

EXPLANATION OF TENDER DOCUMENTATION

within the meaning of Section 98 (3) of the Act No 134/2016, on public procurement, as amended
(hereinafter the “**Act**”)


Name of public contract:


DELIVERY OF MOBILE CAMERAS AND PROVISION OF RELATED SERVICES

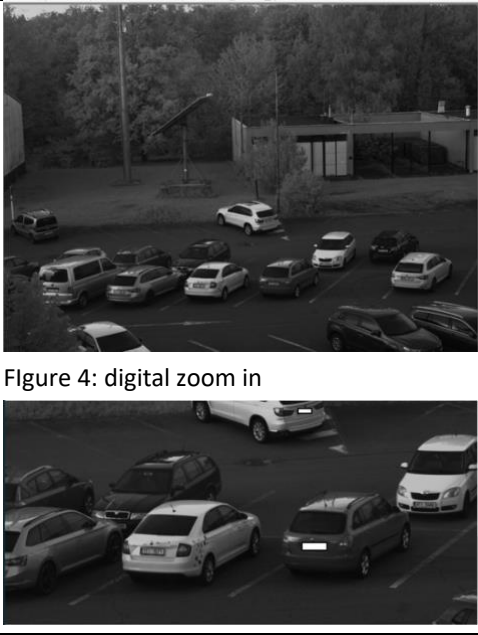
Above-the-threshold public delivery contract,
open procedure (hereinafter the “**Public Contract**”)

Reference number: VZ_2020_A48

ID	Question	Explanation
1	<p>According to the tender documentation, the camera must meet the "autofocus mode". Why does the contracting authority require this functionality? From experience with this functionality, we are afraid that this is not exactly what the contracting authority expects, as it is not a functionality suitable for a dynamically changing scene. Autofocus works on the principle of sharpness (thinness) of edges measured in a given area of the image (most often in the middle or on dedicated pixels at the edge of the sensor). The focus speed is on the order of seconds, as the function must scan the entire focus range and select the most appropriate level. That is, at that point, the dynamic traffic scene is different from what the camera originally focused on, and there may be a situation where the camera will do nothing but refocus (especially when shooting at a shorter distance). We propose to use a solution that will completely eliminate this functionality (ideal variant), ie a combination of lens and camera, whose depth of field will cover the requirements of the client. To give you an idea, we send a picture taken from a car while driving about 30 km / h - 01_hloubka-ostrosti.jpg.</p> <p>Another solution is automatic focusing in the so-called One-push button mode, ie one-time focusing based on the operator's signal, eg from SW.</p>	<p>Explained.</p> <p>There are two reasons for the contracting authority's requirement for autofocus: practical and economical. The contracting authority requires an autofocus mode mainly for maximum simplification of camera operation, ie in order to minimize the contracting authority's costs that the contracting authority would have to spend for initial training of operators and new users (the contracting authority's clients defined a wide range of future users).</p> <p>The example given by the participant well illustrates the interviewer's proposal to use a lens with a high focus depth, but does not correspond with the use case required by the contracting authority in paragraph 2.2 (slow driving use, so-called patrolling) for two reasons:</p> <ol style="list-style-type: none"> 1) the vehicle speed of 30 km/h, at which the picture was taken according to the information of the participant, is too high for this way of scanning the license plate; 2) the angle of scanning the license plates (vehicles standing on the left side) is too sharp, for the purposes of the use case according to paragraph 2.2. the operator should rotate the camera further to the left. <p>Autofocus in one-push button mode could be acceptable for the purpose of meeting the contracting authority's requirement if this push button was virtual, ie launched via the operating</p>

