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SENEGAL SANS FIL: DEPLOYING A MUNICIPAL WIRELESS NETWORK IN SENEGAL

A FEASIBILITY STUDY

August 2006

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CONTENTS

ACRONYMS

AGOA	African Growth and Opportunity Act
ADIE	Agence De l'Informatique de l'Etat
ADSL	Asynchronous Digital Subscriber Line
AOF	Afrique Occidentale Française
AP	Access Point
ART	Agence de Régulation des Télécommunications
ATI	Alliance Technologie Informatique
BDS	Business Development Services
BPL	Broadband over Power Lines
CAPEX	Capital Expenditure
CDMA	Code Division Multiple Access
CISPR	Radioelectrectric Interferences Special International Committee
COP	Chief of Party
CRDS	Centre de Recherche et de Documentation du Sénégal
CSS	Compagnie Sucrière Sénégalaises
DFI	Digital Freedom Initiative
DS3	45 Mbps
DSL	Digital Subscriber Line
E1	2,048 Mbps
ESP	Ecole Supérieure Polytechnique
ETSI	European Telecommunications Standards Institute
FAC	Fonds d'Aide et de Coopération
FCC	Federal Communications Commission
GDS	Grands Domaine du Sénégal
GSM	Global Service Mobile
GOS	Government of Senegal
HIPERLAN	High Performance Radio Local Area Network
ICT	Information and Communication Technologies
IP	Internet Protocol

IPM	Institution de Prévoyance Maladie
IQC	Indefinite Quantity Contract
IRG	International Resources Group
ISP	Internet Service Provider
ITU	International Telecommunications Union
LTL	LTL Strategies
M&E	Monitoring and Evaluation
NRA	National Regulatory Authority
OPEX	Operational Expenditure
PPP	Public-Private Partnership
PPIP	Projet de Promotion des Investissements Privés
QoS	Quality of Service
RF	Radio Frequency
RFID	Radio Frequency Identification
RLAN	Radio Local Area Network
SAED	Société d'Aménagement et d'Exploitation du Delta
SAGIC	Support for Accelerated Growth and Increased Competitiveness
SC	Steering Committee
SME	Small and Medium Enterprise
SMS	Short Message Service
SO1	Strategic Objective 1
SOGED	Société de Gestion et d'Exploitation de Diama
SONATEL	Société Nationale des Telecommunications
SOW	Statement of Work
STE	Sénégalaise de Télécommunications
TC	Telecommunications Code
TCP/IP	Transmission Control Protocol/Internet Protocol
TO1	Task Order 1
TO2	Task Order 2
UCAD	Université Cheick Anta Diop
UGB	Université Gaston Berger
UNETTS	Union Nationale des Exploitants de Telecentres et Teleservices du Sénégal

USAID EG	Support for Accelerated Growth and Increased Competitiveness
USAID	U.S. Agency for International Development
USAID EG	USAID's program on economic growth
USG	United States Government
VOIP	Voice Over Internet Protocol
VSAT	Very Small Aperture Terminal (small satellite dish)
WAEMU	West African Economic and Monetary Union
WiFi	Wireless Fidelity
WISP	Wireless Internet Service Provider
WMN	Wireless Municipal Network
WiMAX	Worldwide Interoperability for Microwave Access

I. BACKGROUND

The USAID/Senegal Support for Accelerated Growth and Increased Competitiveness (SAGIC) program is an Indefinite Quantity Contract (IQC) which builds on USAID/Senegal's successful work on competitiveness enhancement, the considerable potential of the $200-million African Global Competitiveness Initiative announced by President Bush in 2005, successes of the West Africa Trade Hubs in Dakar and Accra, the Agricultural and Natural Resource Management Program known as "Wula Nafaa" which helps local communities to increase trade in non-traditional and natural resources, the Digital Freedom Initiative and the Government of Senegal's own program on accelerated economic growth.

The Government of Senegal (GOS) has recognized the importance of a vibrant and competitive private sector, and has developed an Accelerated Growth Strategy, which USAID/Senegal supports. The GOS also recognizes that the key to development is attracting private investment. The challenge is to identify the strategic areas that have the proper conditions to yield the most impact on economic growth in Senegal.

On December 12, 2005, USAID/Senegal awarded International Resources Group (IRG) a single award IQC to provide technical expertise and management in areas related to accelerated growth, increased competitiveness and trade. The IQC has the following four components:

- Development of strategic sub-sectors using a Business Development Services (BDS) model or other state-of-the-art intervention, to promote increased trade, especially AGOA-related trade.
- Development of public-private partnerships (PPPs) that attract investment for efficient delivery of public goods or services.
- Policy reforms for improved business environment.
- Fiduciary services/management services and building Government of Senegal (GOS) capacity.

The first Task Order (Task Order #1) under the SAGIC IQC temporarily known as USAID's program on economic growth (USAID EG) covers three components: Business Development Services (BDS), Public-Private Partnerships (PPPs), and Public Policy Reforms. It requires IRG to use local expertise in all aspects of the implementation of the scope of work, and to help build the capacity of firms in Senegal to provide advisory services, particularly related to trade, BDS and PPPs. In addition, USAID/Senegal wishes to support the desire of the GOS to strengthen its own capacity in these areas; therefore, IRG may be required to place experts in GOS entities to address various technical areas of the scope of work.

This Feasibility Study has been completed under the second Task Order (Task Order #2) of the SAGIC IQC with a goal of building on the progress made and lessons learned from the first phase of the Digital Freedom Initiative (DFI). The goal of the Digital Freedom Initiative (DFI) is to promote economic growth by transferring the benefits of information and communication technology (ICT) to entrepreneurs and small businesses in the developing world. The DFI/Senegal Steering Committee (SC) recognizes the need to move from "micro" to "macro" activities to achieve a bigger impact by focusing on universal access through deployment of low cost alternative infrastructure for communication, especially for Internet.

II. EXECUTIVE SUMMARY

This study was conducted over a six week period by a team of five evaluating the areas of telecommunications policy, infrastructure, market demand and public-private partnerships as they pertain to deploying a municipal wireless network in a secondary Senegalese city. The team conducted onsite visits and interviews, as well as literature searches to obtain the information necessary to complete the study. Additionally, a detailed analysis of the legal policies and regulations affecting the possible deployment of a municipal wireless network was conducted simultaneously with the other project activities. Specifically, the team investigated the areas of:

A. Policy Challenges

B. Infrastructure Challenges

C. Market/Business Challenges

D. Project realization through a Public-Private Partnership (PPP) Approach

The first order of business was to select the pilot city where the municipal wireless network would be deployed if it proved feasible. A decision matrix was constructed and three candidate cities were selected for onsite visits and evaluation. The result of that process was the selection of Saint Louis as the pilot city. Saint Louis provides a rich tapestry of all the economic and cultural sectors a wireless municipal network could impact in a positive fashion and would provide for the demonstration of the economic enhancing power of a wireless municipal network. It would also serve as an excellent proving ground for applications and services to be extended to other municipalities in Senegal if it was decided to expand the WMN throughout Senegal.

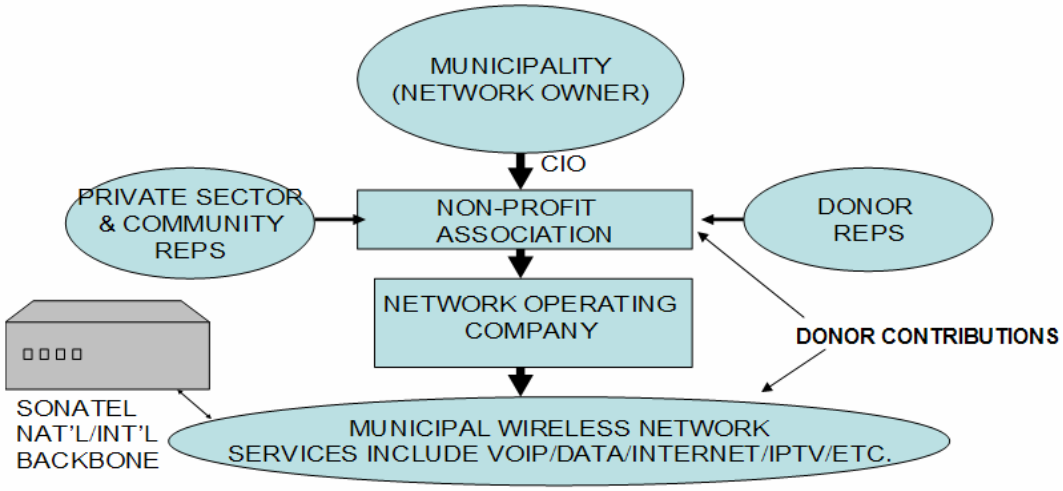
THE GOOD NEWS

The team's work concluded that indeed, a wireless municipal network would be an excellent approach for Senegal to utilize to accelerate economic activity through empowering its citizens, businesses and municipalities while significantly reducing the digital divide. Interviews with potential public and private stakeholders produced concrete indications that a public-private partnership approach to deploying the network would be feasible.

The business model suggested, with modifications appropriate for Senegal, resembles that of the approach chosen by Philadelphia and Boston to build their WMNs wherein the municipality contracts with a nonprofit entity to actually manage the network. It is important to point out that while both Philadelphia and Boston have an advanced culture in, and use of, Information Technologies - including Chief Information Officers (CIO). Such is not the case in Saint Louis. Thus, the function and culture of a CIO would have to be implemented by the PPP in order for Saint Louis to reap the maximum benefit from its WMN and move to sustainability of this technological approach.

A representation of the business model is shown on the following page.

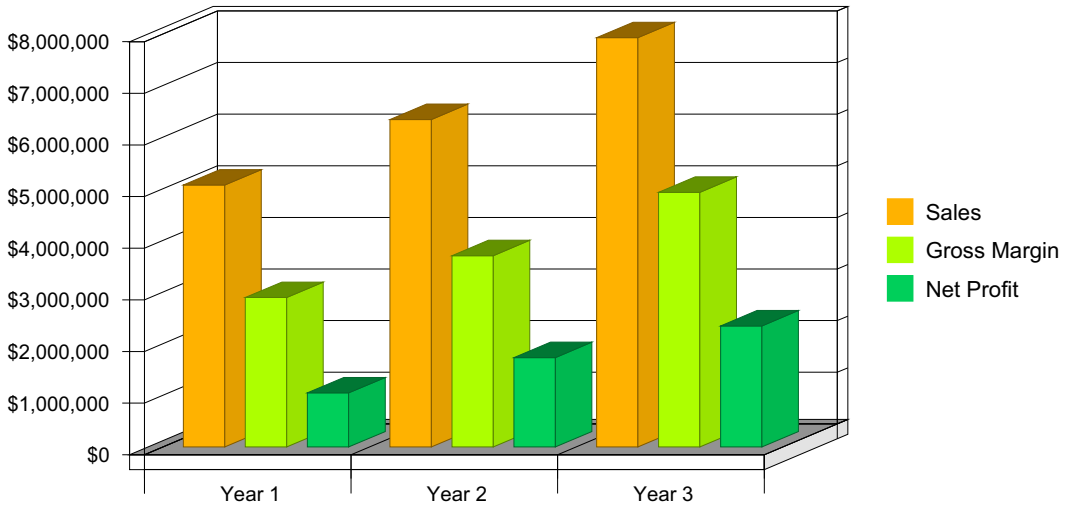
Figure 1. Senegal Sans Fil Business Model



With this business model, the nonprofit association will receive income from the operation of the WMN and will use those funds to assure universal access goals are met as well as the staffing and training of a municipal IT department under the leadership of a Chief Information Officer.

A key to this PPP approach is that private sector operators will bring their own investment funds and bid on an RFP, issued by the nonprofit company, to build and operate the actual network. In order to demonstrate that investors will be interested, a full, notional business plan for installing and operating such a network has been completed and can be found in Appendix C.

This plan shows that with an investment of $2,000,000, a very modest sum for telecommunications projects, an income of close to $1,000,000 can be generated within a year with increasing revenues thereafter:



BUSINESS OBJECTIVES:

- Sales over $3,000,000 in the first year
- Increase contracted sales force to 30 by year 3
- Net worth over $20,000,000 by year 3.
- Coverage 100% of the population by end of year 2.

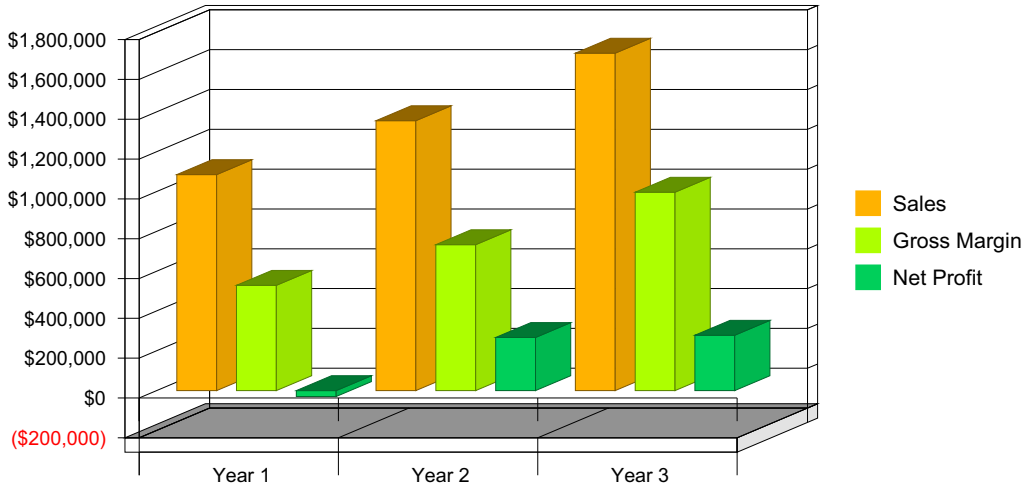
A significant portion of the income of the operating company, will go to the nonprofit association to assure universal access and digital divide issues are adequately addressed via, for example, improving municipal IT capabilities and processes, connecting underserved segments of the population, providing training via cybercenters, purchasing required computers and IT equipment for villages, and so on. Another benefit of this business model is that it creates a win-win situation with SONATEL which will realize increased revenues from providing bandwidth and services to the customers of the wireless municipal network, through the nonprofit association, most of whom will be new customers.

ASSUMPTIONS:

- Two million dollars is the capital needed to cover the entire area that includes the university, all industries and businesses.
- Coverage area is 13 KM for 100% coverage and 50 KM for point-to-point to service such businesses as the sugar factory.
- Hybrid equipment utilizing tri-band frequencies of 2.4 GHz (WiFi), 4.9 GHz (emergency services) and 5.8 Ghz (WiMax for backhaul and point to multipoint services for businesses with very large needs).
- Sufficient working capital to meet all the needs of the company as securing bank financing or other financing is difficult and very expensive in Africa.
- Approach is based on real-life, actual, African experiences and thus represents a 'most likely' scenario.

Worst case scenario

As stated, the scenario above is based on real-life, African experiences and is thus a 'most likely' scenario. However, in the event that unforseen problems arise that impinge on the level of business – and thus profits, generated by this business – we have constructed a 'worst case scenario.' The full business case for is included in Appendix D.



BUSINESS OBJECTIVES:

- Sales over $1,000,000 in the first year
- Increase contracted sales force to 10 by year 3
- Net worth over $3,000,000 by year 3.
- Coverage 20% of the population by end of year 2.

- Services Penetration 15% of the population by end year 2.
- Services Penetration 15% of the business by end year 2.
- Services Penetration 15% local government by end year 2.

ASSUMPTIONS:

- **Same as above**

In this scenario, it can be seen that the network penetration is much smaller and will take a longer time period to reach 100% of the municipality. In a case such as this, an 'anchor tenant' approach could be utilized in the short-term to bolster profitability and increase the attractiveness of the project to the private sector. An example of the anchor tenant approach can be seen in the case of Macedonia where USAID is providing two million dollars a year to the private sector operator, to connect some 500 schools for two years. However, this appraoch should be undertaken carefully with a viable 'exit strategy' for USAID to cease such payments while the service to the schools continues.

THE BAD NEWS

Unfortunately, as excellent an approach as this is (under the most likely scenario) for improving the quality of life and economic growth for Senegal's citizens, it cannot be deployed under current Senegalese laws and regulations. Through the advanced technologies utilized in the WMN, the municipality would be able to offer a full range of telecommunications services, making it a telecommunications operator. Under current Senegalese law, this is not permitted. Additionally, the current legal environment does not allow any private sector operator to install and operate such a network. To permit this would require a long and tenous process to change existing laws.

THE WAY FORWARD

Our review of Senegalese law points to two ways to move forward:

1. Change the law to allow municipalities to become operators (as was done in France in 2004); or
2. Assist the municipality of Saint Louis to create a "Convention Agreement" with the government of Senegal, allowing it to operate its own network.

Of the two solutions above, it is recommended to proceed with the second solution. A "Convention Agreement" could be written, agreed upon and concluded within 3 months. Changing the law would be much more difficult and take much longer.

It should be noted that SONATEL does not need to compete to become an operator as it already has the right to install such a network anywhere in Senegal. Their priorities to date have not led them to undertake such a task (like large incumbent businesses everywhere) and because of the win-win approach suggested herein, we believe they will derive enough profit from partnering with this effort rather than trying to compete with a smaller, more nimble, highly competent operator chosen by the municipality.

RECOMMENDATIONS

The team thus recommends that the DFI Steering Committee, with USAID financial assistance, assist the leaders of Saint Louis to conclude a "Convention Agreement" with the government of Senegal. Following the signing of this Agreement, USAID could move forward with the next steps required to deploy a wireless municipal network in Saint Louis.

The team does recommend, however, that in lieu of creating a PPP Management Committee in Phase 2 that USAID assist in the creation and implementation of a PPP nonprofit association, comprised of

telecommunications and business experts, to oversee the installation and operation of the wireless municipal network and assure universal access goals are achieved.

The team also recommends that USAID use existing DFI funds to initially provide for the hiring and training of a Chief Information Officer for the municipality. The CIO function is a critical success factor to this project. According to the Treasury Board of Canada, the six strategic priorities of the government CIO are:

1. Consolidate and transform IT infrastructure and applications services.
2. Establish robust and comprehensive IM Program.
3. Lead the development of workplace and workforce to support the IM and IT agendas.
4. Enable transformation of programs and services.
5. Improve outcomes in IM and IT enabled initiatives.
6. Renew management practices in Privacy, Access to Information and Security

These priorities form the bedrock of a sound e-government program. In the U.S., the function of the government CIO is also taken very seriously. Indeed, the General Services Administration has formed a CIO University (http://www.cio.gov/index.cfm?function=cio_university) in collaboration with six universities. For several years, USAID has been providing training for regulators utilizing the United States Telecommunications Training Institute (www.ustti.org). USAID Senegal should look into creating a government CIO training course with USTTI, perhaps utilizing the two universities in the consortia located near Washington DC: George Mason and George Washington Universities.

In summary, USAID Senegal should use its remaining DFI funds for assisting the St. Louis municipality to:

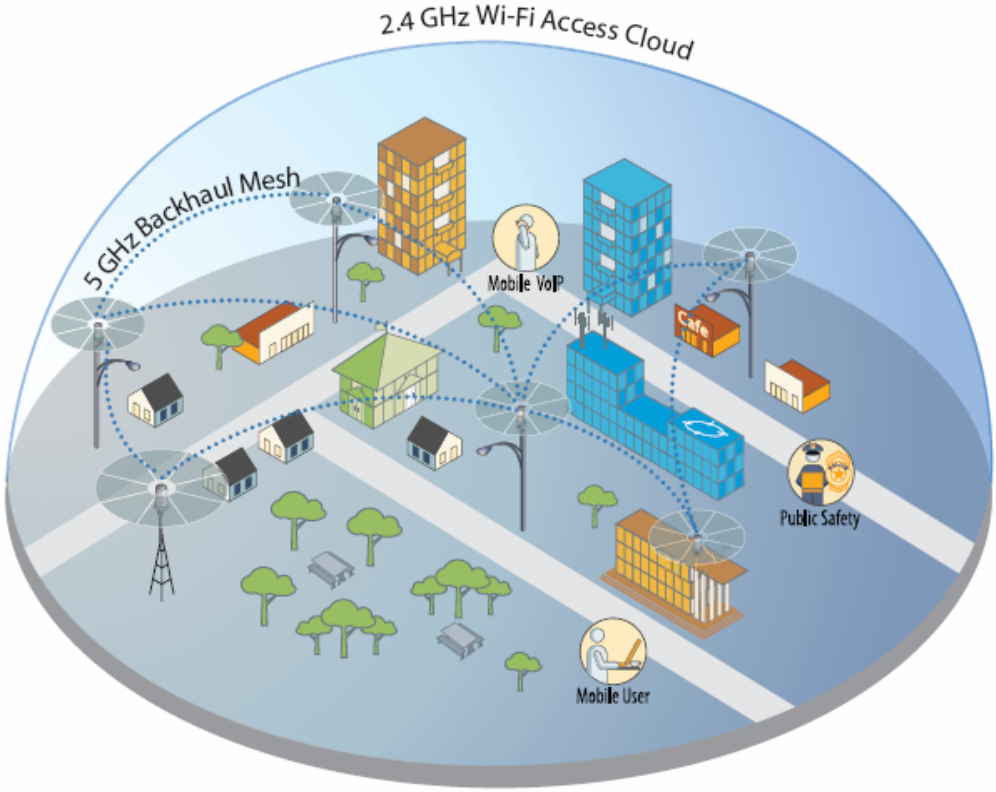
- Conclude a Convention Agreement
- Assist with the formation and staffing of the nonprofit association
- Prepare and issue an RFP (assuming a successful Convention Agreement is reached)
- Evaluate RFPs and select vendors
- Select, hire and train a CIO
- Provide first year's salary for the CIO (ongoing salary will be paid by income from the MWN)
- Encourage, and proactively organize, other donor participation and donations via a PPP approach

As discussed in Section IV, our research on the PPP approach shows that USAID will not be alone in this endeavor as there are many potential donors willing to be partners in this effort.

III. FEASIBILITY STUDY—WIRELESS MUNICIPAL NETWORKS

A wireless municipal network (WMN) is a network that covers an entire municipality (city, county or village) with an 'always on' wireless broadband connection to the Internet. The term 'broadband is open to interpretation but for the purposes of this study will be considered as having at least 256 kbs upload and download speed – with considerably more speed available for businesses and power users. The WMN is available everywhere within the municipality to include indoors, outdoors and while moving around within the municipality (mobile). This approach has been made technically possible by WiFi and Wi-Max wireless technologies which have substantially lowered costs and increased geographic coverage while still providing a high Quality of Service for telecommunication networks via a wireless approach. One vendor depicts the WMN as follows:

Figure 2: Vendor's Representation of a Municipal Wireless Network



In addition to being ubiquitous and always-on, the other critical attribute of the WMN is that it is usually owned and/or operated by the municipality it serves. One exception is Google's provision of free broadband access to all the residents of the town in which its headquarters is located.

Wireless Municipal Networks are a revolution in telecommunications, and installations are growing rapidly as it is the most cost-effective way to achieve universal access and eliminate the digital divide. There are already hundreds of WMNs installed in smaller communities throughout the world and hundreds more will be installed this year in the United States, Europe and Asia. Outside of Mauritius, which has stated its intention to becoming a 'wireless nation', Senegal would be the first in Africa to have a WMN.

Municipalities turned to this approach in the realization that telecom companies simply were not able or willing to cover all the inhabitants within that municipality. In Philadelphia for example, the Mayor stated that more than 40% of its citizens do not have access to broadband, as one of the reasons for deploying their WMN. The other reasons, also aimed at Universal Access and better citizen services, were given as:

- To spur economic development
- To enhance community neighborhoods
- To help overcome the Digital Divide
- To reduce the cost of government

Furthermore, the city branded its activity as "Wireless Philadelphia" with a mission statement that read: "Wireless Philadelphia aims to strengthen the City's economy and transform Philadelphia's neighborhoods by providing wireless Internet access throughout the city. Wireless Philadelphia will create a digital infrastructure to help citizens, businesses, schools and community organizations make effective use of this technology to achieve their goals while providing a greater experience for visitors [tourists] to the city."

Grand Haven, Michigan claims to be the first city in the U.S.A. to be completely covered end-to-end with WiFi Internet access. Some of the benefits already claimed by them as a result of deploying this network are:

- Bridging the digital divide through lower cost Internet and VOIP telephony
- Increased quality of life for residents and businesses
- Reduced city operational costs and increased city revenue
- Improved public safety and health
- Improved education
- Increased attraction for tourism

WMNs with similar missions and goals are underway in other large cities such as Atlanta, Portland, San Francisco, etc., and the Mayor of Paris recently met with the Mayor of Philadelphia to explore possibilities.

The goal of this study is to explore the feasibility of deploying Wireless Municipal Networks in Senegal, in a sustainable and replicable fashion, municipality by municipality until a true "Senegal Sans Fil" becomes a reality and citizens throughout Senegal, whether urban or rural, will have access to broadband Internet and the economic and social benefits such access enables.

The feasibility of such a deployment depends on four areas:

1. Infrastructure adequate to support the deployment, operation and maintenance of required equipment and services.
2. Demand and Supply for the products and services that will provide the economic and social benefits envisioned (E-commerce, E-gov, E-learning, Health, Agriculture, Tourism, etc.)
3. Policies as they relate to telecommunication network ownership and operation.
4. Ability to create a Public-Private Partnership to build and operate the network.

The extent to which Senegal can positively address these 4 areas will determine whether "Senegal Sans Fil" can be a reality.

METHODOLOGY

Our approach for this feasibility study was to select a pilot city in Senegal which will provide a rich palette of activities/requirements to demonstrate the power of Municipal Wireless Networks and their sustainability and replicability throughout Senegal. That is, to determine the feasibility of providing an affordable, ubiquitous, 'always-on', wireless network in a secondary city in Senegal in a manner that provides a high quality of service (QoS), is widely utilized in a productive manner (e-Gov, E-learning, E-commerce, health and agriculture sector improvement, etc), is sustainable and is replicable in additional secondary Senegalese cities.

