Utah Connected

Intermediate Working Paper:

V2X Hardware RFP

Document Description:
UDOT issued this RFP to procure V2X hardware needed for several *Utah Connected* project deployments. Six device types—DSRC RSU, DSRC OBU, C-V2X RSU, C-V2X OBU, dual unit RSU, and dual unit OBU—are included in the RFP with mandatory minimum requirements (MMR) and mandatory response comments (MRC) specified for each device type.

USDOT FY18 ATCMTD Grant

Grant Submittal 692JJ318NF00010

UDOT Project Number F-ST99(634)

UDOT PIN 17981

Cooperative Agreement Executed: Sept 16, 2019

Utah Public Procurement Place

Provided by State of Utah DAS Division of Purchasing

UDOT V2X Equipment (Including DSRC and C-V2X)

UDOT is advertising a multiple award solicitation for V2X equipment (DSRC and C-V2X)

Open	9/23/2020 10:00 AM MDT	Type	Request for Proposal
Close	10/8/2020 11:00 AM MDT	Number	DOT210040KT-1
		Currency	US Dollar

Sealed Until 10/8/2020 11:00 AM MDT

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Commodity Codes

Commodity Code	Description
43230	Information technology software including computer software
25170	Vehicle components and systems including safety and security, roof and lighting, braking system, electric charging stations, warning lights and sirens
99900	UDOT Utah Department of Transportation

Description

REQUEST FOR PROPOSALS
UDOT DSRC and CV2X Equipment
SOLICITATION #DOT210040KT-1

This Request for Proposals (“RFP”), having been determined to be the appropriate procurement method to provide the best value to the Conducting Procurement Unit, is designed to provide interested Offerors with sufficient basic information to submit proposals. This Request for Proposals ("RFP”) is issued in accordance with the Utah Procurement Code and applicable administrative rules of the Utah Administrative Code. If any provision of this RFP conflicts with the Utah Procurement Code or Utah Administrative Code, then the Utah Procurement Code or Utah Administrative Code will take precedence. It is not intended to limit a proposal's content or exclude any relevant or essential data. Offerors are at liberty and are encouraged to expand upon the specifications to evidence service capability.

Purpose of this Solicitation

The purpose of this RFP is to enter into a contract to provide: DSRC and CV2X equipment.

Award of Contracts
It is anticipated that this RFP may result in a multiple award contract. Offerors must pass the technical evaluation stage with 60 percent of the maximum points for that device type. Offerors that have passed the technical evaluation stage will have their cost revealed, offerors with a "scoring cost" within 300 percent of the lowest proposed scoring cost will be awarded a contract.

Offerors are asked to provide a response to at least one of the following discreet categories:
- DSRC RSU (1550 Maximum Pts)
- DSRC OBU (1525 Maximum Pts)
- CV2X RSU (1400 Maximum Pts)
- CV2X OBU (1375 Maximum Pts)
- Dual Unit RSU (1650 Maximum Pts)
- Dual Unit OBU (1575 Maximum Pts)

Offerors may be awarded in one category or in several categories. Additionally several offerors may be award in each category

Closing date and time
The closing date and time for this sourcing event is Thursday, October 8, 2020 at 11 AM Mountain Time. If your time is different from that shown, your profile may be set to a different time zone. Please see the attachment titled "Changing Your Time Zone" in the Buyer Attachments section for directions on how to update your profile. It is your responsibility to make sure you submit your response by the date and time indicated above.

Length of the Contract
The contract resulting from this RFP will be for FIVE (5) years.

Background
UDOT has deployed significant Dedicated Short-Range Communication (DSRC) and Cellular Vehicle to Everything (CV2X) devices on several projects as part of their Connected and Automated Vehicle (CAV) program, and is the first Department of Transportation in the nation to successfully deploy and implement a fully functional and operational Transit Priority and Snowplow Pre-emption system. The DSRC

equipment utilized in these deployments consists of Roadside Unit (RSU) and Onboard Unit (OBU) to send and receive standard J2735 messages using the DSRC band.

There is market competition for DSRC and CV2X technologies, which make both technologies of interest to UDOT. UDOT has also deployed several Dual-Unit radios that consist of DSRC and CV2X communication capabilities. Currently the two technologies do not overlap in UDOT's systems, but it is UDOT's plan to merge both technologies into a single platform in the future.

It is UDOT's desire to procure both DSRC and CV2X devices for maintenance of existing systems and for the deployment and expansion of new systems. CAV systems are rapidly evolving, therefore UDOT is interested in offerors that have experience with these technologies, are actively engaged in the market, and who will continue to be in the CAV market. As such, engineering level support is listed in the mandatory requirements section to ensure technical issues can be quickly addressed during deployment, testing and troubleshooting / diagnostic phases of implementation.

Issuing Procurement Unit, Conducting Procurement Unit, and Solicitation Number

The Utah Department of Transportation is the issuing and the conducting procurement unit for this RFP (referred to as "UDOT"). The reference number for this RFP is Solicitation #DOT210040KT-1 this Description solicitation number must be referred to on all proposals, correspondence, and documentation submitted to the State relating to this RFP.

Additional Information

Offerors are prohibited from communications regarding this RFP with the conducting procurement unit staff, evaluation committee members, or other associated individuals EXCEPT the UDOT procurement officer overseeing this RFP.

Wherever in this RFP an item is defined by using a trade name, brand name, or a manufacturer and/or model number, it is intended that the words, "or equivalent" apply; and invites the submission of equivalent products by the Offerors.

Offerors may be required to submit product samples to assist the chief procurement officer or head of a procurement unit with independent procurement authority in evaluating whether a procurement item meets the specifications and other requirements set forth in the request for proposals. Product samples must be furnished free of charge unless otherwise stated in the invitation for proposals, and if not destroyed by testing, will upon written request within any deadline stated in the invitation for proposals, be returned at the Offeror's expense. Samples must be labeled or otherwise identified as specified in the invitation for proposals by the procurement unit.

The State reserves the right to conduct discussions with the Offerors who submit proposals determined to be reasonably susceptible of being selected for award, followed by an opportunity to make best and final offers pursuant to UCA § 63G-6a-707.5, but proposals may be accepted without discussions.

New Technology

Pursuant to Utah Administrative Rule R33-12-502 the awarded contract(s) may be modified to incorporate new technology or technological upgrades associated with the procurement item being solicited, including new or upgraded: (i) systems; (ii) apparatuses; (iii) modules; (iv) components; and (v) other supplementary items. Further, a maintenance or service agreement associated with the procurement item under the resulting contract(s) may be modified to include any new technology or technological upgrades. Any contract modification incorporating new technology or

technological upgrades will be specific to the procurement item being solicited and substantially within the scope of the original procurement or contract.

Right to Open For Competition

The State of Utah reserves the right and may reopen this solicitation, or create a new solicitation if it determines there may be more competition for the procurement item than when the original solicitation was posted.

Required to View Event

★ Required to Enter Bid

Prerequisites

★	1.	All questions must be submitted through SciQuest during the Question and Answer period.
★	2.	Offeror must guarantee its pricing for the period described in this RFP.
★	3.	Any Offeror requesting that part of its bid be protected shall include with the bid a Claim of Business Confidentiality.
★	4.	The proposed Scope of Work has been attached to this RFP.
★	5.	The mandatory minimum requirements are the objective criteria in which the conducting procurement unit will evaluate proposals. Offeror must upload a document which provides a point by point response to the mandatory minimums listed in this prerequisite.
★	6.	To determine which proposal provides the best value to the State, the evaluation committee will evaluate each responsive and responsible proposal that has not been disqualified or rejected using the subjective criteria listed in this prerequisites section.
★	7.	All proposals in response to this RFP will be evaluated in a manner consistent with the Utah Procurement Code, Administrative Rules, policies and the evaluation criteria in this RFP. Offerors bear sole responsibility for the items included or not included within the proposal submitted by the Offeror. Each area of the evaluation criteria must be addressed in detail in the proposal.
★	8.	Offeror's cost proposals will be evaluated independently.
★	9.	Offeror may take exception and/or propose additional language to the Standard Terms and Conditions that have been attached to this RFP.
★	10.	The issuing procurement unit may not accept a proposal after the time for submission of a proposal has expired.
★	11.	The UDOT Procurement Division does not guarantee any purchase amount under this Contract.
★	12.	Proposals can be submitted electronically, through SciQuest, or by submitting a hard copy to the address provided below.

