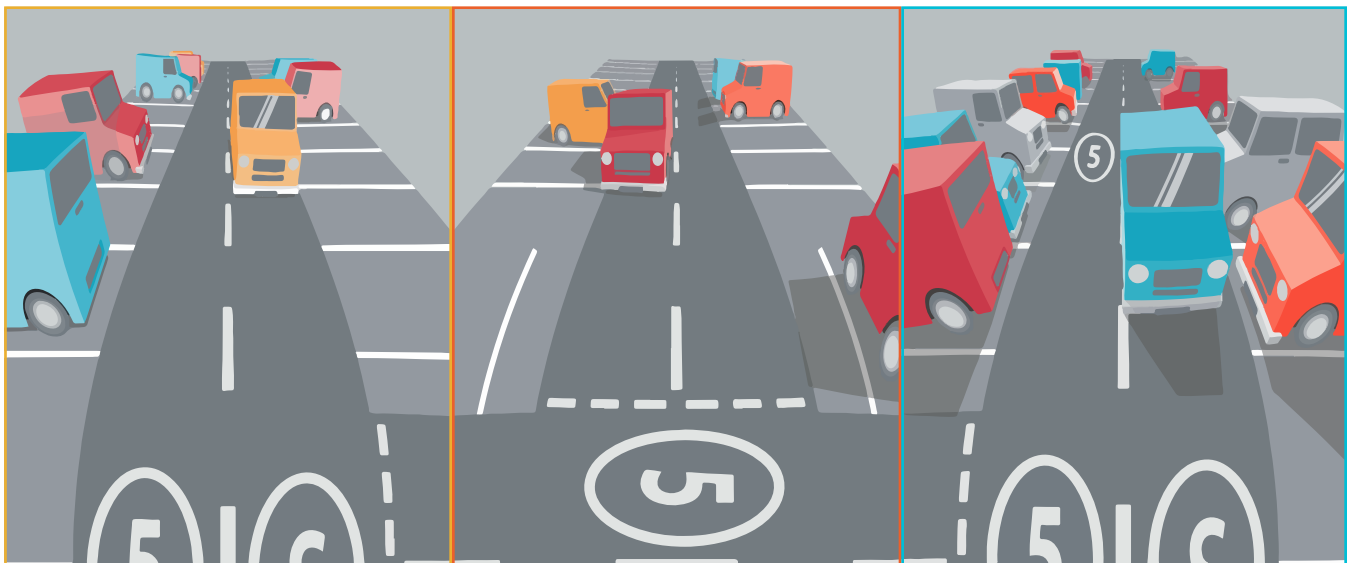

Image 5: Native fisheye illustration

Image 6: Dewarped T Corridor+ illustration

Decide the orientation of the images with the ability to rotate and get the perfect coverage thanks to Scene Offset and focus on what matters most.

THE BENEFITS

- Nothing goes amiss: T-Corridor+ gives the dewarped views of three directions of a 360-degree image
- Complete coverage of a junction with no blind spots
- Gives three natural looking views of a corridor junction
- Save bandwidth by focusing on what matters most

THE USE CASES

- Lift lobby
- Corridor junction (hotels, hospitals, universities / schools, subway stations)
- Street surveillance

VCAMS

Often, you want to focus the camera on a key location in your scene.

To do that, you can use a Narrow Field-of-View (NFoV) camera permanently pointed in that direction, but by doing this, everything else that happens outside that field of view goes unseen unless there's a second, 360-degree camera capturing the rest. This problem can be solved with a 360-degree camera feauturing **VCams.**

A VCam or "Virtual Camera", is a dewarped view of a specific section of the 360-degree image.

