Definitional Mission to Evaluate ICT Projects in Brazil: Volume 1: Statewide Broadband Network for Acre

Final Report

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ACRE'S STATEWIDE BROADBAND NETWORK[1]

A. INTRODUCTION

Developing competitiveness in today's ever more globalized and knowledge-based economy requires a new kind of infrastructure. While terrestrial highways, railways, rivers and airports remain important for the transport of goods and people, information highways are critical to establish linkages with the world's knowledge base. This can be called infostructure.

Access to the broadband Internet is essential for the development of science and technology, of course, but also for lifelong education of the labor force and for reducing transactions costs through various types of e-commerce as well as by reducing opportunities for corruption in government bidding in transparent e-procurement procedures for government contracts. Through providing the means for improving the quality of education, health, public safety and other government services as well as access to global and Brazilian markets for businesses located in Acre, broadband Internet access can also contribute to social and economic development.

Table 1: Internet Access in Brazil, Northern Region and Acre

Geographic Area/socio-economic group	% Homes with Internet Access 2006 (PNAD)	% Homes with Television set 2006 (PNAD)	% Homes with Telephone (fixed or mobile) 2006 (PNAD)	% Urban population that has never accessed Internet 2007 from any location (CETIC.br)
Brasil	16.8	93.0	74.5	59.0.
North	9.7	85.0	59.9	68.0
Acre	7.7	82.1	66.4	n.a.
Acre/Urban	n.a.	94.1	n.a.	n.a.
Acre/Rural	n.a.	36.4	n.a.	n.a.
Class A	n.a.	n.a.	n.a.	6.0
Class B	n.a.	n.a.	n.a.	27.0
Class C	n.a.	n.a.	n.a.	53.0
Classes DE	n.a.	n.a.	n.a.	83.0

Source: Annex A (PNAD and CETIC.br)

As of July 2008, the latest official statistics on homes with internet connections in Acre come from the 2006 National Household Sample Survey (*Pequisa Nacional por Amostra de Domicílios* – PNAD), but there are data for the Northern Region for the year 2007 from the Center for ICT Studies (*Centro de Estudos sobre as Tecnologias da Informação e da Comunicação* - CETIC.br www.cetic.br) (Table 1). The detailed data on which this table is based are included in Annex A to

[1] The Statewide Broadband Network Project is known in English by its Portuguese name *Floresta Digital* or Digital Forest.

this report. Later in 2008 the 2007 PNAD data should be released. It is highly likely that, in 2008, less than 10% of homes in Acre have a computer with access to the Internet. The penetration is certainly far lower for rural areas and socio-economic classes C, D, and E.

The government of the State of Acre recognizes that the right of citizens to information is fundamental for both social justice and competitiveness. In other Brazilian states there are municipalities that recognize this right or have already realized it. But it seems that Acre is the first state, other than the Federal District, that has decided to build wireless networks with free public access and covering the entire state. This is objective is part of a project entitled Digital Forest *(Floresta Digital)*. The goal is to reach 100 percent coverage of the population by the end of 2010. There are also various kinds of digital states projects in various stages of execution for example, in São Paulo, Rio de Janeiro, and Ceará, though as yet these other states have not made universal free internet service an integral part of their official objectives.

Table 2: Population by Município, Acre - 2007*

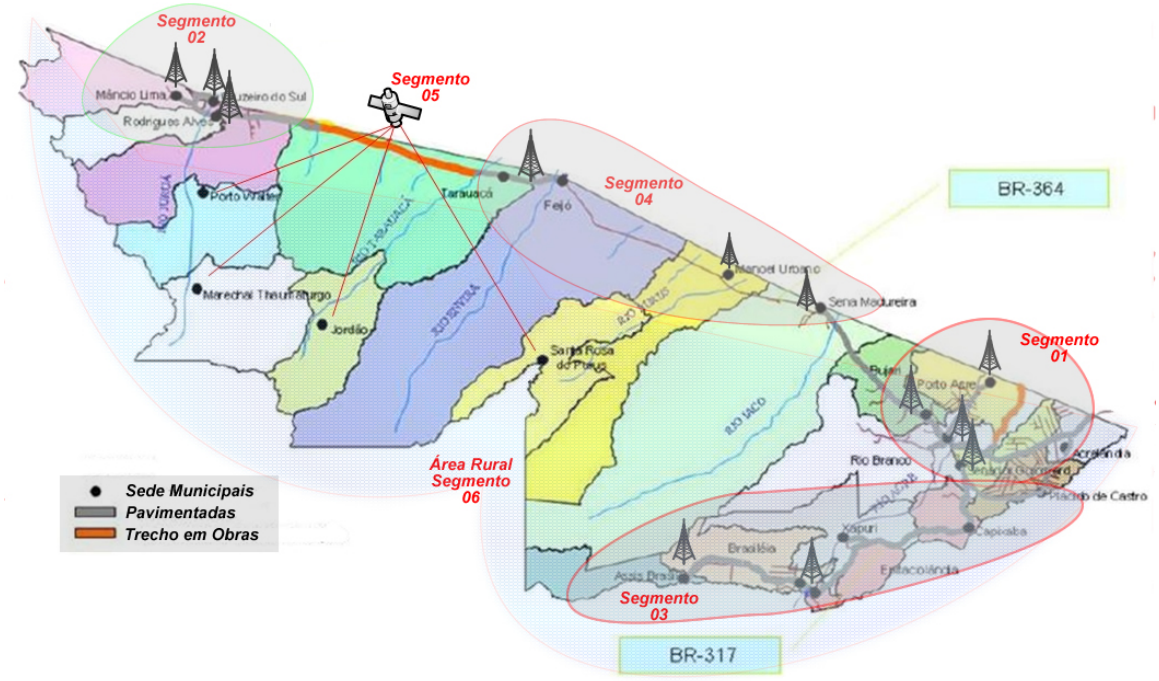
Acre	**655 385**
Acrelândia	11 520
Assis Brasil	5 351
Brasiléia	19 065
Bujari	6 543
Capixaba	8 446
Cruzeiro do Sul	73 948
Epitaciolândia	13 434
Feijó	31 288
Jordão	6 059
Mâncio Lima	13 785
Manoel Urbano	7 148
Marechal Thaumaturgo	13 061
Plácido de Castro	17 258
Porto Acre	13 716
Porto Walter	8 170
Rio Branco	290 639
Rodrigues Alves	12 428
Santa Rosa do Purus	3 948
Sena Madureira	34 230
Senador Guiomard	18 863
Tarauacá	32 171
Xapuri	14 314

Source: IBGE, *Contagem da População 2007*.
*Population including estimated population of closed homes
Available at ftp://ftp.ibge.gov.br/Contagem_da_Populacao_2007

The Statewide Broadband Network project seeks to bring broadband Internet services to all of Acre's 22 *municípios* (Table 2) as an integral part of the vision of sustainable development and of *florestania* that guides the socio-economic development policies of this state, (this project is being

developed by the Secretariat of Administrative Management (*Secretaria de Gestão Administrativa* – SGA)). In December 2007, SGA contracted a consultancy firm to prepare studies on the network development strategy, potential partnerships (public, private, national and international) to implement the project and develop content for the network (including e-government, education, health, and community development services), and also to identify financing sources to complement resources from the state budget.

Figure 1: Acre's Road Network, and *Municípios,* and *Infovia Floresta Digital*



Source: Secretaria de Gestão Administrativa

Segmentation of the Statewide Broadband Network for the feasibility study

To facilitate planning and implementation of the Statewide Broadband Network, Acre's 22 municípios have been divided into six segments. The six segments identified have more or less homogeneous characteristics as regards access to current and planned infrastructure – more specifically the existence of a fiber optic backbone of RBMetroNet in Rio Branco, which should be operational in early 2009, and of Brasil Telecom (BrT) which in October 2008 expects to complete fiber optic cable links between Rio Branco and Cruzerio do Sul, near the border with Peru (following the route of Federal Highway BR-364 and with Assis Brasil, near the border with Bolivia, following the route of Federal Highway BR-317 (Figure 1).

1. *Rio Branco (city) e the seats of six nearby municípios* (Bujari, Porto Acre, Senador Guiomard, Bujari, Placido de Castro, Acrelandia e Capixaba), connected by fiber optics or microwave, distribution within urban áreas by fiber optic cable, and some combination of WiMAX, Wi-Fi, Wi-Mesh and/or Power Line Communications (PLC) – the technologies to be used should have the lowest costs for the desired service levels.

2. Cruzeiro do Sul (city) e the seats of two nearby *municípios* (Mâncio Lima e Rodrigues Alves), connection via fiber optic cable or microwave, distribution by WiMAX/Wi-Fi/Wi-Mesh/PLC – the technologies to be used should have the lowest costs for the desired service levels.

3. *Seats of municípios along BR-317* (Acrelândia, Assis Brasil, Brasiléia, Epitaciolândia, Xapurí), connection via fiber optic cable or microwave, distribution by WiMAX/Wi-Fi/Wi-Mesh/PLC – the technologies to be used should have the lowest costs for the desired service levels.

4. *Seats of Municípios along BR-364* (Feijó, Manuel Urbano, Sena Madureira e Tarauacá), connection via fiber optic cable or microwave, distribution by WiMAX/Wi-Fi/Wi-Mesh/PLC – the technologies to be used should have the lowest costs for the desired service levels.

5. *Seats of remaining municípios in Acre* (Jordão, Marechal Thaumaturgo, Porto Walter, Santa Rosa do Purus), connection via satellite, distribution by WiMAX/Wi-Fi/Wi-Mesh/PLC – the technologies to be used should have the lowest costs for the desired service levels.

6. *Rural áreas of all municípios in Acre*, with priority to the áreas with the greatest population density. Connection via satellite, distribution by WiMAX/Wi-Fi/Wi-Mesh/PLC – the technologies to be used should have the lowest costs for the desired service levels. Assuming that the rural population of the state is roughly one third to the total population, the population to be covered in this last segment should be on about 281,000, but could be less if it is possible to reach part of the population in rural areas via wireless technologies from the seats of the municipalities, avoiding the need for more expensive satellite connections.

The greatest urgency for SGA is to build a network linking all government offices (including the integrated citizen service centers and public telecenters) in Rio Branco its six neighboring *municípios* (Segment 1) and in Cruzeiro do Sul and its neighboring *municípios* (Segment 2) and giving them access to the Internet, taking advantage of existing fiber optic backbones of the incumbent telecommunications operator, Brasil Telecom (BrT) and the new Metropolitan Network for Science, Technology, Innovation and Development of Rio Branco – (*Rede Metropolitana para Ciência e Tecnologia, Inovação e Desenvolvimento de Rio Branco* – RBMetroNet) which is a fiber optic ring being built in Rio Branco that should become operational in early 2009.[2] Something like this has been done in the Pedreira and Campinas (SP), Belo Horizonte (MG), Fortaleza (CE), Belém (PA) and Porto Alegre (RS). There are many other municipal networks already in place or being constructed, and the state of Santa Catarina has its own fiber network, while Ceará is constructing one.

The seats of the four most isolated *municípios* (Jordão, Marechal Thaumaturgo, Porto Walter, Santa Rosa do Purus) and the rural zones of all 22 *municípios* not reachable economically by fiber optic landlines, including indigenous and riverside communities, constitute the most difficult segment of the Statewide Broadband Network network. It will be necessary to use satellite connections to complement landlines, making use of wireless technologies (WiMAX, Wi-Fi and/or Wi-Mesh) for local distribution of the signal.

[2] RBMetronet is examined in some detail below.

Building roads in the Amazon is an extremely costly and herculean task. The digital highways involved in the Statewide Broadband Network project are the most viable solution for shortening distances and reducing isolation.

The Statewide Broadband Network project is closely associated with parallel initiatives of SGA to develop more efficient government services, including increased use of e-government through a unified portal (see www.ac.gov.br) and integrated citizen service centers (called OCAs) in the two most important cities, Rio Branco and Cruzeiro do Sul. The OCAs are modeled on São Paulo's *Poupatempo* (Timesaver) centers (www.poupatempo.sp.gov.br) and are being prepared with the help of a Res Publica, a consultancy firm headed by the former head of the *Poupatempo* program. Both of these programs will make extensive use of the first "layer" in the Statewide Broadband Network, that connecting all government offices, in the state with high-speed internet connections. The second layer will provide relatively high speed connections to public internet access points (community telecenters), schools, and health posts – that can also be used as telecenters when classes are not in session. The third layer will provide medium-band (256-512 kbps) connections to the general public, free of charge, as a public service, much as public lighting – in the digital cities movement, this is known as "illuminating" an area with wireless internet. An optional fourth layer would provide optional commercial high-speed Internet access for businesses and homes seeking higher bandwidth than that available for free access and value-added services requiring such bandwidth.

Early implementation of the network involves VoIP telephony for government offices using existing Internet connections. In order to conserve state budgetary resources, the development of the Statewide Broadband Network project is being closely coordinated with some key federal government programs and initiatives as described below.

The "exchange of obligations" to provide broadband backhaul to all municípios and urban schools. The "exchange of obligations" of telecommunications operators under their existing concessions involves bringing broadband internet backhaul to all Brazilian *municípios* currently lacking it and connecting 55,000 urban schools with a minimum of 1 Mbps by the end of 2010 free of charge through 2025 – substituting for previous commitments to the incumbent fixed line operators to put in place 8461 Telecomunication Services Posts – (*Postos de Serviços de Telecomunicações* – PSTs). The agreement was codified in a presidential decree published on 4 April 2008.[3] For Acre, the incumbent operator is Brasil Telecom (BrT). BrT's fiber optic backbone as of December 2007 is shown in Figure 2. It links the state capital of Rio Branco with Porto Velho in the neighboring state of Rondônia, and thence to Cuiabá (Mato Grosso), Goiânia (Goiás), Brasília, and thence to the global backbone of the Internet through a submarine cable. By October of 2008 BrT should have extended its fiber backbone along BR-364 to Cruzeiro do Sul, and along BR-317 to Assis Brasil (Figure 1), and this should provide the backhaul for the Statewide Broadband Network Project.

[3] Decreto Nº 6.424, de 4 de abril de 2008 available on the Internet at http://legislacao.planalto.gov.br/legisla/legislacao.nsf/fraWeb?OpenFrameSet&Frame=frmWeb2&Src=%2Flegisla%2Flegislacao.nsf%2FViw_Identificacao%2FDEC%25206.424-2008%3FOpenDocument%26AutoFramed.

Figure 2: BrTelecom Long Distance Backbone as of December 2007

Source: Atlas brasileiro de telecomunições 2008 (São Paulo: Converge Communicações, 2008), p. 66

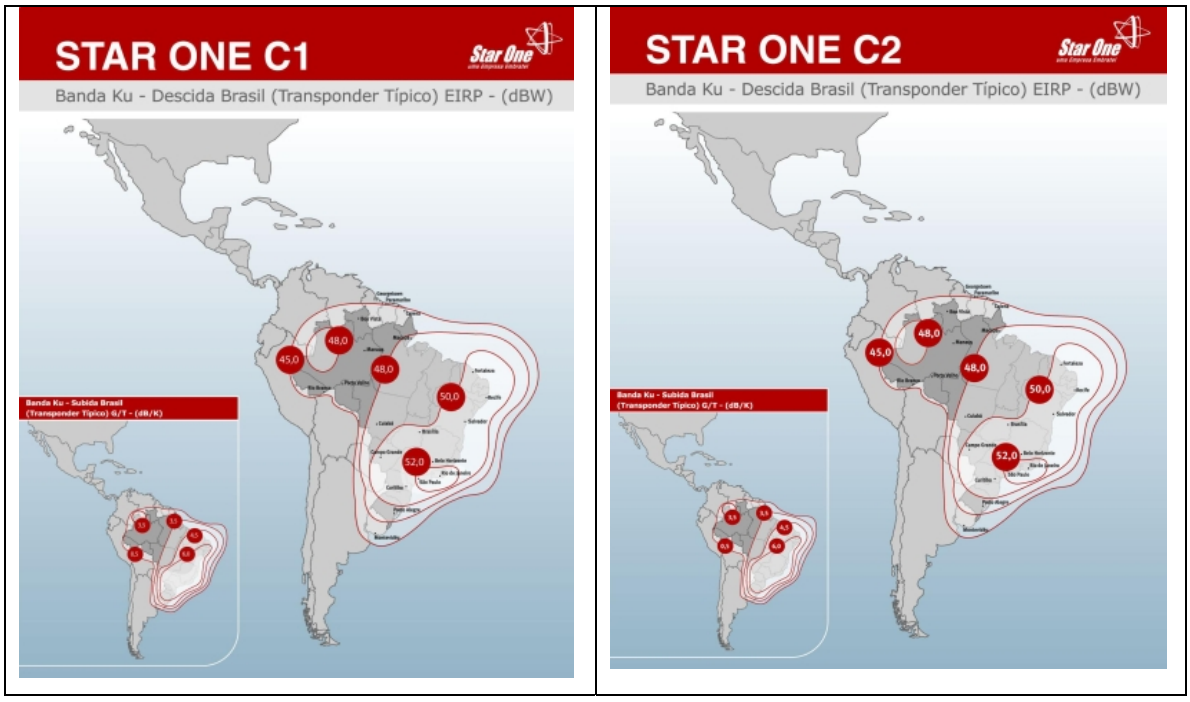
Gesac. The second federal initiative is Electronic Government Service to Citizens (*Governo Eletrônico Serviço de Atendimento ao Cidadão* – Gesac), which is the largest federal government digital inclusion program. In April 2008 a consortium led by Embratel (and including BrT, Oi and Telefônica) won two separate auctions organized by the Ministry of Communications (MC) to provide 12,000 broadband connections to specific points in Brazil, many of them schools participating in the Ministry of Education's Proinfo (computer laboratories for schools) program. Of these 12,000 points, 114 are located in Acre, many of them in areas considered urban (see Annex 2 for a complete list of the points). Gesac already has 48 connections in Acre, several of them in Rio Branco.

