

## REQUEST FOR INFORMATION (RFI)

### Pre-funding – Pre-solicitation

R001- 09

Release Date – October 19, 2009

By the Dixie Technology Funding Agency

A Special Purpose Local Government

Economic Development Agency

in La Verkin, Utah

### MULTI-CARRIER WIRELESS COMMUNITY MOBILE COMMUNICATIONS INFRASTRUCTURE

**Informational Proposals will be accepted until Friday November 6, 2009, 3:00PM**

Note: Supplemental information may be submitted after the November 6 deadline up and until December 6, 2009, 3:00 PM, but will not be considered unless an initial proposal has already been submitted before the November 6 deadline.

Contact: James Driessen, Consulting Attorney  
DTFA  
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(801)796-6924

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# ADMINISTRATIVE INFORMATION

## A. Purpose

The Dixie Technology Funding Agency, hereafter, “DTFA” (a Utah 17C(3) Special Purpose Local Government Economic Development Agency) is seeking product and services information with general cost requirements from qualified companies for furnishing wired and/or wireless network infrastructure equipment to help the DTFA achieve its vision with a first-of-its-kind Real-Time Community Mobile IP local access network. The DTFA has memorialized this vision for 14 communities in Washington County, among other documents, in its grant applications filed with the NTIA/RUS Broadband grants programs.<sup>1</sup>

The purpose of this pre-funding inquiry is to give your company opportunity to explain how your company’s technology or business models can fit in with the growing paradigm shift towards “cloud” computing and perhaps teach us a little bit more about what business models will create our best job growth potentials. While failing to submit a response to this RFI will not limit your opportunity to submit any possible RFPs, the decisions which the DTFA will make concerning these RFI responses may greatly affect how the DTFA may proceed in its Community Mobile project. We highly recommend that if your company wishes to become involved in any possible Community Mobile project that you will respond to this RFI.

By “cloud” computing we mean – the provision of dynamically scalable and often virtualized resources as a service. Traditionally, this cloud computing has only been done over the internet. But in today’s modern broadband environments, we have seen new capabilities in two-way digital communications for cloud computing also in ubiquitous local and subnet systems which may further improve the deliverability and scalability of cloud services.

Interconnectivity (connection to the internet) remains the strongest tie into to the global communications platforms, but local networks can also offer new investment opportunities for the DTFA and the Country. We now know these technology innovations described in this RFI are not just available sometime in the near future; the technologies are available here right now and ready.

Our job is just to figure out how we can best leverage these new technologies to bridge the rural communications gap with the entire world. We know these things because in La Verkin, we have set up and can demonstrate a first of its kind anywhere 3 node test network with fast roaming 300 Mbps bidirectional ("fiberless") fully IP Core wireless network with seamless convergence to GSM, CDMA, etc. This network was setup using primarily off-the shelf wireless mesh network equipment and customized quad-radio node configurations built-from-scratch using open Linux based mesh block controller platforms. While the “test” network was limited in scope, its functionality proved to be extremely important for several reasons:

1. "Last-mile" deployment of "triple play" capable network without laying cable (fiber);
2. Mobile smart phones, Wi-fi capable, with onboard VOIP and/or SIP telephony
3. Mobile calls to anywhere in the world essentially for free \*

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<sup>1</sup> Can be viewed at <http://www.redisistribution.com/BBI.pdf>; <http://www.redisistribution.com/PCC.pdf>; <http://www.redisistribution.com/SBA.pdf>

4. Seamless convergence (over to your Sprint, T-Mobile, ATT, etc.) means the call is not dropped when passing out of the cloud;
5. millisecond hand-off between nodes ensures the call is not dropped, when traveling in a car for example, and making a call on the VOIP/SIP capable handset;
6. Noticeably "clearer" voice calling; and
7. Deployment at a fraction of the cost (no or little spectrum licensing fees)

Do NOT confuse this with the old "muni-wifi" business model that merely promised bridged "hot spots" through a city wide area. These new Ubiquitous networks will offer true "Community Mobile" capable systems with even better quality and bit rate capabilities right around the corner.

Right now, in the USA, we have an opportunity to take a major step forward in the paradigm shift happening in telecommunications around the world, transitioning from the old "channeled" capacity models of cable and wired broadband internet into the "segmented" capacity wireless "cloud" computing models.

Today, the term "broadband" (or large capacity two-way data communications) must take on new meaning which includes more than just the "internet." The reason this has not happened before is because wireless technologies were not quite there yet in capacity, bandwidth, data rates, and consumer device availability. All that is changed now!