SELECTION OF PILOT MUNICIPALITY

Given the significant cost and effort to design and install a municipal wireless network (MWN), as well the importance of such networks to the economic growth of Senegal; it is critical that the location for the pilot effort provide the best environment (product and service variety and demand) for obtaining a successful and sustainable network. The results of completing that network, including products and services created, as well as lessons learned, can then be used to replicate such networks more successfully, and on an appropriate scale, throughout Senegal. With this in mind, the criteria listed in the matrix below, are considered 'critical success factors' and are used for selecting the most likely candidates for this pilot project. While the criteria are certainly present in all cities, an '**X**' indicates that that the team believes that criterion is present **and** sufficiently robust to **meet the needs of this project.**

Criterion	Cities					
	Ziguinchor	St.-Louis	Mbour	Thies	Kaolack	Diourbel
Existing ITC Infrastructure	–	X	X	X	X	X
Electric Power Infrastructure	X	X	X	X	X	X
Sufficiently large gov't. bureaucracy (E-Gov)	X	X	X	X	X	X
Large University (E-Learning)	–	X	–	X	–	X
Local Expertise Available	–	X	X	X	–	–
Number of Cybercafes	–	X	X	X	X	–
Diverse Commercial Activity (E-Commerce)	X	X	X	X	X	X
Port/Airport (RFID, etc.)	X	X	–	–	–	–
Tourist Destination (E-Tourism)	X	X	X	–	X	–
Population Size	X	X	X	X	X	X
	6	10	8	8	7	6

The team decided not to apply weighting to the criteria unless there was no unequivocal best candidate. Based on the results of the decision matrix analysis, three cities were chosen as candidates: 1)Saint Louis; 2)Thies; and 3)Mbour. While Saint Louis was the best and thus primary candidate per the matrix, buy-in by local stakeholders is critical and thus two additional candidates were selected as backups should problems arise with Saint Louis. The next step was to send our team members to the candidate cities to conduct onsite research and data gathering to permit analyses of the following areas:

A. Policy Challenges (National Level)

- Spectrum allocation/management and interference
  - what frequencies are available
  - are they licensed or unlicensed
  - how will interference be handled

- Voice Over Internet Protocol (VOIP)
  - who can offer VOIP
  - what rules/regulations pertain to VOIP
  - are regulatory changes required
- Universal Access
  - how will a municipal wireless network positively impact this goal
  - are there any regulatory/legal issues
- Competition
  - are processes related to licensing voice and data telecommunications pro-competitive

B. Infrastructure Challenges

- Existing Infrastructure
  - what are the existing broadband access technologies available, e.g., DSL, optical fiber, VSAT (satellite), Broadband Over Power Lines (BPL)
  - electric power situation/availability
- Proposed Broadband Infrastructure
  - options for network ownership structures
  - technical management and operation roles required
  - network costs to include capital expenditure (CAPEX) and operational expenditure (OPEX)
  - technical customer service support wholesale bandwidth providers
  - electric power provision alternatives
- Site Recommendation
  - technical assessment of candidate cities/localities with prioritized recommendations of appropriateness from a technical standpoint

C. Market/Business Challenges

- Market/Demand Issues
  - provide a detailed market analysis showing existing estimated demand levels and future projections of demand for project's services
  - identification of market/customer segments
- Revenue
  - define revenue generation models with affordable pricing structures
- Supply Issues

- supply side inventory of local Internet Service Providers and available Content providers (need not be local at the beginning)
- an inventory of existing and potential value-added service and applications to be provided to customers/end-users

– Site Recommendation

- prioritized recommendations of appropriate pilot sites based on business factors

Lastly, if conditions in Senegal permitted the deployment of such a network, provide information for:

D. Project Realization and Management through a PPP Approach

– Utilizing Information from Above:

- propose a sound business model(s), funding strategy(ies), and options for structuring an appropriate public-private partnership (PPP)
- understanding the technical and business/market constraints, prioritize recommendations for the appropriate city/locality
- promote harmonization with existing and proposed national development programs and strategies
- if the feasibility study proves positive - estimate a timeline for implementing the proposed additional three phases (phases 2-4) of this project leading to replication of a municipal wireless network in additional Senegalese cities/localities

The team members conducted their onsite research and Saint Louis was confirmed as the best candidate city for the pilot. Thus the remainder of this feasibility study will focus on Saint Louis.

BACKGROUND ON ST. LOUIS

BRIEF HISTORY AND CULTURE SUMMARY

Saint-Louis city, former capital of French West Africa (AOF), was replaced by Dakar to become a modest regional capital. The city was founded in 1638 by French colonizers and was the first French permanent commercial counter, a big trade center, which included the slave trade. From this historical situation, Saint Louis has kept beautiful infrastructure built under colonial rule (bridge, rail roads, roads, administrative buildings, houses etc.). Saint Louis has also kept its culture and traditions.

POPULATION DATA

The 1988 population census shows a population of 818,560 inhabitants, which was 9% of the national population.

Population 2006

Department Dagana	213.342
Department Podor	343.436
Department Saint Louis	231.228
Saint Louis Commune	162 089
Total	788.006

Saint Louis has the second highest rate of unemployment among 11 regions of Senegal. Among job seekers, 50% are less than 35 years old and 67% are married and have dependants. 70% of those unemployed are illiterate and 90% do not have any professional training.

The poverty rate is high, 17% of the population has less than 224 FCFA a day. 65% of households do not have electricity, and 54% do not have clean water. The region has many migrants living overseas and the money transfer is very important.

EDUCATION

All levels of education exist in Saint Louis (K-12). The private sector dominates the kindergartens. Many kindergarten school age children are in Daara to learn Koran. The attendance rate in elementary school is about 80%. Middle schools are expanding. The region has seven public high schools, two vocational public schools, one public university, and many private higher education institutions. Associations offer literacy training classes to populations and the majority of students are women.

Besides all the infrastructure, the beggary is high among children attending Daara, (2-14 years old), teachers are not trained enough, there is a lack of classrooms and equipment, lack of teaching materials and books for students, and illiteracy is high among rural people.

Evolution of the Gross Enrollment rate

	Population 7/12 Years			Number of Students			Gross Schooling Rate		
Year	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
2002	51,750	53,975	105,725	45,897	47,541	93,438	88.7%	88.1%	88.4%
2003	53,093	55,375	108,468	48,710	52,212	100,922	91.7%	94.3%	93.0%
2004	54,824	57,180	112,004	51,425	54,941	106,366	93.8%	96.1%	95%

Source: inspection d'académie, situation économique et sociale de saint louis août 2005

Number of High Schools Students April 2005

Names of High Schools	Boys	Girls	Total
Lycée A.M. wellé	987	561	1,548
Lycée Ahmed Fall	0	1,339	1,339
Lycée Charles de Gaule	993	397	1390
Lycée Cheikh Omar Foutiyou Tall	622	403	1,025
Lycée El Hadji Baba Ndiongue	666	499	1,165
Lycée Prytanné Militaire C. N.	453	0	453
Total	3,721	3,199	6,920

Source: inspection d'académie, situation économique et sociale de saint louis août 2005

HEALTH

The region of Saint Louis has five health districts; a medical doctor heads each of them. The region has one regional hospital, a reference center located in Saint Louis, a department hospital in Ndioum, 5 health Districts, and 128 posts de santé.

Besides all the investment, health infrastructures are not enough and they are not equally distributed, and there are not enough personnel: 17 *postes de santé* were closed because of the lack of personnel. There is one medical doctor for 53,000 inhabitants. The region has one of the highest HIV/AID rates in Senegal (4% of the emigrant population were tested HIV positive in Ourossogui).

Overall, all health infrastructures are located in the city of Saint Louis

Distribution of Infrastructures

	Hospital	Health Centers	Poste De Santé				Rural Maternity	Case De Santé	Sous Brigade D'hygiéne	Cabinet Medical	Pharmacy
Saint Louis	1	1	2	12	4	18	4	31	1	6	13
Total Region	2	4	13	20	65	98	41	139	6	7	21

Source: Région Médicale, situation économique et sociale de saint louis août 2005

COMMUNICATIONS

The region has an international airport, a secondary seaport, 671 km of roads, 1,000 km of fiber optics from Dakar to Kidira. The railroad exists, but is no longer functional. Some zones, such as the Walo, are isolated during the rainy season, because of the many lakes in the region; villages can be isolated for up to two months. In the Diery, the lack of roads and secondary production roads prevents residents from selling their produce and buying other products.

RESULTS OF ONSITE RESEARCH – ST. LOUIS

A. POLICY CHALLENGES

The deployment of a municipal wireless network that may benefit the secondary Senegalese cities requires a sound analysis of the legal/regulatory framework of wireless communications services. Such an analysis will cover the four following issues:

- The radio spectrum policy,
- The type of communication services (VOIP) and their provision conditions,
- The services recipients (universal access) and
- The competition rules applying to voice and data telecommunications.

Consequently, we will mention the relevant existing provisions for wireless communications and determine whether legal and regulatory reforms are needed for the WIFI/WIMAX service implementation.

A.1 RADIOELECTRIC SPECTRUM POLICY

A.1.1 The legal and regulatory regimes applying to wireless telecommunications services

In Senegal, ***radioelectric frequency use*** is governed by both primary (telecommunications Code) and secondary legislation (decrees, orders and ART decisions).

A.1.1.2 A pre-approval regime for radioelectric terminal equipment, installations and installers:

The Telecommunications code and the ART (the Telecommunications Regulatory Agency). decision defines the pre-approvable conditions of terminal equipments, radio-electric installations and equipment installers.

This regime has been adopted in respect of the essential requirements.[1]

- **Radioelectric installations and terminal equipments:**

Whereas the telecommunications code (TC) provides that **radio-electric installations** are subject to **approval** (art. 18), it is allowed to establish internal networks and radioelectric installations exclusively made

[1] Essential requirements are restrictions in the general public interest and include the security of users and personnel of the telecommunications network operators, the protection of networks, the effective use of radiofrequency, the interoperability of the services and terminal equipments and data protection.

up of low power and limited range devices (art.20). The categories of these devices are listed by ART (ex: RLAN, HIPERLAN, alarms, wireless microphones, wireless telephones etc.).

Terminal equipments are then provided at no cost(art.27 of the Code). However if they are intended to be connected to a public telecommunications network, they are subject to a **pre-approval** by the ART or by a testing and telecommunications equipment measurement laboratory which must be certified by ART.

In any cases, the approval is required for the radioelectric equipments whether or not they are meant to be connected to a public telecommunications network. The radioelectric installations and terminal equipments shall, at any time, be consistent with the approved model.

ART's approval can be based on a recognized foreign approval certificate or a report delivered by a testing laboratory of a recognized reputation that certifies that the equipment is consistent with the standards of ITU (International Telecommunications Union), ETSI (Telecommunications Standards European Institute) or CISPR (Radioelectric Interferences Special International Committee).

The approval must be notified to the recipient within a two month period starting on the request date. The 2004 ART Decision defines the pre-approvable conditions of terminal equipments, radio-electric installations and equipment installers and provides that terminal equipments and radio-electric installations cannot be manufactured for the national market, imported, freely distributed or for valuable consideration, connected to a public telecommunications network or be publicly advertised if they are not pre-approved by ART (art.2).

- **Radioelectric installers:**

Testing laboratories and radioelectric equipments **installers**, working for their own right or for third parties, shall be approved by the ART (Art. 29 of TC). The latter recognises their technical qualifications in radiocommunications or telecommunications (art. 11 of the 2004 ART Decision). These installers shall be registered on the ART approved list.

ART will dispose of the approval application within a two month period. Any refusal is reasoned and notified to the applicant. If no response is given within that time frame, the approval is deemed obtained.

A.1.1.3 Licensing regime for the provision of public telecommunications networks and services:

A.1.1.2.1 License requirement:

A public network is defined as all the telecommunications networks established or used by a telecommunications company for the needs of the public.

A wireless municipal network is, accordingly to this definition, a public network,
The settlement and/or the operation of a public telecommunications network, and/or the provision of telecommunications services to the public are subject to a **license** (art.16 TC).

The license to set up and/or operate public telecommunications networks, and/or to provide telecommunications services to the public is a right given by decree stating the approval of a concession agreement and its specifications.

The concession convention determines the license object and duration, the renewal conditions and procedures, its modification and termination terms and conditions, and the conflicts resolution provisions (art.21).

The specifications state the network settlement and operation and the telecommunication services provision conditions and the obligations of the license holder.

The ART determines in the specifications:

- the conditions of continuity, quality, availability and access to the network and services;
- the nature and characteristics of the covered area and the network and services deployment time-table;
- the standards and specifications of the network and services;
- the radioelectric frequencies and the allocated blocks of numbers, the use conditions and the applicable fees;
- the minimum professional and technical qualifications and the requisite financial guarantees from the applicants;
- the universal service provision obligations and the satisfying of the users right to benefit the principle of equal treatment;
- the license period of validity and the conditions of its renewal;
- the terms of payment of the financial consideration
- the rights and obligations pertaining to interconnection

The license is awarded to any body corporate, winner of a bid, and that has engaged itself to observe the telecommunications code provisions and the specifications covering the public telecommunications network's terms of settlement and operation.

The competitive bidding procedure is ensured by ART and it includes at least the following steps:

- issuance of bid solicitation
- receipt of bids
- opening and evaluation of bids
- adjudication of the license

The license holder is subject to the payment of fees specified in the license specifications.
In relation to radio frequencies, the license will be awarded with a number of forethought frequencies.

A.1.1.2.2 ART authorization requirement:

ART is in charge of the management, planning, allocation and control of the radioelectric frequencies spectrum and the frequencies use conditions (art.3 of TC).

Under the 2003 Decree provisions, the allocation of radio frequencies for the network operation and service provisions results from an authorization application to ART which has a two months period to accept or refuse it.

Thus, the grant to the public telecommunications operator is given at the same time with the license, for the same duration and in the same conditions as for the license. A certain fee rate must be paid therefore.[2]

In addition, the operation of a radioelectric station requires an ART **authorization** under threat of financial penalty, affixing of seals or seizure of radiocommunication apparatus (art.36 of the 2003 Decree on Frequencies and radio-electric frequency bands, radio-electric apparatus and equipments operators). The application shall be a written document that includes the trademark and the number of apparatuses to be used, the desired frequency (ies) and the intended type of operation: private radios, radio ham, Citizen Band,

[2] The fees are composed of the costs of the application study which are once chargeable at the application date, the management costs of the spectrum resource authorization which are yearly payable, and the fees for the frequencies provision which are yearly payable.

For the rural telephony radio links, the radioelectric fee is levied for every couple of frequencies used in each local network.

etc. (art.37 of the Order). Moreover, for testing purposes, the applicant shall give to ART his telecommunications apparatuses for approval. The latter shall be returned to the applicant within a reasonable time frame(art.41 of the order).

This ART authorization is given for five years except for operators who are owners of public networks. The authorization is then renewable (art.16 of the Order).

A.1.2 PROVISIONS APPLYING TO THE USE OF WIRELESS TECHNOLOGIES FOR THE SETTLEMENT OF A MUNICIPAL WIRELESS NETWORK

A.1.2.1 The available frequencies:

The available frequencies on the radio spectrum are from 1.9 to 20 GHz.

- **2.4 GHz frequency band:**

The 2400 to 2483.5MHz bands are available for WiFi applications.
An ART authorization is required for the use of a frequency band for an independent network[3] and, for the implementation of a public telecommunications network.

- **2.5 GHz and 5.7 GHz frequency bands:**

It is possible to use 5.7 GHz and 2.5 GHz bands for WIFI applications but none have been allocated yet.

- **3.5 GHz frequency band:**

ART stated[4] that the use of wireless local loop networks for data transmission in the 2.4 and 3.5 and 5 GHz band frequencies in order to provide international telephony or high speed Internet services is subject to the grant of a license.

For the 3.5 GHz band, the ADIE (Information Technology Agency) and the third coming telecommunications operator[5] have been allocated 42 MHz each.

From the 3.3 to the 3.4 GHz frequency range and from the 3.6 to the 3.8 GHz range, wimax technologies can be deployed.

ART presently examines with the WIMAX forum this technology's development possibilities in Senegal.

A.1.2.2 Interference issues regulation

Whereas the Telecommunications Code states no provisions on interference as such, it sets out offences for telecommunications interrupts. Anyone voluntarily causing telecommunications interruptions resulting from wire failure, apparatuses degradation or any other means, is sentenced from two to five years imprisonment and a penalty of one to three millions FCFA Francs (art.56 of TC). It adds that anyone who, without the intent of interrupting the telecommunications, commits an act that causes interrupt will be sentenced to a maximum of six months imprisonment and a penalty of one to two millions FCFA Francs.

The 2003 Order firstly provides that radiolectric stations operation authorizations can include obligations for the holder to have his installations checked by ART if he considers that their operations may cause interferences and if the transmitter operation causes interferences with other radioelectric systems, he must take necessary technical measures to eliminate or reduce the interferences as expeditiously as possible. The related costs are supported by the holder.

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[3] An independent network is a telecommunications network reserved to a private or shared use. It is a private network when it is reserved to the use by the person or the body corporate establishing it. It is a shared network when it is reserved to the use by several persons or body corporates constituting one or several closed users groups in order to exchange internal communications within a same group.

[4] ART press release on the operation of Wireless local loop networks without prior authorization, 29 October 2005.

[5] SONATEL is the first operator having a global license and SENTEL is the second operator having a GSM license.

The 2003 Order secondly states that nobody can cause high interferences in radio communications and interrupt or seriously disrupt radio communications under threat of financial penalties, the affixing of seals, the apparatus seizure or the authorization withdrawal (art.69).

ART is the arbitrator in interferences disputes between radiolectric stations operation authorization holders (art.70) and invites the wrongdoer to readily cease all behaviours causing radioelectric interferences.

Besides the interference issues, the means to secure the network communications shall be analyzed.

A.1.2.3 The network securement measures

A.1.2.3.1 The telecommunications code

Art.37 of the Telecommunications Code provides that the use of a cryptology[6] means or service is allowed at no cost if:

- - the means or the cryptology service do not allow confidentiality functions but ensure the communication authentication or the integrity of the transmitted message,
- - the means or the cryptology service ensure confidentiality functions and use secret protocols adopted by an approved organization.

In other cases, the use of such technologies is subject to an ART authorization.

Moreover, the 2005 Decree[7] provides that for any signal exchanged on a public telecommunications protected by a code or an encryption, the operator shall provide ART with the decryption and code-breaking means.

Besides the telecommunications code, there are three other proposed legislations addressing contents transmitted via the network and covering cyber criminality, data privacy protection and digital signatures.

A.1.2.3.2 The cyber criminality bill

The specific offences, sentences and criminal procedures applicable to Information and Communications technologies are specified.

Punitive actions are taken against computer confidentiality[8], integrity [9]and availability[10] violations and computer data violations[11].

The proposed legislation is favorable to the proper functioning of a municipal wireless network as it ensures a protection against illegal attacks against an information system.

A.1.2.3.3 The personal data protection bill

This proposed legislation creates an incentive for users to have confidence in the wireless network as it ensures their data privacy protection. The following obligations apply to data communicated via the wireless

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[6] A proposed decree on the cryptology means and benefits is pending.

[7] Article 6 of the Decree on the general conditions for the establishment and operation of public telecommunications networks, 6 December 2005

[8] It is illegal to fraudulently access or try to access to all or a part of a computer system. A computer system is defined as all devices insulated or not, all interconnected devices ensuring all or parts of an automated data processing in execution of a program.

[9] It is illegal to impede or distort or try to impede or distort the functioning of a computer system

[10] It is illegal to fraudulently access or try to access, introduce or try to introduce data in a computer system.

[11] It is illegal to fraudulently intercept or try to intercept by any technical means computer data upon their transmission to, from or within a computer system.

It is also illegal to fraudulently damage or try to damage, erase or try to erase, impair or try to impair, alter or try to alter, modify or try to modify computer data.

network. The companies and other commercial agents named as data controllers[12]/processors will have to comply with these provisions.

The collection, processing, storing and use of personal data, the automated or non automated processing of data and the transborder flow of data by a person, the State, local governments, public or private corporate bodies are subject to this legislation,.

Data processing is subject to the consent of the data subject.

A data protection Commission is to be established. Its role is to ensure that personal data processings are consistent with the law on penalty of fines, to give prior approval to sensitive[13]data processing, to solve disputes, and to allow transborder data flows.

Personal data must be processed confidentially, fairly and lawfully, collected for specified, explicit and legitimate purposes, accurate and where necessary kept up to date.

The data controllers/processors[14]are obliged to ensure that appropriate technical and organizational measures shall be taken against unauthorized or unlawful processing of personal data and against accidental loss or destruction of, or damage to, personal data.

Data subjects have individual rights and remedies including a right of information on the identity of the data processor, its place of business, telephone numbers, access and rectification of inaccurate data and a right to object to data processing.

The Decree on the general conditions for the setting up and operation of public telecommunications networks provides specific conditions applying to the telecommunications sector. Billing and traffic data shall be processed in conformity with their declared purposes. Caller identification can be offered but the telecommunications operator shall give the data subject the option to deny any transmission of his subscriber number. In addition, unsolicited calls and call-forwarding requires the prior consent of the subscriber.

Telecommunications operators can benefit from servitudes and rights of way for the setting up and operating of their infrastructures and services.

A.1.2.4 Servitudes and rights of way for the wireless network operation

In relation to public telecommunications operators, art. 41 of the Telecommunications Code states that a decree provides the conditions and servitudes required by public and private operators for the exercise of their public service mission.

The 2005 Decree[15] states that public telecommunications networks operators can benefit from a right of way on the road public domain (all the public domain properties of the State, departments and communes allocated to road traffic) and radioelectric servitudes on private properties in order to allow the installation and protection of the network equipments and ensure good waves propagation. These servitudes on private properties will give to the owners a compensation right for the damage to the property, which damage has to be direct and certain.

The infrastructures and equipments installations on the public domain shall not be inconsistent with its allocation. They must be realized in respect of the environment and with a commitment to comply with the areas aesthetics and in the less harmful conditions.

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[12] An individual or undertaking who, either alone or jointly or in common with other persons, determines the purposes for which and the manner in which personal data are, or are to be processed.

[13] Data related to opinions and religious, philosophical, political activities, ethnic origins, race and sexual life, health, proceedings, administrative and criminal penalties (…).

[14] Any person who processes the data on behalf of the data controller.

[15] Decree on the prerogatives and servitudes of public telecommunications operators, December 6, 2005.

The servitude request is addressed to the mayor of the commune where the private properties are situated and it shall include the location state of these installations and a written opinion justifying the recourse to a servitude.

The 2005 Decree also states that servitudes and obligations for the protection of radiolectric receptions can be imposed in order to ensure the operation of radioelectric receptions carried out in any type of centers (art.12).

The occupation of the public domain is subject to the payment of fees.

A.1.3 LEGAL AND REGULATORY CONSTRAINTS ON THE RADIO FREQUENCY AND LICENSE ISSUES

A.1.3.1 Burdensome administrative procedures

The compliance of **all** terminal equipments, installations and installers to the above mentioned provisions can impose unnecessarily heavy burden on service providers in terms of technical specifications and time consuming procedures. Burdensome administrative procedures can constitute barriers to the free movement and trading of goods and the freedom to provide services.

New ART provisions can determine which equipments are subject to a conformity evaluation and those that do not guarantee the security of users and operators personnel, the telecommunications network protection and the good use of the radioelectric spectrum.

In relation to the operation of radioelectric stations, the ART administrative procedures can also constitute a barrier to the municipal network implementation.

Thus, Art. 41 of the 2003 Order may specify a time period instead of a reasonable time. The ART issuance process for the approval or refusal of authorization may also be shorter than two months.

For radio communications interferences, new provisions covering the ART arbitration process (powers, penalties and time period) may be necessary.

A.1.3.2 Licensing regime

The Senegalese Government published a white paper, named the Sector Policy Letter, which sets out the Senegalese State's objectives in the Information Technologies (ICTs) sector, the telecommunications strategy lines and the different action plans to implement.

A.1.3.2.1 Private operators providing public telecommunications networks and services

A.1.3.2.1.1 Operation through the obtaining of an experimental license

The Sector Policy Letter[16] asserts that several operators have expressed their will to experiment alternative telecommunications solutions but their initiatives are blocked due to the regulatory provisions in place. The Senegalese State intends to incrementally and selectively open the different telecommunications markets' segments to competition. Therefore it will envision granting experimental licenses to public telecommunications networks for the technologies testing in actual size and the validation of economic models.

Although the municipal wireless network project can be implemented through an experimental license, it might be difficult to obtain this type of license because of the state of the art. The wireless technologies are elsewhere used and there is no doubt in relation to its working. Moreover, this kind of license has not been addressed by any legal and/or regulatory framework yet and this lack constitutes though an obstacle to an experimental deployment.

A.1.3.2.1.2 Operation through the obtaining of a traditional public telecommunications license

[16] *La lettre de politique sectorielle*, January 2005.

- **The existing national law**

The obligation to be licensed in order to provide a public wireless municipal network is probably a limit to the development of local telecommunications network and services as it is a burdensome administrative, expensive and time-consuming procedure as described above.

There are currently two licensed telecommunications operators in Senegal: SONATEL[17] holding a global license and SENTEL holding a mobile telecommunications license.

The Senegalese government intends to launch a competitive bidding procedure for the grant of a global license and the ART is preparing the license specifications.

- **The West African Economic and Monetary Union [18] (WAEMU or *UEMOA*) regulatory framework**

It is relevant to mention that the Senegalese telecommunications regulatory framework will change in the coming years as a result of the transposition of the new regional framework.

Senegal is a member of the West African Economic and Monetary Union which adopts legislation in the form of directives and regulations.

Regulations directly implement WAEMU policy in member states without the need for member states to enact their own legislation. Directives require member states to implement their provisions nationally.

Six Directives[19] covering the telecommunications sector and aimed at promoting the deployment of telecommunications networks and services have been adopted. The Member States shall ensure that national regulatory authorities (NRAs) exercise due care and diligence to implement their provisions, and where relevant, adapt the legal and regulatory sector policies within two years after their effective date.

In 2008, the actual licensing regime shall be replaced by an **authorization** [20]and a **declaration** [21] regime setting less burdensome procedures.

