

Key considerations when selecting a dash cam



Dash cameras (dash cams) have become a standard fleet-management tool for larger fleets. In recent years, the cost has become affordable for small fleets operating any type of vehicle. Dash cams were initially developed for documenting what happens during an accident, to protect an organization against false accusations. Video footage often leaves little dispute about the facts.

More advanced telematics-based dash cam systems can identify unsafe driving behaviors such as harsh braking, distracted driving, following too closely and rolling through stop signs.



Who switched lanes into whom? Dash cam video shows the facts, rectifying conflicting statements.

Proper implementation of these advanced systems can significantly reduce accident frequency. Several studies have found that use of a telematics-based dash cam system, in combination with driver feedback and coaching, resulted in a more than 50% reduction in unsafe driving events.¹

Dash cams generally fall into 2 categories: stand-alone cameras, which provide accident documentation; and telematics-based systems, which add a host of safety features. Quality stand-alone cameras range from \$100 to \$350. Telematics-based cameras range from \$300 to \$600 and have a \$20 to \$40 monthly monitoring fee per camera.

Stand-alone dash cams

Stand-alone dash cams are connected to a power source in the vehicle but do not have any other connections. Forward-facing cameras are standard, and many have dual lenses: forward- and driver-facing. More advanced systems have the ability to add remote side- or rear-facing cameras.

Stand-alone dash cams record and save video to a memory card within the unit in 30- to 60-second video clips. Once the memory card is full, depending on the size of the memory card, new video records over the older clips. This is referred to as loop recording. Better cameras have a built-in accelerometer, which measures directional force to detect unsafe driving events such as hard braking or an accident. These event clips are typically saved within a protected folder on the memory card so they cannot be overwritten.

To view video(s) on a stand-alone camera, the user/manager must plug the camera into a computer or remove the memory card and download the data to a computer. Some cameras will Wi-Fi connect to a smartphone app for viewing on the phone.

A major limitation with stand-alone cameras is that they do not notify managers of an event. Organizations must rely on the driver to tell them an event occurred that should be reviewed/saved. Other concerns include a driver turning off the camera, unplugging the power source or removing the memory card.

Telematics-based dash cam systems

Telematics-based dash cam systems combine the video camera with a telematics system. Video is saved to the cloud so it cannot be lost, and alerts are sent if the camera is not operating. Telematics data, including vehicle location, trip histories and unsafe driving events such as speeding, harsh braking, sudden accelerating and harsh cornering, is generally available. Dash cams integrated with a telematics system can utilize both the video and the telematics data for managing driving behavior, providing driver feedback and training drivers. Video provides management with a better understanding of the root cause and contributing factors related to the incident they're investigating.

More advanced "smart camera" systems incorporate artificial intelligence (AI) capabilities into their cameras. The AI can identify unsafe driving behavior such as distracted driving, fatigue, improper seat belt use, following too closely, rolling through stop signs, etc. These items are tracked/scored like other events for management review.



Limiting monthly subscription costs

High monthly subscription costs are largely due to each camera having its own cell plan for transmitting video and data. To lower these costs, some telematics systems operate through an app on the driver's cellphone, utilizing the phone's existing data plan. Some systems use Wi-Fi to transfer data when the vehicle returns to its home location. The disadvantage to this is that there is no real-time transfer of data. Organizations need to determine whether the delay in receiving information is acceptable.

Comparison Table			
Dash Cam Type	Hardware Cost per Vehicle	Monthly Monitoring Fee per Vehicle	Comments
Advanced	<ul style="list-style-type: none"> \$300 - \$600 May require professional installation 	<ul style="list-style-type: none"> \$20 - \$40 Multiyear contracts* 	<ul style="list-style-type: none"> Driver management portal Automatic video event recording; video saved to cloud Additional vehicle monitoring: <ul style="list-style-type: none"> Location- Trip maps Speeding, hard braking, etc. Some systems have: <ul style="list-style-type: none"> AI (smart camera) capabilities Live video Gamification and rewards Coaching and counseling
Stand-Alone	<ul style="list-style-type: none"> \$100 - \$300 Self-installation 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> Inexpensive accident documentation Manual downloading of video Difficulty in identifying unsafe driving and using for driver coaching Can be disabled by drivers without management knowledge
Wi-Fi Systems	<ul style="list-style-type: none"> \$400 - \$600 \$800 - \$1,200 Wi-Fi router May require professional installation 	<ul style="list-style-type: none"> None, or minimal** 	<ul style="list-style-type: none"> Many of the benefits of a telematics-based system without the monthly fee Alerts and video downloaded when vehicle returns to office or terminal** Fewer of these systems exist

* Monthly camera-related fees are generally lower if the camera is added to an existing telematics system.