Questions ★ Required Questions

Group 1:	**Important Procurement Restriction**	
1.1	Section 889(a)(1) of the 2019 National Defense Authorization Act prohibits the United States federal government, government contractors, and grant and loan recipients (which includes UDOT) from procuring or using telecommunications equipment produced by Huawei Technologies Company, ZTE Corporation, Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities), as a "substantial or essential component of any system, or as critical technology as part of any system." Offerors shall certify that their proposed equipment complies with this regulation (Annual recertification of compliance may also be required). If you do not comply your proposal will be rejected. Do you comply with the statement above?	★
Group 2:	**Acceptance of Prerequisites**	
2.1	Is Offeror presently or has Offeror ever been debarred, suspended, proposed for debarment, or declared ineligible by any governmental department or agency, whether international, national, state, or local? If yes, Offeror must provide a statement regarding its debarment or suspension.	★
2.2	Is Offeror an employee of the State of Utah? If yes, then Offeror must submit an external employment form signed by its manager at the State of Utah.	★
2.3	Offeror acknowledges that it must acquire and maintain all applicable federal, state, and local licenses before the contract is entered into. Licenses must be maintained throughout the entire contract period. Persons doing business as an Individual, Association, Partnership, Corporation, or otherwise shall be registered with the Utah State Division of Corporations and Commercial Code. NOTE: Forms and information on registration may be obtained by calling (801) 530-4849 or toll free at 877-526-3994, or by accessing: www.commerce.utah.gov.	★
2.4	Offeror acknowledges that it has uploaded a document providing a point-by-point response to the following prerequisites: the mandatory minimum requirements prerequisite, the technical requirements prerequisite, and any other prerequisite that required a document to be uploaded.	★
Group 3:	**Vendor Information**	
3.1	Please provide your firm's legal company name.	★
3.2	Please provide your federal tax identification number? (If the vendor is sole proprietor please do not provide your social security number.)	★
3.3	Please provide your firm's contact information for this contract, including the name, phone number, and email address of your firm's authorized representative.	★
3.4	Please provide your ordering address and the remit to address. Please clearly identify each address.	★
3.5	Please provide your firm's State of Utah Sales Tax ID Number.	★
3.6	Identify your firm's type of business.	
3.7	Does your firm assert a claim of business confidentiality for any of the following information submitted in response to this solicitation? If yes please attach the following business confidentiality claim as part of your bid. In addition, please attach a redacted copy of any document that contains confidential information.	★
3.8	Vendor acknowledges that all agreements for services entered into during the duration of this Contract whose performance and payment time frames extend beyond the duration of this Contract shall remain in effect for performance and payment purposes (limited to the time frame and services established per each written agreement). No new rentals, maintenance or other agreements for services may be executed after the Contract has expired.	★
3.9	Vendor certifies that the procurement item it provides meets or exceeds the specifications/product requirements provided in this RFP.	★

Product Line Items

There are no Items added to this event.

Service Line Items

There are no Items added to this event.

DETAILED SCOPE OF WORK

UDOT understands that the Connected Vehicle market is rapidly changing, so this solicitation tries to balance the need to procure devices that will work with the current systems, while allowing for new deployments that need to adhere to newer standards and technological features / enhancements. This solicitation has therefore been organized to allow offerors to bid on those device types that are most relevant to their product line. Each category will be evaluated and scored on its own merit, and Offerors may choose to submit on any or all device types as defined below:

Device Categories:

TYPE 1 - DSRC RSU
TYPE 2 - DSRC OBU
TYPE 3 – C-V2X RSU
TYPE 4 – C-V2X OBU
TYPE 5 - Dual Unit RSU (both DSRC and C-V2X)
TYPE 6 - Dual Unit OBU (both DSRC and C-V2X)

This multi-stage request for proposal is organized to first define the list of features or requirements that a device must meet in order to be considered compliant. These items are listed in the MANDATORY MINIMUM REQUIREMENTS (MMR) matrix table. Offerors are required to respond to each of the MMRs, indicating whether their product meets the requirement. To qualify for the first stage of this multi-stage request for proposal, a device must comply with all items listed in the MMR.

A second matrix of requirements called MANDATORY RESPONSE COMMENTS (MRC) is comprised of technical specifications that the Department considers to be of significant value. Offerors are required to address the current status of these items for their product, but a non-compliant response to a specific item will not eliminate the product from further evaluation. Rather, these items will be individually scored, and the sum of this score will be used to determine if further consideration of the product is warranted. A maximum point score is defined for each requirement listed, and is an indicator of the relative importance of this feature to the Department. In the event that an offerer does not comply with one of the MRC items, it is recommended to expound on the response for that item. Furthermore, it is also recommended to expound on these items even if the offeror is compliant to obtain the most points possible.

MANDATORY RESPONSE COMMENTS (MRC) EVALUATION CRITERIA

The Department's Review Committee will evaluate the comments entered in the MRC matrix and score each criterion based on how well the product complies with the specification. Points will be awarded for each requirement as follows:

0 = Fail, the proposal fails to address the requirements or criteria described in the RFP or cannot be assessed due to missing information

1 = Poor, the proposal inadequately addresses the requirements or criteria described in the RFP or cannot be assessed due to incomplete information

2 = Unsatisfactory, the proposal addresses the requirements or criteria described in the RFP in an unsatisfactory manner

3 = Satisfactory, the proposal addresses all requirements or criteria described in the RFP in a minimum satisfactory manner

4 = Good, the proposal addresses all requirements or criteria described in the RFP and in some respects exceeds them

5 = Excellent, the proposal addresses and exceeds all of the requirements or criteria described in the RFP

INSTRUCTIONS TO OFFERORS:

A. TECHNICAL COMPLIANCE MATRIX

There are six Technical Compliance Matrices, one for each device type category. For each device type category being bid, the Offeror must complete a Technical Compliance Matrix in its entirety. Each matrix is organized as follows:

i. Item #: This column is used to organize the list of requirements. Using a 3-level format (N.N.N) the first number refers to the device type (1: DSRC RSU, 2: DSRC OBU, 3: C-V2X RSU, 4: C-V2X OBU, 5: DUAL UNIT RSU, 6: DUAL UNIT OBU); the second number distinguishes between the requirement type (1: MMR, 2: MRC); and the third number is the sequential numbering of the requirement.

ii. The "Descriptor" column defines / organizes each requirement by a type of category (i.e., vendor experience, physical attributes, standards, etc.).

iii. In the MMR portion of the matrix, a "Mandatory Minimum Requirements" column defines the specifications that must be met. The Y/N column is to be completed by the Offeror indicating whether the offered product meets the listed criteria. Any response that does not contain a "Y" for YES in all rows of the MMR will eliminate this bid from further consideration.

iv. In the MRC portion of the matrix, a "Mandatory Response Comments" section identifies features that are important to the Department. The "Required Responses" column defines the criteria being evaluated. Although it is not a requirement for the proposed device to meet all of these items, each item will still receive a technical score based on the Offerors response in the "Comment" column.
Offeror's are encouraged to provide a brief discussion in the Comment section of the MRC table to succinctly address each of the criteria listed. It is not the intent for these comment responses to be lengthy or complex, but they should be of sufficient detail as to demonstrate compliance of the product being offered with the stated requirement.
A blank response will result in a zero score. Likewise, an overly complex response or reference to an attached product document that makes it difficult for the evaluator to interpret the compliance of the product may similarly result in a low score.
The "Max Pts Possible" column indicates the number of points that may be assigned to each requirement. A minimum total score of 60 percent of the total possible points MRC portion is required for the offered product to be considered further. Technical responses that fail to meet the 60 percent of total points will be disqualified from further consideration.

v. In addition to the requirements listed, Offerors may include one or more features of their product that were not identified, but which might be of interest and value to the Department. This information should be entered in the last row of the MRC portion of the matrix. Evaluators will consider these additions and, if they deem them to be beneficial, they will have the option to assign an extra 50 points to the score. Note, multiple features may be identified to increase the opportunity to receive these extra points, but no more than 50 points will be awarded regardless of the number of additional features listed.

B. DEVICE TYPE CATEGORIES

Offerors may choose to submit on any or all device types as defined below, but a unique and stand-alone response must be submitted for each Device Type proposed. See respective document for a description of the technical requirements and cost sheet form which must be included with each of the Offerors responses.

