F.No. 63013/09/2014-Ord/BSF/MHA-Prov-I 1778
Bharat Sarkar/Government of India
Griha Mantralaya/Ministry of Home Affairs
PM Division

26, Man Singh Road, Jaisalmer House
New Delhi, Dated 9th September, 2015

To,

DsG: AR (through LOAR), BSF, CISF, CRPF, ITBP, SSB, NSG & BPR&D.

Subject: QRs and Trial Directive for Under Vehicle Scanning System (UVSS) with Image & Automated License Plate Recognition System.

Sir,

The QRs and Trial Directives in respect of Under Vehicle Scanning System (UVSS) with Image & Automated License Plate Recognition System as per Appendix-A & **B** respectively have been accepted by the Competent Authority in MHA.

2. The CAPFs concerned will be accountable for correctness of the QRs/Trial Directives.

3. Henceforth, all the CAPFs should procure the above item required by them strictly as per the laid down Technical Specifications/QRs.

Yours faithfully,

Encl: As above

(Manohar N. Sukole)
Under Secretary to the Govt of India
Tel: 23381278

Copy forwarded to the Section Officer (IT), MHA with request to host the QRs and Trial Directives (soft copy being emailed separately) on the MHA website (under the page of Organizational Set up- Police Modernization Division- Qualitative Requirement under Surveillance Equipment.

(R.K. Soni)
Section Officer (Prov-I)

Copy to: DDG (Procurement), MHA.

Appendix-A

DIRECTOR GENERAL BORDER SECURITY FORCE
(PROVISIONING DIRECTORATE (ORD SECTION)

The Sub-group of Technical Experts constituted by MHA vide their letter No. IV-24011/12/2011-Prov-I dated 13 Jun 2012, No. IV-24011/12/2011-Prov-I dated 28 Dec 2012 & UO No. IV-24011/12/2011-Prov-I- 350 dated 27 Jun 2013 held its meeting at BSF Headquarters on 21st November 2014, 23rd Jan 2015 , 15th Apr 2015 and 12th May 2015 to formulate the Qualitative Requirement of **'Under Vehicle Scanning System (UVSS) with Driver Image & Automated License Plate Recognition System (ALPRS)'.**

After detailed deliberations, the referred Sub-group has formulated the QRs of **'Under Vehicle Scanning System (UVSS) with Driver Image & Automated License Plate Recognition System (ALPRS)'** which are as under:-

QUALITATIVE REQUIREMENTS OF UNDER VEHICLE SCANNING SYSTEM (UVSS) WITH DRIVER IMAGE & AUTOMATED LICENSE PLATE RECOGNITION SYSTEM (ALPRS)

S.No.	Draft Qualitative Requirements
A	**Specifications of UVSS:**
1	The UVSS should be able to capture a very high resolution and complete composite under body image of any vehicle passing over it using a single high resolution area-Scan GigE IP camera without requiring the vehicle to stop.
2	The UVSS should be able to handle vehicles moving at different speeds ranging from 0-40 km/hr while the composite image captured by the system should be automatically and dynamically adjusted according to the speed of the vehicle using multiple loop-based sensors/IR Sensors.
3	The composite imaging camera should be a high quality, Color Area Scan, GigE type, with minimum XGA resolution of 1024 x 768 or above. The minimum specification of this area-scan camera shall be: a) Camera type: Gigabit Ethernet Progressive Area-Scan Color Camera. b) Sensor: 1/3" CCD c) Horizontal/Vertical Resolution 1024 x 768 Pixels or better. d) Frame rate: Minimum 50 fps at full resolution. e) Camera Certification CE, FCC, with 30 FPS f) Suitable Camera Casing.
4	The UVSS should be capable of producing a clear and undistorted image of the vehicle's underside, even when a vehicle has completely stopped over the UVSS unit, i.e. it must be able to create a seamless and perfect composite image of the underside irrespective of the vehicle stopping or moving in a non-uniform manner over the scanner.
5	The UVSS must have a feature to magnify the composite images (current and past), in order to facilitate a closer view of any part of the composite image.
6	The underside illumination must be adequate and obtained through any state-of-the-art, long-life LED lighting modules. It should not use Halogen or CFL-type lighting elements for illumination of the underside.
7	The UVSS should be able to dynamically and automatically adjust the brightness and contrast of the composite image, so as to ensure good quality images, irrespective of the different external lighting conditions.
8	The UVSS should also provide a feature to capture the image of the driver,