According to the terms of reference for the auction, the officials in charge of the Gesac program in the MC, state that it is possible to re-locate most of the 114 planned Gesac connections to rural areas not accessible by landlines. Under the new Gesac terms of reference, these points of presence can be used to extend broadband Internet access via wireless technologies (e.g. Wi-Fi, Wi-Mesh) to areas, and not just to a specific installations (telecenters, schools, military posts, NGOs, etc.).[4] The contract with the consortium was signed in late August 2008. Also MC plans to hold a third auction for an additional 8,000 rural mostly satellite broadband links. Acre should be able to get its share of these links, perhaps another 60 or so. These Gesac links should provide a starting point for the Statewide Broadband Network Project.

[4] The bidding documents for the competition won by Embratel are available at http://www.mc.gov.br/ Inclusão Digital/Gesac /Segunda Audiência Pública.

For the satellite connections Embratel is almost certain to use two advanced communications satellites, Star One C1 and Star One C2, launched respectively in November 2007 and April 2008. They have advanced Ku Band transponders ideal for this purpose and footprints, which include Acre (Figure 3). The 114 points plus an additional 60 or so to be awarded in the August auction will not be sufficient to cover the rural areas for the *Floresta* Digital project, but according to the Ministry of Communications official heading the Digital Inclusion program, it should be possible to contract additional points at the same low price of the Gesac contract.[5]

Figure 3: Satellite Footprints, Star One C1 and C2



Sources: http://www.starone.com.br/source/website/corporativo/segmentoespacial/starone_c1_ku_brasil.cfm
and
http://www.starone.com.br/source/website/corporativo/segmentoespacial/starone_c2_ku_descida_brasil.cfm

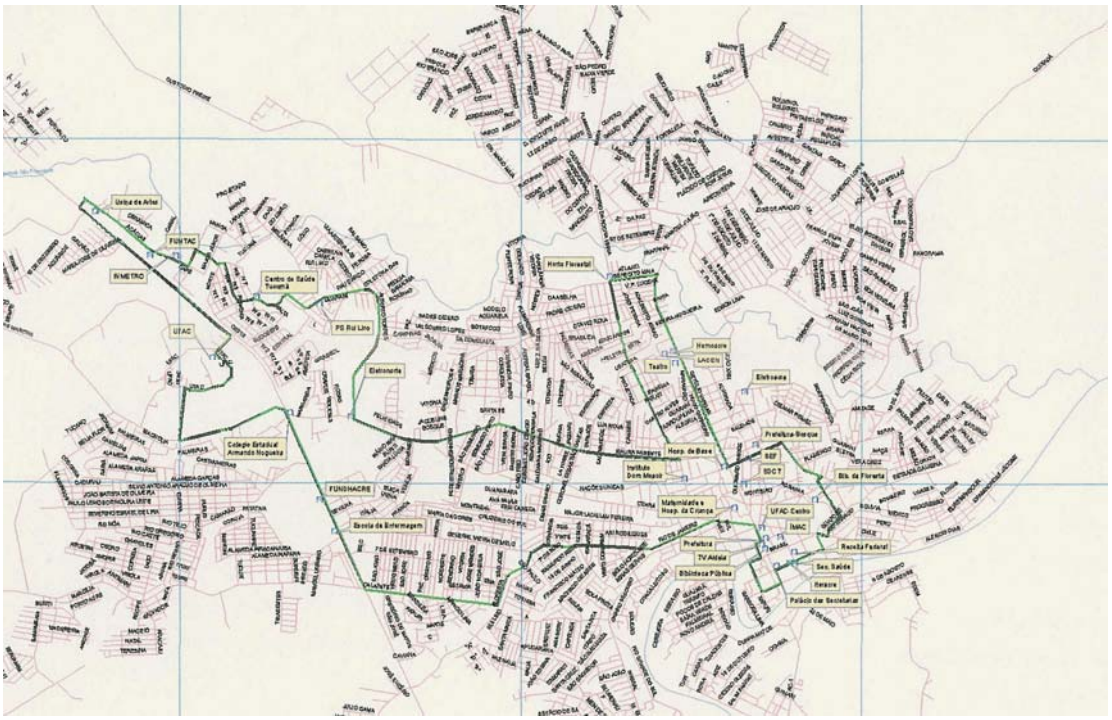
Urban connections in the *municípios* where BrT has or will soon have fiber would probably be provided by BrT, since they would be faster, cheaper, have less latency.[6] But it is probably in the interest of Acre to have almost all of the Gesac connections in rural areas, since urban schools will be served by BrT under the "exchange of obligations" program and provided free service through 2025, which is much longer than the Gesac contract. Any other urban locations served now by Gesac can be served via terrestrial links, which can be provided through the Statewide Broadband Network as it is implanted.

RBMetroNet and Rede Comep. With support of the Ministry of Science and Technology (MCT) and the National Research Network (*Rede Nacional de Pesquisas* – RNP) and the program for Metropolitan Community Education and Research Networks (*Redes Metropolitanas Comunitárias*

[5] Interview with Dr. Heliomar Medeiros de Lima, Brasília, 3 July 2008.
[6] Latency is the delay, measured in milliseconds in two way communication – due to electronic processing and travel of the signal at the speed of light – which in a round trip to a geosynchronous satellite 22,500 miles above the earth takes longer than over terrestrial fiber optic cable.

*de Educação e Pesquis*a – Redes Comep), a fiber optic ring called RBMetroNet is being established in Rio Branco and the construction contract has been won by the Manaus firm Brastelecom. RBMetronet will link research institutions, higher education institutions, and government offices. The plan is to share the fiber of RBMetroNet (and possible WiMax or other high-speed wireless extensions of it) with the Statewide Broadband Network in Rio Branco. The map of this network is shown in Figure 4. RB

Figure 4: RBMetroNet – Metropolitan Network of Rio Branco Redecomep – Community Network for R&D



The topography of RBMetroNet is provided in Figures 5 and 6 – there may be minor changes in this topography before the network is implemented. Construction is scheduled to begin in October/November 2008 and it is expected that RB Metronet will be in operation by February/March 2009. Note that wireless links are planned to the campus of Embrapa (the federal government agricultural research enterprise) and the UFAC agricultural research station at Catuaba, though a fiber link sharing the fiber of the Eletronorte (a subsidiary of Eletrobrás responsible for the power generation, transmission and distribution in the states of Amazonas, Pará, Acre, Rondônia, Roraima, Amapá, Tocantins and Mato Grosso) is also being studied for these connections. The Federal University of Acre (UFAC) and Embrapa are key institutions for developing more knowledge-intensive exploitation of Acre's natural and genetic resources.

Figure 5: Topography of RBMetroNet

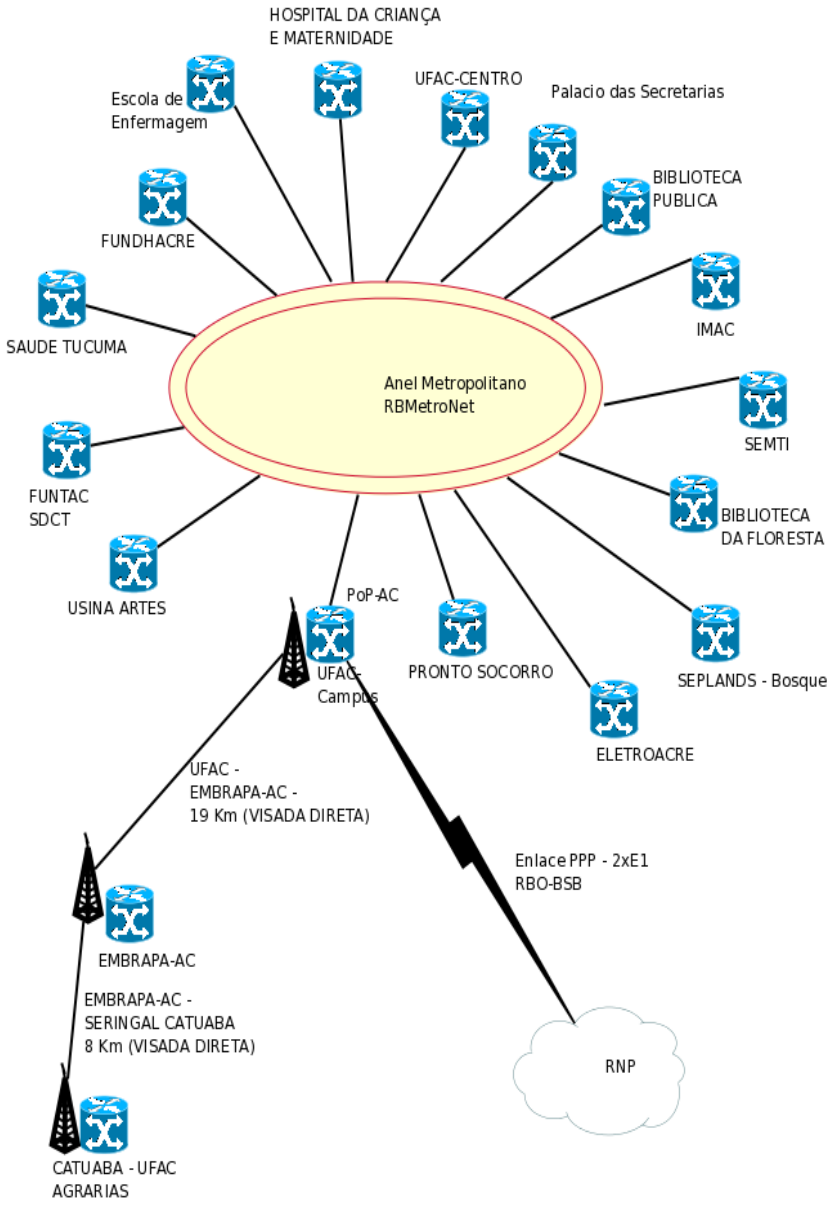
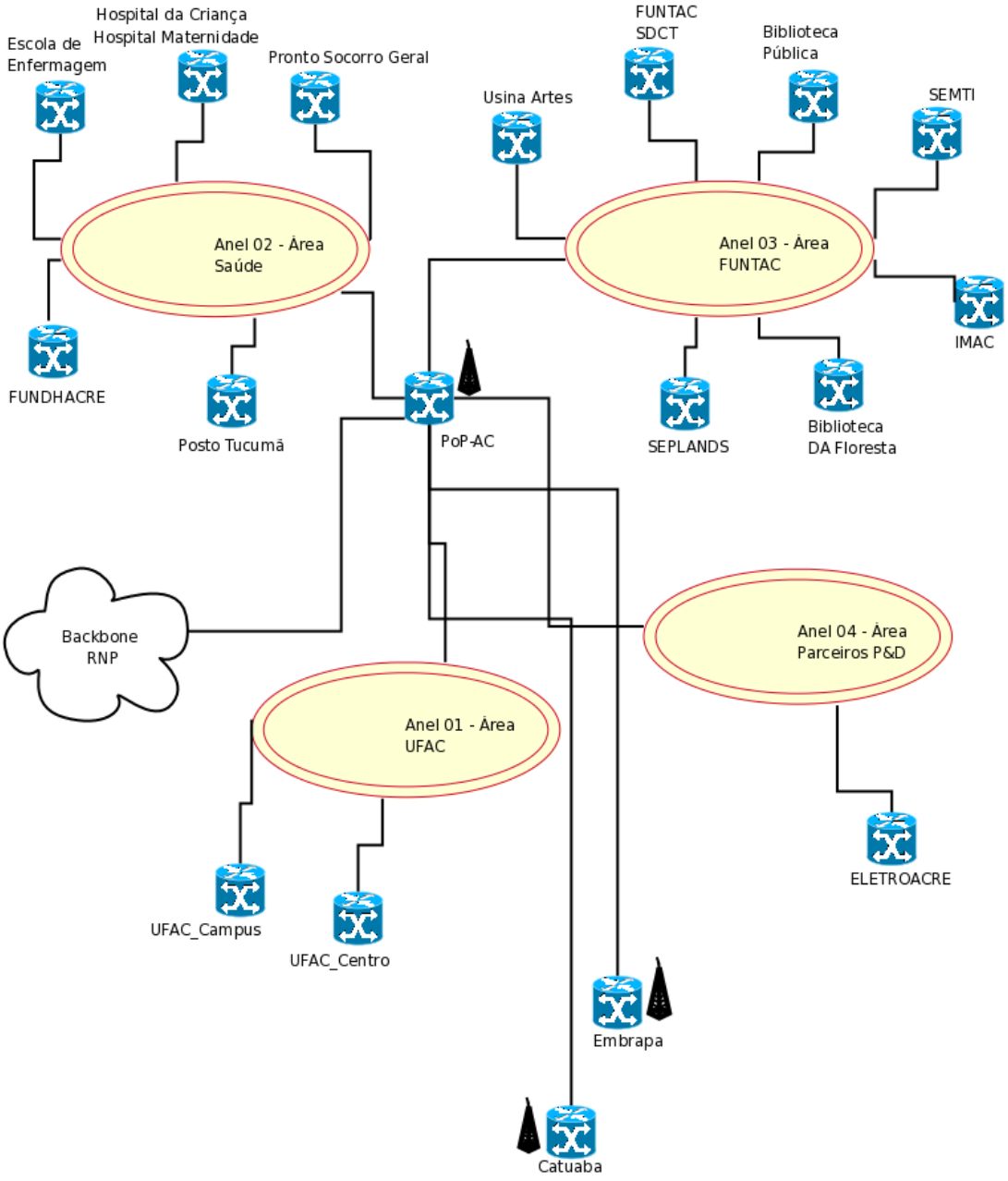


Figure 6: Logical Topography of RBMetroNet



Current planning calls for 18 fiber pairs in the fiber ring of RBMetroNet, of which at least two would be for the GOA. GOA would be responsible for lighting these fibers and preliminary estimates are that eight GOA points of presence on the ring would require equipment costing about R$100,000 each, or a total of about US$500,000.

Telcenter kits program, Ministry of Communications. This program provides, funded by the Federal Government, a standard set of equipment for community telecenters with broadband connections to the Internet, and has the objective of promoting social and economic development of the communities served, reducing social exclusion and providing opportunities for citizens. The telecenters provide free broadband access to citizens, access to e-government services, digital

literacy training, and can also be used for various other kinds of training and community development activities. To keep costs down, they make use of free software like the Linux operating system and the Open Office suite of office applications. The MC provides a kit consisting of the following equipment to *municípios* duly registered under the program.

- Computer equipment
  - 1 telecenter server
  - 10 workstations
  - 11 voltage stabilizer
  - 1 wireless router
  - 1 laser printer
  - 1 camera for remote control.
- Audiovisual equipment:
  - 1 multimedia projector
- Furniture
  - 21 chairs
  - 1 teacher's desk
  - 1 storage cabinet
  - 11 tables for computers
  - 1 table for printer

Mayors offices of registered *municípios* need to sign an agreement in which they agree to provide at least 48 square meters of space with adequate infrastructure (drinking water, lighting, bathrooms, accessibility for people with disabilities, a broadband internet connection (which can be a Gesac connection), a telephone line for contacting the MC and technical support, support for the telecenter operating costs, including at least one technical assistant, and setting up a Management Council.

In the Northern Region of the country, the MC has been more proactive, directly contacting every mayor's office. By the end of October 2008 the official in charge of this program in the MC says that every *município* in Acre will have a new telecenter with a Gesac connection, and in Rio Branco, the capital, there will be five (as in other state capitals), making a total of 26 new telecenters.[7]

B. Funding for the Statewide Broadband Network Project

In addition to resources to be provided by BrT, for which no estimates are available, and by Gesac and other federal government programs, resources for the Statewide Broadband Network project network as of July 2008 are expected to come from two main sources: The Proacre Project[8] and GOA (Government of Acre) budget. These two sources of funds are discussed below.

[7] Telephone interview with Carlos Roberto Paiva, in charge of this program in the MC, 15 July 2008.
[8] Proacre is a $150 million operation under development by the World Bank and a team led by Acre's Secretariat of Planning – SEPLAG.

C. Fundamental decisions that need to be taken before or after the feasibility study

It is important for the GOA to reach some basic definitions regarding the property and operation of the Statewide Broadband Network. Probably the feasibility study would be cheaper were possible to resolve these issues prior to the conduct of the feasibility studies, however it is possible to include in the feasibility study a detailed examination of the options at an additional cost. That is what H&A recommends.

The basic decisions have to do with

1. The ownership of the physical network,
2. The bandwidth to be made available free of charge to the general public (outside of schools, community telecenters, etc.) and how to avoid abuses of free access that could affect the sustainability of the project, and
3. Whether the same physical network will be used to sell services to the public (including to businesses) above the bandwidth provided for free public Access.

The first and third issues are interlinked, because under current legislation the State cannot sell telecommunications services directly to the public (though it may create a company to do this or enter into an agreement with a private operator to do so, possibly through a PPP.