No.	Device Type
1	TYPE 1 - DSRC RSU (1550 Maximum Pts)
2	TYPE 2 - DSRC OBU (1525 Maximum Pts)
3	TYPE 3 – C-V2X RSU (1400 Maximum Pts)
4	TYPE 4 – C-V2X OBU (1375 Maximum Pts)
5	TYPE 5 - Dual Unit RSU (1650 Maximum Pts)
6	TYPE 6 - Dual Unit OBU (1575 Maximum Pts)

TECHNICAL REQUIREMENTS

TYPE 1 - DSRC RSU

Utah Department of Transportation

SOLICITATION #: DOT210040KT

TYPE 1 – DSRC RSU

ITEM #	DESCRIPTOR	MANDATORY MINIMUM REQUIREMENTS (MMR)	Y / N
1.1	**DSRC RSU**		Enter
1.1.1	Experience	RSU shall be new production level devices (not beta or R&D versions) available for purchase	Y or N
1.1.2	Experience	RSU manufacturer shall have produced DSRC RSUs for open purchase for at least three years or shall be Omniair Certified	Y or N
1.1.3	Physical	RSU enclosure shall be a complete integrated unit and provide Ingress Protection of IP67 or greater and shall be pole mountable without an additional enclosure	Y or N
1.1.4	Physical	RSU shall have 100 or 100/1000 Base-T Ethernet interface	Y or N
1.1.5	Physical	RSU shall be FCC Compliant	Y or N
1.1.6	Physical	RSU shall have a minimum antenna output power of no less than +20dBm when set to maximum	Y or N
1.1.7	Standards	RSU shall be capable of broadcasting MAP at 1 Hz interval	Y or N
1.1.8	Standards	RSU shall be capable of broadcasting SPaT at 10 Hz interval	Y or N
1.1.9	Standards	OBU shall be capable of broadcasting SSM	Y or N
1.1.10	Standards	RSU shall be capable of receiving BSM from multiple vehicles broadcasting at 10 Hz intervals	Y or N
1.1.11	Standards	RSU shall be capable of receiving SRM from multiple vehicles broadcasting	Y or N
1.1.12	Standards	RSU shall be capable of broadcasting TIM	Y or N
1.1.13	Physical	RSU shall be capable of transmitting and receiving messages on any two DSRC channels from CH172 to CH184 on 5.850 GHz to 5.925 GHz	Y or N
1.1.14	Application	RSU shall be capable of transmitting and receiving messages on only CH180	Y or N
1.1.15	Security	RSU shall be capable of forwarding unsigned/unsecured messages and forward to a separate host	Y or N
1.1.16	Support	RSU shall be furnished with a complete product user manual, quick start guide, software development manual, description of APIs, and proprietary commands	Y or N
1.1.17	Support	RSU shall provide engineering-level support (as defined in 1.2.22) to UDOT or its representative at no cost during the warranty period	Y or N
1.1.18	Support	RSU shall have 2 Year Warranty from date of purchase	Y or N

TYPE 1 – DSRC RSU

ITEM #	DESCRIPTOR	MANDATORY RESPONSE COMMENTS (MRC)		
1.2	**DSRC RSU**	**Required Responses**	**Comment**	**Max Pts Possible 1550**
1.2.1	Experience	Describe the company's experience in producing and delivering DSRC RSU equipment and solutions. What would the lead time be to deliver 40 units?	Click or tap here to enter text.	100
1.2.2	Experience	Provide 3 references, including contact information (Name, Entity, Phone and Email), of three different deployments of the equipment begin offered.	Click or tap here to enter text.	100
1.2.3	Experience	Describe the company's experience with Omniair certification and intentions on certifying RSU.	Click or tap here to enter text.	50
1.2.4	Physical	Does the RSU operate in the temperature range -34 C to 60 C? If not, provide the operating temperature range of the device.	Click or tap here to enter text.	50
1.2.5	Physical	Is the RSU powered over ethernet (PoE) - 802.3AT or 802.3AF? If not, describe the power requirements for the device.	Click or tap here to enter text.	50
1.2.6	Physical	Does the RSU have two DSRC radios which are capable of being configurable to operate either in "Continuous" or "Alternating" Mode?	Click or tap here to enter text.	50
1.2.7	Physical	Does the RSU have a GNSS Receiver with an accuracy of at least 3.0 meters?	Click or tap here to enter text.	50

TYPE 1 – DSRC RSU

ITEM #	DESCRIPTOR	MANDATORY RESPONSE COMMENTS (MRC)		
1.2.8	Physical	Describe all of the items that are delivered with the RSU, including all subsystem components (i.e., antennas, surge suppressors, power supplies, etc.)	Click or tap here to enter text.	25
1.2.9	Standards	Describe the RSU's compliance with the RSU 4.1 standard.	Click or tap here to enter text.	50
1.2.10	Standards	Does the RSU broadcast WSA on CH178?	Click or tap here to enter text.	50
1.2.11	Standards	Does the RSU meet IEEE 802.11p, IEEE 1609.2, IEEE 1609.3, and IEEE 1609.4?	Click or tap here to enter text.	50
1.2.12	Standards	Describe the RSU's support for J2735 messages.	Click or tap here to enter text.	100
1.2.13	Standards	Describe the RSU's support for J2945 messages.	Click or tap here to enter text.	75
1.2.14	Application	Does the RSU support SNMP for commanding functions and device parameters?	Click or tap here to enter text.	75
1.2.15	Application	Describe the ability and process by which applications can be written developed and deployed natively to the RSU.	Click or tap here to enter text.	50
1.2.16	Application	Describe allowable access level to the RSU applications and operating system that will be provided to UDOT and their representatives.	Click or tap here to enter text.	75
1.2.17	Application	Does the RSU support the following Provider Service Identifiers (PSIDs)? • BSM – 32, (0x20) • MAP – 2113687 (0x204097) • SPaT – 130 (0x82) • SRM – 2113686 (0x204096)	Click or tap here to enter text.	100

TYPE 1 – DSRC RSU				
ITEM #	**DESCRIPTOR**	**MANDATORY RESPONSE COMMENTS (MRC)**		
		• SSM – 2113685 (0x204095) • TIM – 131 (0x83) • RTCM – 128,129 (0x80, 0x81)		
1.2.18	Application	Describe how your RSU can be implemented as a drop-in replacement for existing UDOT RSU equipment based on RSU support of the following: • Receiving and immediately forwarding MAP messages from a separate host and broadcast on the DSRC interface on CH172 or CH180 at 1Hz intervals • Storing and forwarding MAP messages from a separate host and broadcast on the DSRC interface on CH172 or CH180 at 1Hz intervals • Receiving and immediately forwarding SPaT messages from a separate host and broadcast on the DSRC interface on CH172 or CH180 at 10Hz intervals • Receiving and immediately forwarding SSM messages from a separate host and broadcast on the DSRC interface on CH184 or CH180 • Receiving BSM messages on CH172 or CH180 on the DSRC interface and forwarding to a separate host	Click or tap here to enter text.	100

TYPE 1 – DSRC RSU

ITEM #	DESCRIPTOR	MANDATORY RESPONSE COMMENTS (MRC)		
		• Receiving SRM messages on CH184 or CH180 on the DSRC interface and forwarding to a separate host		
1.2.19	Application	Does the RSU host 3rd party applications?	Click or tap here to enter text.	50
1.2.20	Application	Does the RSU support development of 3rd party applications using an Software Development Kit (SDK) and/or API in a Linux environment? Describe the development environment, SDK, API and Logging capabilities of the RSU.	Click or tap here to enter text.	50
1.2.21	Security	Describe the RSU's security capabilities and features, specifically the device's Hardware Security Module, integration with certificate authority, and support of production level certificates.	Click or tap here to enter text.	100
1.2.22	Support	Describe the company's commitment for providing engineering-level support (support directly from a member of the RSU manufacturer's engineering team on hardware and software issues) and how quickly support will be provided.	Click or tap here to enter text.	100
1.2.23	Other	Describe other features of the RSU that you feel are worth noting that have not been identified.	Click or tap here to enter text.	50

COST PROPOSAL

TYPE 1 - DSRC RSU

Utah Department of Transportation

SOLICITATION #: DOT210040KT

Device Type	Unit Cost (Each)	Unit SDK Cost (Lump Sum)	Evaluation and Scoring Cost (Assumes 10 units and 1 SDK) *
TYPE 1 – DSRC RSU	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.

* This "Scoring Cost" is for evaluation and scoring purposes only. Using the Unit Cost amounts, Offerors are instructed to enter an extended Cost based on an assumed order of 10 units of the given Device Type and a Software Development Kit (SDK). The purpose of this "Scoring Cost" is to help distribute the cost (if any) of the lump sum (SDK) price across 10 units. This Scoring Cost will be entered into the scoring price formula by the UDOT Purchasing Agent to determine an Offerors cost score eligibility (i.e., must be within 300% of the lowest bid received). This should not be interpreted as a guarantee of an order of any quantity.