The benefit of using aVCam is quite simple: while the 360-degree camera has a view of
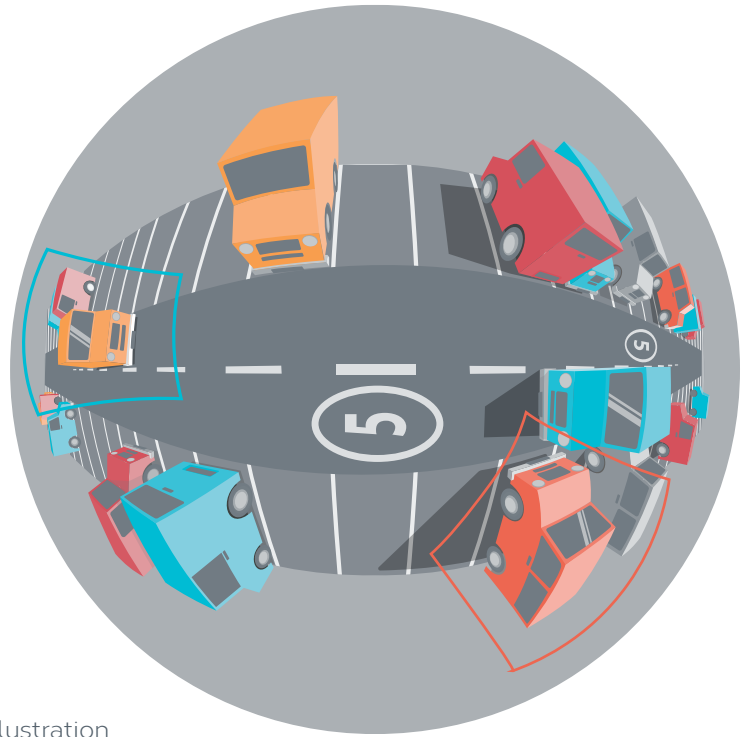
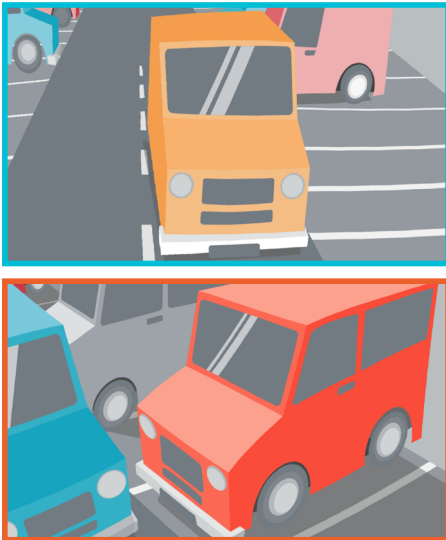Image 7: Native fisheye illustration

Image 8: Dewarped VCams

the entire scene, the VCam gives a natural-looking view of a specific area, which can be streamed separately, for example for live monitoring on a screen.

This becomes particularly powerful when combined with a retrospective view: recording the entire 360-degree image captures what happened elesewhere in the scene at the time of an incident, focusing beyond what is just visible in the VCam.

Up to 4 separate VCams can be created, or up to 3 alongside the fisheye stream.

THE BENEFITS
- Dewarped view of a particular portion of the 360-degree image
- Focus on one particular area, without losing the overall view being recorded with the 360-degree view

THE USE CASES
- Building entrance or exit
- Tills
- Reception desk

Here are some examples on how to combine these different views thanks to Multi-Mode.
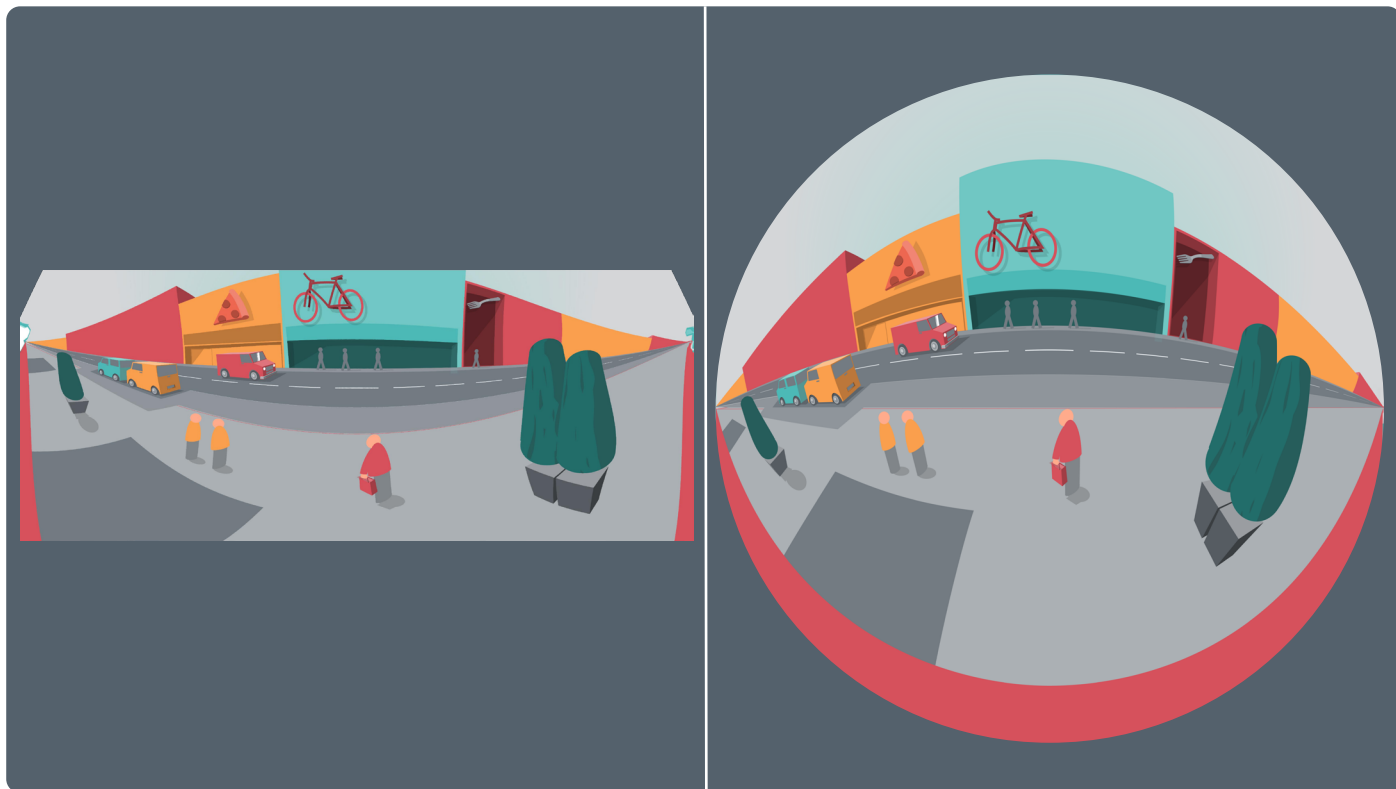