Property of the physical network

To build and operate networks of any kind (fiber optic cable, other kinds of cables, wireless) within Acre is an option for the GOA, but any state-owned network would have to contract with BrT and/or another operator to Access the fiber optic landlines connecting Acre to the backbone of the Brazilian and international Internet, and with satellite operators for satellite connections to these backbones. As explained above, in Rio Branco RBMetroNet is already under construction, and the GOA plans to share this fiber infrastructure.

To operate its own networks the GOA would have to assume all the risks and responsibilities that come with being the owner of a network, to maintain it in operation, keep it technologically up-to-date, employ the necessary specialized personnel, etc. This could be done by creating a state ICT company, obtaining the necessary licenses, or just operating the state network without creating a state company. But in this last case it would not be possible to sell telecommunications services (including Internet access, VoIP telephony, etc.) to the public, only to make these services available without charge, as is done in Sud Mennucci (SP) and Rio das Flores (RJ) for example. In the Federal District (DF), the Secretariat of Science and Technology is planning to build its own network, taking advantage of spare capacity in the existing fiber in the InfoVia Brasília. Santa Catarina has a fiber optic network of 200 kilometers, covering the capital, Florianópolis, and the Southern Region. In Pará the state will use 1,800 kilometers of fiber optic cables of the Eletronorte power company for voice and data and vídeo. In Ceará the state ICT company is sharing fiber with Chesp (another Power company) and investing in its own fiber cable to complete a ring in the state called the *Cinturão Digital* (Digital Belt).

Another option is to contract a private enterprise to operate the network, as is currently done in some other states like Rio de Janeiro and São Paulo, though so far these networks have been used mainly to link state government offices, not to offer free internet access to the general public except in public telecenters. In the case of São Paulo, the Government Program of Governor José Serra says the state will offer access to the state network (*Rede Intragov*) operated under a concession by the incumbent telco in that state, Telefônica, for *municípios* with up to 100,000 inhabitants. In Rio

de Janeiro state something similar is being planned, and work is currently underway to provide wireless Internet connectivity to some 4 million people in the Baixada Fluminense (working class bedroom suburbs of the Rio de Janeiro city).

Yet another model being developed in São Paulo state involves a partnership to operate municipal networks in which the *município* operates a portal integrating various government and private sector services offered to citizens in partnership with private sector firms such as Banks, telecommunications companies, offering microcredit to micro, small and medium enterprises. A GIS-based set of software modules for municipal administration (Program) and a citizen card giving access to various services are integrated with the portal. This model seeks to make the provision of internet Access to citizens economically sustainable.

Another possibility would be to create a Public-Private Partnership (PPP) between the State of Acre or a state ICT company that would have to be created, and BrT and the consortium RBMetroNet, where management would be shared, but operation would be by BrT for segments 3, 4 and 5 and the state firm for segments 1 and 2, and the inter-state and international connections to the Internet by BrT.

It is a delicate matter to design a good contract with a private sector partner to prevail over a multi-year period (up to five years under federal law 8666), but it could be possible. The principal difficulty would be to design objective indicators that could be used to divide equitably between the partners the cost reductions derived from future technological change that cannot be estimated with any precision for such a long period. In such a contract it would be possible to include sale at commercial rates of bandwidth above the basic level envisioned for free public access, and to design the network capacity and architecture taking this option into account. This would allow developing a true partnership with BrT for segments 1-5, because that company should have fiber along BR-364 and BR-317 and will have to find a way to connect the four isolated *municipios* of segment 5 under the terms of Decree 6424 that made official the "exchange of obligations" described above.

It is unlikely though, not impossible, that any other telecommunications firm will want to invest in fiber connections which would run parallel to those of BrT within Acre and then back as far as the capital of Goiás, Goiania, (the furthest western extension of Embratel's fiber backbone) or even Brasília (where several other operators have fiber connections (Oi, Eletronet, Intelig, Global Crossing and GVT).[9] The GOA could offer a reduction in the state value added tax (ICMS) as part of the negotiations for this partnership, and possibly loose little or no revenue as demand should increase sharply (income and price elasticities for telecommunications services are likely quite high, especially at lower income levels. For segment 6, Gesac can be used and it should be possible to contract additional satellite connections at favorable prices from Embratel, as explained above. Embratel could participate in a consortium or separate contract for this purpose and also to provide a redundant link to the national and international Internet backbone via satellite should the terrestrial link of BrT be interrupted.

Bandwidth for free public access and avoiding abuses

Considering the first layer of the Statewide Broadband Network to be links between government offices, a second layer being used to provide relatively high bandwidth to community telecenters, the third layer would be for providing free access to the general population in their homes or small

[9] Maps of each of these companies' fiber backbones are available in the *Atlas Brasileiro de Telecomunicações* published annually by Teletime in São Paulo. The latest version (2008) was published in December 2007.

businesses, probably using Wi-Fi and Wi-Mesh technologies to connect to WiMAX and/or fiber or to VSAT connections. A decision needs to be taken on how much bandwidth to offer in this third layer, for example 256 kbps in areas where satellite connections are used and 512 kbps in areas where terrestrial fiber provides the backhaul, either directly, or through WiMAX. These speeds are sufficient for e-mail, web browsing, and use of free VoIP services like Skype, for carrying out e-government transactions, e-commerce, and to participate in distance education. Such speeds can also provide a return channel for interactive digital television using set-top boxes with small Linux-based Wi-Fi enabled computers included together with the Brazilian middleware software, Ginga,[10]. In principle the network can be designed to permit a fourth layer to offer commercial paid Internet Access and other value-added services beyond those available at the speeds contemplated for layer 3. The full feasibility study should estimate the costs of the different options.

There is, however, a very real possibility of abuses of free access to the Internet — individuals or businesses could leave their computers on all the time so as to be able to download vídeos, even at relatively low speeds, or to participate in complex multiplayer games, thus creating network congestion and raising the costs of providing such access. There are means to limit this kind of abuse, interrupting the connection periodically, for example it is also possible to limit the number of daily hours of free access, the type of content that can be downloaded, etc. It is also possible to reduce the cost of accessing the national and international Internet by caching on servers within Acre the most frequently downloaded content coming from other Brazilian states or other countries. Such content could be downloaded during the early morning hours when regular traffic is lowest,

But within the GOA intranet (layer 1), the velocity should be high, allowing the creation of knowledge bases and caches of government content, perfecting the use of the Internet that today wastes bandwidth.

Sale to the public of higher bandwidth Internet Access, including VoIP services using conventional telephones

As explained above, this option (layer 4 of a common physical network) would be ruled out if the Statewide Broadband Network was owned directly by the GOA. In this case, level 3 bandwidth, above the maximum, that is provided to the public would be sold by commercial operators using their own networks, and the Statewide Broadband Network would have only three layers (government intranet, public telecenters, and free wireless service).

The detailed feasibility study should include an evaluation of the pros and cons of each of these three issues (the property of physical networks, the bandwidth to be provided free to the public, and the provision higher-bandwidth commercial services.

What should be included in the feasibility studies?

The possibility of consolidating segments 3 and 4 (municipal seats along the two principal highways crossing the state) should be considered, It should also be possible to cover part of the rural areas of the municípios in segments 1-4 from their seats, leaving a smaller area requiring inherently more expensive satellite connections in segments 5 and 6. The objective of the segmentation should be to reduce the area requiring exclusive satellite connections to the locations where satellite connections are the cheapest technology available.

[10] Ginga is the Brazilian middleware, developed in two universities, and standard for use in set top boxes and new digital TVs.

For each segment of the network, the feasibility study should include activities to produce deliverables that will allow the preparation of bidding documents for implementing that segment of the Statewide Broadband Network.[11]

Results expected from the study

1. Theoretical profile of the network, with survey of the probable strategic points of presence and criteria for selecting them
2. Structure of equipment posts and protection for the points of presence
3. Reference infrastructure for remote points
4. Basic design for civil construction for the points of presence
5. Report on the present situation of points of presence
6. Recommendations for locating and dimensioning towers for the points of presence
7. Graphs analyzing the local spectrum and analysis of the same
8. Specification of frequencies for the network connections
9. Specification of protocols for network connections
10. Calculation of the throughput of the network connections
11. Specifications for the radios and antennas to be used
12. Specification of the parameters for quality of service (QOS)
13. Identification of the characteristics of the most appropriate equipment for the projected network, so as to assure competition between suppliers
14. Evaluation of the number of users projected by point of presence (base station radios)
15. Specification of the capacity of the links for serving users
16. Maps of projected coverage, by point of presence and for each município
17. Options for sharing infrastructure with existing or projected networks (e.g. RBMetroNet, Eletronorte's network, muncipal networks)
18. List equipment for the points of presence (BOM – build of materials)
19. List of materials for remote points (BOM)
20. Graphic diagram of the projected logical network
21. Specifications of the classes of addresses to be used
22. Analysis of the existing physical network of the SGA and specification of network protocols to be used, so as to assure the maintenance of compatibility and interoperability, including with existing or planned networks of municipal governments;
23. Analysis of the existing management system of the SGA
24. Recommendations for network management so as to complete the existing management system and assure that the new network will be well managed
25. Analysis of the existing logical security system in the SGA
26. Specification of security tools to be used in the wireless network, to preserve the integration with the existing system
27. Recommendations to complete the existing server structure with a view to security;

[11] The proposed activities are adapted from those used in a study for the municipal network of Belo Horizonte contracted by the municipal ICT company, Prodabel.

28. Specification of the structures for login, passwords, and data protection
29. Recommendations for compatibility of equipment to be acquired, so as to assure capacity expansion and extend the live of the new network
30. Terms of reference for the bidding documents to be issued, taking into consideration the above design of the network
31. Cost estimates to implement each section of the network (new investment required) and annual operating costs for each segment of the network, always bearing in mind the obligations of BrT to provide the broadband backhaul to all 22 municípios in the state and to connect all urban public schools by 2010 as provided for in Decree 6424 and the regulations to be issued for it. The estimated costs of satellite connections should also consider the transferring of existing or currently planned Gesac points to segment 6.

D. VIABILITY OF THE PROJECTS

H&A ascertained that the proposed project fits well within a broader State of Acre strategy for consolidating the state government's physical and electronic infrastructure, with expected savings in both capital and current expenditures. The extent of the cost savings will have to be determined in the feasibility studies, but improved technology and the elimination of redundant functions and computing capacity should mean that these savings are significant.

On the organizational side, SGA together with the SF have the technical capacity to manage the public side of the proposed Statewide Broadband Network, But they could clearly benefit from USTDA-financed international technical assistance to develop detailed feasibility study for this project. The study would serve as the basis for developing bidding documents (*editais*) to select private sector partners for the construction and/or management of the network.

The Statewide Broadband Network project has already got broad support across the government, since it will reduce overall operating costs for government communications, and supply the necessary information infrastructure for the Proacre project under preparation for World Bank funding. This project involves several different stakeholders (Figure 7, page 20), since the Statewide Broadband Network, while coordinated from SGA, involves the Secretariat of Planning (which coordinates the Proacre project), various secretariats that will make use of it for improving services to citizens (especially Education and Health), the Federal University of Acre (UFAC), and Embrapa, as well as any private sector partners.

The feasibility study will have to explore all aspects of project feasibility and their interrelations in greater depth as shown schematically in Figure 8.

Figure 7: Stakeholders in the Statewide Broadband Network Project

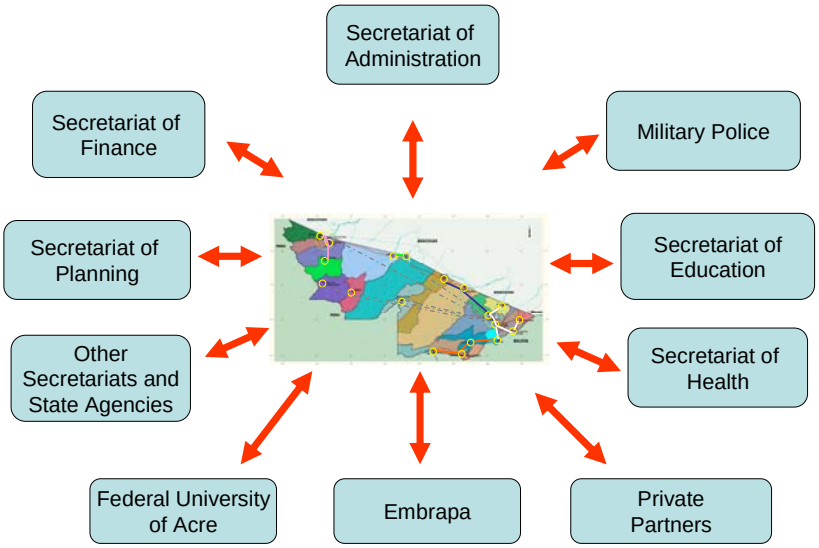
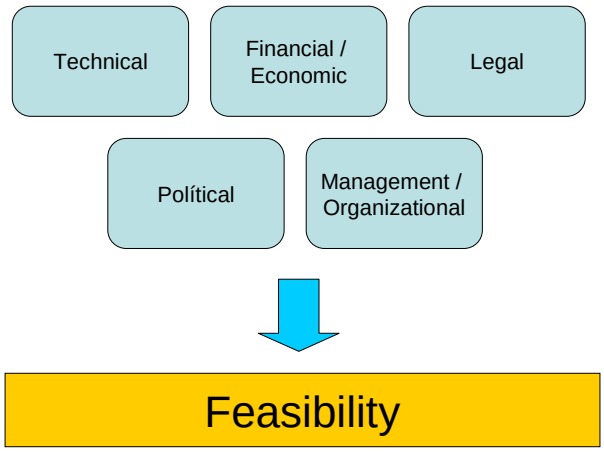


Figure 8: Elements of the Feasibility Study



E. CRITICAL SUCCESS FACTORS FOR PROJECT IMPLEMENTATION

Following the DM discussions H&A prepared a list of critical success factors applicable to the project.

- A successful change management process be conducted in the affected secretariats and government agencies
- The government shares with the private sector benefits of productivity increases arising from technological change, and not just the costs
- Continual monitoring of the contractual conditions in relation to the market is carried out – provisions for this need to be incorporated in the contracts themselves
- Training of state personnel in the management of outsourcing, SLA, SLM, etc.
- Clear definition of contract objectives (scope, service levels, metrics, requirements, etc.)
- Support from top government managers
- Priority for payments to private sector partner for strategic and critical activities outsourced
- Establishment and application of penalties for non compliance with contract conditions
- Definition of a clear process exiting from the contract and transition to another supplier
- The partnership between public and private sides becomes a conventional client and supplier relationship
- Other critical success factors inherent in outsourcing processes for ICT projects

F. PROJECT RISKS

In addition to the legal risks mentioned above, the following risks have been identified by H&A:

- A ten-year or more contract is very long given rapid technological change in the ICT and telecommunications industries and the possibility of paradigm changes, requiring design of rules governing the sharing of the benefits of technological change between the public and private partners
- Isolation from market forces over an extended contract period unless appropriate rules can be devised (see point above)
- The project budget estimates are still based on desk studies at this time
- The private sector partner could face financial and operational difficulties
- SGA's capability to manage a complex project of this nature will need to be increased through training and recruitment
- Political and economic instability could develop, though this does not seem at present to be a problem
- Poor implementation of the guarantee fund
- Other risks inherent in outsourcing contracts for ICT infrastructure

G. DEVELOPMENTAL IMPACT

Two somewhat differing developmental impacts of the project can be distinguished:

1. a *shorter-term impact* stemming from the results of the study itself; and
2. a *longer-term impact* as a result of the SGA succeeding in developing partnerships with private sector firms.

Both of these impacts are described more fully below.

Primary Developmental Benefits

Particular primary developmental benefits can be enumerated as follows:

- **Infrastructure:** In the short term, although it will be the responsibility of the private sector partners to put in place the basic electronic infrastructure (e.g. fiber, servers, routers, wireless distribution systems, VSAT equipment, storage capacity, support personnel), SGA will have to provide overall guidance in the design of the Statewide Broadband Network, information systems, web pages, and associated databases and conduct the organizational reforms that will enable the new network to function effectively, reaping economies of scale and eliminating excess personnel and equipment throughout the state government. The project will facilitate the process, on a general level by transfer of knowledge and experience, and more specifically, by providing guidance on the design of the Statewide Broadband Network and its mode of operation. In the longer term, to the extent that the Statewide Broadband Network enables reduced operating costs and improved service levels, the benefits should extend well beyond the state government to the citizens, enterprises, and municipalities it serves, and could be quite significant. Much of this infrastructure, moreover, could be supplied by US-based sources. (See also Section G.)
- **Human Capacity Building:** The proposed Terms of Reference for the feasibility studies include a task (Task 6) that involves reviewing the organizational preparedness of SGA to guide the development off the Statewide Broadband Network and datacenter. A particular focus of this task is the attendant human-resource requirements (number of personnel, skill sets, etc.), together with the corresponding capacity-building activities. Indirectly and longer term, successful implementation of the project would free up resources within SGA and other secretariats and agencies of the government to plan and develop new e-Government services.
- **Technology Transfer:** In terms of technology transfer, the principal impact will be to familiarize SGA with the existing and emerging technology solutions and platforms in network project in both public and private sectors worldwide and with international and Brazilian experience with outsourcing contracts for network services. This knowledge and experience can then be shared with other states.
- **Market Oriented Reforms:** The project would contribute directly to market oriented reforms of public administration in Acre and Brazil by contemplating private sector responsibility for operating the network while leaving planning and strategic direction in

the public sector. The Statewide Broadband Network could take partnership with the private sector to a new level – the service is already outsourced to Brasil Telecom.

