Technical Specification and System Requirements

In order to be considered suitable for installation in a Council Licensed vehicle, a taxi camera system must meet the following requirements:

1.0 Operational Technical Specifications

Ref	Specification	Details
1.1	100% solid state design or a proven vibration and shock resistant system	The system should not have any fan and the recording should be vibration and shock proof, i.e.: - Flash-based SSD (100% industrial grade), - Hard disk with both mechanical anti-vibration and anti-shock mechanism and self-recovery and self- check file writing system. SD Cards would only be acceptable if used with a secure unit that the driver does not have access to.
1.2	8 to 15 Volts DC	Operational between 8 and 15 volts DC
1.3	Reverse polarity protected	System to be protected against reverse voltage.
1.4	Short circuit prevention	System to be protected against short circuits
1.5	Over voltage protection	System to be protected against high voltage transients likely to be encountered in the vehicle electrical system.
1.6	Automotive Electromagnetic Compatibility Requirements	The taxi camera equipment must be e-marked or CE-marked with confirmation by the equipment manufacturer as being non-immunity related and suitable for use in motor vehicles.
1.7	System override switch to be located in a position where it is not accessible from inside the vehicle (i.e. in the boot) The over ride switch must be illuminated when switched “on”	The system is required to be active at all times that the vehicle is being used as a licensed vehicle. This will allow the facility for the system to be deactivated during times when the vehicle is being used for private purposes (e.g. domestic use). The switch that deactivates the system must be located within the vehicles boot or engine compartment (i.e. it must not be possible to deactivate the system from inside of the vehicle).
1.8	First-in/first-out buffer recording principle	The system must automatically over write to create a constant cycle recording

1.9	Access record	A service log must be kept and maintained by the approved installer and the local authority.

1.10	Security, duration and auto-clearing of log files	
1.11	Image recording formats and media	Images must be encrypted to a minimum of FIPS 140/2
1.12	Image protection during power disruption	Images must be preserved in the event of loss of power. Battery back-up will not be permitted
1.13	Unit must operate without the ignition being turned on.	The Unit must have the ability to operate for at least 30 mins without power from the ignition. The device must be hard wired to both constant and ignition supply.
1.14	Image and audio data shall be recorded and stored in a unit separate from the camera head.	Self-contained storage cards within the camera head will not be acceptable
1.15	GPS capability	System must have GPS capability.
1.16	The system must be capable of recording audio time synchronized to the recorded images.	If activated, the audio must record within the video file.
1.17	The system shall not record audio except when audio recording is activated by means of an approved trigger / panic switch	The system should have the ability to start recording audio data by means of at least two trigger buttons. One trigger button must be capable of being activated by the driver. Once the trigger is activated the system must begin to record audio data. The system will continue to record audio until the same trigger is activated again. The second activation of the trigger must result in the cessation of audio recording. The second trigger button must be capable of being activated by the passengers in the vehicle independently of the driver. Once the trigger is activated the system must begin to record audio data. The system will continue to record audio until the same trigger is activated again. The second activation of the trigger must result in the cessation of audio recording. Both audio activation triggers must be independent of each other – this means that audio recording can only be deactivated by means of the same trigger (driver or passenger) that was used to activate the audio recording or

		the system is reset after a time period of 5 minutes for recording has elapsed.
1.18	The audio playback, when triggered, shall be in 'real time' and synchronised with the images that are captured.	
1.22	Audio data and image data must be stored together, not in separate files, and must be protected against unauthorised access or tampering.	
1.23	The system must support testing of the audio function for installation set-up and inspection purposes.	
1.25	Recorded images by the system shall not be displayed within the vehicle.	Any monitor, if fitted, must display live images as clearly visible by having a glance around as per ICO specifications, it must not display recorded images
1.26	The system must have at least two activation triggers (alert buttons).	At least one trigger/audio activate button must be capable of being operated by the driver AND a passenger. Once activated, this switch must trigger the recording of video and audio in accordance with section 6.1 below.
1.27	The system must include a visual indicator that will clearly show when audio recording is taking place. This indicator must be visible to all passengers within the vehicle.	This may take the form of an indicator LED built into the audio activation switch which can clearly be seen by passengers.