The Directive on the harmonization of the regimes applying to network operators and services providers states that Member States shall ensure that the setting up and operation of public telecommunications networks, the setting up and operation of independent networks (telecommunications networks reserved to a non profit-making private or shared use) using the public domain, the provision of public telephony services, the provision of leased-lines services and the use of scarce resources (radioelectric frequencies and numbers) are only subject to **an authorization** and payment of **fees.**

Conditions on the use of radio frequencies[22] and numbers may be attached to the authorization and they must be proportionate and consistent with the competition rules provided in the West African Economic and

[17] Société Nationale des Télécommunications

[18] *Union économique et monétaire Ouest Africaine*

[19] The Directive N01/2006 on the harmonization of control and regulation policies of the telecommunications sector, the Directive N0 2/2006 on the harmonization of the regimes applying to network operators and services providers, the Directive N0 3/2006 on the interconnection of networks and telecommunications services, the Directive N0 4/2006 on the universal service and performance obligations of the network, the Directive N0 5/2006 on the harmonization of the telecommunications services pricing and the Directive N0 6/2006 organizing the general framework of cooperation between the telecommunications national regulatory authorities, March 23, 2006.

[20] An authorization is an administrative act (license, concession agreement, approval or any other authorizations) that grants to a company specific rights and obligations allowing the said-company to establish and operate networks or provide telecommunications services.

[21] A declaration is an act performed by an operator or a telecommunications service provider before starting its activities and that does not require from the said operator or provider to obtain an explicit decision from the national regulatory authority before exercising the rights resulting from this act.

[22] The attached conditions include: 1. the designation of the service or the network type and technology for which the right to use the frequency is awarded, 2. the technical and operational conditions to avoid harmful interferences and limit the public exposure and 3. tariff policy / territorial coverage / service quality (…)

Monetary Union Treaty. The authorization procedure is limited to a two months period after the application receipt. This time period may be extended to four months in specific cases defined in the national legislation implementing the Directive. If a Member State decides to limit the authorizations number, it shall publish a reasoned decision and launch a transparent, non discriminatory and proportionate bidding procedure.

In addition, the provision of Internet services [23]and value added services [24]including voice mail are subject to **declaration**. Specific conditions[25] may also be attached to a declaration. The national regulatory authority shall give a response within a month. Its silence over a period of four weeks amounts to an implied acceptance of the service declared.

This upcoming legislation in all the Union Member States is favorable to the deployment of a municipal wireless network as it will set out an **authorization** regime. The eligible telecommunications operator will operate the municipal wireless network and provide telecommunications services as soon as it complies with the authorization basic terms and conditions specified by the ART.

Our project to set up a municipal wireless network could be readily available if the Senegalese government takes the lead in adopting a legislation implementing these authorization and declaration regime and specifying the use conditions of radiofrequencies attached to the authorization.

A.1.3.2.1.3 Operation through the obtaining of a regional/local license

The Telecommunications' Sector Policy Letter emphasizes that the access to telecommunications services in rural areas is not extensive and that new telecommunications technologies availability at reduced deployment costs will help catching up regarding the provision of said technologies. It also mentions that the State would, if necessary, grant regional licenses to private operators in order to meet those goals. Those regional licenses are not available yet as they are not covered by any legal and /or regulatory provisions.

In this respect, the Senegalese government should undertake a review of the telecommunications code, and enact an appropriate new legislation that would, among other requirements, determine the allocation process (e.g. bidding procedure) and the regional license specifications.

A municipal wireless network operator will then be in a position to apply for this type of license.

A.1.3.2.2 Public operators providing public telecommunications networks and services

A.1.3.2.2.1 Operation through the obtaining of a regional/local license

Despite the universal service provisions and the obligation to satisfy users equally [principle of equal treatment, incumbent on private operators, public telecommunications networks and services are still restricted to urban areas and more accessible to middle or high income consumers. In his will to improve rural access to telecommunications, the Senegalese government plans through his Letter that in case of lack, inadequacy, or deficiency of "private initiatives" local governments shall be entitled, under specified conditions, to set up networks and provide telecommunications services.

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[23] Internet services includes services of electronic mail, data transmission, connection to a remote computer, dialogues in the form of written messages between users groups, information search in servers.

[24] Value-added services are telecommunications services which are not delivery services but they use support services or final telecommunications services to add other services to support services or answer new specific telecommunications needs.

[25] The conditions attached to a declaration include: 1. payment of fees for the participation to universal service, 2. services interoperability and networks interconnection, 3. requirements relating to the environment, the urban and land use planning, the access rights granted to the public or private domain and the infrastructure share conditions, 4. the network and services quality and continuity, 5. the personal data protection, 6. network security (…)

The possibility for local governments to provide public telecommunications networks and services requires a review of the Act on the Local Governments[26] in order to empower local authorities and specify the conditions under which they can operate.

The Local governments' missions are the design, programming and implementation of actions for the economic, educational, social and cultural development, in the regional, communal or rural interest (art.3 of the Local Governments Code).

Moreover, the proposed Act on the Information Society states that local governments, within the limits of its powers, participates to the development of the information society.

As soon as they will be granted the title of public telecommunications operators, they will be in a position to apply for or a regional/local license to provide public telecommunications networks and services.

A.1.3.2.2.2 Operation through a Concession convention between the State and the local government

The legislative review allowing local governments to become telecommunications operators is likely to be a time-consuming process, significantly affecting the implementation of the project. The Senegalese legal arrangements offer a way to go round such obstacle, by way of general provisions that are not expressly provided for the telecommunications sector. The government can actually delegate powers to local authorities in a given area of competence by virtue of a concession agreement Thus, it is conceivable that a local government enters into a concession agreement[27] with the Senegalese State for the provision of a telecommunication public service. It will then have jurisdiction on telecommunications activities, with a possibility to set up and/or operate public telecommunication network. This concession agreement additionally provides that the local government might ensure the telecommunication public service through the signing up of an arrangement with a private operator. By virtue of the local governments Code, the contract between the local government and the private operator can be a local industrial or commercial public service concession agreement or a farm-out agreement ("*affermage*")[28]". The difference between the two contractual options is that, in the "farm-out arrangement", the person in charge of the public service do not keep the full amount of fees collected on the users and has to remit part of the profits to the local government. Moreover, the private operator designation results from a bidding procedure.

This option is the most favorable at short notice for the implementation of a municipal wireless network as it does not require any legislative review but negotiations with the Government for the signing up of a concession agreement.

A.1.3.3 Over-the-Air Reception Devices

Whereas broadcast communications services are covered by legislations on audiovisual services, non-broadcast communications services are addressed in the telecommunications code and the secondary legislations. However, there are no specific provisions applying to satellite based communications network and services because the regulation is technologically neutral.

The obligation to obtain a license for the public provision of such networks and services or the authorization for the setting up of an independent network[29] applies.

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[26] The Act defining the Local Governments Code sets their administrative architecture which is the Region, the Commune and the Rural Community, March 22, 1996.

[27] The concession agreement charges a person or a body corporate to ensure a public service, at his own expenses, and who is paid through the public service operation with a right to collect fees on the public service users.

[28] A farm-out contract is where a local government assigns to an individual a public service management, at his own risks and profits, and provides works and buildings for payment of a valuable consideration charged on the service operation resources.

[29] The independent networks can be established and operated by any person or a body corporate subject to the grant of an ART authorization (art.26) and the payment of fees determined by the ART.

In addition, there are no rules applying to the reception devices such as customer-end fixed wireless antennas (satellite or terrestrial) receiving and transmitting fixed wireless signals[30] used to provide telephone service or high speed Internet access to a fixed location.

ART shall take a decision defining fixed wireless signals, the type of antennas covered by this decision such as customer-end antennas[31] (either satellite or terrestrial), the antennas' size limitation and the type of property concerned (commercial and/or residential).

The objective of this decision is to eliminate any unreasonable restrictions to the device installation, maintenance or use and any obstacles to the reception of a quality signal.

In relation to radio interference, the conditions of the band frequency use are determined in the authorization or the license specifications granted to the public telecommunications operator. This information mainly addresses the telecommunications network efficacy but there are no provisions covering the public health and safety in relation to the use of over-the-air reception devices. Therefore the adoption by ART of guidelines regarding radio frequency exposure limits is recommended.

Those guidelines may state that providers of fixed wireless service shall exercise with reasonable care and that devices such as customer-end antennas shall be labeled to give notice of any potential safety threats.

The devices installation may consequently be restricted or banned under the safety exception which has to be:

- clearly defined (e.g., radio frequency radiation);
- applied in a non-discriminatory manner;
- necessary to achieve users and the public protection;

The municipal wireless telecommunications networks aims at offering Internet based telecommunications services such as voice over Internet Protocol but it also constitutes a platform for electronic commercial transactions.

A.2 TELECOMMUNICATIONS SERVICES

A.2.1 VOICE OVER INTERNET PROTOCOL

The telecommunications code has no provisions on Voice over IP as such but it mentions the possibility to provide value added services using the available capacities of public telecommunications networks as soon as a declaration is made to the ART(art. 19). This declaration is subject to the payment of fees determined by the ART.

ART determines the categories of value-added services[32] subject to this declaration obligation and this list will be subject to an annual revision. At any time, the value-added services providers can ask to the ART Director-General the recognition of a new telecommunication service as a value-added service.

Value added services are telecommunications services which are not delivery services but they use support services or final telecommunications services to add other services to support services or answer new specific telecommunications needs.

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[30] The US Federal Communications Commission defines fixed wireless signals in its Over-the-Air Reception Devices Rule (October 19, 1996) as any commercial non-broadcast communications signals transmitted via wireless technology to and/or from a fixed customer location.

[31] The 1996 FCC Rule defines customer-end antennas as antennas placed at a customer location for the purpose of providing service to customers at that location as opposed to antennas used to transmit signals to and/or receive signals from multiple customer locations.

[32] ART decision, 28 April 2004, sets out the list of value-added services: e-mail, voice mail, audiotext, Electronic Data Interchange, facsimile, on-line information services, data access services (search and processing), files and data transfer, protocol and code conversion, Internet services (email, files transfer, real time users chat, information search in servers) and mobile services (SMS, Wireless Application Protocol, I Mode, Multimedia Messaging Services)

A support service is a simple data delivery service aimed at transmitting, retransmitting and routing signals between the networks termination points without applying to those signals other treatments than those necessary to their transmission, routing and functions control.

The commercial operations of value added services can be made by a person or a body corporate after having applied to ART with a declaration of intention to open a service (art.31). This declaration shall include information on the service opening terms, the geographical coverage, the access conditions, the service delivery, and the tariffs applied to users. This service shall use, on a lease basis, the liaison capacities of one or several existing public telecommunications networks, except if this service provider holds the license and wants to use the liaison capacities covered by his license.

In relation to the transmission means, Voice over IP can be defined as data communications opposed to voice communications as this technology takes voice and transmits it as packets of data on broadband networks. It can thus be considered a support service subject to declaration to ART.

However, the ART through its communication on VOIP[33] stated that the provision of public voice telephony services, whichever the used technology, is subject to the grant of a **license.**

Voice over IP is then deemed to be traditional public voice telephony as it is regulated in the same way and requires a license. Any operator providing such services to the public without a license on a commercial basis commits an offence.

> *Whereas the provision of VOIP over a public telecommunications network is subject to the obtaining of a license, its provision over an independent, network is permitted as soon as the operator of such a network has obtained the ART authorization[34]. As above-said, an independent network is a telecommunications network reserved to a private or shared use. It is a private network when it is reserved to the use by the person or the body corporate establishing it. It is a shared network when it is reserved to the use by several persons or body corporates constituting one or several closed users groups in order to exchange internal communications within a same group.*

To conclude, an Internet service provider (ISP) that exclusively provides access to Internet is subject to the declaration of its services to ART and the payment of fees. In addition, if the ISP needs radiofrequencies to provide access to Internet (Wireless Internet service provider, WISP)), it will need an ART authorization which will grant the needed radiofrequencies and specify their use conditions.

A WISP that intends to provide auxiliary services such as VOIP to the public is then subject to a license.

The ART communication on the obligation to obtain a license for the provision of voice over IP services to the public limits a general access to telephony services, particularly in remote rural areas that are not connected to any wireline or wireless networks. In order to enhance access to telephony services, VOIP may be defined by ART and included in the list of value-added services and the provision of such services would then be subject to a declaration and payment of fees.

This regulatory change will reflect the Senegalese State's strategy for the development of universal service and allow the deployment of telecommunications infrastructures and value-added services for the benefit of people with low-income revenues living in urban areas and those living in rural areas.

A municipal wireless network can also be used as an instrument for the economic, social, scientific and cultural development.

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[33] ART Communication on the voice services operation or voice over IP, 29 October 2005.

[34] Art.26 of the telecommunications code states that the setting up and operating of independent networks requires an ART authorization.

A.2.2 ELECTRONIC COMMERCE

The proposed Act on the Information Society[35] states that the Government will present tax, customs, trade and social reforms before the National Assembly. These measures will cover:

- the grants for the acquisition of materials and software;
- the materials and software taxation;
- the taxation of the ICTs companies incomes;
- the ICTs entrepreneur conditions;
- the incorporation of ICTs companies in the most depressed areas;

These reforms will be favorable to our project as they promote investments and technological innovation in the information society sector.

The proposed Act on digital transactions will significantly have a positive impact on e-commerce as it is the legal framework for Internet intermediaries and merchants activities.

Are subject to this proposed legislation the intermediaries who provide services to parties, including fundamental communications services such as access, information storage (…), those providing some additional services which facilitates a transaction between end users, e.g. identifying one of the parties (digital signatures), providing search facilities and those having a role in relaying information through TCP/IP packet switching. This raises the question of the latter's' potential civil and criminal liability for the third party information content of those packets.

The proposed legislation[36] states that technical telecommunications service providers are not subject to general obligations to check the information communicated or stored, or to search for facts and circumstances disclosing unlawful activities. However, there are reasons for imposing liability where the providers know or have reason to believe that the information content they transmit is unlawful and where, irrespective of the providers' knowledge, they benefit directly from the transmission.

They have the obligation to set up an easily accessible and visible device allowing anybody to inform them of unlawful contents. Moreover, they shall as expeditiously as possible give notice of such activities to the public authorities and announce their control means of unlawful activities.

Besides the intermediaries issues, are covered by this legislation the electronic contracts and the securing mechanisms.

The electronic contract validity is recognized, the merchant's obligations are stated and cover an information obligation including the name/corporate name, business address, corporate and trade registration number, and the compliance with electronic marketing rules including the spamming and misleading advertising ban.

In relation to securing measures, the proposed Act [37]states that an electronic written document is admitted in evidence as a paper base document and has the same evidentiary weight subject to the proper identification of the author, the writing and storage in conditions ensuring its integrity.

Certified advanced electronic signatures are legally recognized and the certification service providers shall be accredited by the State Information Technology Agency[38].

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[35] The proposed Act on the Information Society, 2006, is pending.

[36] Art.4 of the proposed digital transactions Act, 2006.

[37] Art.42 of the proposed Act on digital transactions, 2006.

[38] Agence de l'Informatique de l'Etat (ADIE).

A definition of advanced electronic signature lacks in this proposed legislation and may be introduced before its enactment.

A proposed definition may be an electronic signature which meets the following requirements:

- it is uniquely linked to the signatory;
- it is capable of identifying the signatory;
- it is created using means that the signatory can maintain under his sole control; and
- it is linked to the data which it relates in such a manner that any subsequent change of the data is detectable.

Another suggestion covers the enactment of a legislation addressing secure on-line payment mechanisms. There are no legal provisions covering the electronic transactions payments.

As we have noted, a municipal wireless network is an economic development instrument but also has social effects as it provides telecommunications access to rural and urban areas.

A.3 UNIVERSAL ACCESS/SERVICE

The Sector Policy Letter emphasizes that the rural areas access to telecommunications and information networks (part.2) is fundamental to economic, social and cultural development. The telecommunications are essential for the development of agriculture, tourism, education (tele-education) and the enhancement of health services (telemedecine).

In order to achieve these objectives, the Government telecommunications strategy includes inter alia the increase of services offer and the access facilitation to telecommunications and information services to the largest amount of users in rural areas. This access will be ensured by the definition of the telecommunications operators obligations in respect of land use planning and universal service.

A.3.1 UNIVERSAL SERVICE DEFINITION AND SCOPE

The Telecommunications Code defines universal service as the disposal for all of a minimum service including a voice service of a specified quality at an affordable price, routing of emergency calls, provision of a dial-in service and a subscribers' electronic or printed directory and the national territory provision of telephone booths installed on the public domain and all this shall be provided in respect of the principles of equality, continuity, universality and adaptability.

A proposed universal service Decree[39] states other basic services such as the provision to every rural communities of ,at least, one public point of access and service provision to the Regional Council and a health center, Moreover, it states that auxiliary services may be charged (mettre a la charge de) to all telecommunications operators that accept to provide those services on the national territory and that are able to ensure them. They include an offer of:

- access to a digital network of integrated services;
- leased-lines;
- packet data switching;
- Internet services;
- voice telephony advanced services;

[39] The Universal service Decree's signature by the public authorities is pending and is subject to changes before its adoption.

- telex services;
- Internet access services;

A.3.2 UNIVERSAL SERVICE INCUMBENT

The concession agreement, signed in 1997, between the Senegalese State and SONATEL designates the latter as the incumbent for universal services obligations except for the provision of dial-in services. These obligations were given in exchange of its monopoly on basic telecommunications services[40].

The Senegalese telecommunications market liberalization occurred in 2004 and Sonatel is no longer the de jure incumbent. However, it is unclear whether it remains the de facto incumbent as its license specifications are enforced until 2007.

The appended specifications to the concession agreement give to SONATEL the monopoly on the provision of telephony between fixed points for a period of seven years with an automatic renewal for a supplementary period of three years if the obligations mentioned in the specifications such as the services quality and network deployment are discharged.

When the proposed universal service Decree comes into force, the universal service incumbents may be all the public telecommunications operators and the ART will determine their universal service obligations in their license specifications.

A.3.3 UNIVERSAL SERVICE FUNDING

The 2001 telecommunications code provides that the public telecommunications networks operators conjointly participate to the missions and charges of the universal service development and contribute to the financing of these missions and charges (art. 9 of the TC).

The amount of their contribution is 3% of their turnover excluded of the taxes and interconnection fees between public telecommunications operators.

The contribution is collected by the ART and deposited in the telecommunications universal service development fund. Its operation and management rules are provided in the proposed Decree.

Besides the universal service incumbents, the State and the local governments are also contributors to this fund. It pays for the phone service to rural or otherwise disproportionately expensive endpoints of the traditional phone network and it finances local projects on distance learning, telemedecine and e-government.

As above-mentioned, the proposed Decree enlarges the universal service scope and includes Internet access and voice telephony advanced services in order to reflect the pace of technological and market development.

A municipal wireless network will positively impact the universal service goals as it will allow population, in secondary cities and rural areas that are not connected to any wireline or wireless networks, to access high speed Internet services (e.g. data, voice, and video).

With the proposed extension of the universal service scope, the activities of the municipal wireless network operator will then encompass a universal service obligation.

A.4 COMPETITION ISSUES

On 19 July 2004, the Senegalese State terminated the de jure SONATEL's monopoly on basic telecommunications services that covered national services but also international access. In relation to the latter, SONATEL has an exclusive access to sub-marine cables SAT3 and Atlantis 2 and to the INTELSAT satellite as it belongs to the two consortia holding these communications networks.

[40] The basic telecommunications services are the fixed-telephony services, the provision of leased-lines, the telex and telegraphy services and the packet-switched data communications services.

A.4.1 VOICE TELECOMMUNICATIONS SERVICES

Public circuit switched networks have been installed and operated to provide public voice telecommunications services. Therefore, the regulatory framework firstly addressed voice services. A voice service is defined in the telecommunications code as the commercial operation of direct voice transfer in real time between users connected to interconnection points of the telecommunications network.

As its license specifications are enforced until 2007, SONATEL keeps a de facto monopoly on the provision of national telephony between fixed points and international telephony as it is the owner of the essential facility above-mentioned.

In relation to fixed voice telephony, the incumbent operator authorizes private customers, named telecenters, to resell basic telecommunications services and the end-users pricing is determined in an agreement between SONATEL and the telecenters.

Whereas the fixed-voice telephony provision is presently not competitive, there is a limited competition on the mobile telephony services market as SENTEL is the second operator.

Thus the processes for licensing are clear for voice services except for voice over IP.

A.4.1.1 Licensing process

The licensing process for the setting up and operation of a public telecommunications network has been above-described. Transparency is ensured as it is conducted openly.

In relation to voice services, the telephony providers will benefit from interconnection, access and tariff regulations imposed on the dominant operator SONATEL.

A.4.1.2 Interconnection and access

The decree[41] on the interconnection of public networks and services states that dominant public telecommunications networks operators shall provide interconnection at any technically feasible point in the network, on non-discriminatory terms, rates and of a quality no less favorable than for the incumbent's own supply, in a timely fashion and on terms that are transparent and reasonable, and on an unbundled basis so that a buyer does not pay for unnecessary services.

Every year, the incumbent operator shall publish an interconnection catalogue which is subject to the ART approval and that includes at least:

A.4.1.2.1 Provided services

- a service of telephone switched traffic routing, offering technical access and financial options for the implementation of local loop unbundling;
- leasing-capacities service;
- data transmission services;
- possession of sites, access to energy source, underground ducts, overhead poles and radio transmitters;
- co-location;
- number portability and carrier pre-selection modalities;
- enhanced basic services using intelligence built into local exchange or into the network (e.g. calling line identification, virtual private network services);

[41] Decree on the interconnection of public telecommunications networks and services, December 6, 2005.

A.4.1.2.2 Technical conditions

- shall be described all the interconnection points and the physical access conditions to these points;
- shall be described the interconnection interfaces, the signaling protocol used at those interfaces, and their implementation conditions;

A.4.1.3 Tariff regulation

The interconnection decree states that interconnection, leasing capacities, interfaces access and other facilities sharing charges shall be cost-oriented. SONATEL, as a dominant service provider is required to file with and to obtain approval from the ART for its rates and tariffs to users and other service providers.

A.4.1.4 Service obligations

Dominant operators are required to meet specific quality services specified in the interconnection agreements which are negotiated under fair and non-discriminatory conditions. Any disputes between the operators will be resolved by the ART.

A.4.2 DATA NETWORK SERVICES

Accordingly to the technological neutrality principle, the concept of telecommunications networks covers all types of networks including packet-switched data networks.

The telecommunications code gives a definition of a packet-switched data communication service which is the commercial operation of a direct data transfer in real time between users connected to termination points of the packet-switched data communication network.

A.4.2.1 Data network services providers

As already mentioned, SONATEL's license gives a de jure monopoly on packet-switched data communications services. The said-company provides to business customers services such as X. 25 network services and IP networks.

Data network services provision is ensured by SONATEL but the legal regime applying to such services has not been specified.

There is subsequently no licensing process for data network services in Senegal.

A.4.2.1.1 Data network services list

A non exhaustive list of data network services may be determined by the ART for the identification of the relevant services and geographical markets. This step will be a prerequisite for the market power assessment of the different telecommunications services providers.

A decree[42] already specifies the conditions for the public provision of telecommunications services and addresses, in particular, leased lines provision.

This list may then include:

- leased-lines
- Internet Protocol -Virtual Private Network
- Internet protocol transit and access
- frame relay
- wave length services

[42] Decree on the public provision conditions of telecommunications services (leased lines), December 6, 2005.

A.4.2.1.2 Conditions to provide data network services

Telecommunications operators shall provide services under transparent, objective and non-discriminatory terms and under the same conditions as those offered to their subsidiaries or associates (Telecommunications code, art.5).

A.4.3 INTERNET SERVICES AS VALUE-ADDED SERVICES

A.4.3.1 Provision of value-added services

The telecommunications code addresses value-added services (voice and data) which are only subject to a declaration to ART.

As earlier mentioned in the study, a list has been adopted and includes, among other things, e-mail, voice mail, audiotext, facsimile, on-line information services, data access services (access to information stored in servers or databases through the use of the public telephone network infrastructure or the data transmission network), files and data transfer, Internet services (email, files transfer, real time users chat, information search in servers) and mobile services (SMS, Wireless Application Protocol, Multimedia Messaging Services).

A.4.3.2 Internet services providers

A.4.3.2.1 Resellers

The telecommunications code does not give a definition of Internet services.

The service providers are Internet service providers (ISPs) and operators of the large capacity backbone telecommunications networks that carry Internet traffic (IP backbone operators). The latter provides transit services as it carries large volume of Internet traffic for long distances between ISPs and Internet hosts. Moreover, providers of Internet transit services may or may not provide any Internet content or access services.

The ISPs in Senegal are SENTOO, ARC Informatique, Silicon Valley, ATI, ENDA (...).

SONATEL, as the Internet backbone operator, provides Internet content, transit services and also operates as an Application Service Provider (ASP) for all Internet service providers. SONATEL is presently the dominant facilities-based Internet service provider.

SONATEL controls an essential facility as it has an exclusive access to the sub marine Cable SAT3/WASC offering high speed Internet access and services.

As it has a monopoly on the collection, transit and connection to the international gateway, ISPs presently operate as local Internet access resellers (ADSL). Moreover, the customer's management is shared between ISPs and SONATEL provider of the local loop.

A.4.3.2.2 Internet Access providers

However, new Internet service providers may be permitted, but not required, to build national network facilities. Such national network facilities may be used to link respective data switching networks throughout Senegal and/or establish direct access lines to customers.

Alternatively, new Data telecommunications service providers may choose to lease or otherwise acquire some or the entire national and access transmission capacity from the incumbent operator. As a dominant service provider, SONATEL will be required to make available to new Internet service providers interconnection and access to its infrastructure.

Moreover, with the full liberalization of the international access, new Internet service providers will be entitled to carry international data traffic on their own networks in and out of Senegal.

A.4.4 RECOMMENDATIONS

The flexibility for the provision of converged services on the Internet makes more complex the separation between voice, data, and video services.

As the telecommunications code and the decree on the conditions for the public provision of telecommunications services do not specify the legal regime applicable to data network services and Internet services, it is recommended that ART:

- Defines and recognizes the ISP status (definition of the provided services and the provision limitations)
- Clarifies the status of data network services (definition and legal regime applying to the provision of data network services. The aim is to determine whether or not a clear separation can be made between data network services and Internet services.
- Determines which category of data network services providers is required to be licensed.

The goal is to maintain a level playing field for all data network service providers and to ensure that they operate under the same general license terms and conditions.

Shall existing licenses for mobile and fixed voice services be extended or shall specific licenses be adopted for new data network services providers?

Moreover, ART may define the scope and geographic coverage of services which should be covered in such licenses in order to meet the data network service needs in Senegal.