H. PROJECT SPONSOR'S COMMITMENT

This project has a separate line item in the Proacre Project being developed jointly with the World Bank, which is an indication of its priority. The basic framework for the proposed projects was developed by the Brazilian firm Telemática e Desenvolvimento Ltda. in discussions with Governor Binho Marques, Secretary of Finance and of Administration Mâncio Lima Cordeiro, and other GOA officials. H&A developed this framework into draft Terms of Reference (TOR), which were subsequently reviewed and discussed with José Alcimar da Silva Costa, Deputy Secretary for Management Technologies in the SGA and Secretary Cordeiro. They indicated that a USTDA-financed feasibility study for the Statewide Broadband Network along the lines indicated is a major priority for the GOA and would receive full support and cooperation from the GOA. While the Statewide Broadband Network project is not explicitly mentioned in the Multi-Year Plan for 2008-2001 with this name, a number of its components, including the high-speed fiber network in Rio Branco, and applications are. Accordingly, the commitment of the proposed project sponsor (SGA) is high.

I. IMPLEMENTATION FINANCING

The state of Acre's contribution will be monthly payments for services rendered by the private partner(s). Current operating costs for government network and communications are R$1.1 million (about US$700,000) per month, and at least this much in real terms should be available for the project. Improvements in efficiency would be another source of "finance" – how much could be saved as Statewide Broadband Network expands and after allowing for improved security and better quality of service in the datacenter would be established during the feasibility studies.

In addition to the state budget and the contribution of federal agencies, the World Bank is currently preparing a loan to the State of Acre for the Proacre project. Proacre is a $150 million operation under development by a World Bank team and and a team led by Acre's Secretariat of Planning – SEPLAG. Financing will be by a US$120 million loan and US$30 million in counterpart funding mobilized by the State of Acre. It is expected to be approved by the World Bank Board of Directors early in 2009. An agreement between SGA and SEPLAG provides for a line item for the Statewide Broadband Network, which should help link network development to the development of education, health, and community development services in the rural Priority Attention Zones (*Zonas de Atendimento Prioritário* – ZAPs) of Acre as well as to improved public sector management through implementation of e-government services.

The estimates as of late July 2008 are for a total expenditure of US$9.5 million (World Bank and GOA resources over six years on the Statewide Broadband Network (about 40 percent World Bank and 60 percent GOA funding), and another US$3.5 million for SGA e-government projects like a citizen's card and a situation room. For the Statewide Broadband Network the allocations for the first two years (2009 and 2010) are US$3.8 million from the World Bank and $.9 million from the GOA budget. But the bulk of Proacre funding is intended for education, health, and community development —and all of these components can make use of the infrastructure provided by the

Statewide Broadband Network, which will itself draw on resources coming from the federal government initiatives and projects described above.

Estimates based on desk studies conducted by a Brazilian firm specialized in wireless networks suggest that the total cost of the Statewide Broadband Network could be as high as R$49 million (about US$30.6 million) should the GOA assume all of the costs of creating the network. A Figure closer to the amount budgeted for the network in the Proacre project might be possible if full advantage is taken of the backhaul being built by BrT under the "exchange of obligations" established in Decree 6424 and of the Gesac points provided by the Ministry of Communication. In any case the feasibility study is intended to determine project costs more precisely, and would be carried out in early 2009, when the arrangements with BrT and the Gesac program should be clearer.

As for financing of the private partner(s), the International Finance Corporation (IFC) is already seeking to make pilot investments in firms providing outsourcing services for e-Government in Brazil, and has indicated an interest in principle in financing the private sector partner(s).

Any future e-Brazil or Brazil e-Government project that might be developed at the federal level with state participation and financed by the Inter-American Development Bank (IADB) or World Bank might also increase the availability of funds in Acre for e-Government work and thereby provide additional comfort to the private sector partner that the state government would have the resources necessary to meet its commitments under an outsourcing contract. H&A verified that both the IADB and the World Bank are interested in such projects should they be proposed by the State Governments and/or the Federal government and receive the Federal Government's priority for its international borrowing program (the Federal Government must give a guarantee for any IADB or World Bank operations, but not for IFC operations). The Brazilian National Economic and Social Development Bank (BNDES) is another potential source of financing.

Three private sector companies – NextWave, IBM and Cisco Systems – expressed Interest in the project to H&A. Participation in the feasibility study is prohibited in the conventional contracting framework (Law 8666).

J. US EXPORT POTENTIAL

1. Estimation of Export Potential

To estimate the potential for US exports that could eventually be created by the Statewide Broadband Network project, it is necessary to resort to certain assumptions, namely:

- The feasibility study results in the successful implementation of the Statewide Broadband Network.
- The Statewide Broadband Network will require substantial new investments in fiber, routers, servers, wireless communications hardware, antennas and other equipment (however we have no idea at this time of the magnitude of the investment required, which will have to be estimated during the feasibility study).
- The feasibility study results in the successful implementation the Statewide Broadband Network.

There are further uncertainties associated with the estimation of the resultant export potential. We were unable to obtain any cost estimate data on the Statewide Broadband Network project from the SGA. It is really too early in the project to be able to determine any type of figures for the potential of US exports to be gained.

Because the costs are so situation-specific, it is extremely difficult, if not impossible, to make more than order-of-magnitude estimates about the aggregate value of equipment and software for network implementation. Still, based on a preliminary estimate prepared for SGA by a Brazilian firm, R$29,580,000 would be required the needed hardware and software for the basic network, and that approximately 80% could be import content. Using an exchange rate of R$1.6 per US$, this would be US$14.7 million, most of which would probably be purchased from US suppliers since the leaders in high-throughput networking equipment are mostly US-based. In addition some international consulting services might be provided by US companies depending on the specifications of the network. It should be noted that these estimates are based on desk studies and assume that the GOA would finance the entire network infrastructure. Depending on the extent to which the final configuration of the project relies upon infrastructure and equipment provided by BrT or the MC's Gesac program and already purchased outside the project, the amount in the final bidding document (*edital* in Portuguese) could be less.

2. Potential US Suppliers

The range of state-of-the-art technologies that may be used in Statewide Broadband Network is not that large. At a minimum, it includes the following:

- Servers
- Chips
- Desktop PCs
- Storage area networks (SAN)
- Server switches, routers, HBA
- Wireless networking equipment (WiMAX, Wi-Fi, Wi-Mesh)
- Software, particularly security (anti virus/spam/hackers), database, server. e-mail, and datacenter management software

Identification of specific US suppliers is complicated by the fact that a considerable number of companies supply market for IP-based voice, data and video networks. For example in servers, IBM, HP, Dell, Sun, Silicon Graphics, Cubix, Aspen Systems, and Dell come to mind, but there are many more specialized producers. Table 7 presents a list of some potential suppliers in the categories mentioned above. Many if not most of these suppliers are active in Brazil and have networks partners for sales. Additionally many more US firms or European firms with US arms are members of the different networking technologies forums, such as the WiMax forum, the WiFi Forum.

Table 7: US-Based Suppliers of Hardware and Software

Category / Products	Potential Suppliers
Servers	IBM, HP, Dell, Sun, Silicon Graphics, Aspen Systems, StorageTek, Alcatel Lucent, Cisco Systems, and Dell, Sun Microsystems
Chips	Intel, AMD
Desktop PCs	Dell, IBM, HP
Storage	IBM, HP, EMC, Amdahl, Unisys
Networking Technologies	Avaya, Cisco Systems, Juniper Networks, Pulse Communications, 3-Com, Agilient, Sequans Communications
Transmission Distribution	Harris, Motorola, Alcatel-Lucent, Nortel, Comcast
Wireless Network technologies (WiMAX, Wi-Fi, Wi-Mesh)	Aperto Networks, Motorola, Intel, GigaBeam, Proxim, Wavesat Commscope, Cisco Systems, NextWave, 3Com, Sprint Nextel, AT&T, Airspan, Intel, Clearwire, Texas Instrument, XOHM, Qualcomm, Sequans Communications, Telsima
Switches & Routers	Qualcomm, Cisco, Alcatel-Lucent, Nortel, Buffalo, MIndspeed Technologies, Netgear, Linksys, Juniper Networks, Foundry Networks
VSAT equipment	Hughes, Starband, Wild Blue, Via Sat, Intelsat
"Content-Related" Hardware	Sun, Hewlett-Packard, IBM, Teradata, Cisco Systems, Google
Software	Sagem Communications, Oracle, Google, Microsoft, Acentis, Kronos, Broadcom, Symantic, McAfee, numerous other suppliers; however, Brazilian directives on the use of "open-source" software may be restrictive of US exports

K. FOREIGN COMPETITION

US companies are clearly dominant in the market for ICT and e-government hardware, software, and services (including outsourcìng) as well as in telecommunications equipment, but these firms face increasing competition from European and Asian suppliers and manufacturers. A USTDA financed feasibility study for the State of Acre would help US suppliers get in at an early stage in the development of a new market for outsourcing of e-government infrastructure in Acre and potentially other states.

On the implementation side, it is most likely that a significant share of implementation services will be delivered by Brazilian subsidiaries of US firms. US systems integrators, such as IBM and UNISYS can expect competition from European and Asian firms, but above all from Brazilian firms, such as Itaútec and Lanlink. These firms and Brazilian datacenter operators like TIVIT,

however, tend to use predominantly hardware and software from US firms and their Brazilian affiliates.

Table 8 lists some foreign competitors in the same categories provided in Table 7.

Table 8: Non-US Suppliers of Hardware and Software

Category / Products	Potential Suppliers
Servers	NEC, Toshiba, Fujitsu
Storage	Fujitsu, NEC
Networking Technologies	Fujitsu, NEC, Nortel, Alcatel, Siemens, Acer, Hitachi, Huawei, ZTE, BritishTelecom, Bell Canada, Soma Networks, Comsys, Tata Communications
Wireless Networking (WiMAX, Wi-Fi, Wi-Mesh)	Alvarion, Fujitsu, Comsys, Nokia-Siemans, MTI Wireless Edge, Tranzeo Wireless Technologies Inc., ZTE, Huawei, WiNetworks, Cambridge Broadband, British Telecom, KDDI, KT, Nokia, Samsung, Nortel, SK Telecom, Redline Communications, Soma Networks, Tata Communications[12]
VSAT equipment	Gilat, iDirect, Bell Canada,
"Content-Related" Hardware	Fujitsu, NEC, Acer, Hitachi, Nortel
Software	SAS

L. IMPACT ON THE ENVIRONMENT

The proposed Acre Statewide Broadband Network and datacenter are unlikely to have any significant negative impact on the environment, especially since they would merely consolidate and upgrade the existing server infrastructure and government networks, and provide public access to the IP network to the general population both through government installations and in homes and small businesses. As such, the project will have no discernable detrimental effect on waterways, vegetation, or ground cover. In fact, it should have a positive effect as it represents the consolidation of several different mini datacenters, and provides Internet access which should make sustainable development of Acre's forest resources more feasible, through upgrading the state's human capital base and enabling the development of new high-value products derived from the states genetic resources. The techniques for installing and maintaining communications networks and datacenter equipment are standard and are not expected to result in any environmental impact. In particular, the benefits of IT and the consolidation of the small and poorly structured datacenters within the state and the many different benefits that this consolidation generates should have a positive impact on the environment. Nevertheless, the two proposed feasibility study will include an environmental impact assessment.

[12] For a complete list of supplier's US and non-US suppliers see the following website for members of the WiMax forum, http://www.wimaxforum.org/about/roster

M. IMPACT ON US LABOR

Funding for the proposed Statewide Broadband Network project will result in the creation of US jobs as major software integrators, hardware, and equipment items are purchased from US manufacturers. This could be directly if a US firm or its Brazilian affiliate becomes the private sector partner (or member of a consortium), or indirectly if a Brazilian or even a European or Asian firm were to be the partner, since US suppliers are dominant in the market for datacenter hardware and software. If USTDA finances the initial feasibility study and the contractor works closely with the US firms that expressed interest in this project, the likelihood of an increase in US jobs is even greater.

Financing the two feasibility study and the actual execution of the Statewide Broadband Network will not result in the transfer or displacement of US jobs. The feasibility study is designed to facilitate communication and cooperation between the Government and the private sector both within Acre and more broadly, in Brazil, as the definitional mission conducted for Acre state by H&A already have had this effect. Moreover, USTDA financing of this feasibility study will not be used to assist in the development of an export-processing zone or any other commercial zone that could have a negative impact, direct or indirect, on US jobs.

N. QUALIFICATIONS OF THE CONSULTANT TEAM

General Qualifications

As is evident from the accompanying Terms of Reference (Statewide Broadband Network TOR; see Annex I), the proposed TA is multidisciplinary in nature. Accordingly, the skill sets and expertise of the Consultant Team are expected to be diverse. The following general attributes on the part of the Consultant Team are considered critical to the successful outcome for a detailed feasibility study of the project:

Information technology specialists

- Experience in hybrid network development including fiber optic cable, all wireless technologies (especially WiMAX, Wi-Fi, Wi-Mesh, and VSATs)
- Experience in ITIL, COBIT, ISO and other methodologies and standards of governance for ICTs
- Experience with calculation of total cost of ownership (TCO) for ICTs (not just operating costs)
- Experience with outsourcing of ICTs, must include experience with outsourcing of datacenters
- Experience with management of complex information technology contracts
- Experience in defining and monitoring service level agreements (SLAs) for ICTs

Specialist in Brazilian public budget finance project analysis

- Knowledgeable in Brazilian public budget finance, competitive bidding and public contracts

Specialist in project analysis

- Expertise in the economic and financial analysis of projects and feasibility studies involving rapid technological change

Team Composition and Experience

In terms of the composition and particular credentials of the Consultant Team, it is judged that the team should consist of the following:

- One (1) Team Leader
- One (1) ICT specialist with telecom network and engineering expertise, including fiber optics, WiMAX, Wi-Fi, Wi-Mesh and VSAT systems
- One (1) ICT specialist with experience in management of complex information technology contracts, including total cost of operations (TCO) and return on investment (ROI) analysis
- One (1) Environmental Assessment Specialist
- One (1) Brazilian ICT specialist with telecom network and engineering expertise, including fiber optics, WiMAX, Wi-Fi, Wi-Mesh and VSAT systems
- One (1) Brazilian Government Budget analyst/local liaison
- One (1) Brazilian Project Analyst
- One (1) Procurement Specialist

More specific descriptions follow.

Team Leader:

- At least fifteen (15) years' experience in the ICT industry
- Strong background in one of major areas of the TA (Telecom Network/Engineering, Definition of SLAs, economic and financial project analysis)
- Both a US and an international perspective on the ICT industry, with the international perspective preferably gained through on-the-ground project work, ideally in the area of data centers
- Management, organizational and cross-cultural skills and perspective to structure, oversee and carry out the Feasibility Study effectively
- Ability to communicate findings effectively and to liaise appropriately within the SGA and more broadly the Acre government framework and with other stakeholders, including other Acre public sector entities, academic and research institutions, and potential private sector partners
- Fluency in Portuguese would be an advantage

Local Brazilian Lawyer Specializing in Brazilian concession law (Law 8666)

- Familiarity with the federal, Acre, and other state legislation and regulations governing concessions and service contracts in Brazil
- Ability to conduct necessary research and legal/regulatory diligence
- High degree of fluency in English would be an advantage

ICT Specialist with Telecom Network and Wireless Engineering Experience

- At least ten (10) years' experience in the telecom/ICT industry, including hands-on experience with IP based networks, broadband wireless and Wimax solutions, Fiber-optic infrastructure, satellites, and networking
- Significant experience with detailed IT needs assessment, system specification and implementation planning
- Experience with IT project cost estimation and specification
- Ability to assess technical feasibility, price/performance, trade-offs, etc of a variety of possible network deployment alternatives
- At least five (5) years' experience in defining and monitoring (SLAs) for ICTs.
- Fluency in Portuguese would be an advantage

ICT Specialist with experience in ICT Governance issues

- At least ten (10) years' experience in the telecom/ICT industry, including hands-on experience with management of complex information technology contracts
- Experience in defining and monitoring service level agreements (SLAs) for ICTs
- Expertise in the economic and financial analysis of projects and feasibility studies involving rapid technological change, including total cost of operations (TCO) and return on investment (ROI) analysis
- Fluency in Portuguese would be an advantage

Environmental Specialist

- Experience in social and in environmental assessments of projects in developing countries
- Experience with donor-funded environmental and social performance standards and their interpretation, specifically those of the IDB and the World Bank.
- Ability to assess and guide the Government in developing environmental and social action plans and assessments that comply with all local and federal laws as well as World Bank and IDB rules.
- Fluency in Portuguese would be an advantage

Project Coordinator

The responsibilities of the Project coordinator include, but are not limited to, the following:

- Basic support logistics for everyone on team and their support people to ensure a smooth running of the project, such as deliverable coordination (formatting, timeliness, and other coordination),
- Travel coordination,
- Arranging workshops and conferences in person and by telephone.
- Managing and editing of deliverables, thereby ensuring that the deliverables closely follow

the scope of work outlined. This way there are no surprises.