TECHNICAL REQUIREMENTS

TYPE 2 - DSRC OBU

Utah Department of Transportation

SOLICITATION #: DOT210040KT

TYPE 2 – DSRC OBU

ITEM #	DESCRIPTOR	MANDATORY MINIMUM REQUIREMENTS (MMR)	Y / N
2.1	**DSRC OBU**		Enter
2.1.1	Experience	OBU shall be new production level devices (not beta or R&D versions) available for purchase	Y or N
2.1.2	Experience	OBU manufacturer shall have produced DSRC OBUs for open purchase for at least three years or shall be Omniair Certified	Y or N
2.1.3	Physical	OBU shall be FCC Compliant	Y or N
2.1.4	Physical	OBU shall be capable of transmitting and receiving messages on any two DSRC channels from CH172 to CH184 on 5.850 GHz to 5.925 GHz	Y or N
2.1.5	Physical	OBU shall have a minimum antenna output power of no less than +20dBm when set to maximum	Y or N
2.1.6	Standards	OBU shall be capable of receiving MAP at 1 Hz interval from multiple RSUs	Y or N
2.1.7	Standards	OBU shall be capable of receiving SPaT at 10 Hz interval from multiple RSUs	Y or N
2.1.8	Standards	OBU shall be capable of receiving SSM	Y or N
2.1.9	Standards	OBU shall be capable of broadcasting BSM	Y or N
2.1.10	Standards	OBU shall be capable of broadcasting SRM	Y or N
2.1.11	Standards	OBU shall be capable of receiving TIM	Y or N
2.1.12	Application	OBU shall be capable of producing Part 1 core data BSM messages without vehicle input. Minimum required fields are: location (lat/long), speed and heading	Y or N
2.1.13	Support	OBU shall be furnished with a complete product user manual, quick start guide, software development manual, description of APIs, and proprietary commands	Y or N
2.1.14	Support	OBU shall provide engineering-level support (as defined in 2.2.22) to UDOT or its representative at no cost during the warranty period	Y or N
2.1.15	Support	OBU shall have 2 Year Warranty from date of purchase	Y or N

TYPE 2 – DSRC OBU

ITEM #	DESCRIPTOR	MANDATORY RESPONSE COMMENTS (MRC)		
2.2	**DSRC OBU**	**Required Responses**	**Comment**	**Max Pts Possible 1525**
2.2.1	Experience	Describe the company's experience in producing and delivering DSRC OBU equipment and solutions. What would the lead time be to deliver 40 units?	Click or tap here to enter text.	100
2.2.2	Experience	Provide 3 references, including contact information (Name, Entity, Phone and Email), of three different deployments of the equipment begin offered.	Click or tap here to enter text.	100
2.2.3	Experience	Describe the company's experience with Omniair certification and intentions on certifying OBU.	Click or tap here to enter text.	50
2.2.4	Physical	Is the OBU rated for vehicular environments with an operating temperature range of -34 C to 74 C, operating voltage of 9 to 18 VDC, and color coded fakra connectors for antenna interfaces?	Click or tap here to enter text.	50

TYPE 2 – DSRC OBU

ITEM #	DESCRIPTOR	MANDATORY RESPONSE COMMENTS (MRC)		
2.2.5	Physical	The OBU should configured to operate in vehicular environments and should be capable of sensing if the vehicle is on or off through an ignition sense input, interface via a CAN connection and also provide user connections through an Ethernet connection (natively or through an adapter). Does your OBU comply with each of these? If not, provide the connections that are available.	Click or tap here to enter text.	50
2.2.6	Physical	Does the OBU support channel switching and concurrent operation of two radios?	Click or tap here to enter text.	50
2.2.7	Physical	The OBU should be capable of booting and obtaining GPS in less than 60 seconds, and also have a GNSS Receiver with an accuracy of at least 3.0 meters. Explain how the OBU meets or exceeds these needs.	Click or tap here to enter text.	50
2.2.8	Physical	Does the OBU have GPIOs for interfacing with equipment on the vehicle?	Click or tap here to enter text.	25
2.2.9	Physical	Describe all of the items that are delivered with the OBU, including all subsystem components (i.e., antennas, surge suppressors, power supplies, etc.)	Click or tap here to enter text.	25
2.2.10	Standards	Describe the OBU's support for J2735 messages.	Click or tap here to enter text.	100
2.2.11	Standards	Describe the OBU's support for J2945 messages.	Click or tap here to enter text.	75
2.2.12	Standards	Does the OBU meet IEEE 802.11p, IEEE 1609.2, IEEE 1609.3, and IEEE 1609.4?	Click or tap here to enter text.	50

TYPE 2 – DSRC OBU

ITEM #	DESCRIPTOR	MANDATORY RESPONSE COMMENTS (MRC)		
2.2.13	Standards	Does the OBU receive WSA on CH178 and forward to a separate host.	Click or tap here to enter text.	50
2.2.14	Standards	Does OBU support the following Provider Service Identifiers (PSIDs)? • BSM – 32, (0x20) • MAP – 2113687 (0x204097) • SPaT – 130 (0x82) • SRM – 2113686 (0x204096) • SSM – 2113685 (0x204095) • TIM – 131 (0x83) • RTCM – 128,129 (0x80, 0x81)	Click or tap here to enter text.	100
2.2.15	Application	Describe the ability and process by which applications can be written to and run on the OBU.	Click or tap here to enter text.	75
2.2.16	Application	How is the OBU configured (via a network API such as SNMP, RESTful, etc.)?	Click or tap here to enter text.	50
2.2.17	Application	Describe allowable access level to the OBU applications and operating system that will be provided to UDOT and their representatives.	Click or tap here to enter text.	75

2.2.18	Application	Describe how your OBU can be implemented as a drop-in replacement for existing UDOT OBU equipment based on OBU support of the following: • Providing live GNSS feed off of the OBU to a separate host through the Ethernet interface • Pass unsigned/unsecured messages and forward to a separate host • Independently broadcasting basic BSM messages on the DSRC interface on CH172 or CH180 at 10Hz intervals • Receiving MAP messages on CH172 or CH180 on the DSRC interface from multiple RSUs and forwarding to a separate host through the Ethernet Interface • Receiving SPaT messages on CH172 or CH180 on the DSRC interface from multiple RSUs and forwarding to a separate host through the Ethernet Interface • Receiving and immediately forwarding SRM messages from a separate host and broadcasting on the DSRC interface on CH172 or CH180 • Receiving SSM messages on CH184 or CH180 on the DSRC interface and forwarding to a separate host through the Ethernet interface	Click or tap here to enter text.	100
2.2.19	Application	Does the OBU host 3rd party applications?	Click or tap here to enter text.	50
2.2.20	Application	Does the OBU support development of 3rd party applications using an Software	Click or tap here to enter text.	50

TYPE 2 – DSRC OBU

ITEM #	DESCRIPTOR	MANDATORY RESPONSE COMMENTS (MRC)		
		Development Kit (SDK) and/or API in a Linux environment? Describe the development environment, SDK, API and Logging capabilities of the OBU. Does the OBU have an API to provide injection of data elements of the J2735 BSM and does it provide access to the GNSS service and CAN interface?		
2.2.21	Security	Describe the OBU's security capabilities and support of production level certificates.	Click or tap here to enter text.	100
2.2.22	Support	Describe the company's commitment for providing engineering-level support (support directly from a member of the OBU manufacturer's engineering team on hardware and software issues) and how quickly support will be provided.	Click or tap here to enter text.	100
2.2.23	Other	Describe other features of the OBU that you feel are worth noting that have not been identified.	Click or tap here to enter text.	50

COST PROPOSAL

TYPE 2 - DSRC OBU

Utah Department of Transportation

SOLICITATION #: DOT210040KT

Device Type	Unit Cost (Each)	Unit SDK Cost (Lump Sum)	Evaluation and Scoring Cost (Assumes 10 units and 1 SDK) *
TYPE 2 - DSRC OBU	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.

* This "Scoring Cost" is for evaluation and scoring purposes only. Using the Unit Cost amounts, Offerors are instructed to enter an extended Cost based on an assumed order of 10 units of the given Device Type and a Software Development Kit (SDK). The purpose of this "Scoring Cost" is to help distribute the cost (if any) of the lump sum (SDK) price across 10 units. This Scoring Cost will be entered into the scoring price formula by the UDOT Purchasing Agent to determine an Offerors cost score eligibility (i.e., must be within 300% of the lowest bid received). This should not be interpreted as a guarantee of an order of any quantity.