## **B. Request for Information Definition**

Responses to this RFI are considered non-binding proposals and are only used to gather information for budgetary and specification preparation purposes. A submitter of response shall hereafter be referred to in this document as a "Respondent."

The Responses shall be used to determine the number of qualified vendors that exist in the industry for a possible future competitive procurement. We are also seeking information and cost on applications/designs that can be tested in a laboratory or field environment to determine the acceptability and function of proposed units and applications. A contract will NOT be awarded as a result of this RFI. However all firms that respond to this RFI will be invited to submit proposals if the DTFA chooses to proceed with a formal Request for Proposals ("RFP"), Invitation for Bids ("IFB"), or Justified Sole Source Acquisition ("JSSA").

## **C. Demonstration Units or Locations Provided for Testing**

Since the DTFA in some respects has pioneered some of this shift toward local access cloud computing, our Community Mobile project did not have the luxury of sitting idle while waiting for technology to develop in these areas. In all potential RFPs, IFBs, or JSSAs the DTFA has and will continue to always seek Testing-Prior-to-Acquisition ("TPA") proposals and bid requirements, meaning:

1. For any Respondents to this RFI, the DTFA gives Notice that by submitting a response, Respondent agrees that prior to entering into any further or official

proposals, the Respondent must provide a “Showcase” of each style, brand, and or manufacturer that they would like to have tested, at no cost to the DTFA and according to all provisions in this RFI. In other words, the DTFA may pay for all of its own administrative, time, travel (if the testing is not to be local) per diem, etc. so long as those indirect costs are not considered over burdensome, at the DTFA’s sole discretion. However, the DTFA will not pay for any testing equipment, storage, shipping, handling or travel for which the DTFA determines the cost is over burdensome.

2. The Respondent must provide these test networks and may offer suggested testing procedures, however the DTFA shall have final say on any testing methods in either Lab or Field settings as proposed by the Respondent for a period of up to 2 months. All firms providing the test networks are hereby advised by the DTFA that if any testing equipment is potentially harmed or destroyed in the evaluations, any test equipment delivered to the DTFA or tested by the DTFA will not be returned by the DTFA and the cost of the potentially harmed or destroyed equipment will not be reimbursed to the Respondent. If Respondent wishes to have any testing equipment (working order or other) returned, it will be at Respondent’s costs for shipping and handling. The DTFA is not responsible for any damage to Respondent’s equipment, personnel, vehicles, third party equipment, etc.
3. Additionally the DTFA is requesting that all interested Respondents to this RFI shall provide initial price points for a minimum of 404 multi-radio mesh wireless node configurations with power input capability, antenna configurations, and capable of delivering broadband client side two-way communications simultaneously with broadband back-haul between nodes and the primary access points with a minimum of 100 Mbps and up to Gigabit data rates. All Respondents that provide units or existing locations for testing purposes will be provided the DTFA’s testing data and results<sup>2</sup>

Any other pricing information such as software platforms, engineering, installation, network operating facilities, and personnel etc, can be provided by the Respondent in this RFI, if the Respondent feels these will help the DTFA better understand its product advantages over the competition – however, those price points will be primarily reserved for the official RFPs, IFBs, or JSSAs.

## **REQUIREMENTS**

### **E. General Requirements**

A Carrier Agnostic Community Mobile Cloud network is the epitome of consumer choice. The DTFA seeks network ownership through asset participation contracts to prevent disruption of the vision and policies outlined below:

1. The DTFA supports activities described in this RFI
2. The DTFA maintains a lean Director of Contracts (DOC) outsourcing organization; this means the building and installing of the cloud technology (nodes), network operating center (NOC)/Training Center, provided training,

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<sup>2</sup> Note: in current laptop configurations, client side 802.11n wireless devices can provide up to 100-300 Mbps depending on the distances from the node or primary access node

and other services will be on a Request for Proposal (RFP) and competitive bid basis;