- Reviewing, coordinating and distributing presentation materials, both the electronic and paper versions of presentations.
- Developing and creating a library of resource material so that all consultants have easy access to any resource material, 24 x7, maintaining the library
- Arranging housing and payments for project related expenses,
- Coordinating with Project Manager on Project Finance issues such as expense payments, consultant time
- Arranging logistics for conferences and workshops
- Ability to speak and write Portuguese and English

Brazilian ICT Specialist with Telecom Network and Wireless Engineering Experience

- At least ten (10) years' experience in the telecom/ICT industry, including hands-on experience with IP based networks, broadband wireless and Wimax solutions, fiber-optic infrastructure, satellites, and networking
- Significant experience with detailed IT needs assessment, system specification and implementation planning, including for digital cities
- Experience with IT project cost estimation and specification
- Ability to assess technical feasibility, price/performance, trade-offs, etc of a variety of possible network deployment alternatives
- At least five (5) years' experience in defining and monitoring (SLAs) for ICTs.
- Fluency in English would be an advantage

Brazilian Public Budget Analyst:

- Duly qualified/accredited Brazilian expert with extensive knowledge of Brazilian government budgetary processes, competitive bidding and public contracts
- Familiarity with Brazilian federal, state and municipal public IT enterprises in Brazil
- Ability to serve as local liaison, set up meetings (secretarial service available)
- Fluency in English would be an advantage

Brazilian Project Analyst

- Expertise in the economic and financial analysis of projects and feasibility studies involving rapid technological change
- High degree of fluency in English would be an advantage

Procurement Specialist

- At least five (5) years expertise in Procurement processes, compiling and writing proposals and bidding documents (*editais*)
- Familiarity with IT, Telecom and datacenters
- Familiarity with the purchasing process
- Fluency in Portuguese would be an advantage

In practice, it is unlikely that the backgrounds of the team members will fit the above profiles exactly. However, the collective qualifications of the Consultant Team should correspond to those described. If a proposed Consultant Team offers a comparable skill set but with a different distribution, or a basic arrangement different from the team specified above, it must be clearly demonstrated how such a team can efficiently carry out the full scope of the Feasibility Study.

3. ***Suggested Evaluation Criteria***

It is suggested that the selection of the Contractor for both of the studies be based on the following criteria:

Criterion	**Max. Points**
Expertise and skills of proposed personnel	50
Proposed approach to the TA and to the individual tasks	30
Pertinent international experience and cross-cultural skills	20
Total:	**100**

O. JUSTIFICATION

As this report has documented, the Government of the State of Acre is heavily committed to development of the Statewide Broadband Network project, a hybrid voice, data and video IP based network. (the operation of which could be outsourced). It is also accelerating its development of e-government services (including one-stop-shops – *OCAs*, and including digital inclusion through community telecenters and allowing free access to medium-bandwidth Internet by individuals and small businesses). The US offers a rich repository of voice, data, and video network; datacenter; and e-government experience. US suppliers are strong in telecommunications equipment and dominant in data center hardware and software.

Moreover, the involvement of a US-based Consultant Team in carrying out the proposed feasibility studies should work to the advantage of US-based suppliers of telecommunications equipment and data center solutions. These suppliers are strong in the major technological areas but face growing competition from foreign suppliers. H&A believes that initiatives to develop outsourced voice, data, and video networks and government data center services in Brazil present a significant export opportunity for US suppliers (see Section G), and even more so if the Acre project generates an interest in similar projects in other Brazilian states and even the Federal Government.

Accordingly, H&A believes that funding of the feasibility study on behalf of SGA would represent a good use of USTDA resources.

P. TERMS OF REFERENCE

The proposed Terms of Reference for the proposed Statewide Broadband Network Feasibility Study is attached as Annex I.

Q. BUDGET

The suggested Budget for the proposed Feasibility Study is attached as Annex II

R. RECOMMENDATIONS

H&A recommends that USTDA fund the Statewide Broadband Network Feasibility Study project, under the conditions set forth in the TOR (Annex I), at a budget level of $573,853.

S. CONTACTS

A complete list of persons and institutions contacted in the conduct of the DM is included in Annex 3.

ANNEX I: TERMS OF REFERENCE FOR ACRE STATEWIDE BROADBAND NETWORK PROJECT

SCOPE OF WORK

The Statewide Broadband Network is the State Government of Acre Broadband Government infrastructure.

TASK 1: PREPARATION AND BACKGROUND RESEARCH

The U.S. Firm shall research the Brazil ICT and e-government sectors. This would include background information on various e-Government programs. The review should also include a review of communications networks used by other cities, states, or countries.

TASK 2: INITIAL VISIT AND ASSESSMENT OF CURRENT SITUATION

The U.S. Firm shall travel to Acre to familiarize itself with the current situation and to meet with the Grantee.

The U.S. Firm should already be very familiar with e-government initiatives, digital inclusion programs, governmental public budget finance, and project analysis.

TASK 3: CONDUCT A NEEDS/REQUIREMENT ANALYSIS FOR THE PROJECT

In this task, the U.S. Firm shall create a needs analysis and requirement document that will be used in Task 4 to create the network's framework. This task will involve significant travel to all 22 municipalities in the State. Some travel will be in very remote and rural areas.

Deliverable: Needs analysis and requirement assessment document.

TASK 4: DEVELOP FUNCTIONAL SPECIFICATIONS, ARCHITECTURE, AND BUSINESS MODEL

The U.S. Firm shall:

- Analyze the findings from Task 3 and develop specifications regarding the architecture and design of the Project.
- Develop more precision in the estimates of network designs, equipment needs and capacity, and resulting capital expenditure and operating costs.
- Conduct a spectrum management study.
- Create a detailed operational model of the Project that will
    - Detail the present use of broadband internet and telephony services by the Government of Acre,
    - Address the administrative environment,
    - Analyze management and security of the Project,

  - Analyze Project services to be contracted and levels of services needed, and
  - Provide a description of the needs and justifications for new network resources, a new operational model, new services to be contracted and updating of current resources, and essential conditions and recommendations.
- Provide technological definition through:
  - Analysis of the technological environment available and of related trends,
  - Definition of the transfer of knowledge for the Grantee implementation team,
  - Definition of essential technical conditions and options for the Project,
  - Definition of Project metrics, performance, and other benchmarks to be used, and
  - Definition of technological standards to be followed.
- Provide a list of potential U.S. suppliers interested in participating in the Project.

The Grantee wishes to develop a high-speed hybrid network at the lowest cost possible while maintaining high quality of service and taking advantage of modern wireless technologies to reach final users (government offices and citizens). The U.S. Firm shall evaluate options for the ownership, management, and operation of the Project. These options may include (i) the State of Acre owning, managing, and operating the Project; (ii) a private sector partner owning, managing, and operating the Project; (iii) the State of Acre and a private sector partner both being involved in the ownership, management, and/or operation of the Project; and/or (iv) universities, research institutions, or other organizations being involved in the ownership, management, and/or operation of the Project. It will be important to take into account the way Brazil Telecom (BrT), the incumbent operator, is fulfilling its obligations of bringing broadband backhaul to all of Acre's 22 municipalities, and to consider how to make best use of the Electronic Government Service to Citizens federal initiative (Gesac) points allocated to Acre by the Ministry of Communications in reaching a least-cost solution compatible with required service levels and quality. The U.S. Firm shall illustrate and describe how these objectives can best be accomplished, and describe the type of pricing formula that will be used to cost out these new products and lower the cost of old products and services in order to enable equitable sharing of technological progress and the introduction of new products.

The U.S. Firm shall design and develop a business model that takes into consideration the rapid and continuing technological evolution and convergence in the communications sector and its impact on the costs, pricing, and development of services. This model shall include a mechanism that makes it possible to plan for future technological change, enabling any private sector partner(s) to make the necessary investments and earn a reasonable return on these investments, while ensuring that the Project benefits the government and people of Acre. The U.S. Firm also shall recommend sustainable models of financing.

Deliverable: Network architecture, design, technology definitions, and business model.

TASK 5: REVIEW OF LEGAL/REGULATORY ISSUES RELATED TO THE PROJECT

The U.S. Firm shall:

- Review all telecom, ICT, and other regulations to ensure that the correct licenses can be issued and to resolve any regulatory or legal issues.
- Identify and determine any contractual obligations of entities involved in Project implementation.
- Determine and assess whether all the necessary regulations have been issued or, if not, what is their status.

Deliverable: Legal/regulatory status and review report.

TASK 6: ECONOMIC AND FINANCIAL ANALYSIS OF THE PROJECT

The U.S. Firm shall:

- Quantify the benefits in expected unit cost reduction and improved quality for the Project.
- Quantify estimates for rates of return for the Project, scenario analysis of trends, project risks, and total cost.
- Quantify the estimate for the amount of counterpart funds needed.
- Assess all aspects of project feasibility (technical, economic, financial, political, legal, and organizational) and their interrelations.
- Prepare economic scenarios, risk analysis, rate return analysis, and analysis of total cost of operation.
- Recommend how the State Government of Acre can share in productivity improvements arising from the use of more efficient technologies and increased returns to scale over the life of any outsourcing contract.

Deliverable: Report on economic and financial analysis and interrelationships

TASK 7: ORGANIZATIONAL ISSUES

The U.S. Firm shall support the development of a professional human resource function designed to be an effective source of capacity building. Since the Grantee is the sponsor of the Project, the U.S. Firm in this task shall help design the organizational structure and requirements that would meet the needs of the Project.

The U.S. Firm shall:

- Identify and prioritize corporate governance issues that are necessary and critical to support the business plan.
- Define the qualifications of the staff needed to carry out the Project.
- Define the respective roles and relationships of the staff.
- Identify the necessary support resources needed for work plan implementation in Task 10.
- Create a mechanism for the Grantee to make use of these available resources or personnel.

- Evaluate the need for organizational or structural changes needed to oversee a wireless network.
- Establish metrics and benchmarks.
- Review current human capital deployment.
- Foster knowledge transfer and capacity building
    - Help prioritize training professional development needs and implement a regular training schedule,
    - Help create communities of practice, by encouraging the sharing of knowledge and information with staff members doing the same type of job, or staff members on different technical committees, as well as staff that previously worked in their areas, to share information, failures, and successes.

Deliverable: Human resources, knowledge transfer, and capacity building plan.

TASK 8: CONDUCT A PRELIMINARY ENVIRONMENTAL IMPACT ASSESSMENT

- Conduct a preliminary review and evaluation of the expected environmental impacts and their compatibility with both local regulations and the requirements of potential lending agencies, especially the World Bank, the IFC, and the IDB.
- Discuss how any potentially significant negative impacts can be minimized.
- Identify agency/department expectations, priorities, opportunities, and trends.
- Develop plans for full environmental impact assessment in anticipation of the Project moving forward to the implementation stage.

Deliverable: Preliminary environmental impact assessment report.

TASK 9: DEVELOPMENTAL IMPACT ANALYSIS

The U.S. Firm shall identify and assess the developmental outcomes that would be expected if the Project is implemented in accordance with the recommendations of the Study. The U.S. Firm shall focus on estimating the Project's potential benefits in any or all of four areas: additions to infrastructure or industrial capacity; nature and effects of any legal/regulatory changes resulting from the Project; expected human capacity building; technology transfer and its effects. The analysis of potential developmental benefits should be as concrete and detailed as possible and include at least one specific example of developmental impact for each area that is relevant for the Project. Any significant developmental impacts outside the four areas listed above should also be included.

Deliverable: A report setting forth the findings and opinions as specified above.

TASK 10: PROJECT PLANNING AND IMPLEMENTATION

The U.S. Firm shall assess and determine whether the critical success factors for Project implementation have been met and the project risks identified have been accounted for and mitigated to the extent possible. The U.S. Firm shall also review the Human Resources, Knowledge

Transfer, and Capacity Building Plan proposed in Task 7 and incorporate these recommendations into the Project implementation plan.

The critical success factors shall include the following:

- A successful change management process in the affected secretariats and government agencies.
- Government shares with the private sector the benefits of productivity increases arising from technological change, and not just the costs.
- Continual monitoring of any outsourcing contractual conditions for the operation and management of the network is carried out – provisions for this need to be incorporated in any such contract itself.
- Training of state personnel in the management of any outsourcing, service level agreement, service level management, etc.
- Clear definition of any outsourcing contract objectives (scope, service levels, metrics, requirements, etc.).
- Support from top government managers.
- Priority for payments to any private sector partner for strategic and critical activities outsourced.
- Establishment and application of penalties for non-compliance with any outsourcing contract conditions.
- Definition of a clear process for exiting from any outsourcing contract and transitioning to another supplier.
- Other critical success factors inherent in outsourcing processes for IT.

The Project implementation report shall recommend the most appropriate structure for the Project, summarize the steps that need to be undertaken by the State Government to implement the Project according to the recommended structure, and analyze any regulatory or other steps involved with the creation of any new legal entity that may be required.

TASK 11: PREPARATION OF TOR FOR A BIDDING DOCUMENT

The U.S. Firm shall prepare one or more bidding documents (*Editals*) that cover all of the goods and services needed for Project implementation. The U.S. Firm shall prepare the *Edital(s)* in consultation with the Grantee. The U.S. Firm also shall develop a timetable for publicizing the *Edital(s),* and for awarding the contract(s) for the goods and services covered by the *Edital(s).* Every *Edital* must be fully consistent with the legal requirements of Brazil and the State of Acre.

Deliverable: Complete draft of the *Edital(s),* ready for publication. The U.S. Firm shall provide copies of the *Edital(s)* in both English and Portuguese.

TASK 12: PRESENTATION AND FINAL REPORT

Upon concluding the tasks listed above, the U.S. Firm shall travel to Acre to formally present to the Grantee the findings and recommendations and a draft version of the Final Report. The Grantee will be able to use this opportunity to ask questions or provide further comments and suggestions based on the presentation and the draft of the Final Report.

After the Presentation, the U.S. Firm shall make the final changes suggested by the Grantee and submit the Final Report. The U.S. Firm shall prepare and deliver to the Grantee and USTDA a substantive and comprehensive final report of all work performed under these Terms of Reference ("Final Report"). The Final Report shall be organized according to the above tasks, and shall include all deliverables and documents that have been provided to the Grantee. The Final Report shall be prepared in accordance with Clause I of Annex II of the Grant Agreement.

The U.S. Firm shall provide to the Grantee three (3) hard copies and one (1) electronic version of both the confidential and public versions of the Final Report in Portuguese and one (1) hard copy of both the confidential and public versions of the Final Report in English. The Grantee also shall provide copies to USTDA and the U.S. Embassy in Brazil in accordance with Clause I of Annex II of the Grant Agreement.

Notes:

1) The U.S. Firm is responsible for compliance with U.S. export licensing requirements, if applicable, in the performance of the Terms of Reference.
2) The U.S. Firm and the Grantee shall be careful to ensure that the public version of the Final Report contains no security or confidential information.
3) The Grantee and USTDA shall have an irrevocable, worldwide, royalty-free, non-exclusive right to use and distribute the Final Report and all work product that is developed under these Terms of Reference.
4) All deliverables shall be supplied in the English language. Additionally, the Final Report and presentation shall be translated into Portuguese. The U.S. Firm shall ensure the quality and accuracy of the translation.

ADDITIONAL COMMENTS

Comment 1: Successful execution of the FS presupposes that 2) the consultant team has appropriate access to government officials and personnel, resources and data; and 3) the consultant team has appropriate access to the SGA and other government officials and personnel, resources and data. Successful performance of this FS is obviously dependent on full and timely availability of the resources in question. It is expected that candidate firms for carrying out the FS will address these issues in their proposals, both in general terms and in terms of specific requirements (e.g., for desk space, phone/fax, Internet connection).

Comment 2: Below are five possible local consultants who are experts in the industry and who might be interested in working with the US-based consultant team. Some of these firms have worked, or are working, for the sponsor while others are experts in this field and who might be interested in working with the consultant team. These firms are:

IDEA Metro Designer (Mesh and WiMax)
Rua 14, 350 - Sl. 625 - Pontual Shopping
Vila Sta Cecilia - CEP 27260-140
Volta Redonda – RJ
Contato: Gilberto Viana Ferreira
gilberto@gwd.com.br
+55 (24) 3076 9600
+55 (24) 9259-0220

Idea Valley
Estrada da Burucada, 13
25750-362 Petrópolis – RJ
Contato: Sérgio Cabral, CEO
(24) 2221-9300
sergio@ideavalley.com.br
www.ideavalley.com.br

Newton Duarte
Principal Executive
Verto Technologies
Avenida das Américas, 700 Bloco 3, Grupo 238
Barra da Tijuca
22640-100 Rio de Janeiro - RJ
+55 (11) 5095-3499
cel+55 (21) 9433 6934
nduarte@verto.com.br
http://www.verto.com.br/

BRISA
SRTVS Q. 701, Bl. A, s. 201 – Ed. Centro Empresarial Brasília
70041-902 Brasília - DF
Contato, Henrique César de Conti, Diretor de Desenvolvimento Institucional
Tel: (61) 3323 8969
Cel: (61) 9975 9473
henrique.conti@brisa.org.br
www.brisa.org.br

Guerreiro Consult
SBN Quadro 02 Bloco F
Sala 1503
70041-006 Brasília – DF
Contato: Renato Navarro Guerreiro, Diretor Geral
renato.guerreiro@guerreiroconsult.com
(61) 8401-4848
http://www.guerreiroconsult.com/

ANNEX II- ACRE BUDGET

Technical Assistance To The State Of Acre-Broadband Network Project-Summary

Table 1

(Breakdown of labor costs by task in Table 2)

DIRECT LABOR (DL) (*)	NAME, TITLE & LABOR CATEGORY	DAILY (8HR) RATE	# PERSON DAYS	TOTAL
	Team Leader	$1,300	82	$106,600
	ICT Specialist w/ICT Network & Wireless Expertise	$1,400	66	$92,400
	ICT Specialist w/ ICT large/complex IT project Expertise	$1,400	70	$98,000
	Environmental Specialist	$1,100	23	$25,300
	Local Brazilian ICT Specialist w/Network & Wireless Expertise	$900	60	$54,000
	Brazilian Govt Budget Analyst	$750	28	$21,000
	Brazilian Project Analyst	$750	33	$24,750
	Brazilian Attorney	$900	5	$4,500
	Procurement Speciaist	$1,100	13	$14,300
Total			**380**	
OTHER DIRECT LABOR	Project Coordinator	$1,000	48	$48,000
TOTAL DIRECT LABOR				**$488,850**
OTHER DIRECT COSTS	(ODC)			
International Travel	US-Acre	1700	7	$11,900
Ground Transportation	Acre	9500		$9,500
PER DIEM -$	Acre 190 days@188	188	190	$35,720
	Acre-local staff-municipio visits	188	48	$9,024
OTHER				
Visas		125	5	$750
Communications				$750
Translation				$16,624
Supplies, Copy & Reproduction				$735
TOTAL OTHER DIRECT COSTS (ODC)				**$ 85,003**
TOTAL BUDGET				**$ 573,853**

Notes:
(*) Labor rates for each specialist and/or subcontractor contain no mark-up for holidays, vacation, or sick-leave.