2.0 Storage Capacity Technical Specification

Ref	Specification	Details
2.1	Minimum of 28 days i.e. (28 x 24 hours) of recording capacity	The camera system must be capable of recording and storing a minimum of twenty eight days of images of HD1 (720/288) size or better.

2.2	Images must be clear in all lighting conditions	System to provide clear images in bright sunshine, shade, dark and total darkness. Also, when strong back light is present without the need for additional components.

3.0 Camera Head Technical Specification

Ref	Specification	Details
3.1	Camera installation non-obstructive	The camera and all system components shall be installed in a manner that does not interfere with the driver's vision or view of mirrors or otherwise normal operation of the vehicle.
3.2	Protected camera disconnect	The camera head shall be designed to disconnect for ease of removal and replacement only by maintenance personnel.
3.3	Special tools for adjustment/removal	To prevent inappropriate interference only tools supplied to authorised fitters should be capable of carrying out adjustments or removal.
3.4	Field of view to capture all passengers in the vehicle	The lens or the position of the camera must be of a type that captures the driver and all passengers of the vehicle on the recorded image. The lens must be of a style not to create a "fishbowl" effect.
3.5	Images must be clear in all lighting conditions	System to provide clear images in bright sunshine, shade, dark and total darkness and also when strong back light is present.
3.6	Compatible for use in vehicles with a partition (shield)	The camera system must be adaptable to provide clear images when a vehicle is equipped with a shield. This may be accomplished with the use of multiple camera heads.
3.7	Multiple cameras	The unit shall be capable of supporting up to four (4) cameras. Four cameras may be required to provide adequate coverage in larger vehicles and/or certain purpose built vehicles or external images.

4.0 Storage Device Technical specification

4.1	Impact and shock resistance	The recorder shall be impact resistant, sufficient to withstand a typical car accident, or striking with a large, heavy object such as a suitcase.

4.2	Controller in concealed location	The storage unit shall be concealed from within the passenger compartment and effectively inaccessible except by authorised personnel. For example in the luggage area
4.3	Download port provision	The recorder shall be equipped with a communication port within the hard drive housing for downloading by authorised officer
4.4	Download port cable length (1 foot minimum)	Download port shall be at least one foot in length for ease of download.
4.5	Recorder to be securely affixed to the vehicle	
4.6	Log to register each user access	
4.7	Log to register camera system parameter modifications	
4.8	Log to register each image download session	
4.9	Log to register modification/manipulation of downloaded images	
4.10	Log to register exporting of downloaded images	
4.11	Log to register exporting of downloaded clips	
4.12	Log file protected against unauthorised access	
4.13	Time/date stamp	All stored images must be time and date stamped.
4.14	Vehicle ID number stamp	All stored images must have vehicle identification (VIN & or number plate).
4.15	Controller non-modifiable ID code stamp	Each recorded image shall be automatically stamped with a unique and non-modifiable code that identifies the controller that was used to record the image.

4.16	Controller (Storage Recorder)	Manufacturer to supply the Council with a supply of specialised tools to allow for removal of the storage device and download of data when required.

5.0 Specifications for video and audio recording rate

5.1	Video image recording on system activation (when audio is not activated).	The system shall record images at a minimum rate of four (4) images per second.
5.2	Video image recording when audio is activated.	The system shall record images at the rate of twenty five images per second during periods when audio recording is activated (either due to time requirement, or through activation by the driver trigger switch or passenger audio buttons).
5.3	When activated, audio recording must be in real time and synchronised with the video recording.	When activated, audio recording must be in real time and synchronised with the video recording.
5.4	System to continue to record images (and audio when applicable) when engine is off.	System must continue to record images (and audio when applicable) for 30 minutes after engine / ignition or override switch is switched off.