3. The DTFA has a strict —no-franchise policy. All services, including but not limited to TV channels, voice, and data utilizing Community Mobile, shall remain open to free competition.;
4. The DTFA will encourage and nurture the development of these services, but will not prevent anyone or entity from competing for or providing any such services over Community Mobile;
5. All consumers (end-users) of the Community Mobile shall have access to the lawful Internet content of their choice;
6. All consumers (end-users) of the Community Mobile shall be able to run applications and use services of their choice, subject to the needs of law enforcement;
7. All consumers (end-users) of the Community Mobile shall be entitled to connect their choice of legal devices that do not harm the network;
8. All consumers (end-users) of the Community Mobile shall have competition among network providers, application and service providers, and content providers;
9. Community Mobile will not show favoritism to any lawful Internet applications and content over others;
10. The DTFA and anyone utilizing Community Mobile shall display any network management policies in a prominent location on the service provider's web page and providing notice to customers on any changes to these policies;
11. The Community Mobile subnet of any network under the DTFA shall remain a public system;
12. Users of the system, whether connecting to the public Internet directly or indirectly, are promised that the project associated with Community Mobile will not produce a network that is an entirely private closed network;
13. DTFA shall offer premium interconnection services, where technically feasible without exceeding current or reasonably anticipated capacity limitations, on reasonable rates and terms to be negotiated with requesting parties, however, due to the open nature of Community Mobile, the DTFA shall not limit the means by which the Community Mobile is used to obtain interconnection, e.g. even existing residential gateways may become the end-user's mode of interconnection while roaming on the network. No one using Community Mobile can be forced by the DTFA to obtain interconnectivity or any other service through any one particular provider; and
14. Finally, Community Mobile is a network architecture and remains technology neutral as to provider. To the best of DTFAs knowledge at the time of this RFI, currently MIMO 802.11a/b/g/n protocols provide the best performance and consumer device availability. As MIMO technology expands to LTE,

WiMax and others, technology may change and the DTFA is open to further suggestion within this RFI.

## **F. Submission Requirements (SRs)**

A Respondent may submit information in any one or all of the (SR) categories listed below:

### **(SR)(1) Multiple Carrier Platform**

The DTFA seeks Respondents suggestions and demonstrations for how a Community Mobile wireless network can best deploy “subnetting” or other technology to achieve the greatest amount of consumer choice when it comes to internet service providers (“ISPs”). The Community Mobile project demands that more than one ISP may operate through multiple internet gateways on the same local subnet access system offering choice and competition.

Further the DTFA seeks Respondent’s suggestions and demonstration for how a Community Mobile wireless network can best deploy “subnetting” or other technology to achieve residential VPN capabilities – meaning, a consumer should have the right to keep whatever their current ISP situation is and still be able to operate within the “cloud” and maintain secure access to the home or small business. These cloud services may come over the internet or preferably through the local access subnet.

### **(SR)(2) Mobile Broadband**

A major obstacle to convergence in wireless mesh networks has been “hand-off” latency, or in other words, the time it takes for an end-user device to negotiate its connection when traveling between various nodes and cells within the mesh block or to third party networks.<sup>3</sup>

The term “nomadic” capability has been used to describe an end-user connectivity functionality whereby any end-user device negotiating with more than one mesh node has connectivity configured automatically by the device with no further end-user input such as the initial security credentials (if any) supplied at first entry (i.e. connection negotiated at the first node or access point).

The term “mobility” capable mesh has been used to describe end-user connectivity functionality where devices negotiating connectivity with more than one mesh node have no requirement to reconfigure and that the “hand-off” latency is less than 100 milliseconds as to eliminate any loss in connectivity due to the network switching while the device is geographically traveling within or outside-and-back-in to the mesh block.

The term “seamless convergence” has been used to describe end-user connectivity functionality where any end-user device with multi-radio or multi-protocol connectivity such as Wi-Fi, GSM, CDMA, 3G, 4G, LTE, or other may maintain Voice communication when roaming in and out of coverage areas within the various multi-radio networks.

The terms “opti-convergence” or “omni-convergence” are similar to seamless convergence, but have been used to describe end-user connectivity functionality where any end-user device with

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<sup>3</sup> Note that only for this SR, for the term “Broadband,” we mean either or both “broadband internet” or “broadband two-way” digital data communications.

multi-radio or multi-protocol connectivity can maintain both Voice and Data communication when roaming in and out of coverage areas within the various multi-radio networks.

For this (SR)(2) the DTFA seeks information and testing about the Respondent's technology or business models that employ any or all of the above – nomadic, mobility, seamless convergence, or omni-convergence.

### **(SR)(3) QoS**

Many wireless residential platforms, such as home wireless routers and access points, now provide excellent performance in data rates and in distance capability; however, interference, network downtime, weather, and other obstruction can cause less than desirable end-user experiences.

Conversely, in the field of computer networking and other packet-switched telecommunication networks, the traffic engineering term quality of service (QoS) refers to “resource” reservation control mechanisms rather than the “achieved service” quality.