In relation to the licensing fees, ART may define the amount that should be applicable for the licensing of all data network service providers (e.g. license issuance and annual renewal fees, frequency usage fees.). In addition, ART may also determine the appropriateness of imposing the current fee structure and amounts applicable to SONATEL upon the new data network service providers

In relation to service obligations, SONATEL license specifications require the said-company to meet specific quality of service.

ART shall not, at this time, plan to establish specific performance standards or quality of service standards for the new data network service providers, since these licensees will neither be universal service providers nor dominant service providers.

However, if a data network service provider becomes dominant in the data network service market, or if designated as a universal service provider under the proposed universal service decree, the ART may require compliance with the quality of service regulation that it will specify.

To conclude, the ART regulation is required to make data network services pro-competitive.

The determination of the legal regime (e.g. licensing process) applying to new data network service providers will allow them to compete with SONATEL under fair, non discriminatory and objective conditions.

B. INFRASTRUCTURE CHALLENGES

B.1 INVENTORY OF SAINT-LOUIS DU SENEGAL WIRED AND WIRELESS COMMUNICATIONS.

B.1.1 Regional Geography

The region of Saint Louis is located 270 North of Dakar, the capital city of Senegal. Saint Louis is surrounded by Mauritania at North, the Senegal River at East, the Atlantic Ocean at West and the regions of Lounge and Tambacounda at South. The surface of the region is 44,127 Km^2 and represents 22.4% of the national territory. The city is divided into three distinct parts: The"*Langue de Barbarie*," the "Island," and "the continent."

The "*Langue de Barbarie*" is located between the Atlantic Ocean on the west side and the small branch of the river on the east side. It hosts the fishing village Guet Ndar, Santhiaba and Goxumbath and the National Birds Park. The "Island" is bordered by the two branches of the Senegal River. The small island previously housed the colonial administration and its administrative buildings still remain. The famous bridge *Pont Faidherbe*, built by the French General of the same name, links the Island to the "continent." The "continent," Sor, is in fact a big island, which used to be a popular quarter. Saint Louis is surrounded by branches of the Senegal River. The topography of Saint Louis is flat, made up of small rivers.

The region has three departments: Dagana, Saint Louis, and Podor, eleven *arrondissements*, twelve communes, 28 rural communities and 900 official villages. Saint Louis is divided into three ecologic zones:

- The "Walo" wet lands bordering the river Senegal, where irrigated agriculture and pisciculture take place,
- The "Diéri," far from the river, favorable for fruits and vegetables and cattle rearing,
- The "Niayes," located at the sea border, favorable for fishing and vegetables.

Overall, Saint Louis region has a Sahelian climate; the temperature is often high, hot and dry. The rainfall is irregular and often lasts three months. The main natural resources of Saint Louis are: water, forestry, fauna, and mines, which are not yet exploited.

For a city of 165,000 residents Saint-Louis has less than 12,000 fixed phone lines.

Most of those lines are located in the Island of Saint Louis, the business area on the continent, the hotel area in the *Langue de Barbarie*, the University and the tele-center located all around the city.

Sonatel is the operator of reference in Saint-Louis and benefits from its monopolistic position by imposing the use of Mobile GSM instead of fixed lines. The logical reason is that the cost to wire the entire city of Saint-Louis is not economically feasible due to the large numbers of low-income residents in the Saint-Louis area.

Saint-Louis Internet access is limited mainly to cyber cafés and dial-up. There is very little movement toward ADSL connectivity, but without wired lines it is impossible to accelerate the penetration level of high-speed broadband. The buying power of Saint-Louis' population is not going to grow enough overnight to justify the huge investment needed from Sonatel just to cover the entire city limits.

There is no wireless broadband in Saint-Louis and no plan from Sonatel to provide this type of service to the city as of today.

The topology of Saint-Louis and the weather are well suited for the deployment of Wimax and WiFi solutions. The cost of this type of network and the coverage area will definitively eliminate the need for fixed wired lines until the buying power of the population at least reaches the level of Dakar. Even then, it does not appear that Sonatel will give priority to Saint-Louis.

It is clear after our study that the deployment of a Wimax/WiFi network will:

- Immediately create coverage of the entire city and almost the entire region of Saint-Louis. There will not be a home, a school, a business or a government building outside of the coverage area.
- Connect residents in less than 24 hours after a request is placed.
- Reduce the "fracture numerique" (digital divide) for the North-East region.
- Provide Internet and telephony connectivity to every resident, school and business.
- Provide Internet and telephony to all government agencies based in Saint-Louis.

B.2 TYPE OF SERVICES (TOS)

A municipal wireless network for Saint-Louis will allow the following services:

B.2.1 Basic Access

Basic Internet access will constitute the core service, just as is the case with DSL and cable.

B.2.2 E-Government

The primary customer for the MWN is the government which has never considered providing Internet access as an additional service to create a competitive advantage, due to the cost constraints of installing a wired network. Wired networks do not allow the flexibility that wireless does. For property owners, addressing the individual needs of each tenant is expensive using traditional installation practices, so it was never really a viable option for them.

B.2.3 VPN and Transparent LAN

Virtual Private Network (VPN) and transparent LANs, also known as LAN extensions, are the most popular business-related services today and pose interesting possibilities for the network operator since they do not need a lot of additional bandwidth beyond that required for simple high-speed access. A VPN is secure communications from a remote location back to the corporate LAN, generally involving encryption. A transparent LAN takes the concept a step further by providing the remote user the means to run all LAN applications with similar ease as is the case at the corporate headquarters, and not simply to access the database.

VPN and LAN extension can be accomplished by various means. The older method is to utilize tunneling protocols and special hardware for performing the necessary encryption quickly. The preferred method today is to utilize a carrier-grade IP router or Ethernet switch with the built-in capability to setup Ethernet or IP VPNs.

B.2.4 Voice Telephony

Either circuit voice or packet voice may be supported by the Wimax / WiFi network but circuit voice is quite bandwidth intensive, requiring the reservation of 56 kilobits per second (Kbps) channel for each voice transmission. In contrast IP telephony vocoder (digital speech compression devices) can operate at rates as low as 2 Kbps with good fidelity. Though 56 Kbps may not sound like much, it takes 24 voice circuits to eat up 1.5 Mbps of throughput. If the total throughput of available band is only 100 Mbps, then a couple of thousand voice circuits could take up all the resources of the network.

IP telephony service in partnership with Sonatel can be offered to the entire population.

B.2.5 Conferencing

Video and audio conferencing are well within the capabilities of Wimax / WiFi systems. In the past, very expensive proprietary hardware/software platforms were necessary to set up videoconferences with acceptable image quality, but today a multitude of high-performance IP videoconferencing software products are available and can be run over wireless networks.

B.2.6 Storage Area Networks

Data storage is a network application where vital information is off-loaded to remote storage facilities and invoked thereafter, as it is needed.

B.2.7 Telemetry

Telemetry is essentially machine-to-machine communication and generally takes the form of remote monitoring. Examples include measuring inventory in vending machines and signaling when restocking is needed, as well as monitoring traffic lights, water pipelines, chemical plants, power plants, water pollution, and so on.

B.2.8 Bandwidth on demand and self-provisioning

Bandwidth on demand is a temporary change in the amount of bandwidth or throughput allocated to a subscriber in order to meet an immediate need such as large file transfers or video conferencing. Self-provisioning allows subscribers to change the terms of the service from a secure Web site without the intervention of a sales agent.

B.2.9 Backhaul

This service can be a fairly lucrative business and is one that may enable the wireless broadband carrier to avoid paying for tower space by utilizing the facility of the carrier being served.

B.2.10 Hotspot services

Hotspot services are essentially public local area networks where connectivity is provided to transient users, generally via 802.11a/b/g wireless LAN interfaces. Hotspots are located in such venues as airports, shopping malls, hotels, convention centers, city plazas, parks, truck stops, coffee shops, bars, and libraries where they form convenient means for the travelers to check emails, surf the Web, or consult a database.

B.3 REVIEW CURRENT MARKET SOLUTIONS VENDORS, COMPLETE INVENTORY OF MOST SUITABLE SOLUTIONS

Saint-Louis is best suited for a hybrid Wimax /WiFi MESH solution.

The backhaul will be a series of 2 or 3 Wimax antennas placed on the roof of the municipal building and other selected sites around the city, but close enough to Sonatel's central office.

It is possible to use a Point to Multipoint (PtoMP) wireless base station utilizing the Wireless Outdoor Router Protocol (WORP), 802.16 standard with a radius antenna to deliver carrier class broadband Internet to multiple subscriber units at "node points" across an area from the size of a single facility up to an area several kilometers in size.

This Point to Multipoint (PtoMP) backbone should utilize the 3.5GHz, 5.7 GHz, or 5.8 GHz licensed frequency to deliver to each "node point" subscriber unit the broadband connectivity it needs to deliver last mile service.

Each subscriber unit will then redistribute the broadband Internet wirelessly utilizing the 802.11a, 802.11b, and 80211.g standards via an enterprise-level Access Point (AP) to clients/users with laptops or workstations that are WiFi enabled.

Because of the usage of three widely adopted wireless standards, authenticated users will be able to connect to the network with low-cost equipment that is obtainable at most computer and electronics stores.

Achieving a high level of Quality of Service (QoS) has proven to be difficult in the past in a wireless network but newer products and technologies, such as meshing nodes, are making that much easier to achieve.

In order to widen our network and offer inter-operability with outside networks, the WMN operator can integrate aspects of the 802.11f standards into our external vendor plans. By watching the 802.11f standards, the operator can offer roaming and extended off-network services to our customer base, and generate additional revenue.

Though the standard is not 100% ratified it offers a clearer path to follow to take network security beyond current methods and offer security for the network in the future.

We will need to utilize carrier-class, proven equipment and follow global standards for wireless broadband delivery for the WMN network.

There is no local vendor, provider or manufacturer of Wimax and WiFi equipment or local network integrator with the expertise and all skills needed to deploy a Wimax/ WiFi network.

Vendors offering MWN equipment are Airspan, Cisco, Motorola, Linksys, Redline, SkyPilot Network and Tropos, to name a few.

B.4 SITE SURVEY

Saint-Louis RF spectrum in the range of 3.5GHz, 4.9GHz, 5.7GHz and 5.8GHz is completely free of users and will not pose a problem for a future deployment.

In the WiFi range of 2.4GHz there were only some private access points but without a range of more than 30 meters radius and power less than 100mWatts.

Most Government buildings will need some civil engineering to rehabilitate some existing towers and install new 20 to 30 feet simple mount towers.

B.5 INVESTIGATE POWER SUPPLIES

The power supply for each access point can be provided by a solar power unit attached on the public pole where the access point will be installed. This will reduce the power dependency on the Senelec grid and will dramatically reduce the energy cost to the municipality/network operator.

The reliability of the power grid is not so much the issue as the network itself. The main problem is the supply of gas to Senelec that causes the utility company to select areas in each city where they proceed to shut down the supply for periods lasting from 30 minutes to a full day. This issue should be moot once Senelec is able to find a new gas supplier. Nevertheless with the use of an LPG gas turbine generator at the network operating center, wind turbine and solar power will serve as the main source of power. Saint-Louis' location is perfect for wind and solar power energy and once the equipments are purchased this power source will be cheap and steady.

B.6 REVIEW NETWORK OWNERSHIP

A complete business plan with detail on network ownership and financial information is available as an annex of this document.

C. MARKET/BUSINESS CHALLENGES (SAINT LOUIS)

TELECOMUNICATIONS DATA

Situation of the Telephony Network in 2002

Location	Central	Capacity	Subscribers	Telecentres	SONATEL Boxes	POSTE Boxes	Rural Stations
Saint Louis	4	10,900	6,561	487	5	-	21
Total Region	10	10,140	9,923	855	5	8	80

Source: Agence regionale de la SONATEL, situation économique et sociale de saint louis août 2005

Situation of Subscribers and types of consumers in 2003

	Households	Administration	Private Sector	Total
Saint Louis	4,876	177	428	5,481
Total Region	6,538	265	668	7,471

Source: Agence regionale de la SONATEL, situation économique et sociale de saint louis août 2005

Situation of Subscribers and types of consumers in 2004

	Households	Administration	Private Sector	Total
Saint Louis	4,868	198	807	5,873
Total Region	6,441	290	1,063	7,824

Source: Agence regionale de la SONATEL, situation économique et sociale de saint louis août 2005

Evolution of the number of telecentres

	2002	2003	2004
Saint Louis	329	279	486
Total Region	633	613	854

C.1 MARKET ANALYSIS

To conduct the market study for the DFI wireless municipal network, the team of experts reviewed the literature on regional development planning and national telecommunication documents, e.g., "lettre de politique sectorielle" and ART documents. They conducted a five-day site visit covering three pre-selected areas: Thies, Mbour and Saint Louis where they administered questionnaires to different decision makers in health institutions, the private sector, universities, telecenters and cyber cafes. They also visited public institutions such as City Hall, regional governance offices, tourism offices and agriculture extension services. In addition to a market study, the team explored potential private-public partnerships to develop support for the project.

The interviews enabled the team to identify areas of potential demand for a wireless Internet connection and other ICT applications in health, education, business, and different public services. Most interviewees did not talk about other applications such as online banking, finance, shopping, public safety, etc. However, during the discussions, the team sometimes heard about other opportunities the wireless municipal network could offer.

C.1.1 Demand levels

Overall, all institutions visited are committed to developing the ICT sector for their regions. They all understood that a wireless connection will help develop applications in different sectors of the local economy and reduce communication costs at the local, regional, national and international levels. Although some institutions started investing in ICT by buying equipment and creating Websites, others have not done so, but have shown a political will to include ICT in their development strategies. All the respondents to the survey agreed that an accessible, affordable wireless municipal network will contribute to improving the living conditions of residents and will invigorate the city of Saint Louis. Most of them argue that the lack of human resources in ICT, the illiteracy rate, the lack of information, and equipment can slow the demand. The national E-government project will be an opportunity for regional governances and municipalities to develop an ICT pro-active policy and better sensitize the population about ITC opportunities.

C.1.1.1 Telecenters, Cyber Centers, Internet Service Providers

According to an IDRC study on private and community telecenters and cyber centers, the majority of telecenter users are men. Also, 90% of users are between 19 to 55 years, but all ages use the telecenters. Community organizations also use telecenters because they cannot afford their own line. Six among the sample 11 organisations involved in the IRDC survey use telecenters as their main communications tool to get information on various sectors, such as health, commerce, etc.

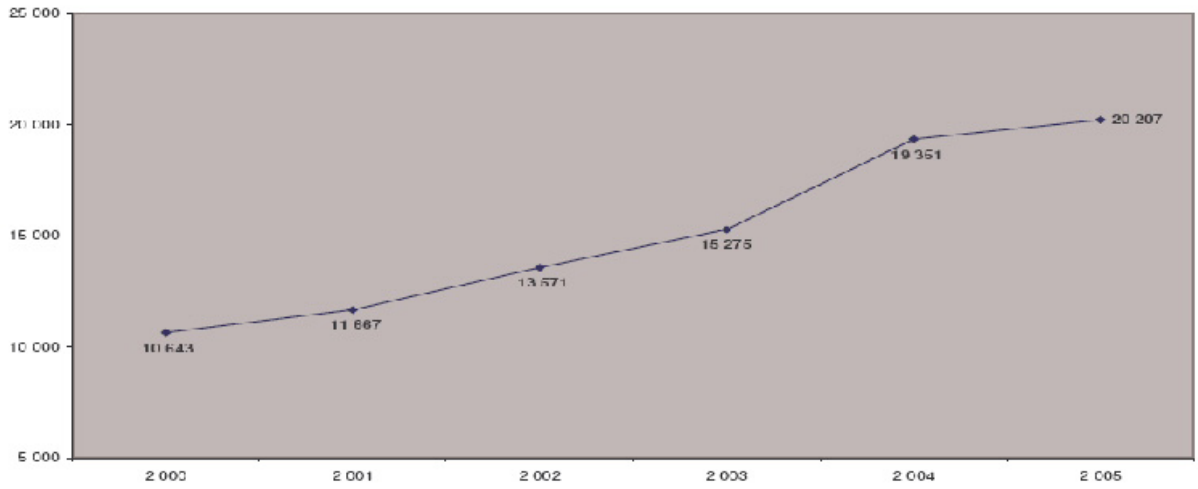
The community telecenters were used by ENDA Cyber pop (a national NGO), Trade Point Senegal (state agency to promote ICT in commerce) to disseminate information among community members and local SMEs. Community telecenters were also found to be very helpful in delivering information in isolated zones.

In Senegal, Internet users can be classified into two categories:

- Internet subscribers such as individuals or companies
- Cyber center users

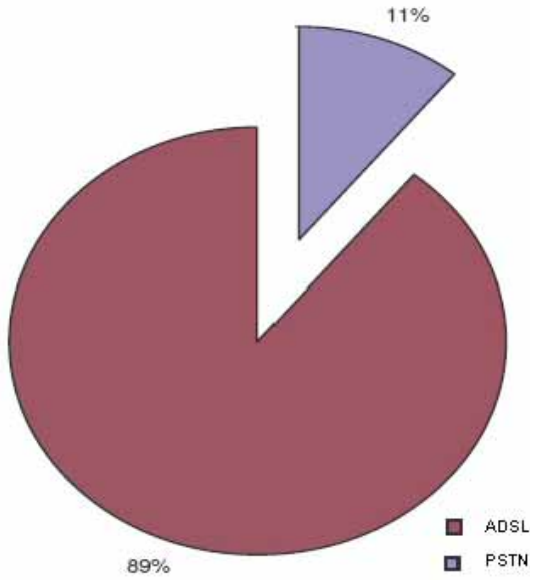
As shown in the diagrams below, there are around 20,000 Internet **subscribers**:

Evolution of Internet Subscribers



Sources: Operators, ART

Partition of Internet Subscribers in 2005



Source: ART

Meanwhile, thanks to cyber centers, the number of Internet **users** is estimated to be approximately 250,000 (**Source Batik N° 80 Mars 2006**).

C.1.1.2 Internet Connection

Senegal has been officially connected to the Internet since March 1996. Senegal is among the four African countries that introduced ADSL since February 2003. Today there are approximately 12 Internet Service Providers (ISPs), but among them only four can provide broadband ADSL connections:

- Sentoo, which belongs to SONATEL
- ATI
- ARC Informatique
- STE

ISPs provide services such as:

- Access to the Internet
- E mails
- Hosting of Web sites
- Development of Web sites

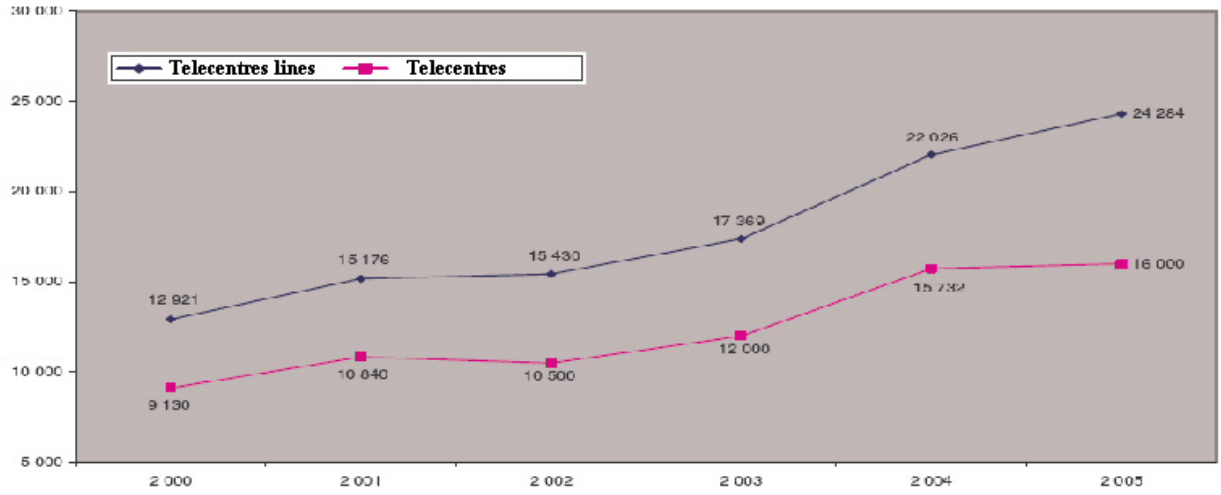
Today, the increasing number of cyber centers has contributed to increasing the number of Internet users in Senegal. SONATEL has connected 39 areas of which, 89% of subscribers are connected through ADSL and 11% through PSTN. In December 2005, Senegal had 18,028 Internet subscribers, among which 9,196 were residential and 8,832 professional subscribers. Besides efforts made to increase Internet connections, the penetration rate of .2% is still low. Internet connection is a 4 billion FCFA market. Cyber centers offer tariffs varying from 150 to 1,000FCFA for an hourly connection. The telecenter and cyber center business contributed to creating 22,000 jobs in Senegal.

Cyber centers and telecenters can be seen as telecom mini-operators. Through their infrastructures, most citizens with low buying power have access to communication tools:

- Cyber Centers: access to the Internet
- Telecenters: access to the phone

While the number of cyber centers is difficult to evaluate, telecenters are organized through an association named UNETTS (*Union Nationale des Exploitants de Télécentres et Téléservices du Sénégal)*. The evolution over time of telecenters is shown in the below diagram.

Evolution of Telecentres



Sources: Sonatel, ART

Cyber centers and multi-use telecenters are the major means used by most Senegalese Internet users to have access to the Internet. Thanks to them, today there are over 250,000 Internet users in Senegal. In addition to their technical role, they also play social roles; therefore they have to modernize their activities.

Provided with low-range wireless facilities, cyber centers, and telecenters, subscribers could access the Internet at a reasonable distance.

Meanwhile, there is no Wireless Internet Service Provider (WISP) in Senegal. Therefore, one of the added values of the project is to promote emergence of WISP so that they can, at a cheaper cost, set up and extend their network and provide broadband Internet access to all areas, mainly in low cost urban areas, as well as in rural areas. The Municipal Wireless Network project is an opportunity to promote WISP. Potential candidates include private operators and, in some cases, telecenters and cyber centers.

In Saint Louis, Richard Toll, there is a demand for telephone communication and low-income people mostly use telecenters located in all quarters. Managers complained about the low profit margin which is between 15 to 9.5 FCFA. One of them said:

> *"We work for Sonatel, I maintain this business for social reasons: the revenue generated just pays my two employees, my rent and my electricity bills. Sometimes I have difficulty to pay my employees who receive their salary on the 10th of the month …. It is very difficult for us."*

Telecenters are not able to save enough money to invest in communication equipment, computers, etc. They have difficulty paying rent, employees and telephone bills. There is potential demand if the wireless is implemented, as the profit margin will increase and telecenters will be able to modernize, invest in training and equipment, offer more services, and be more sustainable. According to the two telecenters managers interviewed, a profit margin of 30 to 50 FCFA per unit sold will help them to grow normally and invest in computers to move to other tele-services.

Cyber centers do not complain about SONATEL charges, but about the lack of customers, the maintenance of the equipment, and the competition of schools and public sectors that are connected to Internet.

In Richard Toll, students are the only customers. Unlike Thies, traders are not aware of the Internet tool to communicate with business partners. The hourly connection is 250 FCFA. The cyber center has about 14 working computers. The manager has difficulty selling enough hours to meet costs. In addition to the Internet connection, he sells drinks and offers other services, such as telephone and photocopy services. The

demand for cyber services is not very important. There is a need to sensitize and inform people about ICT and increase the demand for the population of Richard Toll.

In Saint Louis, cyber center managers did not complain about the price of the connection, but about the lack of customers. Since most of their clients are students, the availability of cyber centers in different schools is a big loss for them. In addition, most public services have an Internet connection. They are not able to sell enough hours to handle electricity and rent, which are the highest costs.

C.1.1.3 Universities

University of Gaston Berger (UGB) of Saint Louis is located in a rural area called Sanar and 4,000 to 5,000 students attend classes every year. The University has an important computer department, which trains students in computers and electronics. All UGB students take computer classes. The University works in partnership with different universities in France, Italy, Canada, and the US (University of Wisconsin). Teachers in different domains of expertise offer short-term seminar classes.

Many UGB teachers offer classes in UCAD, Dakar and other public higher education institutions. The UGB has more than 800 computers. The University is connected to the Internet through ADSL and has a maintenance service. The University uses special liaisons of 2 MBS for its 4,000-5,000 students. Internet is used for mail, research and data transfer.

Thus the demand for wireless is important for the university.

C.1.1.4 Healthcare Providers

The region of Saint Louis has the following health infrastructures:

- 2 regional hospitals (Saint Louis and Ndioum)
- 4 Centres de santé
- 77 Postes de santé (37 in Podor)
- 20 Private Dispensaries (9 in Saint Louis, 6 in Richard Toll, 2 in Dagana, 3 in Podor)
- 2 Gynacological Clinics in Saint Louis
- 5 Private medical doctor cabinets (4 in Saint Louis and 1 in Richard Toll)
- 4 Dentists (3 in Saint Louis, and 1 in Richard Toll)
- 17 Private practice offices
- 41 Rural maternities
- 55 Cases de Santé (8 Dagana, 1 Richard Toll).

The regional hospital has Internet access (ADSL 1024) and a wireless Internet connection. The staff uses it for emails, research, and data transfer. According to the *Medecin Chef* and the Director of the regional hospital, there is a real demand for tele assistance for "*districts sanitaires*" and *"postes de santé*" (public hospitals located in the department and *arrondissement*). They argue that medical specialists in different medical fields are located at the regional levels, while only generalists are available at the District level. *Postes de santé* have no doctor, only nurses are available. The tele assistance will improve the quality and the quickness of medical services and connect the regional hospital with other medical institutions.

The *Medecin Chef* and the Director of the regional hospital expressed the need to connect to the regional hospital, which is a center of reference for universities, hospitals overseas, and to health districts and departments. The impact of online medical services would be:

- To increase efficiency in patient in-take and providing adequate treatment;

- To avoid moving patients, particularly those who are very sick;
- To connect the regional hospital with specialists located in Dakar or at the international level;
- To train medical doctors, to update their knowledge and assist dispensaries and other health institutions located at the department or village level;
- To create a database for patients and be able to exchange information without sending paper (avoid losses);
- To use cyber centers as an information and training center for people (e.g. health education).

In addition, there is a real interest by medical doctors in developing ICT tools to cover medical needs at the regional level.