TECHNICAL REQUIREMENTS

TYPE 3 - C-V2X RSU

Utah Department of Transportation

SOLICITATION #: DOT210040KT

TYPE 3 - C-V2X RSU

ITEM #	DESCRIPTOR	MANDATORY MINIMUM REQUIREMENTS (MMR)	Y / N
3.1	**C-V2X RSU**		Enter
3.1.1	Experience	RSU shall be new production level devices (not beta or R&D versions) available for purchase	Y or N
3.1.2	Experience	RSU manufacturer shall have produced C-V2X RSUs that have been purchased and installed by customers	Y or N
3.1.3	Physical	RSU enclosure shall be a complete integrated unit and provide Ingress Protection of IP67 or greater and shall be pole mountable without an additional enclosure	Y or N
3.1.4	Physical	RSU shall have 100 or 100/1000 Base-T Ethernet interface	Y or N
3.1.5	Physical	RSU shall be capable of transmitting and receiving messages on any single channel within the range of 5.850 GHz to 5.925 GHz	Y or N
3.1.6	Security	RSU shall be capable of receiving unsigned/unsecured and signed/secured messages and forwarding to a separate host	Y or N
3.1.7	Security	RSU shall have an integrated hardware security module installed, with associated software libraries for managing certificate materials	Y or N
3.1.8	Security	RSU shall have completed a security onboarding process with associated attestation documentation	Y or N
3.1.9	Security	RSU shall be compatible with certificates for V2X over the air messages from a nationally recognized security certificate provider	Y or N
3.1.10	Support	RSU shall be furnished with a complete product user manual, quick start guide, software development manual, description of APIs, and proprietary commands	Y or N
3.1.11	Support	RSU shall provide engineering-level support (as defined in 3.2.19) to UDOT or its representative at no cost during the warranty period	Y or N
3.1.12	Support	RSU shall have 2 Year Warranty from date of purchase	Y or N

TYPE 3 - C-V2X RSU

ITEM #	DESCRIPTOR	MANDATORY RESPONSE COMMENTS (MRC)		
3.2	**C-V2X RSU**	**Required Responses**	**Comment**	**Max Pts Possible 1400**
3.2.1	Experience	Describe the company's experience in producing and delivering C-V2X RSU equipment and solutions. What would the lead time be to deliver 40 units?	Click or tap here to enter text.	100
3.2.2	Experience	Provide 3 references, including contact information (Name, Entity, Phone and Email), of three different deployments of the equipment begin offered.	Click or tap here to enter text.	100
3.2.3	Experience	Describe the company's experience with Omniair certification and intentions on certifying RSU.	Click or tap here to enter text.	50
3.2.4	Physical	The RSU temperature range should be -34 C to 60 C. Does your RSU comply? If not, provide the operating temperature range.	Click or tap here to enter text.	50
3.2.5	Physical	The RSU should be capable of being powered over ethernet (PoE) - 802.3AT or 802.3AF. Does your RSU comply? If not, provide the power requirements of the RSU.	Click or tap here to enter text.	50
3.2.6	Physical	Describe all of the items that are delivered with the RSU, including all subsystem components (i.e., antennas, surge suppressors, power supplies, etc.)	Click or tap here to enter text.	25

TYPE 3 - C-V2X RSU

ITEM #	DESCRIPTOR	MANDATORY RESPONSE COMMENTS (MRC)		
3.2.7	Physical	Does the RSU have a GNSS Receiver with an accuracy of at least 3.0 meters?	Click or tap here to enter text.	50
3.2.8	Standards	Does the RSU comply with 3GPP Standards?	Click or tap here to enter text.	50
3.2.9	Standards	Describe the RSU's support for J2735 messages	Click or tap here to enter text.	100
3.2.10	Standards	Describe the RSU's support for J2945 messages	Click or tap here to enter text.	75
3.2.11	Application	Does the RSU support SNMP for commanding functions and device parameters? Describe what functions are supported and the MIB used.	Click or tap here to enter text.	75
3.2.12	Application	Describe the ability and process by which applications can be developed and deployed natively to the RSU.	Click or tap here to enter text.	50
3.2.13	Application	Describe allowable access level to the RSU applications and operating system that will be provided to UDOT and their representatives.	Click or tap here to enter text.	75
3.2.14	Application	Does the RSU support the following Provider Service Identifiers (PSIDs)? • BSM – 32, (0x20) • MAP – 2113687 (0x204097) • SPaT – 130 (0x82) • SRM – 2113686 (0x204096) • SSM – 2113685 (0x204095) • TIM – 131 (0x83) • RTCM – 128,129 (0x80, 0x81)	Click or tap here to enter text.	100

TYPE 3 - C-V2X RSU

ITEM #	DESCRIPTOR	MANDATORY RESPONSE COMMENTS (MRC)		
3.2.15	Application	Describe how your RSU can be implemented as a drop-in replacement for existing UDOT RSU equipment based on RSU support of the following: • Receiving and immediately forwarding MAP messages from a separate host and broadcast on the C-V2X interface at 1Hz intervals • Storing and forwarding MAP messages from a separate host and broadcast on the C-V2X at 1Hz intervals • Receiving and immediately forwarding SPaT messages from a separate host and broadcast on the C-V2X interface at 10Hz intervals • Receiving and immediately forwarding SSM messages from a separate host and broadcast on the C-V2X interface • Receiving BSM messages on the C-V2X interface and forwarding to a separate host • Receiving SRM messages on the C-V2X interface and forwarding to a separate host	Click or tap here to enter text.	100
3.2.16	Application	Does the RSU host 3rd party applications?	Click or tap here to enter text.	50

TYPE 3 - C-V2X RSU

ITEM #	DESCRIPTOR	MANDATORY RESPONSE COMMENTS (MRC)		
3.2.17	Application	Does the RSU support development of 3rd party applications using an Software Development Kit (SDK) and/or API in a Linux environment? Describe the development environment, SDK, API and Logging capabilities of the RSU.	Click or tap here to enter text.	50
3.2.18	Security	Describe the RSU's security capabilities and features, specifically the device's Hardware Security Module, integration with certificate authority, and support of production level certificates.	Click or tap here to enter text.	100
3.2.19	Support	Describe the company's commitment for providing engineering-level support (support directly from a member of the RSU manufacturer's engineering team on hardware and software issues) and how quickly support will be provided.	Click or tap here to enter text.	100
3.2.20	Other	Describe other features of the RSU that you feel are worth noting that have not been identified.	Click or tap here to enter text.	50

COST PROPOSAL

TYPE 3 - C-V2X RSU

Utah Department of Transportation

SOLICITATION #: DOT210040KT

Device Type	Unit Cost (Each)	Unit SDK Cost (Lump Sum)	Evaluation and Scoring Cost (Assumes 10 units and 1 SDK) *
TYPE 3 - C-V2X RSU	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.

* This "Scoring Cost" is for evaluation and scoring purposes only. Using the Unit Cost amounts, Offerors are instructed to enter an extended Cost based on an assumed order of 10 units of the given Device Type and a Software Development Kit (SDK). The purpose of this "Scoring Cost" is to help distribute the cost (if any) of the lump sum (SDK) price across 10 units. This Scoring Cost will be entered into the scoring price formula by the UDOT Purchasing Agent to determine an Offerors cost score eligibility (i.e., must be within 300% of the lowest bid received). This should not be interpreted as a guarantee of an order of any quantity.

TECHNICAL REQUIREMENTS

TYPE 4 - C-V2X OBU

Utah Department of Transportation

SOLICITATION #: DOT210040KT

TYPE 4 – C-V2X OBU

ITEM #	DESCRIPTOR	MANDATORY MINIMUM REQUIREMENTS (MMR)	Y / N
4.1	**C-V2X OBU**		Enter
4.1.1	Experience	OBU shall be new production level devices (not beta or R&D versions) available for purchase	Y or N
4.1.2	Experience	OBU manufacturer shall have produced C-V2X OBUs that have been purchased and installed by customers	Y or N
4.1.3	Physical	OBU shall be capable of transmitting and receiving on 5.850 GHz to 5.925 GHz	Y or N
4.1.4	Physical	OBU antenna output terminal shall measure a minimum power of no less than +20dBm when set to maximum	Y or N
4.1.5	Standards	OBU shall be capable of receiving MAP at 1 Hz interval from multiple RSUs	Y or N
4.1.6	Standards	OBU shall be capable of receiving SPaT at 10 Hz interval from multiple RSUs	Y or N
4.1.7	Standards	OBU shall be capable of broadcasting BSM	Y or N
4.1.8	Standards	OBU shall be capable of receiving TIM	Y or N
4.1.9	Security	OBU shall have an integrated hardware security module installed, with associated software libraries for managing certificate materials	Y or N
4.1.10	Security	OBU shall have completed a security onboarding process with associated attestation documentation	Y or N
4.1.11	Security	OBU shall be compatible with certificates for V2X over the air messages from a nationally recognized security certificate provider	Y or N
4.1.12	Support	OBU shall be furnished with a complete product user manual, quick start guide, software development manual, description of APIs, and proprietary commands	Y or N
4.1.13	Support	OBU shall provide engineering-level support (as defined in 4.2.19) to UDOT or its representative at no cost during the warranty period	Y or N
4.1.14	Support	OBU shall have 2 Year Warranty from date of purchase	Y or N