Quality of service is the ability to provide different priority to different applications, users, or data flows, or to guarantee a certain level of performance to a data flow.

For this (SR)(3) the DTFA seeks information and testing about Respondents technology or business models that employ QoS mechanisms and how Respondents QoS will provide better end-user experience than the competition.

### **(SR)(4) Wireless Based Local Access Television – Signal Based Local Access Television**

Understanding innovation means that the Respondent must first instill in its people the desire lose the old and limited definition for term “broadband” meaning simply “high speed internet” and instead adopt the more accurate and innovative definition meaning “providing large bit-rate two-way data transmissions.”

We all must first understand that the term “internet” is merely a service that has developed on the back of data communications infrastructure (i.e. the telephone wires, overseas cabling, satellite communications, fiber optics, and wireless, to name a few). Limiting ourselves to only one service on that communications infrastructure really limits the business opportunities for Broadband. The differences may at first seem insignificant (the difference between “internet” and “two-way data transmission”) but the limiting factor of only considering internet has indeed limited the scope for development in these areas.

A key example of broadband development that does not involve the internet directly, but can affect government or community life is something we call “local access digital television or DTV. Previously digital TV stations have all been either “signal” based TV such as your local ABC, NBC, CBS, and Fox affiliates – or they have been using the Internet for “IPTV” to deliver only limited and low quality access.

But with the advent of local “wireless” broadband and the new segmented capacities, we see real examples of an opportunity and capability for local “wireless” digital-tv access to operate either independently or along side of the local digital “signal” based tv stations. Local “wireless” digital-tv will provide a much higher level of consumer interaction than was possible with only “signal” based tv stations.

These new communication pathways will in-turn spawn new markets and new growth which we have not seen before. Our State, local and tribal governments must take the lead in getting us out of the internet cloud and into the new pervasive computing cloud. The DTFA cannot stress enough the importance of understanding that the bandwidth hogs of high definition (HD) media must be handled on the local access level with all the “segmented capacity” gates on the local access side with all the caching capabilities and other optimizations that will ensure both service quality and quality of service (QoS) which the internet is not yet ready to provide.

Cloud computing is a paradigm of computing in which dynamically scalable and often virtualized resources are provided as a service. Users need not have knowledge of, expertise in, or control over the technology infrastructure in the "cloud" that supports them. The concept generally incorporates combinations of the following: infrastructure as a service (IaaS); platform as a service (PaaS) or software as a service (SaaS). If these services can operate along side wireless based local access television, then the opportunity for interactivity and choice will create entirely new industries that will not detract from the existing local tv or internet industries – it will simply make it better!

For this (SR)(4) the DTFA seeks information and testing about Respondent’s technology or business models that can deploy with (or are compatible with) wireless based local access television.

### **(SR)(5) Spin-off Industries**

Local access services means opportunity in media, distance learning, security and surveillance, mobile health monitoring, public safety, public information, commerce, mobile maintenance, finance, banking, and literally hundreds of other industries

For this (SR)(5) the DTFA seeks information and testing about Respondents technology or business models that can create compatible business architecture that will drive sustainability and growth within the Community Mobile network and ultimately within the communities.

### **(SR)(6) Legacy Compatibility**

In order for consumer adoption without necessarily having to go out and purchase new and expensive equipment just to partake, the DTFA seeks at least “nomadic” compatibility for wireless “g” devices and/or legacy wimax devices.

For this (SR)(6) the DTFA seeks information and testing about Respondents technology or business models that can deploy with (or are compatible with) legacy wireless consumer devices.

## **(SR)(7) Mesh Block Control**

In order for any of the multiple carrier applications and platforms to operate in a robust environment, the DTFA has identified that the mesh block control program is the primary enablement mechanism.

For this (SR)(7) the DTFA seeks information, testing, and or recommendations for how any of the above described “multiple carrier” services and solutions can be achieved with or without an adaptive mesh block control technology.<sup>4</sup>

## **(SR)(8) From Back-Haul to Tier-1 Interconnectivity**

While local access services are being promoted herein as a great “growth” opportunity, the DTFA is well aware that the internet is and shall remain the key driving force in all broadband and digital commerce.

Tier-1 is herein defined as an IP network that participates in the Internet solely via Settlement Free Interconnection, also known as settlement free peering. The DTFA will require a well connected network with not just back-haul communications between nodes, primary access points, and network operating centers (NOC) but ultimately high availability to the world-wide-web through either direct or very close ties into Tier-1.