Image 9: Wall mount applications with Panoramic+ for live monitoring and a fisheye for retrospective playback
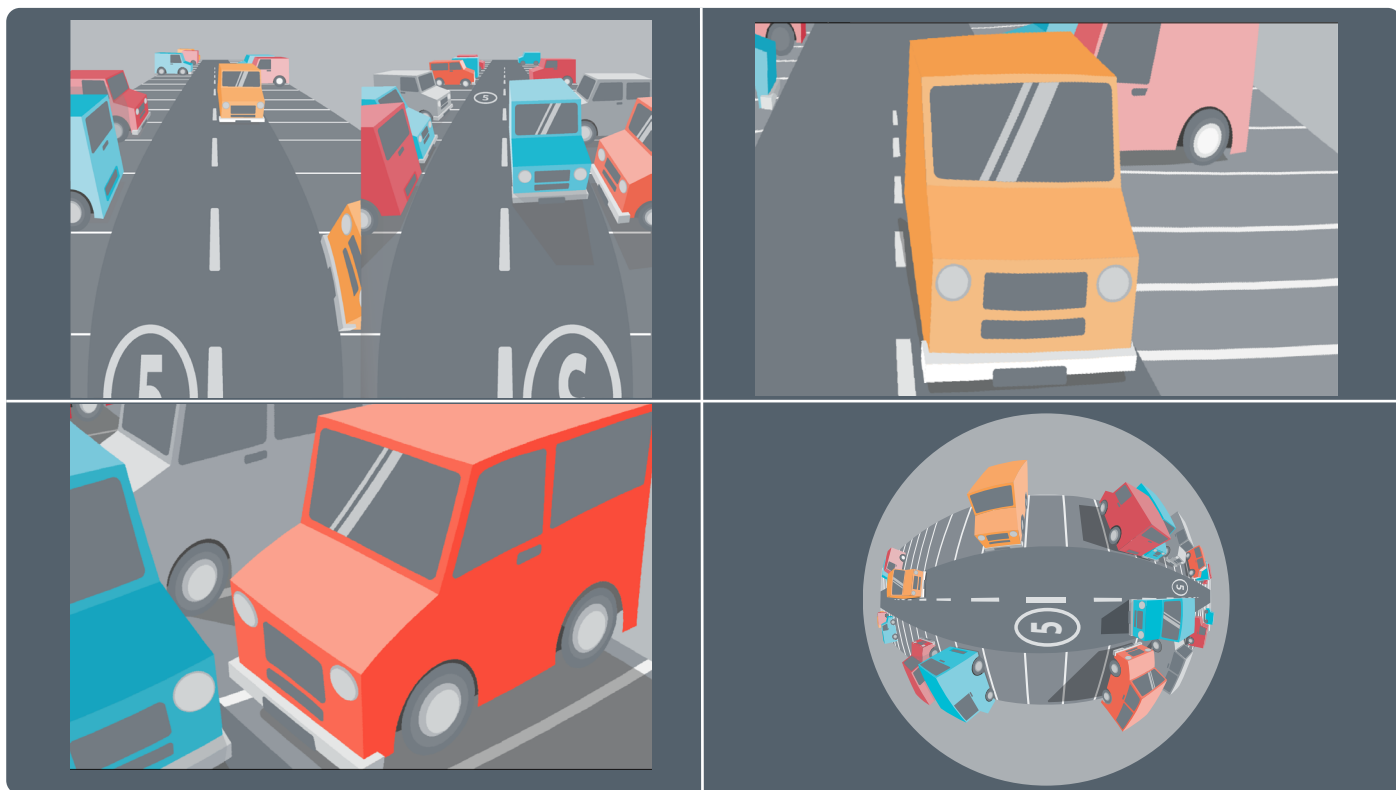