TYPE 4 – C-V2X OBU

ITEM #	DESCRIPTOR	MANDATORY RESPONSE COMMENTS (MRC)		
4.2	**C-V2X OBU**	**Required Responses**	**Comment**	**Max Pts Possible 1375**
4.2.1	Experience	Describe the company's experience in producing and delivering C-V2X OBU equipment and solutions. What would the lead time be to deliver 40 units?	Click or tap here to enter text.	100
4.2.2	Experience	Provide 3 references, including contact information (Name, Entity, Phone and Email), of three different deployments of the equipment begin offered.	Click or tap here to enter text.	100
4.2.3	Experience	Describe the company's experience with Omniair certification and intentions on certifying OBU.	Click or tap here to enter text.	50
4.2.4	Physical	Is the OBU rated for vehicular environments with an operating temperature range of -34 C to 74 C, operating voltage of 9 to 18 VDC, and color coded fakra connectors for antenna interfaces?	Click or tap here to enter text.	50

TYPE 4 – C-V2X OBU

ITEM #	DESCRIPTOR	MANDATORY RESPONSE COMMENTS (MRC)		
4.2.5	Physical	The OBU should be capable of operating in vehicular environments as follows: • Sense if the vehicle is on/off through an ignition sense input • Interface via a CAN connection • Provide user connections through an Ethernet connection (natively or with an adapter) • Over-the-air updates via LTE of all software and firmware modules. Does your OBU comply with each of these? If not, provide information for the connections that are available.	Click or tap here to enter text.	50
4.2.6	Physical	The OBU should be capable of booting and obtaining GPS in less than 60 seconds, and also have a GNSS Receiver with an accuracy of at least 3.0 meters. Does your OBU comply? If not, provide the boot time and accuracy of the GNSS Receiver.	Click or tap here to enter text.	50
4.2.7	Physical	Does the OBU have GPIOs for interfacing with equipment on the vehicle?	Click or tap here to enter text.	25
4.2.8	Physical	Describe all of the items that are delivered with the OBU, including all subsystem components (i.e., antennas, surge suppressors, power supplies, etc.)	Click or tap here to enter text.	25
4.2.9	Standards	Describe the OBU's support for J2735 messages including Part I and Part II of the BSM Message.	Click or tap here to enter text.	100

TYPE 4 – C-V2X OBU

ITEM #	DESCRIPTOR	MANDATORY RESPONSE COMMENTS (MRC)		
4.2.10	Standards	Describe the OBU's support for J2945 messages.	Click or tap here to enter text.	75
4.2.11	Standards	Does the OBU support the following Provider Service Identifiers (PSIDs)? • BSM – 32, (0x20) • MAP – 2113687 (0x204097) • SPaT – 130 (0x82) • SRM – 2113686 (0x204096) • SSM – 2113685 (0x204095) • TIM – 131 (0x83) • RTCM – 128,129 (0x80, 0x81)	Click or tap here to enter text.	100
4.2.12	Application	Describe the ability and process by which applications can be written to and run on the OBU.	Click or tap here to enter text.	75
4.2.13	Application	How is the OBU configured (via a network API such as SNMP, RESTful, etc.)?	Click or tap here to enter text.	50
4.2.14	Application	Describe allowable access level to the OBU applications and operating system that will be provided to UDOT and their representatives.	Click or tap here to enter text.	75

4.2.15	Application	Describe how your OBU can be implemented as a drop-in replacement for existing UDOT OBU equipment. Based on OBU support of the following: • Providing live GNSS feed off of the OBU to a separate host • Independently broadcasting basic BSM messages on the C-V2X interface at 10Hz intervals • Receiving MAP messages on the C-V2X interface from multiple RSUs and forward to a separate host • Receiving SPaT messages on the C-V2X interface from multiple RSUs and forward to a separate host • Receiving and immediately forwarding SRM messages on the C-V2X interface from a separate host • Receiving SSM messages on the C-V2X interface and forward to a separate host • Pass unsigned/unsecured messages and forward to a separate host	Click or tap here to enter text.	100
4.2.16	Application	Does the OBU host 3rd party applications?	Click or tap here to enter text.	50
4.2.17	Application	Does the OBU support development of 3rd party applications using an Software Development Kit (SDK) and/or API in a Linux environment? Describe the development environment, SDK, API and Logging capabilities of the OBU. Does the OBU have an API to provide injection of data elements of the J2735 BSM and does it provide access to the GNSS service and CAN interface?	Click or tap here to enter text.	50

4.2.18	Security	Describe the OBU's security capabilities and features, specifically the device's Hardware Security Module, integration with certificate authority, and support of production level certificates.	Click or tap here to enter text.	100
4.2.19	Support	Describe the company's commitment for providing engineering-level support (support directly from a member of the OBU manufacturer's engineering team on hardware and software issues) and how quickly support will be provided.	Click or tap here to enter text.	100
4.2.20	Other	Describe other features of the OBU that you feel are worth noting that have not been identified.	Click or tap here to enter text.	50

COST PROPOSAL

TYPE 4 - C-V2X OBU

Utah Department of Transportation

SOLICITATION #: DOT210040KT

Device Type	Unit Cost (Each)	Unit SDK Cost (Lump Sum)	Evaluation and Scoring Cost (Assumes 10 units and 1 SDK) *
TYPE 4 - C-V2X OBU	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.

* This "Scoring Cost" is for evaluation and scoring purposes only. Using the Unit Cost amounts, Offerors are instructed to enter an extended Cost based on an assumed order of 10 units of the given Device Type and a Software Development Kit (SDK). The purpose of this "Scoring Cost" is to help distribute the cost (if any) of the lump sum (SDK) price across 10 units. This Scoring Cost will be entered into the scoring price formula by the UDOT Purchasing Agent to determine an Offerors cost score eligibility (i.e., must be within 300% of the lowest bid received). This should not be interpreted as a guarantee of an order of any quantity.

TECHNICAL REQUIREMENTS

TYPE 5 – DUAL UNIT RSU

Utah Department of Transportation

SOLICITATION #: DOT210040KT

TYPE 5 – DUAL UNIT RSU

ITEM #	DESCRIPTOR	MANDATORY MINIMUM REQUIREMENTS (MMR)	Y / N
5.1	**Dual Unit RSU Elements**		Enter
5.1.1	Experience	RSU shall be new production level devices (not beta or R&D versions) available for purchase	Y or N
5.1.2	Physical	RSU enclosure shall be a complete integrated unit and provide Ingress Protection of IP67 or greater and shall be pole mountable without an additional enclosure	Y or N
5.1.3	Physical	RSU shall have 100 or 100/1000 Base-T Ethernet interface	Y or N
5.1.4	Physical	RSU shall be FCC Compliant	Y or N
5.1.5	Security	RSU shall be capable of forwarding unsigned/unsecured and also signed/secured messages and forward to a separate single board computer	Y or N
5.1.6	Security	RSU shall have an integrated hardware security module installed, with associated software libraries for managing certificate materials	Y or N
5.1.7	Security	RSU shall have completed a security onboarding process with associated attestation documentation	Y or N
5.1.8	Security	RSU shall be compatible with certificates for V2X over the air messages from a nationally recognized security certificate provider	Y or N
5.1.9	Support	RSU shall be furnished with a complete product user manual, quick start guide, software development manual, description of APIs, and proprietary commands	Y or N
5.1.10	Support	RSU shall provide engineering-level support (as defined in 5.4.24) to UDOT or its representative at no cost during the warranty period	Y or N
5.1.11	Support	RSU shall have 2 Year Warranty from date of purchase	Y or N
5.2	**DSRC Elements**		
5.2.1	Physical	RSU shall have a minimum antenna output power of no less than +20dBm when set to maximum	Y or N
5.2.2	Physical	RSU shall be capable of transmitting and receiving messages on any two DSRC channels from CH172 to CH184 on 5.850 GHz to 5.925 GHz	Y or N
5.2.3	Standards	RSU shall be capable of broadcasting MAP at 1 Hz interval	Y or N
5.2.4	Standards	RSU shall be capable of broadcasting SPaT at 10 Hz interval	Y or N
5.2.5	Standards	RSU shall be capable of broadcasting SSM	Y or N
5.2.6	Standards	RSU shall receive BSM from multiple vehicles broadcasting at 10 Hz intervals	Y or N
5.2.7	Standards	RSU shall receive SRM	Y or N
5.2.8	Standards	RSU shall broadcast and receive TIM	Y or N
5.2.9	Application	RSU shall be capable of transmitting and receiving messages on only CH180	Y or N
5.3	**C-V2X Elements**		Enter
5.3.1	Physical	RSU shall have a minimum antenna output power of no less than +20dBm when set to maximum	Y or N
5.3.2	Physical	RSU shall be capable of transmitting and receiving messages on any single channel within the range of 5.850 GHz to 5.925 GHz	Y or N