The regional hospital of Saint Louis already has telemedicine equipment, and a computer room. All offices have a computer and the staff is trained to use them. The hospital uses ADSL and has a WiFi system. In addition to patients from the region of Saint Louis, Louga and Thies, many patients come from neighbouring countries of the sub-region, Mali and Mauritania. There is an important demand for WiFi to be used for data transfer and exchange of information among specialists.

The health services of the Compagnie Sucrière Sénégalaises (CSS), Richard Toll, Saint Louis, are connected to Internet through ADSL (2048). The head of the hospital uses Internet for emails and to do research on medical information. He said that a wireless connection will help to work with the regional hospital, other local public dispensaries, insurance companies, pharmacies, medical laboratories, etc.

C.1.1.5 The private sector

Compagnie Sucrière Sénégalaise, Richard Toll, Saint Louis is an agro business company that employs more than 5,000 people and produces yearly about 100,000 tons of sugar from local sugar cane. The yearly sales are about 44,000 billion FCFA and the company distributes about 12 billion FCFA of salary every year. Beside the 100,000 tons of sugar produced, the company imports sugar to cover the national demand.

The headquarters are located in Dakar and the C*entrale d'Achat* is located in Monaco, France. CSS is connected to the Internet, which is available for only heads of departments. According to one of the heads, the Internet connection has not contributed to a reduced cost of communication. Faxes and international phone calls are mostly used (because many partners do not have access to the Internet).

The CSS is open to ICT. The company has already invested 100 million FCFA to modernize the information system and the Website is under construction.

The CSS has express a real demand for wireless connection to facilitate the work with offices in Dakar and overseas, insurance companies (IPM), Mauritanian private companies that buy sugar molasses from the CSS, traders located nationwide, and other service providers who use mostly telephone to communicate. A wireless network will reduce costs for all partners.

According to one manager in the finance department, there is a real training need for employees. The distance prevents them from attending because most of the training takes place in Dakar. A one-day training takes three days for employees (two days for traveling), which is a loss for the company. Online training will help the company to be more productive. In addition, a wireless connection in the area will facilitate communication because buildings are isolated and employees work often in the sugar cane fields and need to be connected.

There is a demand for local SMEs working with big companies like CSS. A wireless connection will facilitate communications within the company and between the CSS and its main customers. In addition, it will

facilitate communication between the CSS dispensary and health services, medical analysis laboratories etc. This technology will help better manage SMEs, leaving more time dedicated to customers and marketing.

C.1.1.6 Public Services

Among public services, regional governances, ports, airports, museums, regional tourism services and other productive sectors like agriculture, catering, parks services, the regional hospital, municipalities, and the hydro electricity dam of Diama, can play an important role in the development of the region.

The port of Saint Louis is one of three secondary ports of Senegal. It is independent from the *Port Autonome of Dakar,* old and underutilized. The main employment opportunity in the area is for youth who are recruited to work for big fishing companies, like those that run the Korean boats. The role of the C*apitain du Port* is to facilitate the process. According to the *Capitain du Port*, he needs to communicate with the custom authorities, boats at sea, traders and youth looking for jobs.

There is a potential demand for communication if the port has to play a role in the development of Saint Louis and the sub-region.

The museum of Saint Louis, *Centre de Recherche et de Documentation du Sénégal,* is an old museum and documentation center created during the colonial era. It contains historical documents and houses a collection of masks, historical artifacts and archaeological materials, showing the history and culture of Senegal. The museum does not have enough personnel to maintain these services. Some documents are degraded and others have disappeared from the shelves. There are no computers in the library.

There is a need to computerize the available information, to scan and archive documents and to train the staff. There could be a potential to create an online museum that can linked to the Website for the local parks.

To collect information on the parks, the team interviewed the Director of *Bureau Information des Parks, Reserves et Aires Protégées de Saint Louis*. The Birds Park of Djoudj is located 60 km from Saint Louis in a remote area of the *Langue de Barbarie*.

There is a demand to connect all parks and to develop an information system to track animals. There is an interest in ICT among employees, but only two computers are available and are assigned to the Director and his assistant. The Director is connected to Internet through ADSL and welcomes any ICT tool that help better manage the parks and connect easily with different sites, located in rural and remote areas.

C.1.1.7 The Dam of Diama

The dam is managed by the *Societe de Gestion et d'Explotation de Diama* (SOGED) . The SOGED was created by the OMVS (Organisation pour la Mise en Valeur du fleuve Senegal). The SOGED receives funding from France (CCCE, FAC), Saudi Funds, the African Development Bank, Abu Dhabi Funds, and European Funds of Development. SOGED is a public, inter-state agency between Senegal, Mali and Mauritania. The main role of SOGED is to conduct feasibility studies, raise funds, and to receive and install equipment. SOGED has 1,300 customers in the agriculture sector including: Compagnie Sucrière Senegalaise (CSS), Grands Domaines du Senegal (GDS), SOCAS (Paste Tomato Company), SAED (state agriculture extension service), SONADER in Mauritania and the Ministry of Agriculture in Mali. The production site of Diama is not connected to the Internet, although offices are located in Mauritania and clients that use water for agriculture needs are spread all along the borders of the Senegal River. The staff uses public telecenters for international communications. The radio is mainly used to communicate with the headquarters in Mauritania. Thus, there is a strong demand for wireless connection, because of the isolation of the production site and the need to communicate with clients and staff.

C.1.1.8 Tourism

In Saint Louis, tourism plays an important role in the local economy. Particularly, the international airport is open to international traffic. Many tourists come directly from Europe to the Saint Louis Airport. The

regional Department of Tourism in Saint Louis is connected through ADSL, but no budget is planned to support expenses related to the Internet.

Estimated at 10,000 FCFA per year, tourist demand for the Internet, satisfied through a wireless network, could boost income for the airport and hotels.

C.1.1.9 Municipality

The City Hall of Saint Louis has an interest in ICTs and in developing a wireless connection throughout the city where 50% of elementary schools are equipped with second hand computers donated by the city of Toulouse in France. The city has its Website: http://www.saintlouisdusenegal.com/english www.communesaintlouissenegal.com.

The City Hall pays between 300,000 to 600,000 FCFA bi-monthly to SONATEL for telephone use. A wireless network will contribute to reducing the cost of communication with partners and creating other services that the city can benefit from.

C.1.1.10 SAED: Société d'Aménagement du Delta (Irrigation)

SAED is an agricultural extension state service for the Delta of the Senegalese Rivers. SAED works with the rural populations and has several offices in the Saint Louis and Tambacounda region. SAED operates in a radius of 800 km. The company works with many subcontractors, has many mobile employees working in different stations or working with rural populations' grassroots organizations. The company has more than 100 computers and is connected through ADSL to the Internet. It spends between 100,000 FCFA to 300,000 FCFA for the Internet and more than 600,000 FCFA for telephone communications.

C.1.2 Demand Opportunities

C.1.2.1 Education

- Develop CISCO classes that can generate income for institutions and provide ICT knowledge
- Create Websites to:
  - Publicize vocational schools and enable students to register or be recruited online,
  - Publish students' final projects online
  - Market the school,
  - Inform private companies about the activities of the school and graduating students for job opportunities
  - Attract exchange students form North American Universities
- Develop E- Learning platforms:
  - To solve distance problems for teachers who travel frequently to give lectures,
  - To upgrade university teachers' knowledge,
  - To train high school teachers in Senegal and the sub region. A project already exists to train math teachers online with University Gaston Berger of Saint Louis,
- Use student projects to develop ICT applications,
- Develop software for health and education,
- Tutor to help elementary and high school students,

- Develop reproductive health education for youth, and
- Train in word processing for those with little education and others who are not familiar with computers.

Main challenge:

- Teachers' compensation to offer online classes;
- Availability of enough computers and ICT equipment;
- High rate of illiteracy;
- Parents need to be informed about online teaching and to be prepared to find means to buy the equipment for their children (community participation such as monthly contribution to buy a computer for many children).

C.1.2.2 Health

- Regional hospitals and private dispensaries;
- Telemedicine with university reference centers;
- Develop an information system for all levels of public and private health institutions to share information;
- Training and distance education for staff;
- General public health education.

Challenges:

- Purchase of the equipment (who will finance?);
- Maintenance of the equipment;
- Training in word processing for staff.

C.1.2.3 Private Sector

Challenges:

- Willingness/ability of private companies to buy computers and equipment to be able to be connected;
- Training in ICT.

C.1.2.4Public Services

Municipalities:

- Computerization of all public documents(marriage certificate, birth certificate etc.);
- E-Government;
- Traffic management, management of the environment;
- Management of health and education infrastructures;
- Relation with youth: create ICT projects to create jobs for youth: example distribution of telephone, water, electricity bills using Internet;
- Dynamic Website for City Hall to increase tourism in St. Louis;

- Website for all hotels to be connected to the City Hall Website, to communicate efficiently with partners/tourists;
- Training for tour guides;
- Implement a network of parks, museums and hotels activities linked to the city Website;
- Computerization of other municipal forms;

Challenge for the Municipalities:

- Staff training;
- Information and sensitization of users to cyber centers;
- Computer training for the public;
- Equipment.

C.1.2.5 Agriculture: SAED, CSS Saint Louis

- Continue the modernization of the information system of the sugar company CSS;
- Organize online training for employees;
- Revise the production system using ICT, purchase stocks, etc.;
- Order products online;
- Online publicity;
- Online training in maintenance and other fields;
- Provide an information system for all producers;
- Connect isolated producers to markets;
- Use ICT for international markets;
- Train staff to use computers and other equipment;
- Interconnect different production sites and offices in SAED and CSS;
- Implement a server for messages;
- Implement a Web server.

Challenges:

- Train rural populations to use equipment and to understand the importance of ICT in their activities: given the high rate of illiteracy among rural people there is a need to train them in writing and math skills to be at least able to use handhelds to exchange information to sell or buy agriculture products
- Train the local personnel in using the equipment
- Install the equipment.

C.2 REVENUE

C.2.1 Pricing Structures

C.2.1.1 Fixed Telephony

- Cost of installation in urban area: connection + guaranty = 39,510 FCFA TTC
- Cost of installation in rural area: connection + guaranty = 117,599 FCFA TTC
- Bimonthly subscription for residential line = 4,830 FCFA TTC
- Bimonthly subscription for professional line = 6,270 FCFA TTC
- Tariff local call for peak hours = 59 FCFA TTC/ 2 minutes
- Tariff local call for off-peak hours = 59 FCFA TTC/ 4 minutes
- Tariff international call for peak hours = 59 FCFA TTC/ 30 seconds
- Tariff international call for off-peak hours = 59 FCFA TTC/ 60 seconds

In June 2005, Sonatel lowered the tariffs of international communication between 11 pm and 7 am, which means 11% for peak hours and 4% for off-peak hours. The tariffs are lower for the countries of the CDEAO/UEMOA zone.

C.2.2 Mobile telephony

Two operators: Sonatel and Sentel (whose commercial name became Tigo since November 2005)

- Sonatel Kit connection: decreased from 7,500 FCFA TTC to 2,500 FCFA TTC with 2500 FCFA TTC of credit of consumption during 2005
- Sentel Kit connection: 2,000 FCFA TTC with 2,000 FCFA TTC of credit of consumption during 2005

C.2.3 Current prices

- Sonatel mobile: 10,000 FCFA TTC with 7,500 FCFA TTC of credit of consumption
- Sentel mobile: 2,000 FCFA TTC with 1,000 FCFA TTC of credit of consumption during 2005 (Source: ART, « Rapport sur le marché Sénégalais des Télécommunications en 2005, p.34-36)

Because of the competition, the two companies carried out many promotion campaigns and reduced their costs in order to increase the number of customers.

The refilling of low value cards dominates the market of mobile telephony.

C.3 ADSL ISP

SONATEL is providing access to the Internet backbone for all ISPs in the country. In Saint Louis the only ADSL ISP is Sentoo, a Sonatel subsidiary.

The fees charged by SONATEL to ADSL ISP are the following:

Services	Charges	Amount CFA TTC
ADSL NET ISP	Access	2 507 500 CFA TTC
	Guaranty	2 414 000 CFA TTC
	Monthly subscription	1 424 260 CFA TTC
Leased line to the backbone	Access	1275000 CFA TTC
	Guaranty	1767048
	Monthly subscription	883488

Source: SONATEL

C.4 BUSINESS CHALLENGES

C.4.1 What is at stake?

The objective of the Municipal Wireless network goes far beyond setting up networks; it is, above all, the deployment of a bridge between the country and the world, mainly the world market.

The globalization of the offer and the demand, combined with the development of new technologies especially that of telecommunications, encourages the digitization of documents and the creation of new services accessible online across the country and around the world, independent of physical location, to the benefit of the citizens and the national and international professionals and thus gives opportunities for business and jobs.

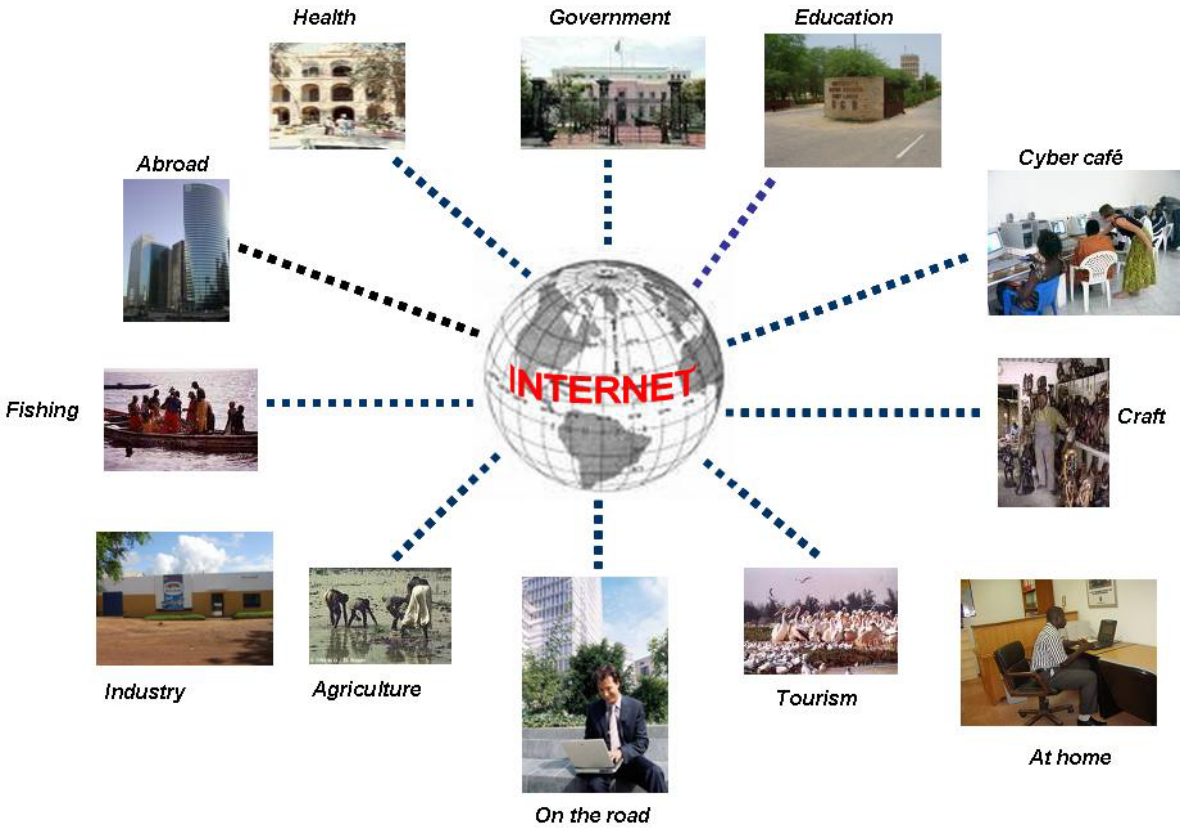
The DFI Municipal Wireless network is a sustainable development tool intended to reduce the digital divide between regional and rural areas in order to develop knowledge, information sharing and economic activities and generate new wealth and well remunerated jobs.

The market study shows that:

1. The extension of Municipal Wireless networks to rural areas is required to improve economic activities in the region.
2. There are business opportunities thanks to basic Internet applications, as well as opportunities for value added services in several sectors:
   - Government: e-government
   - Education: e-learning
   - health: e-health
   - Business: e-business (agriculture, craft industry, fishing, …)
   - Culture: online museum, cultural, events, etc.
   - Tourism: e-booking,
   - Banks: e-financing, etc.

With affordable connections, the PPP Wireless network will extend theInternet to low cost urban areas as well as to rural areas, so that many people can share information, acquire knowledge and improve their business and access services already available or locate them.

Gradual digitization of documents, combined with affordable Internet access, will create conditions for a new citizen Internet user.



One of the main roles of the Municipal Wireless Networks is to ensure the last mile connection and to extend the Internet throughout the country.

Meanwhile, setting up an efficient Municipal Wireless Network for business means:

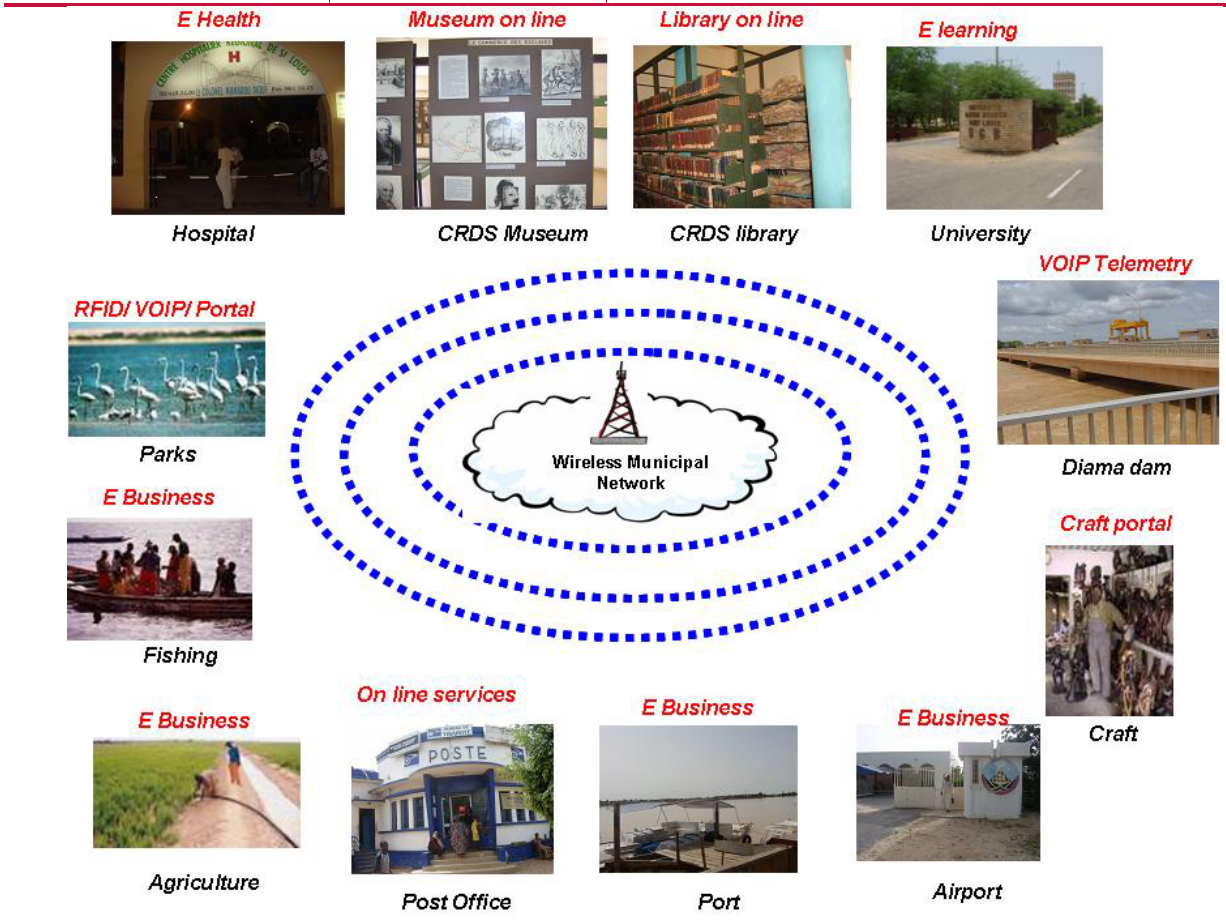
- Reliable and secure space of trust
- Organization of competent bodies for urban areas as well as for rural areas,
- Promotion of wireless ISP,
- Modernization of cyber centers and telecenters,
- Availability of required applications and value added services

C.5 CONCLUSION AND RECOMMENDATIONS

Saint Louis is recommended as the pilot city to implement a wireless municipal network because of the existence of a large university committed to developing ICTs, the port, the international airport and agricultural activities. A wireless network will help connect field workers to offices and different sectors of the local economy; it will help to better market local products at the national and international levels.

The experimental phase should produce favorable results, in terms of quality as well as on quantity, for activities in several areas: education, health, culture, agriculture, fishing, crafts, industry, dams, ports, airports, etc.

Sector	Location	Value added services
Education	University	E Learning
Health	Hospital	Tele-assistance Telemedicine E learning Patient Follow up
Agriculture	CSS SAED Municipality	Portal: • business information (production prices, …) • automation of documents exchange • mails
Fishing	Municipality	Portal on business information
Craft	Craft village	Online catalogue
Culture	CRDS	Online museum Online library
Diama Dam		Portal Auto
Tourism	Parks, hotels,	Portal
Education	University	E Learning
Health	Hospital	Tele-assistance Telemedicine E learning Patient Follow up



WiFi has not fully developed in Senegal. There is a potential for growth if Senegal want to achieve the objectives of facilitating ICT access for everyone, particularly those living in rural areas and increasing the quality and the diversity of services offered to individuals and the private and public sectors (e-commerce, e-administration).

The availably of a municipal wireless connection can contribute by developing applications in different fields and generate income for the city. Since most economic activities are related to agriculture, we strongly recommend:

- To inform and better sensitize the Municipality about the opportunities of developing a Municipal Wireless network for the city, the public and the private sector;
- To invite the private sector to discuss the advantages they can gain from a partnership with City Hall to implement the project;
- To sensitize the private sector to invest in ICT equipment and training for employees;
- To inform and sensitize all segments of the population (women, youth, rural, literate and illiterate) about ICT opportunities;
- To implement a technology that can cover cities and rural areas;
- To develop a partnership between City Halls and rural communities to help the latter take advantage of the returns of a Municipal Wireless network.

IV. PROJECT REALIZATION AND MANAGEMENT THROUGH A PUBLIC-PRIVATE PARTNERSHIP

APPROACH

Most municipalities recognize that they have neither the expertise nor the personnel to operate their own network. Some thus choose to own the network but through a PPP, contract for the deployment and operation of that network with a private sector company. Other municipalities choose to simply be an 'anchor tenant' on the network and negotiate favorable pricing for the services they need in return for use of their assets (poles, building roofs, water towers, etc) for deploying the network.

Philadelphia chose an innovative model which is also being considered in Boston, whereby the city sets up a non-profit organization that will own the network. The non-profit organization (with Philadelphia government representation on its Board) then contracts with a private sector entity to deploy the network and 'wholesale' the services and products to Wireless ISP providers who will, in turn, provide services to the city's residents. Through contract negotiation, a percentage of the profits earned by the wholesaler are paid to the non-profit organization. The non-profit organization then uses these funds to ensure 'universal access' goals are met by subsidizing poor residents, providing computers, training, etc. The non-profit organization is not the usual NGO but is composed of highly skilled/technical personnel who are qualified to manage a technical wholesaler while also being experienced providing services and training to disadvantaged groups.

Given the situation in Senegal, i.e., the lack of expertise and available municipal funds, we believe the Philadelphia approach, with modifications, is the best business model for 'Senegal Sans Fil'. The modifications involve a strong participation, along with provision of some funding by donors. In the U.S. and elsewhere, funds to prepare for deploying a WMN (feasibility study, RFP preparation and management, vendor selection, etc.) come from the municipalities own resources or loans from banks or bond issues. Technical personnel required for these processes can also come from the City itself from the Chief Information Officer's (CIO) department.

In Senegal, the municipalities do not have these options available. Thus it is fortunate that USAID is providing the assistance for the pre-deployment requirements. However, much more assistance from the private sector will be required if Senegal's municipalities are to reap the full benefits from deploying a WMN. Therefore, it is critical to the success that donors and the private sector become full and active partners with the various municipalities in Senegal selected for deploying a WMN.

PARTNERS

- Provide personnel to act as Board Members for the non-profit (includes significant donor representation)
- Provide the municipalities with a comprehensive E-Government program to include:
  - Selection and training of a Chief Information Officer (eventually one for each of the 11 Senegal municipalities—leading to the establishment of a nationwide government CIO organization)
  - Establishment/strengthening of the municipality's Information Technology department
  - Provide all employees with their own computer, or easy access to a computer as necessary.

- Training for all municipal employees to at least the level of that provided by the Internet driver's license certification program http://www.education-world.com/internet_drivers_lic/idl.shtml (can be done using free/open source courses).
- Business Process Reengineering (BPR) of all municipality's products and services (including internal IT processes) to make certain they take full advantage of the economies and efficiencies offered by computerization in general and the WMN in particular—to include the introduction of new services and products.

Note: This will require initial resources from the donors but sustainability will be achieved by the municipality taking on the costs involved through income derived from its WMN funds via increased revenues from additional business activity and reduced costs.

- The university will need to establish and provide academic credits and/or payments to a 'geek corps'/'e-rider' type of student activity where university students, proficient in ICTs, provide technical training and assistance to village and municipal residents. Sustainability is achieved by payments for students eventually coming via the non-profit's 'universal access' fund/activities.
- Donors that are not already present in the pilot area, could possibly initiate new projects in the pilot MWN area in order to demonstrate its usefulness to their goals as well as provide income for the MWN. The MWN will include some villages in its coverage so even village level projects could be initiated. Additionally, donors could underwrite the cost to extend coverage out for several miles to cover a village of interest.

To test the willingness of public-private partners to assist with this project, some ten face-to-face meetings were held with private sector companies, most of whom, but not all, are members of the American Chamber of Commerce. Additionally, a meeting with a group of donor agencies was arranged by USAID to obtain their thoughts on the project.