S.No.	Draft Qualitative Requirements
	captured through a suitable driver view camera.
9	The UVSS should give a real-time output of all the data simultaneously, i.e. the composite image, driver photos, vehicle front image and license Plate display (If Applicable) & all should be displayed on the monitor almost instantaneously.
10	The UVSS must have a built-in software diagnostics capability, to facilitate any distant software support to be offered offline.
11	The UVSS applications and operating software should be based on windows/ Linux platform it must have a user friendly GUI with provision for multiple users logging of events and search facility.
12	The UVSS system must have a facility for backup of all transactions to any usual backup/storage media and also should be able to print out reports.
13	The UVSS underground camera should be enclosed in a suitable all-weather-proof housing of IP 67/66 equivalent or higher standard.
14	The Operating System should be Windows/ Linux.
15	The overall Installed unit should be properly designed, and its structure should be able to withstand a total vehicle load of up to 40 tons at any given point over the structure, more particularly at the center of the unit, so as not to suffer any accidental physical damage to the unit and components under the pit cover. A suitable pit Ventilation system should be provided to cool the UVSS during high temperatures. The installed unit should have automatic wiper system.
16	The front end of the software should be designed on Microsoft .NET/ Linux technology.
17	The back end database should be on latest version of SQL server.
18	The UVSS should have open protocol for integration with other security systems and also networking for any remote monitoring requirements.
19	The end of the day report should export the driver and the number plate image directly to a Microsoft excel sheet for future use or reference.
20	The UVSS should also provide a feature to capture the image of the driver for all RHS driven vehicles, captured through a suitable driver view camera.
21	The UVSS must have a feature to magnify the composite images (current and past), so as to facilitate a closer and zoom-up view of it.
22	**Minimum Specifications of Driver Image Camera** a) Sensor type shall be CCD/CMOS b) Pixel rate: 2MP c) Video format shall be NTSC/PAL d) Resolution shall be 520 TV lines or better. e) Power supply : 12 V DC f) Mechanical Structure : Structural Steel/ Checqured with Rust Free Stainless Steel top g) Camera and light enclosure shall be Minimum IP 66 rated.
23	**The Processing Unit should have:** a) 8 GB RAM or better b) 2 TB HDD or better c) Latest Intel Core i7 processor or better d) Minimum 22" Display Monitor, Keyboard, Mouse

S.No.	Draft Qualitative Requirements
	e) Software for full functioning of the system.
24	**Sensor unit** shall have Inductive loop sensor/ IR Sensors
25	**Suitable Lighting Unit** should be LED 220 V AC
26	Operating temperature: -10 °C to +55° C
27	IP 66 or better.
B	**Specifications for Automated License Plate Recognition System(ALPRS):**
1	The System should automatically detect a four wheeler approaching the installed location by means of inductive loops.
2	On detection of vehicle approach, the system would activate the license plate video capture cameras.
3	The system shall automatically detect the license plate in the captured video feed in real-time.
4	The system shall perform OCR(Optical Character Recognition) of the license plate charters (English alpha-numeric characters in standard fonts).
5	The system shall store JPEG image of vehicle and license plate and enter the license plate number into SQL Server or any other user specified database along with date timestamp and site location details.
6	System should be able to detect and recognize the English alpha numeric License plate in all standard fonts and formats of all four wheelers including cars, HCV, LCV.
7	The system processing should be real time i.e. Instant the recognition of license number plates.
8	The system should be able to process and read number plates of vehicles with speed even up to 40 km/hr.
9	The system should store video clip of the vehicle approaching and leaving the location.
10	The system should have option to input certain license plates according to category like "Wanted", "Suspicious", "Stolen", "Expired". etc by authorized personnel. On successful recognition of the number plate, system should be able generate automatic alarm to alert the control room for vehicles which have been marked as "Wanted", "Suspicious", "Stolen", "Expired". System should have provision/expansion option to add more categories for future need.
11	System shall have option to be integrated with other access control hardware/software on site.
12	The system shall enable easy and quick retrieval of snapshots, video and other data for post incident analysis and investigations.
13	The system should be able to generate suitable MIS reports that will provide meaningful data to concerned authorities and facilitate optimum utilization of resources. These reports shall include:
13.1	Report of vehicle flow at each of the installed locations for Last Day, last Week and Last Month.
13.2	Report of vehicles in the detected categories at each of the Installed locations for Last Day, Last Week and last Month.
13.3	Report of Vehicle status change in different Vehicle Categories.