TYPE 5 – DUAL UNIT RSU

ITEM #	DESCRIPTOR	MANDATORY MINIMUM REQUIREMENTS (MMR)	Y / N
5.3.3	Standards	RSU shall be capable of broadcasting MAP at 1 Hz interval	Y or N
5.3.4	Standards	RSU shall be capable of broadcasting SPaT at 10 Hz interval	Y or N
5.3.5	Standards	RSU shall be capable of broadcasting SSM	Y or N
5.3.6	Standards	RSU shall receive BSM from multiple vehicles broadcasting at 10 Hz intervals	Y or N
5.3.7	Standards	RSU shall receive SRM	Y or N
5.3.8	Standards	RSU shall broadcast and receive TIM	Y or N

TYPE 5 – DUAL UNIT RSU

ITEM #	DESCRIPTOR	MANDATORY RESPONSE COMMENTS (MRC)		
5.4	**DUAL UNIT RSU**	**Required Responses**	**Comment**	**Max Pts Possible 1650**
5.4.1	Experience	Describe the company's experience in producing and delivering DSRC and C-V2X Dual Unit RSU equipment and solutions. What would the lead time be to deliver 40 units?	Click or tap here to enter text.	100
5.4.2	Experience	Provide 3 references, including contact information (Name, Entity, Phone and Email), of three different deployments of the equipment begin offered.	Click or tap here to enter text.	100
5.4.3	Experience	Describe the company's experience with Omniair certification and intentions on certifying RSU.	Click or tap here to enter text.	50
5.4.4	Physical	Does the RSU operate in the temperature range -34 C to 60 C?	Click or tap here to enter text.	50
5.4.5	Physical	Is the RSU powered over ethernet (PoE) - 802.3AT or 802.3AF?	Click or tap here to enter text.	50
5.4.6	Physical	Does the RSU have a GNSS Receiver with an accuracy of at least 3.0 meters?	Click or tap here to enter text.	50
5.4.7	Physical	Does the RSU have two radios which are capable of being configurable to operate either in "Continuous" or "Alternating" Mode?	Click or tap here to enter text.	50

TYPE 5 – DUAL UNIT RSU

ITEM #	DESCRIPTOR	MANDATORY RESPONSE COMMENTS (MRC)		
5.4.8	Physical	Describe all of the items that are delivered with the RSU, including all subsystem components (i.e., antennas, surge suppressors, power supplies, etc.)	Click or tap here to enter text.	25
5.4.9	Physical	Describe the dual-mode capabilities and functionality of the RSU (i.e., single mode at a time vs. simultaneous).	Click or tap here to enter text.	50
5.4.10	Standards	Describe the RSU's compliance with the RSU 4.1 standard.	Click or tap here to enter text.	50
5.4.11	Standards	Does the RSU broadcast WSA on CH178 from separate host?	Click or tap here to enter text.	50
5.4.12	Standards	Does the RSU comply with 3GPP Standards?	Click or tap here to enter text.	50
5.4.13	Standards	Does the RSU meet IEEE 802.11p, IEEE 1609.2, IEEE 1609.3, and IEEE 1609.4?	Click or tap here to enter text.	50
5.4.14	Standards	Describe the RSU's support for J2735 messages	Click or tap here to enter text.	100
5.4.15	Standards	Describe the RSU's support for J2945 messages	Click or tap here to enter text.	75
5.4.16	Application	Does the RSU support SNMP for commanding functions and device parameters?	Click or tap here to enter text.	75
5.4.17	Application	Describe the ability and process by which applications can be written directly to the RSU.	Click or tap here to enter text.	50

TYPE 5 – DUAL UNIT RSU

ITEM #	DESCRIPTOR	MANDATORY RESPONSE COMMENTS (MRC)		
5.4.18	Application	Describe allowable access level to the RSU applications and operating system that will be provided to UDOT and their representatives.	Click or tap here to enter text.	75

TYPE 5 – DUAL UNIT RSU

ITEM #	DESCRIPTOR	MANDATORY RESPONSE COMMENTS (MRC)		
5.4.19	Application	Describe how your RSU can be implemented as a drop-in replacement for existing UDOT RSU equipment. Based on RSU support of the following: • Receiving and immediately forwarding MAP messages from a separate host and broadcast on the DSRC/C-V2X interface at 1Hz intervals • Storing and forwarding MAP messages from a separate host and broadcast on the DSRC/C-V2X interface at 1Hz intervals • Receiving and immediately forwarding SPaT messages from a separate host and broadcast on the DSRC/C-V2X at 10Hz intervals • Receiving and immediately forwarding SSM messages from a separate host and broadcast on the DSRC/C-V2X interface • Receiving BSM messages on the DSRC/C-V2X interface and forward to a separate host • Receiving SRM messages on the DSRC/C-V2X interface and forward to a separate host	Click or tap here to enter text.	100

TYPE 5 – DUAL UNIT RSU

ITEM #	DESCRIPTOR	MANDATORY RESPONSE COMMENTS (MRC)		
5.4.20	Application	Does the RSU support the following Provider Service Identifiers (PSIDs)? • BSM – 32, (0x20) • MAP – 2113687 (0x204097) • SPaT – 130 (0x82) • SRM – 2113686 (0x204096) • SSM – 2113685 (0x204095) • TIM – 131 (0x83) • RTCM – 128,129 (0x80, 0x81)	Click or tap here to enter text.	100
5.4.21	Application	Does the RSU host 3rd party applications?	Click or tap here to enter text.	50
5.4.22	Application	Does the RSU support development of 3rd party applications using an Software Development Kit (SDK) and/or API in a Linux environment? Describe the development environment, SDK, API and Logging capabilities of the RSU.	Click or tap here to enter text.	50
5.4.23	Security	Describe the RSU's security capabilities and features, specifically the device's Hardware Security Module, integration with certificate authority, and support of production level certificates.	Click or tap here to enter text.	100
5.4.24	Support	Describe the company's commitment for providing engineering-level support (support directly from a member of the RSU manufacturer's engineering team on hardware and software issues) and how quickly support will be provided.	Click or tap here to enter text.	100

TYPE 5 – DUAL UNIT RSU

ITEM #	DESCRIPTOR	MANDATORY RESPONSE COMMENTS (MRC)		
5.4.25	Other	Describe other features of the RSU that you feel are worth noting that have not been identified.	Click or tap here to enter text.	50

COST PROPOSAL

TYPE 5 - DUAL UNIT RSU

Utah Department of Transportation

SOLICITATION #: DOT210040KT

Device Type	Unit Cost (Each)	Unit SDK Cost (Lump Sum)	Evaluation and Scoring Cost (Assumes 10 units and 1 SDK) *
TYPE 5 – DUAL UNIT RSU	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.

* This "Scoring Cost" is for evaluation and scoring purposes only. Using the Unit Cost amounts, Offerors are instructed to enter an extended Cost based on an assumed order of 10 units of the given Device Type and a Software Development Kit (SDK). The purpose of this "Scoring Cost" is to help distribute the cost (if any) of the lump sum (SDK) price across 10 units. This Scoring Cost will be entered into the scoring price formula by the UDOT Purchasing Agent to determine an Offerors cost score eligibility (i.e., must be within 300% of the lowest bid received). This should not be interpreted as a guarantee of an order of any quantity.