The private sector companies provided the following feedback:

- Virtually all companies felt they could utilize the MWN to provide better customer service.
- Fleet and product tracking (RFID) would be very useful and result in savings/better service
- Being connected to their office while moving around town would be useful
- Just having high quality, high-speed Internet access is great
- Would like to offer their product/service to the MWN customers

When asked if they would be willing to donate time, materials or funds to the project (non-binding indication only), they responded with:

- Pro-bono legal assistance (project prep stage)
- Donation of their company's IT techs' time up to 1000 hours/year
- Provide their products to the project at reduced prices
- Donate old computers to project - 2 companies
- Assist with hooking up villages near their operation
- Possible software donations

When monetized, these offers came to over $70,000 in value. We thus believe there is considerable willingness by the private sector to be significant partners on this project. It will be necessary to treat this as a new business, complete with branding and the putting together of a 'road show' to garner additional, significant private sector support as well as customer/stakeholder buy-in.

The feedback provided by the donor group was positive but less definitive. They did say that this effort should be harmonized with ongoing Senegalese projects. We were able to assure them that that is one of the precepts of this project should it go forward. We are certain many donors will become partners with the WMN project but much more effort will have to be expended to explain the full benefits of this technology and this project to the decision-makers of the various donor groups. It may prove useful, given the importance and pioneering nature of this project, to organize a joint meeting of the Partnership for Information and Communication Technologies in Africa (PICTA – of which USAID was a founding member) and the African Information Society Initiative (AISI) http://www.uneca.org/aisi/picta/ – two groups focused on ICTs in Africa and whose membership includes many of the donors and executing agencies in Senegal who might be interested in joining such a project:

PICTA

Partnership for ICTs in Africa

working together in building the information society in Africa

AISI

PICTA Home | AISI Home

Search PICTA

Members

[Membership Criteria]

Members participated in the recent annual PICTA meeting:

- Bellanet International Secretariat (Canada)
- Canadian Centre for Management Development
- Economic Commission for Africa (ECA)
- Fantsum Foundation
- Finland
- IBM
- Industry Canada
- International Development Research Centre (IDRC)
- International Institute for Communication and Development (IICD)
- Open Society Initiative for Western Africa (OSIWA)
- Partnership for Higher Education in Africa/New York University
- UK Department for International Development (DfID)
- UNDP

Other Members:

- Association for Progressive Communication (APC)
- British Council
- Canadian International Development Agency (CIDA)
- Carnegie Corporation of New York
- CISCO
- Commonwealth Telecommunication Organisation (CTO)
- Coopération Française
- European Union
- Ford Foundation
- German Technical Cooperation (GTZ)
- Korea
- Japan
- India
- infoDev Program (the World Bank)
- Global Information Infrastructure Commission (GIIC)
- Kellog Foundation
- National Telephone Cooperative Association (NTCA)
- La Francophonie
- Open Society Initiative for Southern Africa (OSISA)
- The Harvard Institute for International Development
- Swedish International Development Cooperation Agency (SIDA)
- United States Agency for International Development (USAID)
- The World Bank (Africa Region) and the World Bank Institute
- WorldSpace Corporation
- WorldSpace Foundation

In addition to: leading UN agencies (ITU, UNESCO, UNDP, WHO, WIPO, FAO, UNICEF, UNCTAD, UNRISD, WTO) and several regional (ATU, Rascom, ADB, etc.) and national organizations.

From the business plan presented in this report, it is clear that this project represents an excellent business opportunity and we are confident technical 'wholesaler' partners will bid to construct and operate this network using their own funds, so long as the proper policy enabling environment is in place. Donors and other private sector partners will thus be needed to ensure universal access goals are met.

An example of donor involvement, including USAID, in a large PPP wireless network project can be seen in this news item:

> In TFYR Macedonia, a country of 2 million people, local network provider On.NET is deploying a broadband wireless network across the country using Motorola Canopy radios. This project is a unique partnership between the donor community, the Government of TFYR Macedonia, and the private sector. The Government of China has donated thousands of personal computers to be used in the nation's primary and secondary schools. Complimenting that donation, USAID is providing broadband internet connectivity to 460 primary and secondary schools and 71 other sites through 2007. This substantial guaranteed countrywide customer base has created the business case for On.NET to make a significant investment in a pervasive countrywide wireless network.

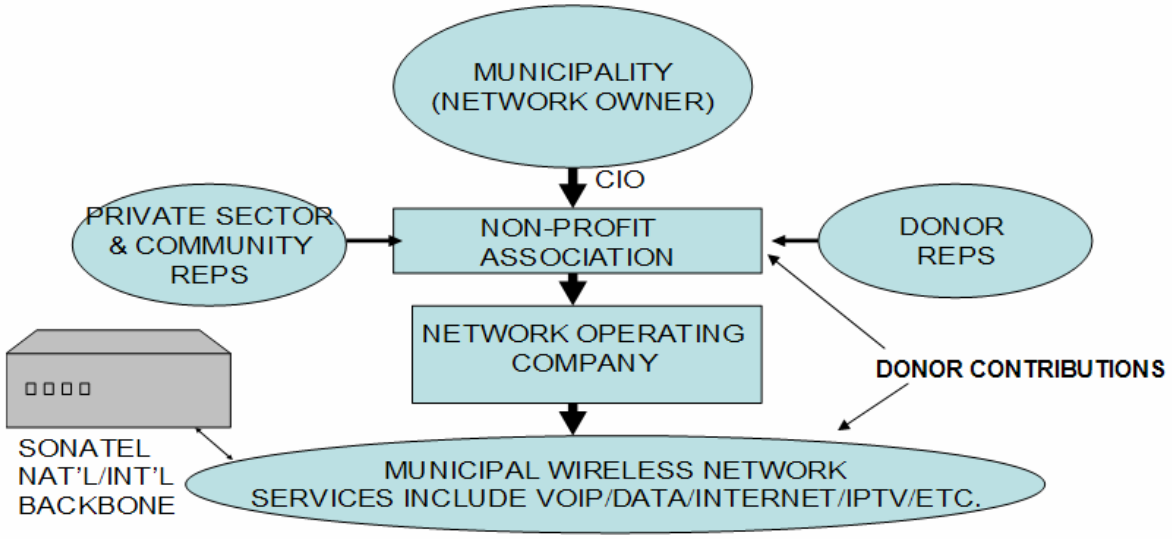
The donors, private sector and Senegalese government, acting together, can achieve a nationwide wireless network for Senegal, just as they are doing in Macedonia, but tailored to the Senegalese situation.

THE BUSINESS MODEL

The business structure to build and operate the network would thus be a hybrid model where the Municipality is the network owner and then contracts with a specialized, technically competent nonprofit corporation to oversee operation of the network and ensure business and universal access goals are met. The PPP nonprofit corporation would, in turn, contract with an experienced private sector network operator to actually build and operate the network.

The following figure depicts the business model:

Senegal Sans Fil Business Model



The nonprofit corporation would be governed by a Board of Directors comprised of public and private sector telecommunications and business experts with the municipality's Chief Information Officer as an ex-officio member to safeguard the interests/goals of the municipality. The day-to-day operation of the

nonprofit would be carried out by paid employees experienced in telecommunications and development project management as they will have to oversee the network operator and conduct universal access projects.

Donors contributing to the project would be represented on the Board to ensure their goals are met and to ensure transparency. Additionally, donors can make contributions to the project either in collaboration with the nonprofit organization or on their own intiative. It is hoped that the preferred method would be to work in concert with the nonprofit as a full PPP member.

Additionally, as this model shows, SONATEL is an important partner as it will provide the backbone for national and international connectivity, as well as value added services such as VOIP and IPTV (on a shared revenue basis). This business model provides a 'win-win' for all partners.

Although this model may be seen as creating an additional level of administration, in the difficult environment of Senegal, this organizational approach – with its built-in safeguards/oversight – is an efficient way to manage the project and maximize its chances for sustainability and success.

CONCLUSIONS AND RECOMMENDATIONS

Based on the research conducted over the past six weeks, the deployment of a wireless municipal network in Saint Louis would be an excellent project for Senegal to undertake. The WMN will assist Saint Louis and, through replication, all of Senegal to increase economic activity, significantly reduce the digital divide, and improve the quality of life for its citizens.

As the study has shown, there are no business or technical impediments to deploying the WMN. On the contrary, the business case for undertaking the implementation of this network is compelling and will attract interest by private sector companies to use their own funds to install, operate, and maintain such a network.

Unfortunately, the legal/policy regime in Senegal, as it now exists, will serve as a roadblock to deploying the network. Our research has shown there are two ways to overcome this roadblock:

1. Change the law to allow municipalities to become operators (as was done in France in 2004); or
2. Assist the municipality of Saint Louis to conclude a "Convention Agreement" with the government of Senegal allowing it to operate its own network.

Of the two solutions above, it is recommended to proceed with the second solution. A "Convention Agreement" could be written, agreed upon and concluded within 1-2 months. Changing the law would most likely take much longer.

However, changing the law should also proceed so as to provide a permanent solution to allow a rapid replication and deployment of municipal networks. We have provided a copy of the French law but would suggest that any such proposed change to the law, ensure that universal access goals are an integral part of the new law.

If USAID should decide to assist the DFI Steering Committee to complete a Convention Agreement between Saint Louis and the government of Senegal, steps 2 – 4 could be completed rapidly. With the research and business case presented in this study, a private sector operator could rapidly reply to an RFP should they decide to bid on the project. With the many RFPs for MWNs available for reference (Philadelphia, Portland, Atlanta, etc.), a legal team should be able to construct an RFP for the Saint Louis MWN within a short period. With these points in mind, the following timetable should be realistic:

1. Construct a Convention Agreement	1 month
2. Conclude the signing of the Agreement	2 months
3. Construct and Issue RFP	1 month
4. Replies to RFP received and evaluated	3 months
5. Award of contract	1 month

With this timetable, the deployment of the Saint Louis wireless municipal network could begin within 8 months from the decision to go forward with the Convention Agreement. The hiring and training of a municipal CIO could proceed simultaneously with the rest of the activities, once the Convention Agreement is signed.

The incorporation of the PPP nonprofit association could begin simultaneously with the construction of the Convention Agreement and would be in place in time to receive and evaluate bids and award the contract.

Although the Task Order calls for implementing a PPP Steering Committee, we would advise against that in favor of incorporating a PPP nonprofit association. The Saint Louis municipal wireless network will be a business and if it is to achieve sustainability, it should be managed in a businesslike manner through the representative (PPP) Board of Directors and the professional operational staff of the nonprofit association. The DFI Steering Committee could oversee the process, along with the USAID Task Order Cognizant Technical Officer, until the nonprofit association is operational.

Lastly, the PPP Partners should undertake those tasks described in Section IV regarding providing the Saint Louis municipality with a comprehensive E-Government program, so that it can take maximum advantage of the municipal wireless network.

APPENDIX A
INCENTIVES FOR A LEGISLATIVE REVIEW

Existing service	Providers	New services through municipal wireless	Benefits for the municipality	Benefits for Sonatel	Benefits for businesses	Benefits for Rural and Urban residents
Voice telephony	SONATEL: fixed: 260000 lines	VOIP	1. improvement of the communication	1. Incomes from the purchase of local termination	1. elimination of lines allocation troubles	1. installation costs elimination
	mobile: SONATEL + SENTEL		2. additional customers not reachable by the fixed phone	2. buy telephone line number	2. faster deployment of the line	2. deposit amount reduced
			3. new revenues	3. buy Direct Inward-Dial (DID)	3. reduction of telephone costs	3. line portability
			4. increase of the penetration rate for fixed and mobile telephony	4. extension of the subscriber's number	4. portability of the line	
Internet Access	SONATEL	municipal wireless broadband	1. increase of the Internet customers	Bandwidth purchase	1. fast Internet network deployment (24H max)	1. fast Internet network deployment (24H max)
	20 000 lines		2. faster deployment		2. increase of the link reliability	2. increase of the link reliability
			3. Internet users subscription and purchase of the wifi network card		3.teleworking	3.teleworking
			4. build customers' loyalty database benefiting from new services			
			5. increase of Internet connectivity in favor of low-income customers			

Existing service	Providers	New services through municipal wireless	Benefits for the municipality	Benefits for Sonatel	Benefits for businesses	Benefits for Rural and Urban residents
Government intranet and VPN	1. SONATEL via leased-lines or ADSL or radio multiplex	1. Intranet	1. VPN immediate delivery: no prior authorization required	None	1. improvement of communication	
	2. each company can request for its point to point	2. VPN via municipal wireless broadband	2. new customers		2. network security and mobility in access	none
			3. better communication between companies and local authorities			
Video-conference	SONATEL and private corporations	access video democratization (Government, Businesses, individuals)	1. communication improvement between central and local governments	increase of the Internet bandwidth use by the municipal network	1. time saving for meetings	1. improve family communications (video-voice)
			2. reduction of traveling costs for public authorities between the Capital and the region		2. communication improvement between the headquarter and branches	
			3. quick responsiveness in emergency cases			
Telemetry	SONATEL and private companies	municipal wireless network	1. traffic light control	None	SDE (water company): control of its equipments, air pollution measures	none
			2. field monitoring (water tank, flooding…)			

Existing service	Providers	New services through municipal wireless	Benefits for the municipality	Benefits for Sonatel	Benefits for businesses	Benefits for Rural and Urban residents
Public Safety: police, army, firemen, ambulance civil protection	SONATEL	1. secured data and radiocommunications on an independent network	1. police: improvement of communication between police forces	None	confidence in public safety services	confidence in safety services
			responsiveness, quick interventions, wrongdoers arrests, drop in criminal activities			
		2. encrypted transmission	2. firemen: communication improved with other emergency services			
			3. ambulance: intervention responsiveness			
			4. alternative network in case of connectivity loss, catastrophes			
Telemedecine	to be determined	new hospital services network	1. creation of a municipal network and interconnection with rural communities in the covered area	increase of the Internet bandwidth use by the municipality	enhancement of health care services	enhancement of health care services
			2. promotion of health monitoring			
			3. hospital care improvement in villages			

Existing service	Providers	New services through municipal wireless	Benefits for the municipality	Benefits for Sonatel	Benefits for businesses	Benefits for Rural and Urban residents
E-learning	Gaston Berger and University Cheick Anta Diop Universities , Suffolk university, Virtual African University	1. e-learning access for all the cities having a wireless municipal network	1. enhance educational public services, Internet access for all educational institutions	increase of the Internet bandwidth use by the municipality	1. training of workers	supervised or non supervised distance learning
		2. high speed Internet connection for all schools in the covered area	2. improved communication between the municipality and schools: prevention actions (aids, vaccination,…), good citizen actions		2. student professional internships	
		3. connection between the schools in the locality				
		4. exchange programs with schools and universities abroad				

APPENDIX B: LEGAL REGIMES APPLYING TO TELECOMMUNICATIONS NETWORKS, SERVICES, AND EQUIPMENT

The telecommunications networks and services operators' applications for licenses, authorizations, declarations and approvals are addressed to the Agency for the Telecommunications Regulation (ART).

Services and networks	License	Authorization	Declaration	Approval
Voice services open to the public: fixed/mobile telephony, Voice over IP	Yes			
Access to Internet	Yes			
Data network services	Yes			
Independent network establishment		yes		
Use of radioelectric frequencies		yes		
Internet services: email, files transfer, real time users chat, information search in servers			Yes	
Value-added services other than Internet services: e-mail, voice mail, audiotext, Electronic Data Interchange, facsimile, on-line information services, data access services (search and processing), files and data transfer, protocol and code conversion			Yes	
Radioelectric installations				yes
Terminal equipments				yes
Laboratories testing and measuring telecommunications equipments				yes
Radioelectric equipments installers				yes

The setting up and operation of a municipal wireless network requires the obtention of a **license**.

Municipal wireless network and services	License	Authorization	Declaration	Approval
Voice services open to the public: Voice over IP	Yes			
Access to Internet	Yes			
Data network services	Yes			
Use of radioelectric frequencies		yes		
Internet services: email, files transfer, real time users chat, information search in servers			Yes	
Value-added services other than Internet services: e-mail, voice mail, on-line information services, data access services (search and processing), files and data transfer, protocol and code conversion			Yes	
Radioelectric installations				yes
Terminal equipments				yes
Radioelectric equipments installers				yes

APPENDIX C: LICENSING PROCEDURE FOR THE ESTABLISHMENT AND/OR OPERATION OF A MUNICIPAL WIRELESS NETWORK

	Permits	Conditions	Time-frame	Benefits	Restraints	Operators	What is required?
Existing Law	1.Traditional License • Global license (fixed and mobile telecommunications) • Mobile (GSM) telecommunications license	1. Elaboration of the license specifications 2. International call for tenders 3. Receipt of bids 4. Opening and evaluation of bids 5. Adjudication of the license	1-3 years		1. time-Consuming 2. burdensome administrative 3. expensive bidding-procedure (selection and application, license allocation, annual renewal fees)	Major-International telecommunications companies	• Procedure adaptation to smaller Operators • Telecommunications Code review
Prospective law	2. Municipal wireless Experimental License	- licensing process and specifications to be defined - new technology to experiment	To be defined	Promote new technologies development	1. Expensive and non-economically viable-pilot project 2. State of the art: no doubt on WIFI-WIMAX technologies functioning	Private telecommunications operators	• Telecommunications Code review or adoption of a new regulatory act

	Permits	Conditions	Time-frame	Benefits	Restraints	Operators	What is required?
	3. Authorization[43]	Conditions appended to the Authorization: 1. designation of the service or the network type and technology for which the right to use the frequency is awarded 2. the technical and operational conditions to avoid harmful interferences and limit the public exposure 3. tariff policy / territorial coverage / service quality 4. optimization of the use of granted radiofrequencies	Up to 2 years to implement the Directive	• less time-consuming process (2-8 months) • authorization granted if the operator meets the appended conditions • less expensive procedure: fees cover the administrative authorization process, scarce resources management and control, telecommunications regulation costs	Public operators such as local governments are not addressed	Telecommunications companies	• Transposition of the Directive into a new national legislation
	4. Regional/Local license for the provision of Universal service (U.S.)[44] and other telecommunications services (VOIP, wireless internet services)	1.operators of public telecommunications network shall provide U.S in their coverage area 2, compliance with ART specifications (tariff, quality, geographic area)	To be defined	• improve rural access to telecommunications services • economic, social and cultural development	Prior obtaining of a license except if the proposed Decree on universal service offers other type of permit to provide universal service	Private telecommunications operators	• Adoption of the proposed Decree on Universal service (2-3 months) • Definition of the licensing process: allocation process, regional license specifications

[43] West African Economic and Monetary Union's Directive on the harmonisation of the regimes applying to network operators and services providers: an **authorisation** is required for the setting up and operation of public telecommunications networks, provision of public telephony services, provision of leased-lines services and use of scarce ressources (radioelectric frequencies and numbers)

[44] Universal service scope: provision to rural communities of public point of access, service provision to the Regional Council and a health center, access to a digital network of integrated services, internet services, voice telephony advanced services, internet access services

	Permits	Conditions	Time-frame	Benefits	Restraints	Operators	What is required?
	5. Local Government license to provide public telecommunications networks and services	• lack of private initiative • license specifications to be defined	Local Government Code review: To be defined	• improve rural access to telecommunications services • economic, social and cultural development • carrier-to-carrier interconnection terms and conditions	Time-consuming legislative review	Local governments	1. Local Governments Code review: transfer of authority in the telecommunications area
	6. Concession agreement between a local government and the State	• - lack of private sponsorship	1 to 3 months	• improve rural access to telecommunications services • economic, social and cultural development	Contract conclusion depends on the intention of the parties	Local governments	• Concession agreement between the State and a local government to be signed - terms and conditions to be defined (area coverage, service quality…) = exceptional • transfer of authority for the provision of telecommunications services including universal services

Accordingly to the time-frame of the license grant, legislative reviews and the need to promote competition on the telecommunications market, the best case scenarios for the implementation of a municipal wireless network are:

1. The Concession convention between the Central Government and the local government;
2. The local/regional License for the provision of universal services and other telecommunications services;
3. The West African Economic and Monetary Union's authorization regime;
4. The local/regional government license as a public telecommunications operator;
5. The experimental license; and
6. The existing license regime

APPENDIX D: MUNICIPALITY WIRELESS ISP TEMPLATE (BUSINESS PLAN - MOST LIKELY SCENARIO)

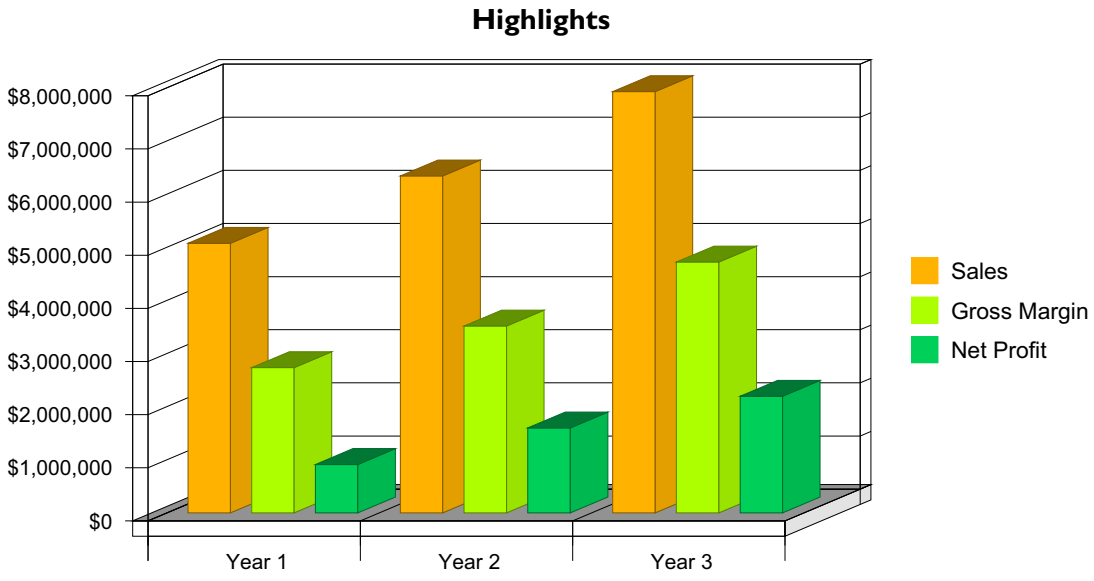
For this model business plan a fictitious name was created for a Public-Private Partnership company in charge of the management of the Municipal Wimax/WiFi Network, ready to build and operate a Wimax/WiFi network in the City of Saint-Louis and its surrounding area.

1. EXECUTIVE SUMMARY

Municipality Wireless Internet Service Provider (MWISP) will be a Saint-Louis du Senegal based corporation to be created in 200_ that will specialize in the setup, delivery, operation, marketing and maintenance of secure wireless communications (Wimax and WiFi) for individuals, businesses, and entire communities. MWISP will offer custom, from the ground up, metropolitan-area data and VoIP installation and delivery.

Wimax/ WiFi are quickly becoming the standard in the delivery of Internet connectivity throughout many organizations, government agencies and businesses. MWISP is focused on the delivery of secure Wimax/ WiFi services to commercial and residential property owners, as well as traditional Internet service providers that are looking to improve the service offerings within their buildings and current services. The primary focus of MWISP is to provide full-service installation, support and management of wireless networks for individual building owners and municipalities. MWISP is a wholesale provider of services to businesses looking to improve their competitiveness and amenities in their commercial properties and townships.

The opportunity for wireless (Wimax / WiFi) installations and ongoing management of these networks has increased greatly in the past year and is projected to grow worldwide at an annual rate of no less than 50% a year. The total industry segment targeted specifically by MWISP is expected to grow to $2 billion annually by the year 2008. The Wimax / WiFi industry, as a whole, is on track to become a $190.8 billion powerhouse. The year 2004 was the beginning of a paradigm shift in how Internet services, hardware and security were all delivered to users throughout the world. MWISP has an opportunity to be the one of first movers in Senegal in this rapidly growing market. Because of the nature of the Senegalese market in its current state, the threat from competitors does not exist so far. Later, competitors in the market will help to increase industry awareness and drive sales within the industry. The overall opportunity in this industry is great. Due to the short-term opportunity to grab a foothold in this emerging market, MWISP is aggressively rolling out the services anywhere demands are generated. As demand increases, the innovative MWISP sales and installer management strategy will allow the company to take advantage of all opportunities in Saint-Louis du Senegal first and the other cities and village later.



1.1 OBJECTIVES

- Sales over US $3,000,000 in the first year
- Increase contracted sales force to 30 by year 3
- Net worth over US $20,000,000 by year 3.
- Coverage 100% of the population by end of year 2.
- Services penetration 20% of the population by end year 2.
- Services penetration 35% of the business by end year 2.
- Services penetration 50% of the local government by end year 2.

1.2 MISSION

The company "Municipal Wimax/WiFi ISP" (MWISP) represents a partnership between the local government and a private partner with expertise in the field of Wimax/WiFi networks and good knowledge of the cultural, political and economic situation of Senegal. This partnership will be financially equal and allow the municipalities to improve their income and their communications in intra and extra city limits through this powerful tool called the Internet.

Everything in this business plan can be applied to other cities anywhere in Senegal, we just need to gather all the information related to your municipality and process them through our spreadsheets.

MWISP will make it easier and more affordable for government, businesses and residents to have Internet access and many other value-added services. We will decrease the costs of basic Internet access, basic IP phone services, allow for portability, and provide high-quality, ongoing customer service. For the government and private owner joint venture, MWISP will provide a ground-level entry port to the next high-impact technology trend, turning around high value returns every year.

1.3 KEYS TO SUCCESS

- Total commitment of the government authorities of the city and the region of Saint-Louis du Senegal and the Direction Informatique de l'Etat du Senegal, to provide access to government facilities, train employees

to be prepared to take charge of the management of MWISP's network in the city of Saint-Louis du Senegal first and all other cities and villages of the region of Saint-Louis;

- Total commitment from the ART to accelerate the update of the Code des Telecoms to allow the municipalities and region of Senegal to become a Wireless Internet Service Provider and IP telephony operator everywhere in their region and in cities not yet served by the incumbent carrier Sonatel;
- Total commitment of Sonatel to facilitate the negotiations to sell to MWISP large Internet bandwidth connectivity, point-to-point dedicated lines to connect Saint-Louis and the submarine cable station of Dakar-Medina;
- Management skills;
- Total synergy between Universite Gaston Berger Direction de l'Informatique and MWISP to prepare the next generation of engineers, managers and users of the MWISP network;
- Work in partnership with expert Government authorities;
- Business, sales, technology, and branding expertise;
- First-mover advantage in an emerging market; and
- Detailed installer database, tracking performance and skill sets.