6.0 Specification for activation via driver or passenger trigger/ audio button

6.1	The activation of a trigger button when activated by driver or passenger.	The system must be fitted with at least one trigger button that once activated will trigger synchronised audio and video recording

7.0 Downloading Technical Specification

7.1	Provision of necessary software, cables, security keys to the Council Licensing Team.	
7.2	Compatible with MSDC systems.	Once downloaded and converted

7.3	Downloaded images stored in non-volatile media	
7.4	Downloaded images stored in secure format	
7.5	Verifiable image authenticity	Each image shall be stamped/watermarked with vehicle ID, and time and date, and be tamperproof.
7.6	Provision of technical support to the Council Licensing team when necessary.	To assist in accessing system in case of damage to the vehicle or to the system in case of accident within a reasonable time frame
7.7	Wireless Download Prohibited	All wireless hardware to be disabled.
7.8	Filter the specific images for events and times for the approximate time of the crime committed.	The playback software must list the files in date and time slot order for ease of location of required file.

8 Requirements in relation to System Information

8.1	Provision of service log	The unit manufacturer shall have a service log. The manufacturer shall also provide detailed instructions for the drivers with each unit.
8.2	Serial number indication on service log	The unit will be marked with a serial number
8.3	Installation date indication	A certificate of installation must be provided which will indicate the installation date
8.4	Clarity of operating instructions	The system shall be provided with clear and concise operation instructions which are written or presented with due consideration to varying levels of literacy.
8.5	Installation by authorised agents	The unit shall only be installed by manufacturer's authorised agents, or other installers approved by those agents
8.6	Provision of authorised agents list to the Council Licensing Team	The manufacturer or supplier shall provide a list of all authorised agents to the Council Licensing Team.
8.7	Documentation	The manufacturer or supplier must provide clear and concise operating instructions which are written or presented in layman's terms. (Details on how the system operates)

8.8	Image Protection	All captured images must be protected using encryption software that meets or exceeds the current FIPS 140-2 (level 2) standard or equivalent.

9.0 System requirements in relation to Vehicle Inspection Facility – Inspections

9.1	Provision of system status/health indicator	The driver shall have an indicator showing when the system is operational and when there is a malfunction. This should include the images as shown to verify the status of each camera.
9.2	Mounting location of system status/health indicator to be seen	The indicators shall be mounted in such a way so as to allow for ease of view.
9.3	Additional indicator requirement	Where a system is fitted with an indicator to show that the system is on, it needs to be separate to the audio trigger.
9.4	Design and or installation to be testable as part of the vehicle compliance test (or persons acting on behalf of the council – such as vehicle inspectors)	The system shall be designed and installed such that the system may be easily tested as part of vehicle compliance test as prescribed.

10.0 General System Requirements

10.1	Vandal and tamper resistance	All component parts must be securely mounted, hard wired and small and discreet enough to remove the risk of tampering.
10.2	Provision of statement of compliance	In addition to a formal test of all aspects of this requirement specification, a statement of compliance shall be provided and signed by an officer of the company.
10.3	Reliability in operational and environmental conditions	The system shall provide reliable and full functionality in all operational and environmental conditions encountered in the operation of taxis.
10.4	Programmability of image timing parameters	It shall be possible to change timing and parameters without the requirement to change components.

10.5	Training and Technical Support and Equipment	Supplier must provide the Council Licensing Team with a Training and Technical support where necessary
10.6	Software and Hardware	Supplier to provide the Council Licensing Team with a supply of cables and software to be installed under the supervision of the council's authorised staff where necessary.
10.7	Agreement between the Camera Supplier and the Council	Agreement to allow the Council access to the relevant software from the supplier/installer so that in the event the manufacturer goes out of business, Council will be able to support the system.