14	The system shall have option to save custom reports for subsequent use.		
15	The system shall have option to export report being viewed to common format for use outside of the ALPRS or exporting into other systems.		
16	The system should provide advanced and smart searching facility of license plates from the database. There should be an option of searching number plates almost matching with the specific number entered (up to 1 and 2 character distance).		
17	The system should have option to add new category by authorized personnel.		
18	The system should have option to update vehicle status in specific category by authorized personnel e.g. On retrieval of stolen vehicle, system entry should be Changed from "Stolen" to "Retrieved".		
19	System should provide an option for advanced users to tune the system parameters.		
20	System should have option to configure site locations and data management settings.		
21	The Central Management Module shall run on the ALPRS Central Server in control room.		
22	The system should work in both day and night conditions with good accuracy		
23	The hardware specification for the ALPRS should be a minimum of below:		
	Camera	Interface	IP
		Format	HDTV 1080 or better
		Resolution	2 Megapixel or better
		Shutter Speed	1/50 to 1/10000 or better
		Operating Temperature(°C)	-10 °C to +55° C
		Frame Rate	25/30 FPS
	Lens	Vertical	5-50 mm
		Electronic IRIS control	DC Type
		Mount	C/CS
		Image Format	¼" / 1/3" /1/2"
	IR Illuminator	Wavelength	850 nm (Semi Covert)
		IR Illuminator Range	10-15 m
		Environment Protection	IP 65/IP 66
	Filters	IR filter	
	Camera Housing	Environment Protection Housing	IP 65/IP 66
	Processing Unit	Processor	Latest Intel Core i7 processor
		RAM	8 GB
		Hard Disk Capacity	2 TB
		Display Monitor	19" Flat
	Speed Limit		40 km/hr
	Installation and Mounting		Pole Mounted
	Integration	Capable of integration with the overall architecture of Surveillance and Access control System.	

24.	Power Supply	The complete system shall operate on 230 V AC ± 10 % suitable UPS to meet the power requirement with backup of upto 1 hour should be provided.

(B.C. JOSHI) DIG SIW BSF

(Abhiram Kanhu) DC, CRPF

(P.P. Singh, AC, SSB)

ASI/RM NARINDER SINGH (SIW)

(A.K. Shukla, Accts)

(Satinder Singh) AC ITBP

(KAPIL, SSA(E), BPR&D)

(S.S. MANRAL, AC) SIW BSF

RECOMMENDED/ ~~NOT RECOMMENDED~~

(D K PATHAK) IPS
DIRECTOR GENERAL
BORDER SECURITY FORCE

Appendix-"B"

(280) (99)

TRIAL DIRECTIVES OF UNDER VEHICLE SCANNING SYSTEM (UVSS) WITH DRIVER IMAGE & AUTOMATED LICENSE PLATE RECOGNITION SYSTEM (ALPRS)