TECHNICAL REQUIREMENTS

TYPE 6 - DUAL UNIT OBU

Utah Department of Transportation

SOLICITATION #: DOT210040KT

TYPE 6 – DUAL UNIT OBU

ITEM #	DESCRIPTOR	MANDATORY MINIMUM REQUIREMENTS (MMR)	Y / N
6.1	**Dual Unit OBU Elements**		Enter
6.1.1	Experience	OBU shall be new production level devices (not beta or R&D versions) available for purchase	Y or N
6.1.2	Physical	OBU shall be FCC Compliant	Y or N
6.1.3	Security	OBU shall have an integrated hardware security module installed, with associated software libraries for managing certificate materials	Y or N
6.1.4	Security	OBU shall have completed a security onboarding process with associated attestation documentation	Y or N
6.1.5	Security	OBU shall be compatible with certificates for V2X over the air messages from a nationally recognized security certificate provider	Y or N
6.1.6	Support	OBU shall be furnished with a complete product user manual, quick start guide, software development manual, description of APIs, and proprietary commands	Y or N
6.1.7	Support	OBU shall provide engineering-level support (as defined in 6.4.23) to UDOT or its representative at no cost during the warranty period	Y or N
6.1.8	Support	OBU shall have 2 Year Warranty from date of purchase	Y or N
6.2	**DSRC Elements**		
6.2.1	Physical	OBU shall have a minimum antenna output power of no less than +20dBm when set to maximum	Y or N
6.2.2	Physical	OBU shall be capable of transmitting and receiving messages on any two DSRC channels from CH172 to CH184 on 5.850 GHz to 5.925 GHz	Y or N
6.2.3	Standards	OBU shall be capable of receiving MAP at 1 Hz interval from multiple RSUs	Y or N
6.2.4	Standards	OBU shall be capable of receiving SPaT at 10 Hz interval from multiple RSUs	Y or N
6.2.5	Standards	OBU shall be capable of broadcasting BSM	Y or N
6.2.6	Standards	OBU shall be capable of receiving TIM	Y or N
6.2.7	Application	OBU shall be capable of producing Part 1 core data BSM messages without vehicle input. Minimum required fields are: location (lat/long), speed and heading	Y or N
6.3	**C-V2X Elements**		
6.3.1	Physical	OBU shall have a minimum antenna output power of no less than +20dBm when set to maximum	Y or N
6.3.2	Physical	OBU shall be capable of transmitting and receiving messages on any two DSRC channels from CH172 to CH184 on 5.850 GHz to 5.925 GHz	Y or N
6.3.3	Standards	OBU shall be capable of receiving MAP at 1 Hz interval from multiple RSUs	Y or N
6.3.4	Standards	OBU shall be capable of receiving SPaT at 10 Hz interval from multiple RSUs	Y or N
6.3.5	Standards	OBU shall be capable of broadcasting BSM	Y or N
6.3.6	Standards	OBU shall be capable of receiving TIM	Y or N
6.3.7	Application	OBU shall be capable of producing Part 1 core data BSM messages without vehicle input. Minimum required fields are: location (lat/long), speed and heading	Y or N

TYPE 6 – DUAL UNIT OBU

ITEM #	DESCRIPTOR	MANDATORY RESPONSE COMMENTS (MRC)		
6.4	**DUAL UNIT OBU**	**Required Responses**	**Comment**	**Max Pts Possible 1575**
6.4.1	Experience	Describe the company's experience in producing and delivering Dual Unit OBU equipment and solutions.	Click or tap here to enter text.	100
6.4.2	Experience	Provide 3 references, including contact information (Name, Entity, Phone and Email), of three different deployments of the equipment begin offered	Click or tap here to enter text.	100
6.4.3	Experience	Describe the company's experience with Omniair certification and intentions on certifying OBU.	Click or tap here to enter text.	50
6.4.4	Physical	Is the OBU rated for vehicular environments with an operating temperature range of -34 C to 74 C, operating voltage of 9 to 18 VDC, and color coded fakra connectors for antenna interfaces?	Click or tap here to enter text.	50

TYPE 6 – DUAL UNIT OBU

ITEM #	DESCRIPTOR	MANDATORY RESPONSE COMMENTS (MRC)		
6.4.5	Physical	The OBU should be capable of operating in vehicular environments as follows: • Sense if the vehicle is on/off through an ignition sense input • Interface via a CAN connection • Provide user connections through an Ethernet connection (natively or with an adapter) • Over-the-air updates via LTE of all software and firmware modules. Does your OBU comply with each of these? If not, provide information for the connections that are available.	Click or tap here to enter text.	50
6.4.6	Physical	The OBU should capable of channel switching and concurrent operation of two radios. Does your OBU comply with each of these? If not, describe what is unsupported.	Click or tap here to enter text.	50
6.4.7	Physical	The OBU should be capable of booting and obtaining GPS in less than 60 seconds, and also have a GNSS Receiver with an accuracy of at least 3.0 meters. Does your OBU comply? If not, provide the boot time and accuracy of the GNSS Receiver.	Click or tap here to enter text.	50
6.4.8	Physical	Does the OBU have GPIOs for interfacing with equipment on the vehicle?	Click or tap here to enter text.	25

TYPE 6 – DUAL UNIT OBU

ITEM #	DESCRIPTOR	MANDATORY RESPONSE COMMENTS (MRC)		
6.4.9	Physical	Describe all of the items that are delivered with the OBU, including all subsystem components (i.e., antennas, surge suppressors, power supplies, etc.)	Click or tap here to enter text.	25
6.4.10	Physical	Describe the dual-mode capabilities and functionality of the OBU (i.e., single mode at a time vs. simultaneous).	Click or tap here to enter text.	50
6.4.11	Standards	Does the OBU meet IEEE 802.11p, IEEE 1609.2, IEEE 1609.3, and IEEE 1609.4?	Click or tap here to enter text.	50
6.4.12	Standards	Does the OBU receive WSA on CH178 and forward to a separate host.	Click or tap here to enter text.	50
6.4.13	Standards	Describe the OBU's support for J2735 messages.	Click or tap here to enter text.	100
6.4.14	Standards	Describe the OBU's support for J2945 messages.	Click or tap here to enter text.	75
6.4.15	Application	Describe the ability and process by which applications can be written to and run on the OBU.	Click or tap here to enter text.	75
6.4.16	Application	How is the OBU configured (via a network API such as SNMP, RESTful, etc.)?	Click or tap here to enter text.	50
6.4.17	Application	Describe allowable access level to the OBU applications and operating system that will be provided to UDOT and their representatives.	Click or tap here to enter text.	75

6.4.18	Application	Does the RSU support the following Provider Service Identifiers (PSIDs)? • BSM – 32, (0x20) • MAP – 2113687 (0x204097) • SPaT – 130 (0x82) • SRM – 2113686 (0x204096) • SSM – 2113685 (0x204095) • TIM – 131 (0x83) • RTCM – 128,129 (0x80, 0x81)	Click or tap here to enter text.	100
6.4.19	Application	Describe how your OBU can be implemented as a drop-in replacement for existing UDOT OBU equipment.. Based on OBU support of the following: • Providing live GNSS feed off of the OBU to a separate host • Independently broadcasting basic BSM messages on the DSRC/C-V2X interface at 10Hz intervals • Receiving MAP messages on the DSRC/C-V2X interface from multiple RSUs and forward to a separate host • Receiving SPaT messages on the DSRC/C-V2X interface from multiple RSUs and forward to a separate host • Receiving and immediately forwarding SRM messages on the DSRC/C-V2X interface from a separate host • Receiving SSM messages on the DSRC/C-V2X interface and forward to a separate host • Pass unsigned/unsecured messages and forward to a separate host	Click or tap here to enter text.	100
6.4.20	Application	Does the OBU host 3rd party applications?	Click or tap here to enter text.	50

6.4.21	Application	Does the OBU support development of 3rd party applications using an Software Development Kit (SDK) and/or API in a Linux environment? Describe the development environment, SDK, API and Logging capabilities of the OBU. Does the OBU have an API to provide injection of data elements of the J2735 BSM and does it provide access to the GNSS service and CAN interface?	Click or tap here to enter text.	50
6.4.22	Security	Describe the OBU's security capabilities and features, specifically the device's Hardware Security Module, integration with certificate authority, and support of production level certificates.	Click or tap here to enter text.	100
6.4.23	Support	Describe the company's commitment for providing engineering-level support (support directly from a member of the OBU manufacturer's engineering team on hardware and software issues) and how quickly support will be provided.	Click or tap here to enter text.	100
6.4.24	Other	Describe other features of the OBU that you feel are worth noting that have not been identified.	Click or tap here to enter text.	50

COST PROPOSAL

TYPE 6 - DUAL UNIT OBU

Utah Department of Transportation

SOLICITATION #: DOT210040KT

Device Type	Unit Cost (Each)	Unit SDK Cost (Lump Sum)	Evaluation and Scoring Cost (Assumes 10 units and 1 SDK) *
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