Assumptions:3 round trips for Team Leader, one trip each for the two ICT specialists, I for environmental specialist, 1 trip for Procurement expert

Per diems are equal to total estimated in-country days of US Consultant Team. Per diem rate is based on the US Government rates
Rates shown are taken from the US State Department website: http://aoprals.state.gov/web920/per_diem_action.asp?MenuHide=1&CountryCode=1042

Cheap Fares to Brazil can be obtained through BACC Travel at 1800-222-2746 (www.bacctravel.com)

Technical Assistance To The State Of Acre-Broadband Network Project

Table 2 -- Breakdown of Labor Costs per Task

DIRECT LABOR (DL) (*)	NAME, TITLE & LABOR CATEGORY	DAILY (8HR) RATE	# PERSON DAYS	COST
Task 1				
Preparation & Background				
	Team Leader	$1,300	5	$6,500
	ICT Specialist w/ICT Network & Wireless Expertise	$1,400	3	$4,200
	ICT Specialist w/ ICT large/complex IT project Expertise	$1,400	3	$4,200
	Environmental Specialist	$1,100	2	$2,200
	Local Brazilian ICT Specialist w/Network & Wireless Expertise	$900	1	$900
	Brazilian Govt Budget Analyst	$750	-	
	Brazilian Project Analyst	$750		
	Project Coordinator	$1,000	4	$ 4,000
Subtotal Task 1			***18***	***$ 22,000***
Task 2				
Initial Visit & Assessment				
	Team Leader	$1,300	7	$9,100
	ICT Specialist w/ICT Network & Wireless Expertise	$1,400	7	$9,800
	ICT Specialist w/ ICT large/complex IT project Expertise	$1,400	7	$9,800
	Environmental Specialist	$1,100	5	$5,500
	Local Brazilian ICT Specialist w/Network & Wireless Expertise	$900	5	$4,500
	Brazilian Govt Budget Analyst	$750	2	$1,500
	Brazilian Project Analyst	$750	2	$1,500
	Project Coordinator	$1,000	4	$ 4,000
Subtotal Task 2			***39***	***$ 45,700***
Task 3				
Conduct A Needs/Requirement Analysis				
	Team Leader	$1,300	10	$13,000
	ICT Specialist w/ICT Network & Wireless Expertise	$1,400	25	$35,000
	ICT Specialist w/ ICT large/complex IT project Expertise	$1,400	25	$35,000
	Local Brazilian ICT Specialist w/Network & Wireless Expertise	$900	35	$31,500
	Brazilian Govt Budget Analyst	$750	3	$2,250
	Brazilian Project Analyst	$750	4	$3,000
	Project Coordinator	$1,000	3	$ 3,000
Subtotal Task 3			***105***	***$ 122,750***
Task 4				
Develop Specs, Architecture, Business Model Etc				
	Team Leader	$1,300	5	$6,500
	ICT Specialist w/ICT Network & Wireless Expertise	$1,400	12	$16,800
	ICT Specialist w/ ICT large/complex IT project Expertise	$1,400	12	$16,800
	Environmental Specialist	$1,100	-	
	Local Brazilian ICT Specialist w/Network & Wireless Expertise	$900	6	$5,400
	Brazilian Govt Budget Analyst	$750	2	$1,500
	Brazilian Project Analyst	$750	2	$1,500
	Project Coordinator	$1,000	3	$ 3,000
Subtotal Task 4			***42***	***$ 51,500***
Task 5				
Review Of Legal/Regulatory Issues				
	Team Leader	$1,300	4	$5,200
	ICT Specialist w/ICT Network & Wireless Expertise	$1,400		
	ICT Specialist w/ ICT large/complex IT project Expertise	$1,400		
	Environmental Specialist	$1,100	2	$2,200
	Local Brazilian ICT Specialist w/Network & Wireless Expertise	$900		
	Brazilian Govt Budget Analyst	$750		
	Brazilian Project Analyst	$750		
	Brazilian Attorney	$900	5	$4,500
	Project Coordinator	$1,000	3	$ 3,000
Subtotal Task 5			***14***	***$ 14,900***

DIRECT LABOR (DL) (*)	NAME, TITLE & LABOR CATEGORY	DAILY (8HR) RATE	# PERSON DAYS	COST
Task 6				
Economic And Financial Analysis				
	Team Leader	$1,300	5	$6,500
	ICT Specialist w/ICT Network & Wireless Expertise	$1,400	3	$4,200
	ICT Specialist w/ ICT large/complex IT project Expertise	$1,400	3	$4,200
	Environmental Specialist	$1,100		$0
	Local Brazilian ICT Specialist w/Network & Wireless Expertise	$900		$0
	Brazilian Govt Budget Analyst	$750	8	$6,000
	Brazilian Project Analyst	$750	7	$5,250
	Project Coordinator	$1,000	3	$3,000
Subtotal Task 6			***29***	***$ 29,150***
Task 7				
Organization				
	Team Leader	$1,300	7	$9,100
	ICT Specialist w/ICT Network & Wireless Expertise	$1,400	2	$2,800
	ICT Specialist w/ ICT large/complex IT project Expertise	$1,400	4	$5,600
	Environmental Specialist	$1,100	2	$2,200
	Local Brazilian ICT Specialist w/Network & Wireless Expertise	$900		
	Brazilian Govt Budget Analyst	$750		
	Brazilian Project Analyst	$750		
	Project Coordinator	$1,000	3	$ 3,000
Subtotal Task 7			***18***	***$ 22,700***
Task 8				
Preliminary Environmental Assessment				
	Team Leader	$1,300	1	$1,300
	ICT Specialist w/ICT Network & Wireless Expertise	$1,400		
	ICT Specialist w/ ICT large/complex IT project Expertise	$1,400		
	Environmental Specialist	$1,100	6	$6,600
	Local Brazilian ICT Specialist w/Network & Wireless Expertise	$900		
	Brazilian Govt Budget Analyst	$750	1	$750
	Brazilian Project Analyst	$750		
	Project Coordinator	$1,000	1	$ 1,000
Subtotal Task 8			***9***	***$ 9,650***
Task 9				
Developmental Impact Analysis				
	Team Leader	$1,300	6	$7,800
	ICT Specialist w/ICT Network & Wireless Expertise	$1,400		
	ICT Specialist w/ ICT large/complex IT project Expertise	$1,400		
	Environmental Specialist	$1,100		
	Local Brazilian ICT Specialist w/Network & Wireless Expertise	$900	-	
	Brazilian Govt Budget Analyst	$750	2	
	Brazilian Project Analyst	$750	5	$3,750
	Project Coordinator	$1,000	1	$ 910
Subtotal Task 9			***14***	***$ 12,460***
Task 10				
Project Planning And Implementation				
	Team Leader	$1,300	7	$9,100
	ICT Specialist w/ICT Network & Wireless Expertise	$1,400	2	$2,800
	ICT Specialist w/ ICT large/complex IT project Expertise	$1,400	4	$5,600
	Environmental Specialist	$1,100	2	$2,200
	Local Brazilian ICT Specialist w/Network & Wireless Expertise	$900	3	$2,700
	Brazilian Govt Budget Analyst	$750	2	$1,500
	Brazilian Project Analyst	$750	3	$2,250
	Project Coordinator	$1,000	3	$3,000
Subtotal Task 10			***26***	***$ 29,150***
Task 11				
Preparation of TOR For Edital	Team Leader	$1,300	10	$ 13,000
	ICT Specialist w/Telecom Network Expertise	$1,400	6	$ 14,000
	ICT Specialist w/ ICT Governance Expertise	$1,400	6	$ 14,000
	Local Brazilian ICT Specialist w/Network & Wireless Expertise	$900	4	$ 5,400
	Brazilian Govt Budget Analyst	$750	6	$ 3,000
	Brazilian Project Analyst	$750	7	$ 3,000
	Procurement Specialist	$1,100	10	$ 4,400
	Project Coordinator	$1,000	9	$ 3,000
Subtotal Task 11			***51***	***$ 59,800***

DIRECT LABOR (DL) (*)	NAME, TITLE & LABOR CATEGORY	DAILY (8HR) RATE	# PERSON DAYS	COST
Task 12				
Final Report, Presentation, & Publicaio	Team Leader	$1,300	15	$ 6,500
	ICT Specialist w/Telecom Network Expertise	$1,400	6	$ 4,200
	ICT Specialist w/ ICT Governance Expertise	$1,400	6	$ 4,200
	Environmental Specialist	$1,100	4	$ 4,200
	Local Brazilian ICT Specialist w/Network & Wireless Expertise	$900	6	$ 2,700
	Brazilian Govt Budget Analyst	$750	2	$ 1,500
	Brazilian Project Analyst	$750	3	$ 1,500
	Procurement Specialist	$1,100	3	$ 3,300
	Project Coordinator	$1,000	10	$ 4,000
Subtotal Task 12			***25***	***$ 27,900***
Total Direct Labor	Team Leader	$1,300	82	$ 106,600
	ICT Specialist w/ICT Network & Wireless Expertise	$1,400	66	$ 92,400
	ICT Specialist w/ ICT large/complex IT project Expertise	$1,400	70	$ 98,000
	Environmental Specialist	$1,100	23	$ 25,300
	Local Brazilian ICT Specialist w/Network & Wireless Expertise	$900	60	$ 54,000
	Brazilian Govt Budget Analyst	$750	28	$ 21,000
	Brazilian Project Analyst	$750	33	$ 24,750
	Brazilian Attorney	$900	5	$ 4,500
	Procurement Specialist	$1,100	13	$ 14,300
	Project Coordinator	$1,000	48	$ 48,000
			428	**$ 488,850**
TOTAL DIRECT LABOR				**$ 488,850**

ANNEX III: CONTACTS

Acre
Government of Acre

Mâncio Cordeiro Lima,
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Secretariat of Administration
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Annex IV: Internet Access and Related Statistics

C1 - PROPORÇÃO DE INDIVÍDUOS QUE JÁ ACESSARAM A INTERNET[1]
Percentual sobre o total da população[2]

Percentual (%)		Sim	Não
TOTAL		41	59
REGIÕES DO PAÍS	SUDESTE	43	57
	NORDESTE	33	67
	SUL	46	54
	NORTE	32	68
	CENTRO-OESTE	45	55
SEXO	Masculino	42	58
	Feminino	39	61
GRAU DE INSTRUÇÃO	Analfabeto/ Educação infantil	9	91
	Fundamental	34	66
	Médio	64	36
	Superior	85	15
FAIXA ETÁRIA	De 10 a 15 anos	59	41
	De 16 a 24 anos	70	30
	De 25 a 34 anos	53	47
	De 35 a 44 anos	31	69
	De 45 a 59 anos	15	85
	De 60 anos ou mais	4	96
RENDA FAMILIAR	Até R$380	16	84
	R$381-R$760	28	72
	R$761-R$1140	46	54
	R$1141-R$1900	57	43
	R$1901-R$3800	75	25
	R$3801 ou mais	77	23
CLASSE SOCIAL[4]	A	94	6
	B	73	27
	C	47	53
	DE	17	83
SITUAÇÃO DE EMPREGO	Trabalhador	43	57
	Desempregado	46	54
	Não integra a população ativa[3]	35	65

[1] Indivíduos que informaram ter acessado a internet pelo menos uma vez na vida, de qualquer lugar.
[2] Base: 17.000 entrevistados. Entrevistas realizadas em área urbana.
[3] Na categoria não integra população ativa estão contabilizados os estudantes, aposentados e as donas de casa.
[4] O critério utilizado para classificação leva em consideração a educação do chefe de família e a posse de uma serie de utensílios domésticos, relacionando-os a um sistema de pontuação. A soma dos pontos alcançada por domicílio é associada a uma Classe Sócio-Econômica específica (A, B, C, D, E).
Veja a tabela de erros estatísticos aproximados para cada variável este indicador.

Números calculados sobre bases de entrevistas pequenas, e que possuem erro estatístico acima de 4%.

Fonte: NIC.br - set/nov 2007

TIC DOMICÍLIOS e USUÁRIOS 2007
setembro / novembro 2007

Acesso às Tecnologias da Informação e da Comunicação (TIC)

A4 - PROPORÇÃO DE DOMICÍLIOS COM ACESSO À INTERNET[1]
Percentual sobre o total de domicílios[2]

Percentual (%)		Sim	Não
TOTAL		17	83
REGIÕES DO PAÍS	SUDESTE	22	78
	NORDESTE	7	92
	SUL	21	78
	NORTE	5	95
	CENTRO-OESTE	16	84
RENDA FAMILIAR	Até R$380	1	98
	R$381-R$760	4	95
	R$761-R$1140	15	85
	R$1141-R$1900	28	72
	R$1901-R$3800	54	46
	R$3801 ou mais	66	34
CLASSE SOCIAL[3]	A	82	18
	B	50	50
	C	16	84
	DE	2	98

[1] Considerado somente o acesso à internet via computador de mesa (desktop) ou computador portátil (laptop e notebook).
[2] Base: 17.000 domicílios entrevistados em área urbana.
[3] O critério utilizado para classificação leva em consideração a educação do chefe de família e a posse de uma serie de utensílios domésticos, relacionando-os a um sistema de pontuação. A soma dos pontos alcançada por domicílio é associada a uma Classe Sócio-Econômica específica (A, B, C, D, E).
Veja a tabela de erros estatísticos aproximados para cada variável este indicador.

Números calculados sobre bases de entrevistas pequenas, e que possuem erro estatístico acima de 4%.

Fonte: NIC.br - set/nov 2007

Tabela 2387 - Domicílios particulares permanentes e Moradores em domicílios particulares permanentes por classes de rendimento mensal domiciliar e existência de microcomputador, acesso à Internet e tipo de telefone				
Ano = 2006				
Brasil, Região Geográfica e Unidade da Federação	Classes de rendimento mensal domiciliar	Existência de microcomputador, acesso à Internet e tipo de telefone	Variável	
			Domicílios particulares permanentes (Mil unidades)	Domicílios particulares permanentes (Percentual)
Brasil	Total	Total	54.610	100,00
		Microcomputador - tinham	12.072	22,11
		Microcomputador - tinham - com acesso à Internet	9.204	16,85
		Telefone - tinham	40.679	74,49
	Até 10 salários mínimos	Total	47.749	87,44
		Microcomputador - tinham	7.468	13,67
		Microcomputador - tinham - com acesso à Internet	5.095	9,33
		Telefone - tinham	34.216	62,65
	Mais de 10 a 20 salários mínimos	Total	3.598	6,59
		Microcomputador - tinham	2.656	4,86
		Microcomputador - tinham - com acesso à Internet	2.311	4,23
		Telefone - tinham	3.573	6,54
	Mais de 20 salários mínimos	Total	1.616	2,96
		Microcomputador - tinham	1.406	2,57
		Microcomputador - tinham - com acesso à Internet	1.342	2,46
		Telefone - tinham	1.610	2,95
Norte	Total	Total	3.777	100,00
		Microcomputador - tinham	372	9,84
		Microcomputador - tinham - com acesso à Internet	226	5,98
		Telefone - tinham	2.263	59,92
	Até 10 salários mínimos	Total	3.486	92,29
		Microcomputador - tinham	225	5,97
		Microcomputador - tinham - com acesso à Internet	112	2,97
		Telefone - tinham	2.011	53,24
	Mais de 10 a 20	Total	161	4,27

	mínimos	**Microcomputador - tinham - com acesso à Internet**	67	1,79
		Telefone - tinham	158	4,17
	Mais de 20 salários mínimos	**Total**	60	1,59
		Microcomputador - tinham	47	1,24
		Microcomputador - tinham - com acesso à Internet	40	1,07
		Telefone - tinham	60	1,59
Acre	**Total**	**Total**	162	100,00
		Microcomputador - tinham	19	11,59
		Microcomputador - tinham - com acesso à Internet	13	8,29
		Telefone - tinham	108	66,35
	Até 10 salários mínimos	**Total**	143	88,39
		Microcomputador - tinham	8	5,00
		Microcomputador - tinham - com acesso à Internet	5	2,87
		Telefone - tinham	91	56,27
	Mais de 10 a 20 salários mínimos	**Total**	10	6,10
		Microcomputador - tinham	6	3,78
		Microcomputador - tinham - com acesso à Internet	4	2,71
		Telefone - tinham	10	6,01
	Mais de 20 salários mínimos	**Total**	5	3,07
		Microcomputador - tinham	4	2,61
		Microcomputador - tinham - com acesso à Internet	4	2,61
		Telefone - tinham	5	3,07

Nota:

1) Até 2003, exclusive a população da área rural de Rondônia, Acre, Amazonas, Roraima, Pará e Amapá.