** Some Wi-Fi download systems send alerts through the driver's phone and then download the video via Wi-Fi. There may be a small monthly fee for this service.

Key considerations for stand-alone dash cams

- **A permanently connected power source.** Without a permanent power connection, there is risk of the dash cam not working when unplugged from the power port. It is simply too easy for a driver to disconnect the camera, in which case an event could occur without a recording.
- **Video quality.** Video quality has gotten very good, with 1080p now being the standard, but 720p is acceptable. Both are considered high definition.
- **Viewing angle.** Generally, the wider the angle, the better; however, as the angle increases, the forward quality generally decreases. 155 to 170 degrees is common.



Night vision capabilities are an important consideration if your vehicles regularly operate at night.

- **Night vision.** Most cameras manufactured today have acceptable night vision, but if your vehicles operate primarily at night, high-quality night recording is essential.
- **Audio.** Most cameras record audio but allow it to be shut off if desired.
- **Automatic event saving.** The camera should automatically save events to another folder so the events are not copied over. Evaluate what types of events are saved: accidents, hard braking, severe cornering, etc.
- **A quality memory card.** Dash cams need to use quality, Class 10 memory cards. Because the card is constantly adding new trip footage and erasing the oldest trips, the card is stressed more than a typical memory application. Using a standard camera memory card is not recommended. The memory card also must stand up to the constant vibration of the vehicle as well as large swings in temperature. Quality cards of the storage capability needed generally range from \$40 to \$80.
- **Memory card size.** The size of card needed depends on the amount of driving done, how long you want video saved and how the storage is set up. Generally, the camera website will provide guidance.
- **Memory card lock.** A memory card lock ensures that the card is not removed or tampered with. The card should be in place to preserve data in every incident, including at-fault accidents.
- **Driver-facing lens.** Many cameras include a driver-facing lens, which is good for identifying driver behavior when an event occurs, such as distractions or fatigue. It is also recommended for livery services to monitor passengers.
- **Multichannel capability.** Channels generally refer to the number of cameras or lenses that can be linked together. For instance, a 3-channel could include a front, back and side camera all feeding a central storage device.
- **Other**
 - Time of day and speed information imprinted on the video are helpful. Speed imprinting requires the camera to have a GPS component.
 - Some cameras have a small viewing screen, but these seem to be going away to reduce cost, size and driver distraction.
 - Parking mode allows the camera to work when the ignition is turned off. Some systems detect motion, so vandalism or theft can be recorded.

Key considerations for advanced dash cam systems

- Video quality, viewing angle and nighttime capabilities as described above
- Warranties on cameras and other hardware

- Whether all video, or just video from triggered events, is saved; how long the video is available
- Whether there is adequate memory on the camera to save video when the vehicle is in an area of poor cell service
- What events trigger video capture, such as speeding, harsh braking, sudden acceleratiing, harsh cornering or accidents
- Whether the system has AI capabilities and, if so, what it can identify
 - Interior camera: distracting activities, fatigue, improper seat belt use
 - Exterior camera: following too closely, not stopping at stop signs, disobeying traffic signs
- How camera software updates are handled, as well as whether the camera can receive updates or will need to be replaced as features are added

- Availability of driver coaching or training tools
- The system's other telematic capabilities; refer to our [Telematics Selection Guide - Advanced](#) for a checklist of key features to evaluate

Testing and trials

Stand-alone dash cams are inexpensive enough that we recommend purchasing 5 or 6 different models to test. The testing models can still be used after the trial, as they do not have to match.

Most advanced telematics-based systems allow you to test several cameras for a short period of time. Generally, they provide the hardware for free but may charge the monthly subscription rate. Because of the cost and length of contract period for these systems, it is a best practice to conduct a trial.



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¹ "Effective Use of Commercially Available Onboard Safety Monitoring Technologies: Guidance for Commercial Motor Vehicle Carriers," M.C. Camden, J.S. Hickman and R.J. Hanowski, National Surface Transportation Safety Center for Excellence, Virginia Tech Transportation Institute Report 15-UT-032 (March 3, 2015).

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