S.No.	Qualitative Requirements	Draft Trial Directives
A	**Specifications of UVSS**	
1	The UVSS should be able to capture a very high resolution and complete composite under body image of any vehicle passing over it using a single high resolution area-Scan GigE IP camera without requiring the vehicle to stop.	Install the complete UVSS system with ALPRS and the BOO check the parameters accordingly.
2	The UVSS should be able to handle vehicles moving at different speeds ranging from 0-40 km/hr while the composite image captured by the system should be automatically and dynamically adjusted according to the speed of the vehicle using multiple loop-based sensors/IR Sensors.	To be physically checked by the BOO by moving the vehicle at different speed from 0-40 Km/hr.
3	The composite imaging camera should be a high quality, Color Area Scan, GigE type, with minimum XGA resolution of 1024 x 768 or above. The minimum specification of this area-scan camera shall be: a) Camera type: Gigabit Ethernet Progressive Area-Scan Color Camera. b) Sensor: 1/3" CCD c) Horizontal/Vertical Resolution 1024 x 768 Pixels or better. d) Frame rate: Minimum 50 fps at full resolution. e) Camera Certification CE, FCC, 30 FPS f) Suitable Camera Casing.	All parameters to be checked by the BOO through technical literature of the product and images should be checked at the given resolution accordingly. For parameter (e), Supplier will submit CE, FCC, 30 FPS certification for camera. Camera casing will be checked physically at the time of trial.
4	The UVSS should be capable of producing a clear and undistorted image of the vehicle's underside, even when a vehicle has completely stopped over the UVSS unit, i.e. it must be able to create a seamless and perfect composite image of the underside irrespective of the vehicle stopping or moving in a non-uniform manner over the scanner.	To be physically checked by the BOO by scanning the underbelly of vehicle in both moving and still condition
5	The UVSS must have a feature to magnify the composite images (current and past), in order to facilitate a closer view of any part of the composite image.	Both current image and recorded image, Image distortion while zooming in etc would also be checked by the BOO.

S.No.	Qualitative Requirements	Draft Trial Directives
6	The underside illumination must be adequate and obtained through any state-of-the-art, long-life LED lighting modules. It should not use Halogen or CFL-type lighting elements for illumination of the underside.	To be physically checked by the BOO.
7	The UVSS should be able to dynamically and automatically adjust the brightness and contrast of the composite image, so as to ensure good quality images, irrespective of the different external lighting conditions.	To be physically checked by the BOO in both low light and daylight.
8	The UVSS should also provide a feature to capture the image of the driver, captured through a suitable driver view camera.	To be physically checked by the BOO
9	The UVSS should give a real-time output of all the data simultaneously, i.e. the composite image, driver photos, vehicle front image and license Plate display (If Applicable) & all should be displayed on the monitor almost instantaneously.	To be physically checked by the BOO
10	The UVSS must have a built-in software diagnostics capability, to facilitate any distant software support to be offered offline.	Supplier should submit the software in CD-R or any standard portable storage media which should support any distant software in offline mode.
11	The UVSS applications and operating software should be based on windows/ Linux platform it must have a user friendly GUI with provision for multiple users logging of events and search facility.	To be physically checked by the BOO
12	The UVSS system must have a facility for backup of all transactions to any usual backup/storage media and also should be able to print out reports.	To be physically checked by the BOO
13	The UVSS underground camera should be enclosed in a suitable all-weather-proof housing of IP 67/66 equivalent or higher standard.	NABL accredited lab certificate to be provided by the bidder.
14	The Operating System should be Windows/ Linux.	To be physically checked by the BOO.
15	The overall Installed unit should be properly designed, and its structure should be able to withstand a total vehicle load of up to 40 tons at any given point over the structure, more particularly at the center of the unit, so as not to suffer any accidental physical damage to the unit and components under the pit cover. A suitable pit Ventilation system should be provided to cool the UVSS during high temperatures. The installed unit should have automatic wiper system.	To be physically checked by the BOO and the bidder will provide OEM certificate.