Para a variável **Domicílios particulares permanentes**:

2) Inclusive os domicílios com moradores sem declaração de rendimento ou cujos moradores não tinham rendimento ou que receberam somente em benefícios.

3) Exclusive os rendimentos dos moradores cuja condição no domicílio era pensionista, empregado doméstico ou parente do empregado doméstico.

Para a variável **Moradores em Domicílios particulares permanentes**:

4) Inclusive os moradores em domicílios sem declaração de rendimento, sem rendimento ou que receberam somente

5) Exclusive os moradores cuja condição no domicílio era pensionista, empregado doméstico ou parente do empregado doméstico.

Fonte: IBGE - Pesquisa Nacional por Amostra de Domicílios

Tabela 1954 - Domicílios particulares permanentes e Moradores em domicílios particulares permanentes por classes de rendimento mensal domiciliar, situação do domicílio e alguns bens duráveis existentes no domicílio

Ano = 2006					
Brasil, Região Geográfica e Unidade da Federação	Classes de rendimento mensal domiciliar	Situação do domicílio	Alguns bens duráveis existentes no domicílio	Variável	
				Domicílios particulares permanentes (Mil unidades)	Domicílios particulares permanentes (Percentual)
Brasil	Total	Total	Total	54.610	100,00
			Rádio - não tinham	6.623	12,13
			Televisão - tinham	50.800	93,02
		Urbana	Total	46.327	84,83
			Rádio - não tinham	5.144	9,42
			Televisão - tinham	44.521	81,53
		Rural	Total	8.284	15,17
			Rádio - não tinham	1.479	2,71
			Televisão - tinham	6.279	11,50
	Até 1 salário mínimo	Total	Total	6.943	12,71
			Rádio - não tinham	1.771	3,24
			Televisão - tinham	5.359	9,81
		Urbana	Total	4.792	8,78
			Rádio - não tinham	1.180	2,16
			Televisão - tinham	4.084	7,48
		Rural	Total	2.151	3,94
			Rádio - não tinham	591	1,08
			Televisão - tinham	1.275	2,33
	Mais de 1 a 2 salários mínimos	Total	Total	12.223	22,38
			Rádio - não tinham	2.055	3,76
			Televisão - tinham	11.014	20,17
		Urbana	Total	9.559	17,50
			Rádio - não tinham	1.578	2,89
			Televisão - tinham	9.005	16,49
		Rural	Total	2.664	4,88
			Rádio - não tinham	478	0,87

			Televisão - tinham	2.009	3,68
	Mais de 2 a 3 salários mínimos	**Total**	**Total**	9.469	17,34
			Rádio - não tinham	1.135	2,08
			Televisão - tinham	8.966	16,42
		Urbana	**Total**	7.973	14,60
			Rádio - não tinham	917	1,68
			Televisão - tinham	7.734	14,16
		Rural	**Total**	1.496	2,74
			Rádio - não tinham	218	0,40
			Televisão - tinham	1.232	2,26
	Mais de 3 a 5 salários mínimos	**Total**	**Total**	10.383	19,01
			Rádio - não tinham	853	1,56
			Televisão - tinham	10.109	18,51
		Urbana	**Total**	9.260	16,96
			Rádio - não tinham	742	1,36
			Televisão - tinham	9.105	16,67
		Rural	**Total**	1.123	2,06
			Rádio - não tinham	110	0,20
			Televisão - tinham	1.004	1,84
	Mais de 5 a 10 salários mínimos	**Total**	**Total**	8.732	15,99
			Rádio - não tinham	472	0,86
			Televisão - tinham	8.637	15,82
		Urbana	**Total**	8.220	15,05
			Rádio - não tinham	432	0,79
			Televisão - tinham	8.157	14,94
		Rural	**Total**	511	0,94
			Rádio - não tinham	40	0,07
			Televisão - tinham	481	0,88
	Mais de 10 a 20 salários mínimos	**Total**	**Total**	3.598	6,59
			Rádio - não tinham	126	0,23
			Televisão - tinham	3.590	6,57
		Urbana	**Total**	3.484	6,38
			Rádio - não tinham	122	0,22
			Televisão - tinham	3.478	6,37
		Rural	**Total**	113	0,21
			Rádio - não tinham	4	0,01
			Televisão - tinham	112	0,20
	Mais de 20 salários mínimos	**Total**	**Total**	1.616	2,96
			Rádio - não tinham	23	0,04
			Televisão - tinham	1.614	2,96
		Urbana	**Total**	1.586	2,90

			Rádio - não tinham	23	0,04
			Televisão - tinham	1.585	2,90
		Rural	**Total**	30	0,05
			Rádio - não tinham	1	0,00
			Televisão - tinham	29	0,05
	Sem rendimento	**Total**	**Total**	492	0,90
			Rádio - não tinham	123	0,22
			Televisão - tinham	392	0,72
		Urbana	**Total**	423	0,77
			Rádio - não tinham	96	0,18
			Televisão - tinham	356	0,65
		Rural	**Total**	69	0,13
			Rádio - não tinham	27	0,05
			Televisão - tinham	36	0,07
Norte	**Total**	**Total**	**Total**	3.777	100,00
			Rádio - não tinham	959	25,39
			Televisão - tinham	3.210	84,99
		Urbana	**Total**	2.879	76,22
			Rádio - não tinham	687	18,19
			Televisão - tinham	2.683	71,04
		Rural	**Total**	898	23,78
			Rádio - não tinham	272	7,20
			Televisão - tinham	527	13,95
	Até 1 salário mínimo	**Total**	**Total**	549	14,52
			Rádio - não tinham	214	5,66
			Televisão - tinham	366	9,68
		Urbana	**Total**	346	9,16
			Rádio - não tinham	135	3,58
			Televisão - tinham	275	7,28
		Rural	**Total**	203	5,36
			Rádio - não tinham	79	2,08
			Televisão - tinham	91	2,40
	Mais de 1 a 2 salários mínimos	**Total**	**Total**	1.064	28,17
			Rádio - não tinham	336	8,88
			Televisão - tinham	850	22,49
		Urbana	**Total**	760	20,11
			Rádio - não tinham	234	6,19
			Televisão - tinham	687	18,20
		Rural	**Total**	304	8,06
			Rádio - não tinham	102	2,70
			Televisão - tinham	162	4,29

	Mais de 2 a 3 salários mínimos	**Total**	**Total**	743	19,68
			Rádio - não tinham	181	4,80
			Televisão - tinham	658	17,43
		Urbana	**Total**	562	14,88
			Rádio - não tinham	137	3,63
			Televisão - tinham	538	14,24
		Rural	**Total**	181	4,80
			Rádio - não tinham	44	1,17
			Televisão - tinham	121	3,19
	Mais de 3 a 5 salários mínimos	**Total**	**Total**	685	18,13
			Rádio - não tinham	132	3,49
			Televisão - tinham	636	16,85
		Urbana	**Total**	563	14,92
			Rádio - não tinham	105	2,78
			Televisão - tinham	546	14,45
		Rural	**Total**	121	3,21
			Rádio - não tinham	27	0,71
			Televisão - tinham	91	2,40
	Mais de 5 a 10 salários mínimos	**Total**	**Total**	445	11,78
			Rádio - não tinham	58	1,53
			Televisão - tinham	429	11,37
		Urbana	**Total**	388	10,28
			Rádio - não tinham	48	1,27
			Televisão - tinham	385	10,19
		Rural	**Total**	57	1,50
			Rádio - não tinham	10	0,26
			Televisão - tinham	45	1,18
	Mais de 10 a 20 salários mínimos	**Total**	**Total**	161	4,27
			Rádio - não tinham	15	0,39
			Televisão - tinham	160	4,23
		Urbana	**Total**	151	4,00
			Rádio - não tinham	13	0,33
			Televisão - tinham	151	3,99
		Rural	**Total**	10	0,26
			Rádio - não tinham	2	0,05
			Televisão - tinham	9	0,24
	Mais de 20 salários mínimos	**Total**	**Total**	60	1,59
			Rádio - não tinham	2	0,06
			Televisão - tinham	60	1,59
		Urbana	**Total**	58	1,54
			Rádio - não tinham	2	0,06

			Televisão - tinham	58	1,54
		Rural	**Total**	2	0,05
			Rádio - não tinham	0	0,00
			Televisão - tinham	2	0,05
	Sem rendimento	**Total**	**Total**	34	0,91
			Rádio - não tinham	13	0,34
			Televisão - tinham	23	0,62
		Urbana	**Total**	27	0,73
			Rádio - não tinham	8	0,22
			Televisão - tinham	22	0,58
		Rural	**Total**	7	0,19
			Rádio - não tinham	4	0,12
			Televisão - tinham	2	0,04
Acre	**Total**	**Total**	**Total**	162	100,00
			Rádio - não tinham	47	29,05
			Televisão - tinham	133	81,80
		Urbana	**Total**	119	73,38
			Rádio - não tinham	35	21,39
			Televisão - tinham	112	69,22
		Rural	**Total**	43	26,62
			Rádio - não tinham	12	7,66
			Televisão - tinham	20	12,59
	Até 1 salário mínimo	**Total**	**Total**	27	16,70
			Rádio - não tinham	10	6,41
			Televisão - tinham	17	10,18
		Urbana	**Total**	16	9,78
			Rádio - não tinham	6	3,87
			Televisão - tinham	13	7,84
		Rural	**Total**	11	6,92
			Rádio - não tinham	4	2,54
			Televisão - tinham	4	2,34
	Mais de 1 a 2 salários mínimos	**Total**	**Total**	46	28,23
			Rádio - não tinham	16	9,99
			Televisão - tinham	35	21,81
		Urbana	**Total**	30	18,69
			Rádio - não tinham	11	6,97
			Televisão - tinham	28	17,14
		Rural	**Total**	15	9,54
			Rádio - não tinham	5	3,02
			Televisão - tinham	8	4,67
	Mais de 2 a 3	**Total**	**Total**	28	17,54

	salários mínimos		**Rádio - não tinham**	9	5,35
			Televisão - tinham	24	14,89
		Urbana	**Total**	20	12,49
			Rádio - não tinham	7	4,45
			Televisão - tinham	19	12,00
		Rural	**Total**	8	5,06
			Rádio - não tinham	1	0,90
			Televisão - tinham	5	2,89
	Mais de 3 a 5 salários mínimos	**Total**	**Total**	24	14,81
			Rádio - não tinham	5	3,37
			Televisão - tinham	22	13,42
		Urbana	**Total**	19	12,00
			Rádio - não tinham	4	2,71
			Televisão - tinham	19	12,00
		Rural	**Total**	5	2,81
			Rádio - não tinham	1	0,66
			Televisão - tinham	2	1,42
	Mais de 5 a 10 salários mínimos	**Total**	**Total**	18	11,11
			Rádio - não tinham	3	1,91
			Televisão - tinham	18	10,81
		Urbana	**Total**	17	10,36
			Rádio - não tinham	3	1,84
			Televisão - tinham	17	10,26
		Rural	**Total**	1	0,75
			Rádio - não tinham	0	0,07
			Televisão - tinham	1	0,55
	Mais de 10 a 20 salários mínimos	**Total**	**Total**	10	6,10
			Rádio - não tinham	2	1,03
			Televisão - tinham	10	6,10
		Urbana	**Total**	10	5,91
			Rádio - não tinham	2	0,97
			Televisão - tinham	10	5,91
		Rural	**Total**	0	0,20
			Rádio - não tinham	0	0,07
			Televisão - tinham	0	0,20
	Mais de 20 salários mínimos	**Total**	**Total**	5	3,07
			Rádio - não tinham	0	0,19
			Televisão - tinham	5	3,07
		Urbana	**Total**	5	3,00
			Rádio - não tinham	0	0,19
			Televisão - tinham	5	3,00

		Rural	**Total**	0	0,07
			Rádio - não tinham	-	-
			Televisão - tinham	0	0,07
	Sem rendimento	**Total**	**Total**	1	0,65
			Rádio - não tinham	1	0,33
			Televisão - tinham	1	0,45
		Urbana	**Total**	1	0,39
			Rádio - não tinham	0	0,19
			Televisão - tinham	1	0,39
		Rural	**Total**	0	0,27
			Rádio - não tinham	0	0,13
			Televisão - tinham	0	0,07

Nota:

1) Até 2003, exclusive a população da área rural de Rondônia, Acre, Amazonas, Roraima, Pará e Amapá.

2) A categoria **Sem rendimento** inclui as pessoas de referência que receberam somente em benefícios.

3) Exclusive os rendimentos dos moradores cuja condição no domicílio era pensionista, empregado doméstico ou parente de empregado doméstico.

Fonte: IBGE - Pesquisa Nacional por Amostra de Domicílios

Annex V: Points in Acre included in the new GESAC bidding document

Lot S (Mainly by Satellite) e Lot TB (Mainly by landlines)

Institution	Address	Neighborhood	CEP	Município	C N L	State	Latitude	Longitude	COD INEP correto[13]	Speed (Kbps)	Fonte	
From Annex XIII, Lote S, p1												
Escola Rural Santa Lúcia III	Rodovia BR 364, Km 90	Centro	69945-000	Acrelândia	ACLD	AC	9º 48m 44,5s	67º 5m 38,8s	12018422	256		N
Secretaria de Estado de Desenvolvimento - Centro de Múltiplo Uso	Rua Rafael martins, s/n	Centro	69935-000	Assis Brasil	ABL	AC	10º 56m 17,5s	69º 33m 52,1s		256		
Prof Iris Célia Cabanelas Zanine	Rua Rneida Batista, 525	Centro	69935-000	Assis Brasil	ABL	AC	10º 56m 22,8s	69º 33m 38,4s	12015946	256	NULL	N
Núcleo de Educação de Bujari	Rua Geraldo Mesquita, 184	Centro	69923-000	Bujari	BJRI	AC	9º 49m 49,6s	67º 57m 10,5s		256		
Secretaria de Estado de Desenvolvimento - Telecentro	Rua Francisco Cordeiro de Andrade, s/nº	Conquista	69922-000	Capixaba	CPXB	AC	10º 34m 23,4s	67º 40m 37,2s		256		
Saúde Indigena - Aldeia Catuquina	Rodovia BR 364 - Terra Indigena Catuquira/Caupina - Aldeia dos Catuquinas, Km 100	Zona Rural	69980-000	Cruzeiro do Sul	CZU	AC				256		
Biblioteca Pública Estadual - C. Sul	Avenida Rodrigues Alves, 443	Centro	69980-000	Cruzeiro do Sul	CZU	AC	7º 37m 56,4s	72º 39m 53,1s		512		
Destacamento de Telecomunicações de Controle do Espaço Aéreo-Cruzeiro do Sul	Estrada do Aeroporto, s/n	Igarapé Preto	06998-000	Cruzeiro do Sul	CZU	AC	7º 35m 44,4s	72º 46m 8,3s		512		
61º Batalhão de Infantaria de Selva	Avenida 25 de Agosto, 3224	Vila Militar	69980-000	Cruzeiro do Sul	CZU	AC	7º 36m 31,2s	72º 40m 45,1s		1024		
Prefeitura Municipal de Feijó - Telecentro Comunitário Digital	Travessa Presidente Kenedy, s/n	Centro	69960-000	Feijó	FJO	AC	8º 9m 54,4s	70º 21m 15,5s		512		
Escola Raimundo Augusto de Araújo	Praça dos Três Poderes, 13	Centro	69960-000	Feijó	FJO	AC	8º 9m 57,1s	70º 21m 19,8s	12004170	512		N
Secretaria de Estado de Desenvolvimento - Escritório Administrativo	Avenida Francisco Dias, s/nº	Centro	69975-000	Jordão	JOAO	AC	9º 11m 22,7s	71º 51m 6,7s		256		

[13] National Institute for Educational Studies and Research (Instituto Nacional de Estudos e Pesquisas Educacionais – INEP) code