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	<p>Figure 1: depth of focus</p> 	<p>software and not just physically on the camera. However, from the contracting authority's point of view, such autofocus in the one-push button mode is still autofocus in the sense of the requirements of the technical specification.</p>
2	<p>According to the tender documentation, the camera must meet the "electronic Image stabilization" function. We assume that the contracting authority requires this functionality to prevent image blur due to vibration. Is it possible to replace this functionality with another, equally effective solution? The solution would be to use a camera with a global shutter and a suitable mounting element, which will ensure the minimization of vibrations and potential blur in the image. To give you an idea, we send a video from a camera with a global shutter mounted on the windshield of the car without any special holder. The video is not part of this document, but attached. The video is compressed due to its size and is accelerated, but you can see that at every point in the video, the image is sharp and the characters are legible.</p>	<p>Explained, not accepted.</p> <p>The contracting authority requires electronic image stabilization mainly in order to eliminate other mechanical elements to eliminate the effect of vibrations, which would complicate the whole solution and could be sensitive to failures.</p> <p>The example given by the participant (the video file is attached to the answer as a separate file) does not correspond to any use case described by the contracting authority in Article 2 of Annex No. 1 to the tender documentation.</p>
3	<p>According to the tender documentation, the camera must meet the "Backlight compensation" function. Backlight compensation is simply an improved brightness balance within a scene. Current cameras can keep the scene at ideal brightness values without explicitly having the Backlight Compensation function listed in the datasheet. Is it possible to supply this type of camera?</p>	<p>Explained.</p> <p>The client is not a camera specialist and does not know all the technical possibilities of current cameras. The client requires backlight compensation to improve the visibility (or legibility) of details of dark (or darkened) objects in the foreground of the image. The result is therefore essential for the fulfillment of the contracting authority's requirement, ie the fulfillment of the purpose of this public contract. The contracting authority admits that its requirement of legibility of objects in backlight, ie compensation of backlight, can be achieved in any technological way. Therefore, the contracting authority does not insist that the words "Backlight Compensation" always be included in the "datasheet" of the product. However, the contracting authority recommends that suppliers always clearly mark and describe the corresponding function or solution in the tender, see also point 2.6 of the tender documentation.</p>
4	<p>According to the tender documentation, camera</p>	<p>Explained.</p>

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	<p>must be equipped with a varifocal lens with an angle of 35° -70°. This is a big jump from the original 6° - 13° and the contracting authority will now have a really big angle. We just want to point out that the contracting authority does not define the resolution of the camera, and therefore when using an angle of 70°, the scene may be essentially unreadable. To give you an idea, we attach a photograph from a 3MP camera with a viewing angle of approx. 45° (02_3MP-47stupnu.jpg), which corresponds to a focus of 8 mm.</p> <p>Figure 2: Angle of view 47°</p> 	<p>The above example illustrates well the wrong combination of use case and angle of view. According to the information of the participant, the image is taken with a set viewing angle of 45° (stated in the text of the question) or 47° (stated in the file name) and this is not required by the client for this case of use. For this case of use (see paragraph 2.1 of Annex No. 1 of the tender documentation - use at rest) - the contracting authority requires an angle of engagement of 70°.</p>
5	<p>According to the tender documentation, camera must be equipped with a varifocal lens with an angle of 35° - 70°. We assume that the contracting authority requires this functionality due to different use cases. In general, any mechanical component introduces a potential problem, and a motorized varifocal lens is certainly a mechanical component. We propose a solution that can eliminate this need. It is a combination of a camera with a sufficiently high resolution and a fixed lens. Then the zoom would be only digital and there would be no need to use a varifocal lens (theoretically of any range). For an idea, we send 2 images. The file 03_digitalni-zoom_maly-uhel.jpg is the entire field of view of the camera and 04_digitalni-zoom_priblizeni.jpg is the maximum zoom without counting pixels.</p> <p>Again, however, there is a need to define the required camera resolution for the lowest angle, now 35°.</p> <p>Figure 3: Digital zoom, low angle</p>	<p>Not accepted.</p> <p>The examples given by the participant illustrate well the reason why the contracting authority requires an optical zoom and not a digital one. Digital zoom works as a crop and significantly reduces the quality of the captured image needed for subsequent processing and recognition of metadata. For this reason, the contracting authority does not explicitly require high-resolution cameras.</p> <p>The contracting authority requires a varifocal lens for 3 different use cases, see Article 2 of Annex No. 1 to the tender documentation. Other use cases, such as the one illustrated by the interviewer in the attached pictures, are not requested by the contracting authority.</p>

ID	Question	Explanation
	 <p>Figure 4: digital zoom in</p>	
6	<p>The client requires control of the lens and profiles via software delivered by the supplier.</p> <p>Does the SW have to meet any requirements, eg for appearance, simplicity, etc.? What HW properties of the device on which the SW will be operated is available to the supplier?</p>	<p>Explained.</p> <p>The contracting authority does not require the supplier to develop or in any way significantly modify the camera control software to meet the customer's requirements and will be satisfied with the ready-made solution (out of the box). The customer, on the other hand, adapts the hardware platform to suit the supplier's control software.</p>

In Prague on 19 May 2020

Ing. Jan Paroubek
in charge of the state enterprise