S.No.	Qualitative Requirements	Draft Trial Directives
16	The front end of the software should be designed on Microsoft .NET/ Linux technology.	To be physically checked by the BOO
17	The back end database should be on latest version of SQL server.	To be physically checked by the BOO
18	The UVSS should have open protocol for integration with other security systems and also networking for any remote monitoring requirements.	To be physically checked by the BOO and the bidder/supplier will provide OEM certificate.
19	The end of the day report should export the driver and the number plate image directly to a Microsoft excel sheet for future use or reference.	To be physically checked by the BOO.
20	The UVSS should also provide a feature to capture the image of the driver for all RHS driven vehicles, captured through a suitable driver view camera.	To be physically checked by the BOO and the bidder/supplier will provide OEM certificate.
21	The UVSS must have a feature to magnify the composite images (current and past), so as to facilitate a closer and zoom-up view of it.	To be physically checked by the BOO.
22	**Minimum Specifications of Driver Image Camera** a) Sensor type shall be CCD/CMOS b) Pixel rate: 2MP c) Video format shall be NTSC/PAL d) Resolution shall be 520 TV lines or better. e) Power supply : 12 V DC f) Mechanical Structure : Structural Steel/ Checqured with Rust Free Stainless Steel top g) Camera and light enclosure shall be Minimum IP 66 rated.	To be physically checked by the BOO along with technical literature of the camera.
23	**The Processing Unit should have:** a) 8 GB RAM or better b) 2 TB HDD or better c) Latest Intel Core i7 processor or better d) Minimum 22" Display Monitor, Keyboard, Mouse e) Software for full functioning of the system.	To be physically checked by the BOO along with technical literature of the camera.
24	**Sensor unit** shall have Inductive loop sensor/ IR Sensors	To be physically checked by the BOO and the bidder will provide OEM certificate.
25	**Suitable Lighting Unit** should be LED 220 V AC	To be physically checked by the BOO.

S.No.	Qualitative Requirements	Draft Trial Directives
26	Operating temperature: -10 °C to +55° C	NABL accredited lab certificate to be provided by the bidder.
27	IP 66 or better.	NABL accredited lab certificate to be provided by the bidder.
B	**Specifications for Automated Number Plate Recognition System(ALPRS):**	
1	The System should automatically detect a four wheeler approaching the installed location by means of inductive loops.	To be physically checked by the BOO
2	On detection of vehicle approach, the system would activate the license plate video capture cameras.	To be physically checked by the BOO
3	The system shall automatically detect the license plate in the captured video feed in real-time.	To be physically checked by the BOO
4	The system shall perform OCR(Optical Character Recognition) of the license plate charters (English alpha-numeric characters in standard fonts).	To be physically checked by the BOO
5	The system shall store JPEG image of vehicle and license plate and enter the license plate number into SQL Server or any other user specified database along with date timestamp and site location details.	To be physically checked by the BOO
6	System should be able to detect and recognize the English alpha numeric License plate in all standard fonts and formats of all four wheelers including cars, HCV, LCV.	To be physically checked by the BOO
7	The system processing should be real time i.e. Instant the recognition of license number plates.	To be physically checked by the BOO
8	The system should be able to process and read number plates of vehicles with speed even up to 40 km/hr.	To be physically checked by the BOO
9	The system should store video clip of the vehicle approaching and leaving the location.	To be physically checked by the BOO
10	The system should have option to input certain license plates according to category like "Wanted", "Suspicious", "Stolen", "Expired". etc by authorized personnel. On successful recognition of the number plate, system should be able generate automatic alarm to alert the control room for vehicles which have been marked as "Wanted", "Suspicious", "Stolen", "Expired". System should have provision/expansion option to add more categories for future need.	To be physically checked by the BOO