1.4 RISKS

The risks involved with starting MWISP are:

- Will the Senegal telecommunications authorities agree to change the Code of Telecoms license or agreement to allow the municipalities to become telecom operators and be authorized to provide all the services described in this business plan to allow a faster reduction of the "fracture numerique"?
- Will the Senegal authorities understand that unless they use this cost-effective approach to close the "fracture numerique," it will take another 20 years?
- Will Sonatel be cooperative enough to support this beneficial partnership that will bring more aggregated business on a B2B side to Sonatel?
- Will the cost of accessing the Internet from home drop so significantly that there will not be a market for public Internet terminals?

2. COMPANY SUMMARY

Wimax / WiFi is quickly becoming the standard in the delivery of Internet connectivity throughout many organizations, government agencies and businesses.

MWISP will focus on the delivery of basic access to Internet and many other value-added services, through a Wimax and WiFi network which will cover the entire city of Saint-Louis, from the downtown area all the way to the University Gaston Berger. The area that MWISP wireless network will cover is about a 13km radius. The primary function of MWISP will be to build, operate, and manage the Saint-Louis municipal wireless network. MWISP will operate in partnership with the city and region of Saint-Louis to create a municipal wireless network of services for organizations looking to improve their competitiveness and amenities in their cities, commercial properties and townships. MWISP charges a set-up fee and a monthly maintenance charge.

2.1 COMPANY OWNERSHIP

Articles of Incorporation

Articles of Incorporation will be filed with the Registre de Commerce office in the city of Saint-Louis. MWISP, S.A. will file as a *Société Anonyme*.

Company Ownership

The Company will be a joint-venture between the city of Saint-Louis, the region of Saint-Louis and a private corporation with expertise in operating wireless Wimax/WiFi interested in deploying and operating networks to cover the city of Saint-Louis and villages around it. Later, this type of joint-venture can be expanded to other Senegalese cities, villages and the region.

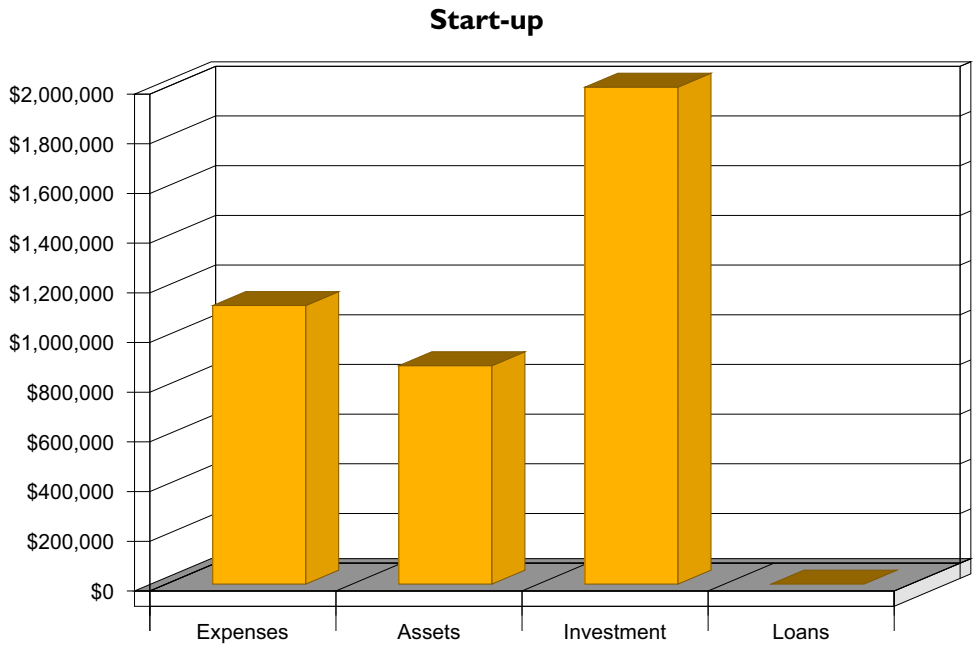
To guarantee that this network will last, it is important that the operational side of the venture stay under the supervision of the private partner and that the staff of the city will be trained in all aspects of network operations and maintenance.

2.2 START-UP SUMMARY

The PPP founders will plan to handle all day-to-day operations of the business and will work with outside vendors and partners in order to ensure that this business venture is a success. It is estimated that the start-up expenses will be US $1,121,100 (including network equipment, deployment, legal costs, advertising, and related expenses). Total start-up requirements include an additional US $878,900 for cash on hand to cover the first year's operating expenses.

Start-Up Requirements

Start-up Expenses	
Authorization permit fee ART	$40,000
Legal	$10,000
Insurance	$5,000
Wireless Network hardware	$875,000
Network operating center	$207,100
Other	$2,000
Total Start-up Expenses	*$1,121,100*
Start-up Assets	
Cash Required	$878,900
Other Current Assets	$0
Long-term Assets	$0
Total Assets	*$878,900*
Total Requirements	$2,000,000



3. SERVICES

It has now become standard procedure to include wired connections for all new construction projects, both residential and business-related. The costs associated with wiring an entire building are extremely high when compared to adding a wireless network that will allow for greater speed and flexibility. As more developers focus on this as a utility which must be included, the demand for greater amounts of wireless technology grows. We are also a great solution for those developers looking to provide services for older buildings that do not already have wired connections in place, or where each tenant has individually set up his own wired network. A private WiFi network would be the most cost-effective and quickest way to offer this service across all tenants. As connectivity to the Internet has become a necessary utility, just like water, phone and electrical hookups, so has the trend of providing a central Internet connection.

MWISP Residential - The MWISP Residential solution is a full-service plan for owners and landlords of multi-family housing units and communities who are looking for ways to add value and improve their occupancy rates. The MWISP Residential solution gives owners the ability to aggregate and redistribute a high-speed Internet connection throughout their property. With cable or DSL, tenants pay anywhere from $10 to $50 a month for an individual Internet connection, either through dial-up or broadband. With the MWISP Residential, multi-family property owners can become the preferred Internet provider for their tenants, saving tenants money and increasing landlords' income and competitive advantage.

MWISP Enterprise - The MWISP Enterprise solution is a full-service plan for owners and landlords of large commercial and industrial properties. Quickly becoming the "fourth" utility, wireless Internet access gives property owners the ability to provide this service at a fraction of the cost of a traditional high-speed wired network. MWISP Enterprise is a completely managed service that includes complete installation, 24/7 management and maintenance.

MWISP E-Government - The MWISP E-Government solution is a full-service plan for all administrations located within the coverage area of MWISP's wireless network.

This plan includes: High-speed Internet access anywhere in the city, high-speed and highly secure Intranet and VPN remote access to their private network, Web portal for population interactions, private VoIP connectivity to allow free phone calls and free video conferences between administration remote sites and more services to be established along the way.

MWISP Enterprise - Internet Service Providers (ISPs): ISPs play an important role within the company. MWISP will partner with key ISPs in order to resell the MWISP Enterprise solution. The benefit to partnering with the ISPs is focus. The core focus for an ISP is to provide raw connectivity to their clients, whether wired or wireless. In either case, these ISPs need service providers to handle the installation of these networks. ISPs usually either outsource these services, or refer them to a reputable provider, if the company does not do the installation themselves. By partnering with MWISP as a hardware solutions provider, the ISPs can remain focused on their core competencies and MWISP will tap into an established customer base. Since MWISP will need a primary connection to the location where the wireless network is requested, the partnership further solidifies the ISP's role in providing connectivity to the location. In all circumstances, MWISP depends on local ISPs to provide the raw feed to any wireless installation, whether it be an E1 direct to the property or an E3 powering a larger wireless base station, where MWISP can distribute its own E1s wirelessly.

The MWISP Enterprise Wimax / WiFi solution can provide network connectivity at speeds starting up to 30mbps for Internet access and up to 1Gbps for Intranet purposes only. This connectivity can be distributed throughout an entire area without the need to re-wire any current wired connections. Not only is this faster than older wired networks, but it's also easier to scale up and upgrade the technology as it improves.

3.1 SERVICE DESCRIPTION

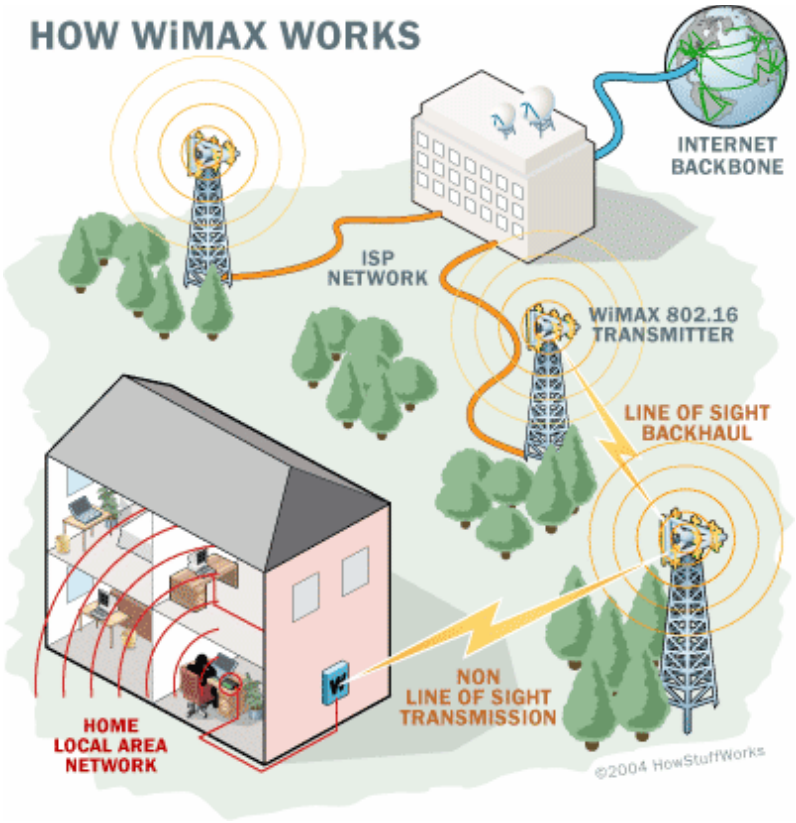
"WiMAX" is an acronym that stands for **W**orldwide **I**nteroperability for **M**icrowave **A**ccess (Wimax forum)

WiMAX is a standards-based technology enabling the delivery of last mile wireless broadband access as an alternative to cable and DSL. WiMAX will provide **fixed**, **nomadic**, **portable,** and, eventually, **mobile** wireless broadband connectivity without the need for direct line-of-sight to a base station. In a typical cell radius deployment of three to 50 kilometers, WiMAX Forum Certified™ systems can be expected to deliver capacity of up to 75 Mbps per channel, for fixed and portable access applications. This is enough bandwidth to simultaneously support hundreds of businesses with T-1 speed connectivity and thousands of residences with DSL speed connectivity. Mobile network deployments are expected to provide up to 75 Mbps of capacity within a typical cell radius deployment of up to 50 kilometers. It is expected that WiMAX technology will be incorporated in notebook computers and PDAs by 2007, allowing for urban areas and cities to become "metro zones" for portable outdoor broadband wireless access.

A WiMAX system consists of two parts:

- A **WiMAX tower**, similar in concept to a cell-phone tower - A single WiMAX tower can provide coverage to a very large area – as big as 3,000 square miles (~8,000 square km).
- A **WiMAX receiver** - The receiver and antenna could be a small box or PCMCIA card, or they could be built into a laptop the way WiFi access is today.

A WiMAX tower station can connect directly to the Internet using a high-bandwidth, wired connection (for example, a T3 line). It can also connect to another WiMAX tower using a line-of-sight, microwave link. This connection to a second tower (often referred to as a **backhaul**), along with the ability of a single tower to cover up to 3,000 square miles, is what allows WiMAX to provide coverage to remote rural areas.



What this points out is that WiMAX actually can provide two forms of wireless service:

- There is the **non-line-of-sight**, WiFi sort of service, where a small antenna on your computer connects to the tower. In this mode, WiMAX uses a **lower frequency range** – 2 GHz to 11 GHz (similar to WiFi). Lower-wavelength transmissions are not as easily disrupted by physical obstructions – they are better able to diffract, or bend, around obstacles.

- There is **line-of-sight** service, where a fixed dish antenna points straight at the WiMAX tower from a rooftop or pole. The line-of-sight connection is stronger and more stable, so it's able to send a lot of data with fewer errors. Line-of-sight transmissions use **higher frequencies**, with ranges reaching a possible 66 GHz. At higher frequencies, there is less interference and lots more bandwidth.

WiFi-style access will be limited to a 4-to-6 mile radius (perhaps 25 square miles or 65 square km of coverage, which is similar in range to a cell-phone zone). Through the stronger line-of-sight antennas, the WiMAX transmitting station would send data to WiMAX-enabled computers or routers set up within the transmitter's 30-mile radius (2,800 square miles or 9,300 square km of coverage). This is what allows WiMAX to achieve its maximum range.

"WiFi" is short for wireless fidelity, technology for broadcasting a high-speed Internet connection to a given area. The Internet connection is plugged into a transmitter, called an access point, and is broadcast to an area about 300 feet in diameter, called a "hotspot." Properly equipped laptop computers or other portable devices can then pick up the signal and log onto the Internet without the need to be plugged into a hard line connection.

WiFi not only allows users to connect anywhere without the cost and delay of installing wired connections, but it is also faster than traditional DSL or cable connections. Just like traditional wired connections, WiFi can be securely set up with an existing wired network or set up as a stand-alone wireless network. WiFi

prevents the need to install a custom wired network, allowing for greater flexibility, particularly for growing businesses that may need to remain flexible in both location and office layout.

WiFi uses radio technology called 802.11a, 802.11b and 802.11g in order to provide secure, reliable, fast wireless connectivity. All WiFi networks operate in the unlicensed 2.4 and 5 GHz radio bands, with an 11 Mbps (802.11b), or 54 Mbps (802.11a) data rate, or with products that contain both bands (dual band). 802.11g is equally as fast as 802.11a and 802.11b, but boasts the backward compatibility to 802.11b required in order to make inexpensive upgrades.

Enterprise level WiFi is just beginning to gain ground with Internet Service Providers worldwide. The ability to distribute large amounts of bandwidth up to 30 miles between WiFi base stations solves the "last mile" problem in many communities, as well as providing a substantial savings when compared to digging trenches and laying fiber in the ground.

3.2 DETAILED SERVICE DESCRIPTIONS

Although each WiFi installation is unique to the specific needs of each client and building, the options available are simple. The more coverage area needed, the greater economies of scale MWISP will enjoy due to the cost structure described below. All products are based on a fixed 40% gross margin on the equipment needed for each installation, plus appropriate installation charges. In addition to the initial installation, a fixed monthly maintenance charge to manage and monitor the network will also be added as part of the standard service offering. These monthly prices are based on the variable raw connection cost (i.e. E1 approximately $800 per month) plus an applicable service fee based on the number of users utilizing the network and the preferred bandwidth for each. For a detailed breakdown of the financial assumptions and pro-forma income statement, please refer to the financials section in this document and Appendix I.

Each location receives its primary Internet connection from a wired E1 line or greater. This provides the base station with the ability to transmit connectivity to access points throughout the coverage area so users can access the network. Note: in some cases a high-speed DSL line may be substituted in order to lower the overall installation cost for the client. Although the primary target market for these services consists mostly of larger installations, this may be considered if an E1 is not needed on the property or nearby properties.

MWISP provides the installation and maintenance of high-speed wireless networks for specific market segments. All of the installation services are packaged as the "MWISP Enterprise Solution" with the specific industry applications added. Currently, the company is actively marketing the MWISP Enterprise solution to three specific industry segments: commercial property owners, multi-tenant residential property owners, and travel hub operators; we will follow up with marketing to ISPs in the next two to three months. These industry segments will each have a custom package, called MWISP Enterprise, MWISP Residential WiFi & MWISP Travel Hub WiFi, respectively. We will divide these three primary service categories for marketing and sales purposes, but will all follow the same install and maintenance process.

The **MWISP Commercial Enterprise** and **MWISP Residential Enterprise** services are both packaged in such a way as to allow property owners or individual business owners to increase the value of their property or business by providing tenants or customers with access to high-speed wireless Internet access. These packages are specifically designed to add value to the owner's enterprise. It is not the goal of MWISP to install networks on speculation and market its services directly to the end user. Instead these services are offered to the commercial or residential owner as a way to generate revenue by installing a wireless network, or by charging a fee for user access. This can be done in a number of different ways, from increasing base rent or lease rates and including it as an amenity of the property, to adding it as an additional access fee. The MWISP Enterprise service allows all working areas of the building, property or business to have wireless Internet access.

In addition to the initial installation, the service also includes secure 24/7 remote management and maintenance for a monthly fee. This service provides full service maintenance, user management and monitoring of the entire wireless network. This allows the owner the freedom to offer these services without

fear of trying to manage a complex wireless network or troubleshooting problems, should they arise. It is completely hands-off for the owner and no technical knowledge is needed in order to offer this at their properties.

The **MWISP ISP Enterprise** solution utilizes the same Enterprise installation and monthly management as described above, but it is positioned differently for the ISPs. Since MWISP is a wholesale provider of wireless Internet access and does not directly market its services to the end users of any network, an ISP partnership is a great fit. ISPs have similar relationships already created with commercial and residential owners and this is an easy add-on sale when discussing options with these clients. The MWISP ISP Enterprise service simply allows the ISP to offer the MWISP Enterprise package through their ISP account, already in place. The installation and management is the same, except the primary connection is still provided through the ISP. The ISP can receive additional revenue as a MWISP reseller (at 10%), while adding new customers and maintaining focus on their strengths – raw connectivity.

MWISP Enterprise - Monthly services included in all plans:

- 24/7 remote management
- Network reporting
- Bandwidth management
- Security maintenance
- User management
- User support
- Upgraded equipment, as needed
- Hands-off management for property owner
- Private customized connection
- No cost truck rolls

Additional services may be added at a later date once the networks are in place at each site. Some of these additional services might include voice over IP (VOIP) and security services. For additional details regarding how these three industry segments will be targeted from a sales and marketing standpoint, please refer to the Marketing Plan section of this document.

3.3 COMPETITIVE COMPARISON

Competitive Comparison
The opportunity for wireless (Wimax / Wi-Fi) installations and ongoing management of these networks has increased greatly in the past year and is projected by industry experts to grow at an annual rate of no less than 50% a year. The total industry is expected to grow to $2 billion annually by the year 2008.

MWISP has an opportunity to be the first movers in Senegal in this rapidly growing market. Because of the non-existence of the market in its current state, the threat from potential competitors does not exist. The overall opportunity in this industry is great and there is unlimited opportunity for wireless installations throughout the next few years. Due to the short-term opportunity to grab a foothold in this emerging market, MWISP will aggressively roll out the services anywhere demand is generated. As demand increases, the scalable sales and installer management strategy will allow the company to take advantage of all opportunities, regardless of location.

WiFi Advantages
The primary advantage lies in the technology of Wimax/Wi-Fi itself. Using licensed and unlicensed radio frequencies (802.11a, 802.11b, 802.11g & 802.16), each new location can be installed quickly. This not only decreases the total cost of a new installation, but also increases the ability to roll out new networks quickly and efficiently. Cellular technology (including the new 3G band) has significantly higher costs and ART Senegal approval is required. Wimax requires an agreement for each frequency and WiFi has absolutely no barriers to entry and can be installed with no restrictions or government regulations. Coupled with the faster connection rate of wireless, the value proposition becomes obvious.

The industry itself has many key advantages over traditional wired networks, from cost to ease, to time for implementation. In many cases, the newer wireless technology will also improve the connection speed at a fraction of the cost. The industry advantage combined with the MWISP management team, Board of Advisors and current marketplace demand for such services will give the company a strong starting position and ability to execute on the plan described herein.

Wimax Advantages (Intel Website description)
WiMAX (World Interoperability for Microwave Access, Inc.), based on the IEEE 802.16 standard, is expected to enable true broadband speeds over wireless networks at a cost point to enable mass market adoption. WiMAX is the only wireless standard today that has the ability to deliver true broadband speeds and help make the vision of pervasive connectivity a reality.

There are two main applications of WiMAX today: fixed WiMAX applications are point-to-multipoint enabling broadband access to homes and businesses, whereas mobile WiMAX offers the full mobility of cellular networks at true broadband speeds. Both fixed and mobile applications of WiMAX are engineered to help deliver ubiquitous, high-throughput broadband wireless services at a low cost.

Mobile WiMAX is based on OFDMA (Orthogonal Frequency Division Multiple Access) technology which has inherent advantages in throughput, latency, spectral efficiency, and advanced antennae support; ultimately enabling it to provide higher performance than today's wide area wireless technologies. Furthermore, many next generation 4G wireless technologies may evolve towards OFMDA and all IP-based networks as an ideal for delivering cost-effective wireless data services.

Intel is poised to deliver the key components needed for successful WiMAX networks. It delivered the fixed WiMAX solution, Intel® PRO/Wireless 5116 wireless modem, and is now sampling a fixed/mobile dual-mode solution code-named Rosedale 2. The highly cost-effective Rosedale 2 solutions was designed to support both standards with an easy upgrade path from fixed to mobile and is expected to further accelerate the deployment of WiMAX networks.

3.4 TECHNOLOGY PLAN

The Wimax/Wi-Fi industry are experiencing substantial growth in both technology and user demand. As a result of this fast growth curve, it is critical that the Technology department stay up-to-date with the newest technology and ensure that the company dedicates appropriate resources towards the adoption and understanding of any new technology related to the installation, implementation and management of wireless networks.

As stated in the marketing section in this document, MWISP will be a full-service, nimble, professional provider of wireless technology. This requires that our technology department and staff be the leading experts in the field to ensure credibility and success in the marketplace.

The technology objective for MWISP is to always stay educated on emerging wireless technologies so that it can provide these advanced services to the client in the easiest possible format without the need for the client to understand the complexities involved. The goal is to package the technology provided by MWISP in an easy-to-understand service that the client can easily grasp.

3.4.1 TECHNOLOGY UTILIZED

To satisfy the growing demand for bandwidth, MWISP will utilize existing fiber networks tapped with a network switch providing our initial Internet feed.

In Saint-Louis du Senegal, we will always start with 30Mbps connection as a foundation.

Connected to a network switch, we will use a Point to Multipoint (PtoMP) wireless base station utilizing the Wireless Outdoor Router Protocol (WORP), 802.16 standard and radius antenna to deliver carrier class broadband Internet to multiple subscriber units at "node points" across an area from the size of facility to several miles.

This Point to Multipoint (PtoMP) backbone will utilize the 5.7 GHz or 5.8 GHz licensed frequency to deliver each "node point" subscriber unit the broadband connectivity will need to deliver the last mile service.

Each subscriber unit will then redistribute the broadband Internet wirelessly utilizing the 802.11a, 802.11b, and 80211.g standards via an enterprise-level Access Point (AP) to clients/users with laptops or workstations that are WiFi enabled.

Because of the usage of 3 widely adopted wireless standards, authenticated users will be able to connect to the network with low-cost equipment that is obtainable at most computer and electronics stores.

Achieving a high level of Quality of Service (QOS) can prove to be a chore in a wireless network. To ensure success in this area, MWISP will follow 802.11e Standards that offer a roadmap for providing a stable, high quality of service for customers connecting to the network.

In order to widen our network and offer inter-operability with outside networks, we will integrate aspects of the 802.11f Standards into our external vendor plans. By watching the 802.11f standards, we can offer roaming and extended off-network services to our customer base, and generate additional revenue.

Network security will be a high priority for the technology team at MWISP. The 802.11i Standards will be used as a guideline for MWISP security strategies; we will utilize many methods for evaluation and monitoring network usage to ensure security of the network. Though the standard is not 100% ratified it offers a clearer path to follow to take network security beyond current methods and offer security for the network in the future.

Utilizing carrier-class, proven equipment and following global standards for wireless broadband delivery, the MWISP technology team will provide Internet services that are just as efficient and fast as traditional wired networks.

3.4.2 VENDOR RELATIONSHIPS

MWISP will use equipment primarily manufactured by AIRSPAN, a global leader in wireless networking technology. AIRSPAN provides the equipment needed for backbone distribution, access points, and client access equipment. In additional to AIRSPAN, other equipment manufacturer products include Cisco, Dell, and Skypilot Network.

MWISP will establish an account relationship with E-Industries, a value-added distributor which sells all the equipment MWISP will use.

MWISP will actively seeking new vendor relationships as manufacturers evolve their product lines and new technologies emerge. Other potential vendors include Company F, a leading 802.16 (MAN) equipment manufacturer, and Company G, an IP voice and video equipment manufacturer.

Keeping an eye on emerging technologies in this fast-paced emerging industry will keep MWISP on the cutting edge of the wireless wave. By carefully evaluating standards, equipment, and potential new relationships, we will be able to offer a high level Quality of Service over our networks.

3.4.3 REMOTE MANAGEMENT

Once a local network has been successfully launched and placed into management mode, it will become part of a larger network that is being monitored 24 hours a day, 7 days a week, by system engineers utilizing standardized management software tailored to MWISP's unique network rollout.

Every access point with the network will be configured with management software that can be accessed remotely by a highly secure network administration interface. Each access point can be monitored separately from the network, or as a whole, by the centralized management system.

All network traffic will be monitored as a whole to evaluate:

- Network bandwidth requirements/usage
- External security threats
- Internal security threats and network misuse
- Service and content usage

Every piece of equipment on the network will be constantly monitored for:

- Network integration and operability
- Quality of Service
- User congestion

All user connections will be monitored individually and as a whole to evaluate:

- Billing requirements
- Network usage statistics
- User bandwidth usage

The entire network will be managed during regular business hours by network engineers, with most changes and updates occurring remotely. However, a team of field resources will be in place to respond to physical equipment failures throughout the network. When critical aspects of the network fail, there will be a pager/cell phone communication network to ensure quick response times to any network situation.

3.4.4 SERVICE PROVIDER RECRUITMENT

Not all resources for MWISP will come from internal sources; the company will depend on a wide variety of consultant resources for site assessment, installation, service, and support.