Image 10: Ceiling mount applications with Corridor+ for live monitoring, 2 VCams to focus on what matters and a fisheye for retrospective playback
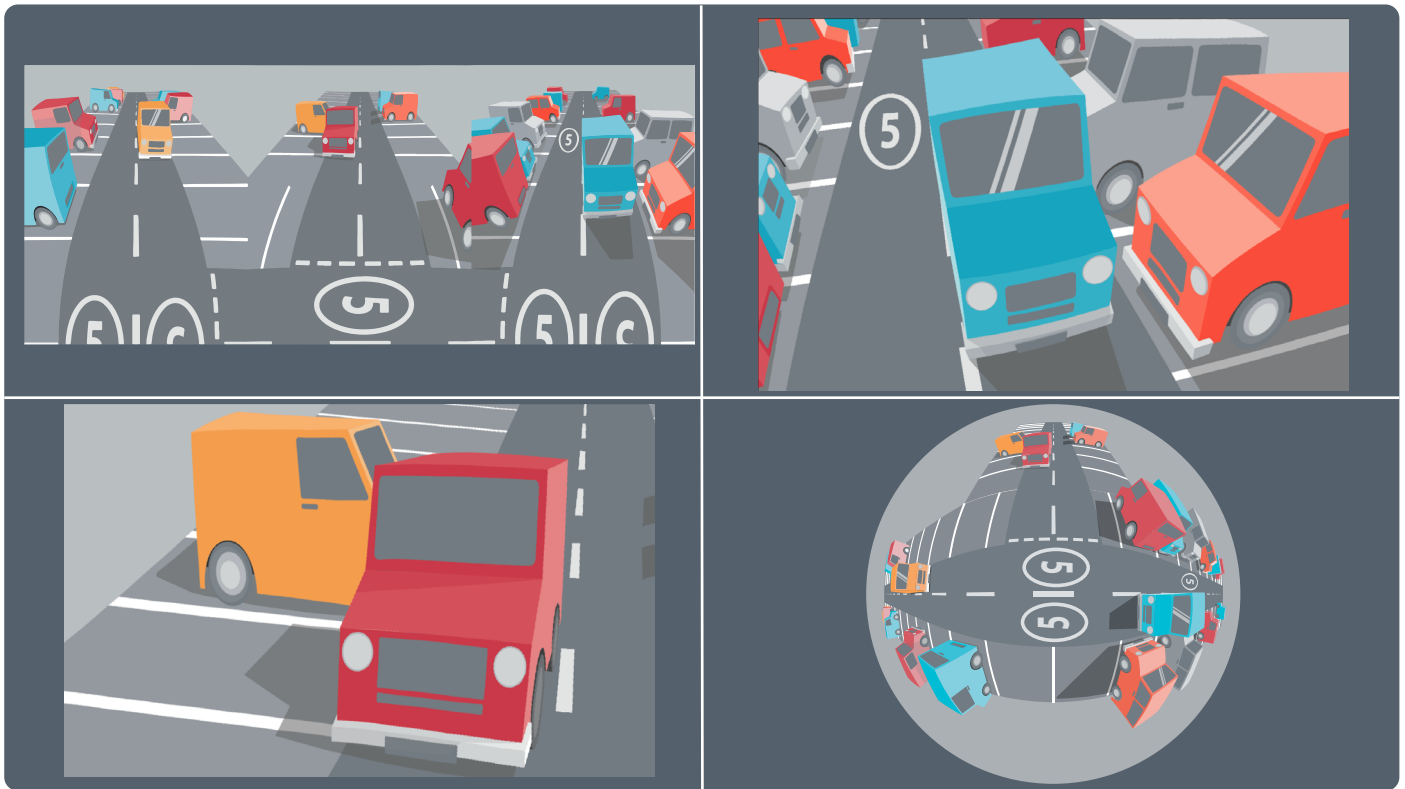
Image 11: Ceiling mount applications with T Corridor+ for live monitoring, 2 VCams to focus on what matters and a fisheye for retrospective playback
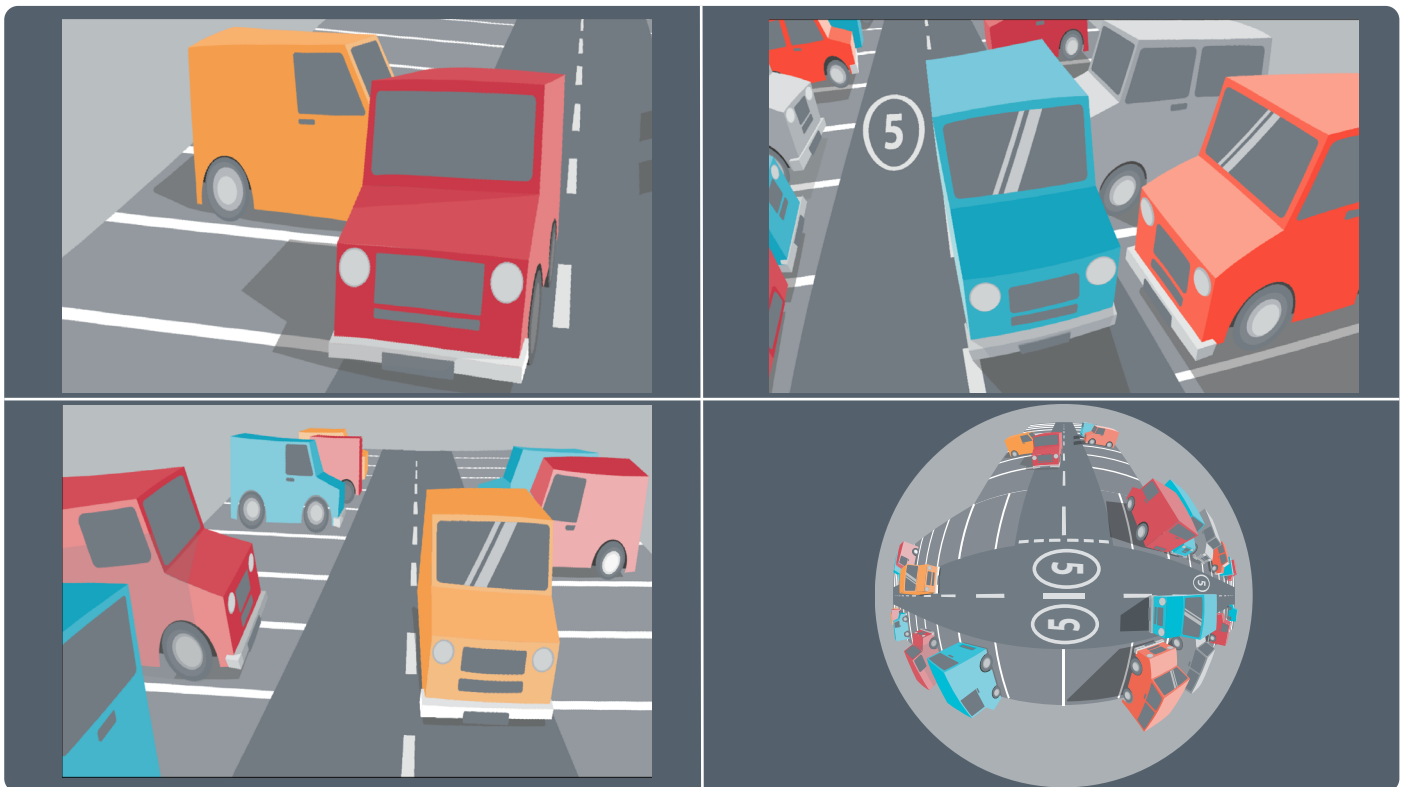

Image 12: Ceiling mount applications with three VCams and a fisheye for retrospective playback

ABOUT US

Oncam is a global independent manufacturer specialized in single-sensor 360-degree fisheye cameras and video surveillance technology. The company creates and deploys an open platform with specialized IP video and dewarping technology to create award-winning video-led solutions for stakeholders from C-suite to the security officer in multiple customer sectors. Oncam allows better decisions to be made based on real-world and digital data.

Oncam, founded in 2007, is part of ONVU Technologies Group, and is a leading innovator in 360-degree and panoramic IP video technologies globally. Oncam is headquartered in Switzerland and operates from regional hubs in the UK, US and India.

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