S.No.	Qualitative Requirements	Draft Trial Directives
11	System shall have option to be integrated with other access control hardware/software on site.	To be physically checked by the BOO and the bidder/supplier will provide OEM certificate.
12	The system shall enable easy and quick retrieval of snapshots, video and other data for post incident analysis and investigations.	To be physically checked by the BOO
13	The system should be able to generate suitable MIS reports that will provide meaningful data to concerned authorities and facilitate optimum utilization of resources. These reports shall include:	
13.1	Report of vehicle flow at each of the installed locations for Last Day, last Week and Last Month.	To be physically checked by the BOO
13.2	Report of vehicles in the detected categories at each of the Installed locations for Last Day, Last Week and last Month.	To be physically checked by the BOO
13.3	Report of Vehicle status change in different Vehicle Categories.	To be physically checked by the BOO
14	The system shall have option to save custom reports for subsequent use.	To be physically checked by the BOO
15	The system shall have option to export report being viewed to common format for use outside of the ALPRS or exporting into other systems.	To be physically checked by the BOO.
16	The system should provide advanced and smart searching facility of license plates from the database. There should be an option of searching number plates almost matching with the specific number entered (up to 1 and 2 character distance).	To be physically checked by the BOO
17	The system should have option to add new category by authorized personnel.	To be physically checked by the BOO
18	The system should have option to update vehicle status in specific category by authorized personnel e.g. On retrieval of stolen vehicle, system entry should be Changed from "Stolen" to "Retrieved".	To be physically checked by the BOO
19	System should provide an option for advanced users to tune the system parameters.	To be physically checked by the BOO and the bidder/supplier will provide OEM certificate.
20	System should have option to configure site locations and data management settings.	To be physically checked by the BOO by login as administrator only.
21	The Central Management Module shall run on the ALPRS Central	To be physically checked by the BOO

S.No.	Qualitative Requirements			Draft Trial Directives
	Server in control room.			
22	The system should work in both day and night conditions with good accuracy			To be physically checked by the BOO by checking in daylight and dark hours.
23	The hardware specification for the ALPRS should be a minimum of below:			To be physically checked by the BOO along with technical literature of the complete system
	Camera	Interface	IP	
		Format	HDTV 1080 or better	
		Resolution	2 Megapixel or better	
		Shutter Speed	1/50 to 1/10000 or better	
		Operating Temperature(°C)	-10 °C to +55° C	
		Frame Rate	25/30 fps	
	Lens	Vertical	5-50 mm	
		Electronic IRIS control	DC Type	
		Mount	C/CS	
		Image Format	¼" / 1/3" /1/2"	
	IR Illuminator	Wavelength	850 nm (Semi Covert)	
		IR Illuminator Range	10-15 m	
		Environment Protection	IP 65/IP 66	
	Filters	IR filter		
	Camera Housing	Environment Protection Housing	IP65/IP66	
	Processing Unit	Processor	Latest Intel Core i7 processor	
		RAM	8 GB	
		Hard Disk Capacity	2 TB	
		Display Monitor	19" Flat	
	Speed Limit		40 km/hr	
	Installation and Mounting		Pole Mounted	

S.No.	Qualitative Requirements		Draft Trial Directives
	Integration	Capable of integration with the overall architecture of Surveillance and Access control System.	To be physically checked by the BOO and the bidder/supplier will provide OEM certificate.
24	Power Supply	The complete system shall operate on 230 V AC ± 10 % suitable UPS to meet the power requirement with backup of upto 1 hour should be provided.	To be physically checked by the BOO.

(B.C. JOSHI) DIG SIW BSF

(Rinchen Sherpa) Dy Dir, DEPTT

(Satvinder Singh) AC ITBP

(KAPIL, SSA(E), BPR&D)

(Abhiram Pankaj, DC, CRPF)

(A.K. Shukla AC(SP))

(S.S. MANRAL, AC) SIW BSF

(P.P. Singh, AC, SSB)

ASI/RM NARINDER SINGH SIW

RECOMMENDED/ NOT RECOMMENDED

9/6

(D K PATHAK) IPS
DIRECTOR GENERAL
BORDER SECURITY FORCE