Escola Manoel Rodrigues de Farias	Avenida Francisco Dias, s/n	centro	69975-000	Jordão	JOAO	AC	9º 11m 22,1s	71º 51m 6,3s	12005240	256		
Núcleo de Educação - M. Lima	Rua Joaquim Generoso de Oliveira, 202	Centro	69990-000	Mâncio Lima	MLI	AC	7º 36m 45,6s	72º 53m 55,5s		256		
Núcleo da Educação de Manoel Urbano	Rua Francisco Freitas, s/nº	São José	69950-000	Manoel Urbano	MLU	AC	8º 50m 19,9s	69º 15m 47,6s		256		
Esc Dom Prospero Bernardi	Rua Paulo VI	Centro	69950-000	Manoel Urbano	MLU	AC	8º 50m 19s	69º 15m 35,9s	12006688	256		
Secretaria de Estado de Desenvolvimento - Centro Administrativo - Mal. T.	Rua Mário Lobão, s/nº	Centro	69983-000	Marechal Thaumaturgo	MLTO	AC	8º 56m 46s	72º 47m 1,8s		256		
Esc Elvira Ferreira Gomes	Rua Mário Lobão, s/n	Centro	69983-000	Marechal Thaumaturgo	MLTO	AC	8º 56m 46,5s	72º 47m 3,7s	12026328	512	NULL	
Núcleo do Adjunto da Solidariedade	Rua Das Margaridas, 28	Vila do INCRA	69921-000	Porto Acre	POAC	AC	9º 43m 43s	67º 41m 57,6s		256		
Esc Jader Saraiva de Machado	Avenida Rui Coelho, s/n	Centro	69921-000	Porto Acre	POAC	AC	9º 35m 18,4s	67º 31m 57,1s	12015342	256		
Secretaria de Estado de Desenvolvimento - P. Walter	Rua Marmed Cameli, s/nº	Centro	69982-000	Porto Walter	PWTR	AC	8º 16m 2,5s	72º 44m 41,2s		256		
Esc Borges de Aquino	Rua Beira Rio, S/N	Centro	69982-000	Porto Walter	PWTR	AC	8º 15m 58s	72º 44m 22,3s	12003050	256	NULL	
Escola Francisco Braga Souza - R. Alves	Avenida Presidente Vargas, 172	Centro	69985-000	Rodrigues Alves	RGAS	AC	7º 44m 15,2s	72º 39m 8,8s	12022004	512		
Secretaria de Estado de Desenvolvimento - Fórum de Desenvolvimento Local	Rua Porfírio de Moura, s/nº	Centro	69995-000	Santa Rosa do Purus	SRSA	AC	9º 26m 23,3s	70º 29m 17,2s		256		
4º Pelotão Especial de Fronteira - 4º BIS	Rua Coronel José Ferreira, 1180	Cidade Nova	69955-000	Santa Rosa do Purus	SRSA	AC	9º 26m 21,6s	70º 29m 32,5s		1024		
Centro da Juventude de Sena Madureira	Rua Maranhão, 1947	CSU	69940-000	Sena Madureira	SMD	AC				512		
Biblioteca Pública - Tarauacá	Avenida Cel. Juvêncio de Menezes, 301	Centro	69970-000	Tarauacá	TAU	AC	8º 9m 38,8s	70º 45m 50s		512		
Video nas Aldeias	Rua Simão leite damasceno, 387	Aldeia Mucuripi	69970-000	Tarauacá	TAU	AC	8º 26m 27,4s	71º 21m 12,5s		512		
From Annex XIII, Lot S, p2												
ESC SAO JOAO BATISTA	RUA JOSE PEREIRA GURGEL, 835	CENTRO	69923000	BUJARI	BJRI	AC			12009369	256		
ESC ARGENTINA PEREIRA FEITOSA	AV FRANCISCO CORDEIRO DE ANDRADE, NULL	CENTRO	69922000	CAPIXABA	CPXB	AC			12009725	256		
ESC MANOEL BRAZ DE MELO	VILA ASSIS BRASIL, NULL	DERACRE	69980000	CRUZEIRO DO SUL	CZU	AC			12000930	256		
ESC MADRE ADELGUNDES BECKER	RUA SANTO ANTONIO, 118	MIRITIZAL	69980000	CRUZEIRO DO SUL	CZU	AC			12000914	512		

ESC CRAVEIRO COSTA	RUA DJALMA DUTRA, 114	NULL	69980000	CRUZEIRO DO SUL	CZU	AC			12000450	512		
ESC MACHADO DE ASSIS I	PA SANTA LUZIA BR 364, NULL	NULL	69980000	CRUZEIRO DO SUL	CZU	AC			12000906	256	NULL	
ESC INDIGENA IXUBAY RABUI PUYANAWA	RESERVA INDIGENA POYANAWA BARAO IPIRANGA, NULL	NULL	69990000	MANCIO LIMA	MLI	AC			12001821	256	NULL	
ESC INDIGENA PEDRO ANTONIO DE OLIVEIRA	T.I NUKINI ALDEIA REPUBLICA, NULL	NULL	69990000	MANCIO LIMA	MLI	AC			12002275	256	NULL	
ESC ANTONIO OLIVEIRA DANTAS	RUA DOM JOSE HASCHER, NULL	SAO VIDAL	69990000	MANCIO LIMA	MLI	AC			12001945	512	NULL	
ESC NAZIRA ANUTE DE LIMA	RUA FRANCISCO FREITAS, NULL	SAO JOSE	69950000	MANOEL URBANO	MLU	AC			12006920	256		
ESC CEL JOSE PLACIDO DE CASTRO	TRAVESSA RAIMUNDO H DE MELO, NULL	NOVA PORTO ACRE	69921000	PORTO ACRE	POAC	AC			12015326	512	NULL	
ESC EDMUNDO PINTO DE ALMEIDA NETO	ROD AC 10 KM 29 L 01 INCRA KMO1, NULL	VILA DO INCRA	69921000	PORTO ACRE	POAC	AC			12015334	256		
ESC CAPITAO EDGAR CERQUEIRA FILHO	BR 317 KM 35 COLONIA VENCEDORA, NULL	NULL	69900050	RIO BRANCO	RBO	AC			12011320	256	NULL	
ESC DR AUGUSTO MONTEIRO	BR-364 KM 07 RAMAL BELO JARDIM KM 14, NULL	NULL	69900050	RIO BRANCO	RBO	AC			12012297	256	NULL	
ESC DR SANTIAGO DANTAS	RODOVIA AC 90 KM 15, NULL	NULL	69900050	RIO BRANCO	RBO	AC			12012360	256	NULL	
ESC SANTO ANTONIO II	BR 364 KM 07 RAMAL BELO JARDIM I, NULL	NULL	69900050	RIO BRANCO	RBO	AC			12014001	256	NULL	
ESC DE ENSINO MEDIO DE SANTA ROSA DO PURUS	SANTA ROSA DO PURUS, NULL	NULL	69955000	SANTA ROSA DO PURUS	SRSA	AC			12028851	256	NULL	
ESC MARIA JOSE BEZERRA DOS REIS	BR 364 KM 39, NULL	NULL	69925000	SENADOR GUIOMARD	SWD	AC			12014770	256	NULL	
ESC PROF MARIA AUXILIADORA CUNHA QUEIROZ	BR 364 KM 80 RAMAL NABOR JUNIOR, NULL	NULL	69925000	SENADOR GUIOMARD	SWD	AC			12014915	256		
Escola Técnica Flodoardo Cabral/ Secretaria de Estado de Educação – Regional do Juruá	Av. 28 de Setembro	Técnica	69980-000	CRUZEIRO DO SUL	CZU	AC			12000418	512		
Escola: São Luis Gonzaga	RUA UAQUIRI, 650	CAMPINAS	69928-000	PLACIDO DE CASTRO	PCY	AC			12010731	256		
Escola Santa Lucia	AC 10 KM 14 RAMAL SANTA CLARA LIMUEIRO, KM 12	PROJETO COLIBRI	69900-050	Rio Branco	RBO	AC			12015555	256	NULL	

Escola Cristo Rei	Estrada de Boca do Acre, KM 72		69900-050	Rio Branco	RBO	AC			12011460	256	NULL	
Escola Maria C. Ramos	ESTR DE SENA KM 52 RAMAL 20	ZONA RURAL	69923-000	Bujari	BJRI	AC			12009679	256	NULL	
Prefeitura Municipal de Mâncio Lima	Av. Japiim, s/n - centro / Rua Mimosa Sá, 21,	Centro	69990-000	Mâncio Lima	MLI	AC				512		
Prefeitura Municipal de Marechal Thaumaturgo	Praça Odon do Vale, s/n	centro	69980-000	Marechal Thaumaturgo	MLTO	AC				512		
Prefeitura Municipal de Rodrigues Alves	Av. São Jose, 780	centro	69985-000	Rodrigues Alves	RGAS	AC				512		
Prefeitura Municipal de Tarauacá	Rua Cel. Juvêncio de Menezes, 267	centro	69970-000	Tarauacá	TAU	AC				512		
Colonia de Pescadores Z-3	Rua Sargento Souza s/n,	Centro	69940-000	Sena Madureira	SMD	AC				512		
Escola de Ensino Médio Dom Júlio Mattioli	Av. Brasil, 322	Centro	69940000	Sena Madureira	SMD	AC			12007617	2048		
Escola de Ensino Médio Dr. Djalma da Cunha Batista	Av. Epaminondas Jácome, s/n	Avelino Leal	69970000	Tarauacá	TAU	AC			12005711	2048		
Escola Municpal Nair Sombra	RUA BENEVENUTO, 100	Centro	69922-000	Capixaba	CPXB	AC			12009881	256		
Escola Municpal José Augusto de Araujo	Av. Antônia Frota s/n	Centro	69970-000	Tarauacá	TAU	AC			12005657	512		
Escola Municipal Mesias Rodrigues	Travessa Guilherme	Bairro da Pista	69940-000	Sena Madureira	SMD	AC			12029408	512		
Escola de Ensino Fundamental Dr. Celso Cosme Salgado	Rua Francisco de Queiroz	Cidade Nova	69955-000	Santa Rosa do Purus	SRSA	AC			12029009	256	NULL	
CENTRO DE MÚLTIPLO USO	RUA RAFAEL MARTINS LEÃO S/N	CENTRO	69935-000	Assis Brasil	ABL	AC				256		
Prefeitura Municipal de Feijó	Avenida Plácido de Castro, nº 672	Centro	69960000	Feijó	FJO	AC				512		
Biblioteca Publica Municipal	Rua Valerio Caldas Magalhaes	Centro	69950000	Manoel Urbano	MLU	AC				256		
From Annex XIII, Lot S, p3												
ASKARJ/ Terra Indígena do Seringal Independência	A definir		69975-000	JORDAO	JOAO	AC				256		
ASKARJ/ Terra Indígena Kaxinawá do Jordão	A definir		69975-000	JORDAO	JOAO	AC				256		
Prefeitura Municipal de Manoel Urbano	A definir		69950-000	MANOEL URBANO	MLU	AC				256		
MMA/ Comunidades Guardiãs do Alto do Rio Juruá/ T.I. Araras	A definir		69983-000	MARECHAL THAUMATURGO	MLTO	AC				512		

Escola da Floresta/ CEFLORA	A definir		69983-000	MARECHAL THAUMATURGO	MLTO	AC				512	
Escola da Floresta/ Sede	A definir		69983-000	MARECHAL THAUMATURGO	MLTO	AC				512	
Prefeitura Municipal de Porto Acre	A definir		69921-000	PORTO ACRE	POAC	AC				512	
MMA/ Resex em criação - Rio Crôa/ Alagoinha	A definir		69980-000	CRUZEIRO DO SUL	CZU	AC				512	
NTE Cruzeiro/ Secretaria de Estado de Educação – Regional do Juruá	A definir		69980-000	CRUZEIRO DO SUL	CZU	AC				512	
MMA/ Reserva Extrativista do Riozinho da Liberdade	A definir		69980-000	CRUZEIRO DO SUL	CZU	AC				512	
Base do Ibama do Parque Nacional da Serra do Divisor	A definir		69980-000	Cruzeiro do Sul	CZU	AC				512	
Prefeitura Municipal de Sena Madureira	A definir		69940-000	SENA MADUREIRA	SMD	AC				512	
Do lote TB, p 1											
Escola Prof. Pedro de Castro Meireles - (Fase 3)	Avenida Paraná, s/n	Centro	69945-000	Acrelândia	ACLD	AC	10º 4m 43,2s	67º 3m 22,3s	12009229	512	
Centro Cultural Sebastião Dantas	Rua Vitória Salvatierra, 190	Ferreira da Silva	69932-000	Brasiléia	BLI	AC	10º 59m 55,9s	68º 45m 2,1s		256	
Secretaria de Estado de Desenvolvimento Humano e Inclusão Social	Rua Capitão Pedro Vasconcelos, 179	Aeroporto	69934-000	Epitaciolândia	EPT	AC	11º 1m 47,1s	68º 44m 21,2s		512	
Secretaria de Estado de Desenvolvimento - Centro da Juventude	Rua Dilmo Martins, s/n	Manchete	69928-000	Plácido de Castro	PCY	AC	10º 19m 31s	67º 11m 6,7s		512	
Secretaria Estadual de Educação - Governo do estado do Acre	Rua Riachuelo, 138	José Augusto	69909-020	Rio Branco	RBO	AC	9º 57m 57,5s	67º 48m 30,3s		1024	
Destacamento de Telecomunicações de Controle do Espaço Aéreo-Rio Branco	Outros Aeroporto Internacional de Rio Branco, s/n	Custódio	69908-970	Rio Branco	RBO	AC	9º 51m 26,9s	67º 53m 46,6s		512	
3º Pelotão Especial de Fronteira - 4º BIS	Rua Colômbia, s/n	Bosques	69909-700	Rio Branco	RBO	AC	10º 19m 29,5s	67º 11m 19,4s		512	
2º Pelotão Especial de Fronteira - 4º BIS	Rua Colômbia, s/n	Bosque	69909-700	Rio Branco	RBO	AC	10º 35m 46,5s	69º 33m 45,6s		512	

1º Pelotão Especial de Fronteira - 4º BIS	Rua Colômbia, s/n	Bosque	69909-700	Rio Branco	RBO	AC	11º 1m 27,8s	68º 44m 5,4s		512		
5ª Delegacia do Serviço Militar da 31ª CSM	Avenida Nações Unidas, 1072	Bosque	69900-901	Rio Branco	RBO	AC	9º 57m 58,9s	67º 49m 3,5s		512		
Comando de Fronteira- Acre E 4º Batalhão de Infantaria de Selva	Rua Colômbia, s/n	Bosque	69909-700	Rio Branco	RBO	AC	9º 57m 24,9s	67º 48m 39,8s		512		
7º Batalhão de Engenharia de Construção	Avenida Nações Unidas, 2100	Estação Experimental	69912-600	Rio Branco	RBO	AC	9º 57m 56,8s	67º 49m 26,9s		512		
Biblioteca Pública Estadual Adonay Barbosa dos Santos	Avenida Getúlio Vargas, 389	Centro	69900-660	Rio Branco	RBO	AC	9º 58m 19,2s	67º 17,48m 42,8s		512		
Prefeitura Municipal de Senador Guiomard - Secretaria Municipal de Assistência Social	Avenida Castelo Branco, 1159	Centro	69925-000	Senador Guiomard	SWD	AC	10º 9m 8,5s	67º 44m 21,3s		512		
Fundação Memória Chico Mendes	Rua Pio Nazario, 292	Centro	69930-000	Xapuri	XPI	AC	10º 39m 7,1s	68º 30m 7,7s		256		
Colégio Municipal Novo Horizonte	RUA KESSIA LOPES CARNEIRO	Centro	69945-000	Acrelândia	ACLD	AC			12023531	512		
ESC JOSE RUY DA SILVEIRA LINO	Rua Olegario França s/n	Leonardo Barbosa	69932-000	Brasiléia	BLI	AC			12016535	512	NULL	
Escola Municipal Raimunda da Cunha Aires	Rua São Sebastião s/n	Jose Assem	69934-000	Epitaciolândia	EPT	AC			12018821	512		
From Lot TB, p. 2												
ESC JOANA RIBEIRO AMED	AV SANTOS DUMONT, 1236	CENTRO	69934000	EPITACIOLANDIA	EPT	AC			12017108	512		
ESC JOAO RICARDO DE FREITAS	AC 40 KM 03, NULL	NULL	69928000	PLACIDO DE CASTRO	PCY	AC			12023779	512		
ESC JOSE RIBAMAR BATISTA	RUA RIO GRANDE DO SUL, 2570	AEROPORTO VELHO	69903420	RIO BRANCO	RBO	AC			12028860	512		
ESC LEONCIO DE CARVALHO	ROD AC 40 KM 08 RAMAL BENFICA, NULL	BENFICA	69900050	RIO BRANCO	RBO	AC			12012750	512		
ESC COLEGIO ESTADUAL BARAO DO RIO BRANCO	AV GETULIO VARGAS, 443	CENTRO	69909650	RIO BRANCO	RBO	AC			12011444	512		

ESC PROF JOSE RODRIGUES LEITE	RUA BENJAMIM CONSTANT, 493	CENTRO	69900050	RIO BRANCO	RBO	AC			12012181	512		
ESC LUIZA CARNEIRO DANTAS	RUA SERTANEJA, 1777	CIDADE NOVA	69900050	RIO BRANCO	RBO	AC			12013021	512		
ESC ALCIMAR NUNES LEITAO	CONJ UNIVERSITÁRIO II AV. PASTOR MUNIZ, 1072	DISTRITO INDUSTRIAL	69915300	RIO BRANCO	RBO	AC			12011584	512		
ESC LOURIVAL SOMBRA PEREIRA LIMA	CONJUNTO TANGARA, NULL	EXTACAO EXPERIMENTAL	69912000	RIO BRANCO	RBO	AC			12013013	512		
ESC HUMBERTO SOARES DA COSTA	TV RIACHUELO, NULL	JOSE AUGUSTO	69909020	RIO BRANCO	RBO	AC			12012017	512		
ESC GLORIA PEREZ	AV. BRASIL CONJ XAVIER MAIA, 85	PLACAS	69918430	RIO BRANCO	RBO	AC			12027758	512		
ESC LOURIVAL PINHO	RUA GUILHERMINO BASTO 2º DISTRITO, NULL	TRIANGULO VELHO	69900970	RIO BRANCO	RBO	AC			12027340	512		
ESC INSTITUTO DE EDUCAÇAO LOURENÇO FILHO	AV GETULIO VARGAS, 2855	VILA IVONETE	69908650	RIO BRANCO	RBO	AC			12012580	512		
ESC DIVINA PROVIDENCIA	RUA BENJAMIN CONSTANT, 118	CENTRO	69930000	XAPURI	XPI	AC			12017540	512		