A common point of contention among people discussing Tier 1 networks is the concept of a "regional Tier 1" versus a “global Tier 1.” The DTFA primarily seeks a relationship with a vendor who is either included in the incumbent carriers within the United States or will extend their networks to the United States and peer openly with many networks.

For this (SR)(8) the DTFA seeks verifiable information, testing, and or recommendations on how Respondent can best tie into “Tier-1” not just as a “marketing” slogan, but with true performance criteria. For instance, many large telephone companies who are also Tier 1 networks buy, sell, or swap fiber amongst themselves; even if it were possible to list every transaction, it is impossible to know for sure if some of those transactions were required for payment of a peering connection. The DTFA seeks true verifiable confirmation for “dream tank” capabilities in Optical Carrier or Satellite based interconnectivity to Tier-1.

## **PROCEDURAL INFORMATION**

### **G. Inquiries**

Vendors may make inquiries of a procedural nature concerning this RFI to:

James Driessen, Consulting Attorney, DTFA, 435 North Main Street, La Verkin, UT 84745  
(801)796-6924

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<sup>4</sup> The DTFA notes that trade secret and/or other intellectual property concerns may be of greatest importance to vendors in reference to this (SR)(7). Please refer to the proprietary information and response material ownership portions of this RFI below.

## H. Response Submissions

Responses should be prepared simply and economically, providing complete details of the vendor's ability to meet the requirements specified in one or more of the SRs listed above.

As a minimum Respondents must include the following information to be considered and/or create the window to supplemental submissions:

1. Company Name and Address
2. History of company including future plans in industry
3. Any other resources and data applicable
4. Statement of agreement to furnish the testing units or locations at no charge to the DTFA
5. Cost proposal to furnish the up to 404 mesh node units.

Initial Responses will be accepted by the DTFA via mail, courier service, or PDF attachment to email until November 6, 2009 at 3:00 P.M. and supplemental Responses will be accepted until December 6, 2009 provided all requirements of this RFI are met.

The address for mailing submissions is:

Dixie Technology Funding Agency  
Attn: RFI R001-09  
435 North Main Street  
La Verkin, UT 84745

Vendors mailing their response through the US Postal Services must have their Response post-marked by the date and time specified and should use either the USPS Express Mail services with signature requested for tracking or Certified Mail – Return Receipt Requested.

Vendors mailing through non-governmental Courier services, by way of example but not limited to UPS, FED EX, DHL, A1, or other "Courier" services must ensure that the Response is sent with enough lead time to ensure it is received at the DTFA offices prior to the specified date and time.

Vendors submitting through email must submit as an email attachment via the commonly used Adobe Acrobat PDF file format. Respondents may use a standard "read notification" reply request to ensure that their Response was received. For information about obtaining PDF compatible creation software, the DTFA suggests (but in no way limits) directing your browser to <http://www.adobe.com> for more information.

The only email address for officially submitting to this RFI shall be:

[RFI00109@dtfa-utah.org](mailto:RFI00109@dtfa-utah.org)

The DTFA is not responsible for any lost or misdirected mails, emails, or delivery.

You may find information about this RFI by going to the City of La Verkin website at <http://www.laverkincity.org> and then clicking on economic development. The City of La

Verkin, however, is not the same entity as the DTFA and any communications concerning this RFI sent directly to the City may be discarded.

The DTFA is not liable for late submission of, or discarding of, responses due to any technological reason, such reason being caused by an action of the DTFA, the City of La Verkin, or the Respondent.

### **I. Cost of Responses**

The DTFA is not liable for any cost incurred by vendors in preparing their response. Respondents may be asked to clarify or expand upon information provided.

### **J. Proprietary Information**

If a response contains information that the respondent does not want disclosed to the public, or used for any purpose other than the evaluation of this response, all such information must be indicated with the following or similar statement:

**“The information contained on pages \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_ shall not be duplicated or used in whole or in part for any purpose other than to evaluate the response provided. If a contract is awarded to this firm as a result of the submission of such information, the DTFA shall have the right to duplicate, use, or disclose this information to the extent provided in the contract. This restriction does not limit the DTFA’s right to use the information herein if obtained from another source.”**

All such nondisclosure items specified in the response shall be subject to disclosure as provided in U.C.A. § 63G -2-101 *et. seq.* known as the "Government Records Access and Management Act" or as otherwise provided by law.

### **K. Response Material Ownership**

All material submitted in response to this RFI becomes the property of the DTFA except for products that are made available for demonstration purposes and proprietary material. All responses, except for items as indicated and according to the Proprietary Information procedures as outlined above, will be available for public review.