We will use initial service providers Sonatel and recruit the network integrator, using an offline list of wireless and network installers. We will have a service provider database where the information is refined and qualified to verify they meet the needs of MWISP. For a snapshot of this database, please refer to Appendix VII.

We will contact service providers and solicit their partnership with MWISP in their respected geographical service areas. Before a partnership is established, we carefully review the service provider's business record and establish communication with a few of their businesses references. Only then do we begin contract negotiations.

Continued service provider recruitment will consist of continued online and offline list evaluation, as well as constant presence of partnership/recruitment materials on the MWISP Website.

3.4.5 INSTALLER DATABASE

In order to expand to the national market quickly and effectively using the suite of products described in this plan, MWISP will create a proprietary database of certified installers throughout the US. After the sale has been made, a certified MWISP installer will visit the location in order to install the necessary equipment. All other activities, including an initial site assessment and ongoing management of the network, will be operated out of the primary office.

MWISP will maintain an online database for company target, evaluation, and tracking of wireless equipment and service providers that we will use to roll out our Wide Area Network and Local Area Networks. In addition to providing network building and support, we will partner with other service providers to offer value-added services once networks are operational.

The service provider database will allows us to track key contact information, service skill sets, pre-contract historical information and MWISP contract history. We will track every aspect of contractor relationships.

All service providers will be evaluated on their value and contribution to the MWISP Company, utilizing the data stored in the service provider database. The MWISP Service Provider database will be the key to the success and efficiency of MWISP, and will be a cornerstone of all network operations.

3.4.6 NEW SITE INSTALL

Each service location will be completely managed and operated via the MWISP remote management system. With an Enterprise Plan, MWISP will be that location's primary ISP for wireless Internet access. For all other plans, the partner ISP will maintain the primary connection, while MWISP manages the wireless network via the remote management system. Connectivity will be provided by a wholesale backbone provider or by another MWISP access point, depending on location.

3.4.7 SITE ASSESSMENT

Part of the MWISP marketing and technology plan will be to include a site assessment in order to determine the costs and return on investment at that particular location. The rep for that particular client will perform the site assessment using a worksheet provided by the company. This site assessment will include mapping out all the necessary data points and equipment needed.

In addition to this initial equipment site assessment, the rep will also provide surveys for owners of Multi-Tenants Units (MTU) to distribute to their current tenants in order to determine the demand for the secure WiFi network.

In many cases, the survey will help to determine the ROI and potential use of the new wireless network. If the primary connection costs plus the variable costs to install the necessary access point is less than the potential revenue that can be derived from the tenants, then the install will not be done unless the client opts for the purchase plan for that location.

Each potential site for a wireless network will be evaluated heavily in two areas before implementation is considered:

- Local needs, goals, and constraints of the company or group of users where the network is being installed.
- Evaluation of role and needs of the site installation in the overall MWISP wireless network backbone.

Other local site assessment processes include:

Planning

- Gather and define the business and community requirements of the installation.
- Interview property managers/owners and identify the needs of the users of the network.
- Define security requirements of the installation.

Radio Frequency Survey

- Obtain all site and building plans and documents that are available.
- Document any existing network infrastructure.
- Conduct an on-site Radio Frequency (RF) survey.
- Perform initial RF cell planning.
- Document any existing RF in detail.
- Present findings of survey to network management and design team.

Design

- Determine the placement and characteristics of appropriate access points, power sources, network cabling, wireless gateways, and network monitoring devices.
- Design the RF solution based upon optimum access point, bridge, and repeater placement.
- Determine appropriate security solution for the organization and the environment.
- Determine appropriate billing solution for the installation.
- Shortlist all manufacturers and their equipment and software that will be needed for the installation.
- Design the wireless network producing detailed diagrams and drawings for the installation.
- Determine network support requirements
- Build preliminary costing for the design and implementation.

Backbone Role and Requirements

- Bandwidth Requirements
- Is MWISP wireless backbone connectivity an option?
- What other "wired" connectivity options are there?
- What is the business and residential density surrounding and beyond localized network?

Careful planning of all types of wireless network installations prior to implementation will contribute to localized network stability and QOS, as well as contribute to the overall MWISP backbone network in a positive way.

3.4.8 PROJECT IMPLEMENTATION

With good planning, MWISP will move to implementation fairly rapidly.

A standardized approach to installations utilizing proven methods will be used, with a careful eye to the evolution of the process as the industry stabilizes and moves forward.

Here is an overview of MWISP network implementation process:

Pre-Installation

- Approve the wireless network design.
- Procure hardware, software.

- Put out Request for Proposal (RFP) to all available installers in MWISP database.
- Approve most qualified installer/contractor.
- Schedule network install with approved design and most qualified installer.

Installation

- Install network feed.
- Install equipment.
- Test wireless network.
- Provide training and/or materials to users or support group.
- Go live with the wireless network.

Once a network has gone live, it will be placed into management mode to ensure continued operation of services. However, if warranted, a secondary network design regarding future growth and enhancements to the network will be conducted upon initial project rollout to ensure the network grows in a healthy, revenue generating manner.

4. MARKET ANALYSIS SUMMARY

The spectrum WiFi utilizes to deliver broadband is licensed by the ART in Senegal, but does require only an agreement permit, which greatly reduces costs in setting up a new network and the time needed in order to install such a network. In turn, this creates a low barrier to entry for MWISP and the ability to deliver services in any location with the need to apply for Wimax special licenses or permits with the ART. When compared to setting up a cellular tower in just one area, Wimax and WiFi takes just a fraction of the time and investment with absolutely no regulatory interference.

Fortunately, for all users of WiFi and the company, WiFi is the global standard for this type of connectivity to the Internet. Unlike GSM or CDMA with non-conforming standards, WiFi has become the *de facto* standard for wireless Internet access, and because of its quick and rapid acceptance, this open standard will stand the test of time. The price of wireless related components, such as the specialized processor chipsets that enable better utilization of this technology, have dramatically decreased in price and jumped in customer demand. For example: in 2002, a WiFi radio chipset cost about $16 wholesale; as of today, this price is lower than $2 by 2006. Demand for these same chipsets has increased over 400% just between 2002 and 2006.

With dropping wholesale prices and rapidly rising demand, the acceptance and implementation of this technology will be very swift. Already in 2004, many manufacturers are offering WiFi cards very inexpensively if not already providing them as built-in options. Today, almost all midrange to high-end laptops include built in WiFi capability.

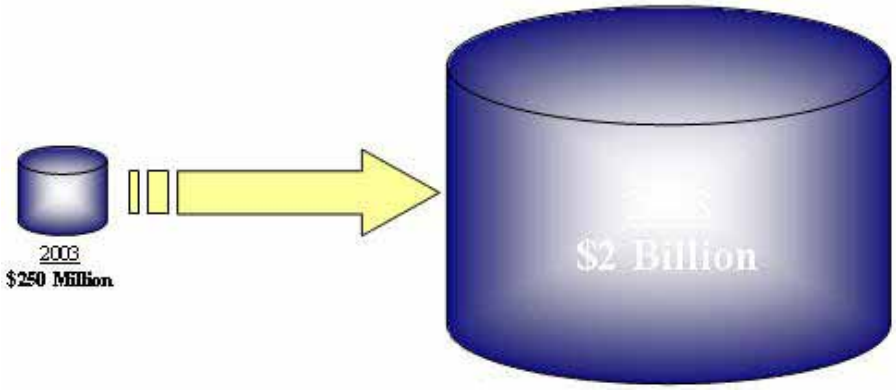
There are various estimates regarding the growth potential of the wireless industry. Some reports look at the WiFi industry as an entire sector, including the sale of both services and hardware, while others examine only the delivery of hardware, chips or services separately. In all cases, the estimated growth is positive for a company like MWISP, as a new player in an emerging market. The WiFi industry as a whole is expected to grow at an incredible rate, with projections ranging from no less than a compounded annual growth rate of 50%, all the way up to 415% over the next five years.

The annual recurring revenue for access services based on worldwide unlicensed broadband wireless (UBW) technologies in 2003 was at $250 million and will approach $2 billion by 2008, according to *'Unlicensed Broadband Wireless: Solutions and Applications,'* a new research report from Parks Associates. This report profiles more than 20 equipment vendors and their unlicensed products, analyzes different service market segments,

provides perspectives of incumbent carriers, wireless ISPs, and consumers, addresses market challenges, and forecasts service and equipment revenue growth.

According to this report, residential service revenue will post the most dramatic growth, followed by the small enterprise (SME) market, and the UBW market will have an overall compound annual growth rate (CAGR) of approximately 50%. Underserved markets in the world still represent the low-hanging fruit for service providers using UBW technologies, according to the report, including newly developed communities and urban edge markets.

"In the past two years, the proliferation of wireless ISPs and the declining cost and improved quality of equipment have generated momentum for this industry," said Yuanzhe (Michael) Cai, research analyst with Parks Associates. "Looking forward, service providers will focus not only on expanding their footprint but also increasing the take rate within existing coverage areas. In the meantime, further declines in equipment costs will help more WISPs justify their residential business plans. Also, the industry will get a further boost this year with real benefits from WiMAX standardization that started materialize."



By 2005, the analysts cited predicted that, "80% of all commercial notebooks sold will be wireless-enabled. They also predicted that by 2005, 50% of Fortune 1000 companies will have extensively deployed wireless LAN technology based on the latest 802.11 standards. And, by 2010, the majority of Fortune 2000 companies will have deployed wireless LANs to support standard wired network technology LANs."

4.1 MARKET SEGMENTATION

Basic Access
Currently basic Internet access will constitute the core service offering just as is the case with DSL and cable. MWISP will serve as the Internet Service Provider and will also establish relationships with third-party providers.

E-Government
The primary customer for MWISP is the government, which has never considered providing Internet access as an additional service to create a competitive advantage, due to cost constraints of installing a wired network. Wired networks do not allow the flexibility that wireless does. For property owners, addressing the individual needs of each tenant is expensive using traditional installation practices, so it was never really a viable option for them due to cost constraints.

VPN and transparent LAN
Virtual Private Network (VPN) and transparent LANs, also know as LAN extensions, are the most popular business related-services today and pose interesting possibilities for the network operator as much as they do not need a lot of additional bandwidth beyond the required for simple high-speed access A VPN is a secure communication from a remote location back to the corporate LAN generally involving encryption,

transparent LAN takes the concept a step further by providing the remote user the mean to run all LAN applications with similar ease as at the corporate headquarters and not simply to access the database.

VPN and LAN extension can be accomplished by various means. The older method is to utilize tunneling protocols and special hardware for performing the necessary encryption quickly. The preferred method today is to utilize a carrier-grade IP router or Ethernet switch with the built-in capability to setup Ethernet or IP VPNs.

Voice Telephony
Either Circuit voice or packet voice may be supported by the Wimax / WiFi network but circuit voice is quite bandwidth intensive, requiring the reservation of 56 kilobits per second (Kbps) channel for each voice transmission. In contrast IP telephony vocoder (digital speech compression devices) can operate at rates as low as 2 Kbps with good fidelity. 56 Kbps may not sound like much, but it takes 24 voice circuits to eat up 1.5 Mbps of throughput. If the total throughput of available band is only 100 Mbps, then a couple of thousand voice circuits could take up all the resources of the network.

MWISP will offer IP telephony service in partnership with any Senegalese incumbent operator for all voice traffic to the PSTN and discounted price communications for all voice traffic between MWISP customers.

Conferencing
Video and audio conferencing are well within the capabilities of Wimax / WiFi systems and are services MWISP will promote, especially videoconferencing. In the past, very expensive proprietary hardware/software platforms were necessary to setup videoconferences with acceptable image quality, but today a multitude of high-performance IP videoconferencing software products are available and can be run over wireless networks.

Storage Area Networks
MWISP will offer data storage services to businesses and government. Data storage is a network application where vital information is off-loaded to remote storage facilities and invoked thereafter as it is needed.

Telemetry
MWISP will offer telemetry service to business and government agencies within the coverage area. Telemetry is essentially machine-to-machine communication and generally takes form of remote monitoring. Examples include measuring inventory in vending machine and signaling when restocking is needed, as well as monitoring traffic light, water pipelines, chemical plant, power plant, water pollution, etc.

Bandwidth on demand and self-provisioning
MWISP will be the first to provide bandwidth on demand and self-provisioning services in Africa. Bandwidth on demand is a temporary change in the amount of bandwidth or throughput allocated to a subscriber in order to meet an immediate need such as large file transfers or video conferencing. Self-provisioning allows subscribers to change the terms of the service from a secure Web site without the intervention of sales agent.

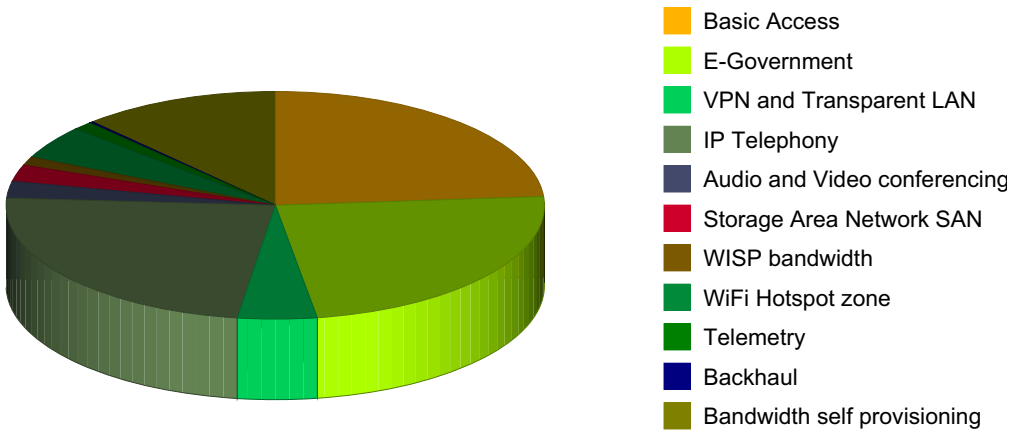
BACKHAUL
MWISP will offer to Sonatel and Sentel access to its network for mobile traffic transit. This service can be a fairly lucrative business and is one that may enable the wireless broadband carrier to avoid paying for tower space by utilizing the facility of the carrier being served.

Hotspot services
MWISP will offer hotspot services to anyone inside the coverage area. Hotspot services are essentially public local area networks where connectivity is provided to transient users, generally via 802.11a/b/g wireless LAN interfaces. Hotspots are located in such venues as airports, shopping malls, hotel, convention centers, city plaza, parks, truck stops, coffee shops, bar,s libraries and they form convenient means for travelers to check emails, surf the Web, or consult databases.

Market Analysis

Potential Customers	Growth	Year 1	Year 2	Year 3	Year 4	Year 5	CAGR
Basic Access	100%	100	200	400	800	1,600	100.00%
E-Government	100%	100	200	400	800	1,600	100.00%
VPN and Transparent LAN	90%	20	38	72	137	260	89.88%
IP Telephony	100%	100	200	400	800	1,600	100.00%
Audio and Video conferencing	70%	10	17	29	49	83	69.73%
Storage Area Network SAN	80%	10	18	32	58	104	79.58%
WISP bandwidth	80%	5	9	16	29	52	79.58%
WiFi Hotspot zone	100%	20	40	80	160	320	100.00%
Telemetry	70%	5	9	15	26	44	72.23%
Backhaul	100%	1	2	4	8	16	100.00%
Bandwidth self provisioning	100%	50	100	200	400	800	100.00%
Total	98.06%	421	833	1,648	3,267	6,479	98.06%

Market Analysis (Pie)



4.2 TARGET MARKET SEGMENT STRATEGY

Although the MWISP Enterprise solution can be utilized in any area where high-speed wireless Internet access is desired, the company will focus its sales and marketing efforts on three key sectors. We project that the government, commercial and residential segments will together comprise 80% of overall sales and the ISP segment will fill in the remaining 20%.

Government, residential and business customers

Our primary marketing goal for these segments will be to educate customers about Wimax / WiFi and the benefits of using a Wimax/WiFi network, both to increase revenue and as a cost-saving opportunity. As part of this effort, we will focus on the ease with which a wireless network can be installed or updated in any location without the need to manage the network on-site.

Commercial property and business owners

MWISP will target office buildings, industrial campuses. The MWISP Enterprise solution allows the building owner to provide this service at a low overall cost to them, without the need to manage it themselves.

Industrial Parks: In many industrial parks throughout in Senegal there is no fiber or ADSL available for broadband access. The individual companies in these parks are often required to purchase a dedicated E1 themselves or simply go without broadband altogether. This segment of the market represents a large opportunity for the company as there are limited "wired" options currently available, and the low price of installing wireless for sharing across multiple tenants will create long-term value, both for the industrial park owner and the tenants as well.

Rural Municipalities: The MWISP Commercial Enterprise solution is a great option for rural municipalities that are in need of wireless Internet access because the costs of updating wired connections are too great or simply unavailable. This is the single largest opportunity not served by the major players in the market. Currently there are 65 million people living in rural America. 62 million of those individuals are not involved in production agriculture. Rural America comprises over 2,300 counties, 80% of the nation's land mass, and 65 million people. These areas are often looked at last due to the spread-out nature of the group. The rural communities are very difficult and very expensive to reach with traditional wired connectivity. With the MWISP commercial Enterprise solution, high-speed wireless access can be delivered inexpensively and more effectively.

Multi-tenant residential property owners:
The MWISP Residential Enterprise solution is focused primarily on multi-tenant housing owners and managers looking to improve the technology available to their renters and/or looking for additional revenue sources outside of the normal rent income collected. Broadband connections are commonplace in new construction for commercial buildings, but are still under-utilized on the residential side. Typically, the tenants themselves arrange the installation of their own broadband connection, whether DSL or cable. In either case, it usually involves additional installation in the individual unit, which must be coordinated and managed by the tenant individually.

Installing a private secure wireless network, with minimal structural modification, not only prevents the need for individual installation in each unit but creates economies of scale for the covered area that benefit both the owner and tenants. The tenants can enjoy a less expensive and faster Internet connection, with the added benefit of portability throughout their living area and common areas of the property. The property owner benefits from the additional revenue generated and competitive advantage in offering these services as an amenity.

Internet Service Providers (ISPs):
ISPs play an important role within the company. MWISP WiFi will partner with key ISPs in order to resell the MWISP Enterprise solution. The benefit to partnering with the ISPs is *focus* - MWISP WiFi can focus on what it does best (assess, design, install, and maintain wireless networks) and let the partnered ISPs focus on their core competencies (providing continuous, high-quality, fast Internet access).

The benefit to the ISP is the ability to receive additional revenue as a MWISP WiFi reseller (resellers receive 10%), while retaining current customers and adding new ones as a result of the new service offering. This also allows them to stay focus on their core competency, which is providing the raw Internet feed.

Since MWISP WiFi will need a primary connection to the location where the wireless network is requested, the partnership further solidifies the ISP's role in providing connectivity to the location. In all circumstances, MWISP WiFi depends on local ISPs to provide the raw feed to any wireless installation, whether it be a E1 direct to the property, or an OC3 powering a larger wireless base station, where MWISP WiFi can distribute its own E1s wirelessly. We estimate that ISPs will comprise over 20% of the sales generated for the company.

Basic Access
Currently basic Internet access will constitute the core service offering just as is the case with DSL and cable. MWISP will serve as the Internet Service Provider and will also establish relationship with third-party providers.

E-Government
The primary customer for MWISP is the government which who has never considered providing Internet access as an additional service to create a competitive advantage, due to cost constraints of installing a wired network. Wired networks do not allow the flexibility that wireless does. For property owners, addressing the individual needs of each tenant is expensive using traditional installation practices, so it was never really a viable option for them due to cost constraints

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Hotspot services
MWISP will offer hotspot services to anyone inside the coverage area. Hotspot services are essentially public local area networks where connectivity is provided to transient users, generally via 802.11a/b/g wireless LAN interfaces. Hotspots are located in such venues as airports, shopping malls, hotel, convention centers, city plaza, parks, truck stops, coffee shop, bar, libraries and they form convenient means for the travelers to check emails, surf the Web, or consult database.

4.2.1 MARKET NEEDS

The current market needs for Wimax/Wi-Fi are infinite as this is a new industry that is already changing the way Internet access and many other services, such as Voice Over IP (VOIP), are delivered throughout the world. Although there are many traditional wired networks already established and continuing to roll out today, the cost and ease of implementing a new wireless network becomes obvious to many businesses and individuals alike. As Wimax/Wi-Fi capacity increases over the next few years, companies such as MWISP will be in the unique position to roll out additional wireless locations without the use of any wired line to the new location.

This will decrease the installation time and will require minimal installation and wear and tear on the desired location in order to saturate the entire area with high-speed Internet access.

The true opportunity and advantage MWISP will enjoy as the market demand for these services expands will actually result in greater gross margins on the primary connection costs. This is the result of greater economies of scale as each geographical location "fills up" with wireless Internet access.

Economies of scale are generated when a specific area within reach of a powered MWISP base station has a need for a greater amount of bandwidth. Because of the ability to transmit large amounts of bandwidth through the MWISP base stations, one base station can be powered by a E3 or STM-1 connection and then provide additional MWISP base stations with their primary connection, replacing the need to have a landline connection at that location.

The ability to "cut the cord" at locations that were previously dependent on the primary E1 connection increases the margins for each affected location and centralizes the primary connection point, giving MWISP even greater ability to provide E1 connections quickly and easily to new locations within reach.

For example, a primary base station location with an E3 connection has enough bandwidth to broadcast up to 17 individual E1 connections wirelessly, without any additional landline use. This will allow MWISP to activate a new location within minutes of installing the necessary hardware without depending on activating a fixed E1 to that particular location.

The cost savings released by the company would be great, as the fixed E1 cost is no longer needed at the affected location. An example of the break-even point is illustrated on the chart below.

For purposes of this example, existing E1 contracts are not figured in to the return on investment equation, although this is a factor to consider as each area is activated.

For estimating purposes the example uses as average monthly service fee estimate of $3,500, E1 wired cost of $3,500 monthly per location and an STM-1 connection cost of $36,000 monthly per location. The break-even point on the monthly connection revenue for installing a central STM-1 connection is 11 clients. From a cost standpoint, the break-even point for expansion is reached when 12 clients are added to the MWISP network.

Although the wired E1 connections to each location will no longer be needed, it should not jeopardize any existing relationships with any partner ISPs, as a larger primary connection to power the base station will still be required. This primary connection will be provided by the partner ISP in that area, thus, mitigating any potential displeasure with the switch from multiple broadband connections to a single larger connection. Long-term, as new wireless installations are added from the new primary base station it could potentially lower the overall margin for the ISP, but significantly increase the overall margins for MWISP.

4.2.2 MARKET TRENDS

The true potential market for Wimax/Wi-Fi installations is currently unknown, as the industry is expanding at break-neck speeds and companies are employing multiple strategies in order to build a niche within the industry as a whole. The current trend for many WiFi providers is the rapid deployment of public hot spots, which provide Internet connectivity in places like coffee shops, hotels and other public gathering spots.

Although this strategy may prove to be a long-term advantage for these larger providers, the time, resources and return on investment are further out than the MWISP business model and are speculative in nature.

4.3 SERVICE BUSINESS ANALYSIS

MWISP will be part of the Data Communications Services industry. MWISP services are similar to those provided by ISPs and DSL installers; in that we help our customers obtain access to the Internet in residential and commercial settings.

Unlike the majority of these businesses, however, MWISP's wireless Internet access points will be less expensive, less invasive of building infrastructure, more portable, and more scalable. At the moment, wireless data communications are largely being driven by customer demand.

With the explosion of cell phone popularity, consumers have become more demanding about wide-ranging, wireless access to data, communications, and the Internet. The initial wave of WiFi "hotspots" in cafes and airports has fed this demand worldwide, and the public now wants better, faster, cheaper, and more accessible wireless connections. Many travelers now seek out wireless access as a necessary amenity in their hotels.

As consumers push demand individually, they are also creating a paradigm shift in business workplaces. Employees comfortable with wireless technology more clearly see the disadvantages to hard-wired, immobile data connections in their offices. As businesses and property owners come to see the public's eagerness for such technologies, wireless is becoming less of a risk to install, and more of a clear necessity.

The current market for Wimax/Wi-Fi services is wide open. In Senegal so far the major provider Sonatel, have not been able to apply Wimax/WiFi to expand the telecommunication access to the customers and Sonatel seems to have chosen to deploy fixed wireless CDMA network to provide Universal Services. This technology cannot compete with the cost efficiency and the quick time to market that the bundle Wimax/WiFi bundle can provide. This is partly due to the fact that Sonatel in involved in very large investment to expand its GSM network and that at the time Sonatel chose its wireless CDMA solutions the Wimax solutions was not in operational status. This is a strict personal assumption based on the information received from Sonatel's technical staff and the latest report on the telecommunication industry in Senegal of 2005.

In most cases, the Wimax/Wi-Fi providers are focused on a small to medium geographical region.

The first install a network, then try to sell to individual users within the radius of that signal. Not only is this an expensive and speculative proposition, but the lengthy sales cycle and individual effort needed does not lend to a favorable return on the investment.

MWISP will instead immediately deploy the entire municipal wireless network and provide a blanket of connectivity that will cover all customers need and offer all described services within hours or days not months like before.

4.3.1 COMPETITION AND BUYING PATTERNS

For the first targeted markets E-Government, Businesses, commercial property owners, multi-unit residential property owners and residents, MWISP will compete against hard-wired Internet access, often tenant-installed, and against inertia.

There are no direct wireless competitors in Saint-Louis du Senegal where MWISP will offer wireless access installation for these clients.

For MTU owners and other large office building MWISP challenge here will be to educate potential customers on the advantages of wireless over wired access, and to encourage them to assume the costs of installation for a larger payoff from tenants in the future (or for the benefits of scalability and upgrading, for business owners).

With ISPs, MWISP will be competing against established installers of DSL. MWISP will make itself competitive by emphasizing management's expertise, and by convincing them of the public's demand for wireless access. As a preferred partner for wireless access installation, MWISP will have a first-mover advantage with ISPs by the time larger conglomerates enter the market.

5. WEB PLAN SUMMARY

MWISP will create a user-friendly, content-packed Website with information on our services and prices, as well as on the general benefits of wireless connections. As we are geared toward wholesale with property owners and ISPs, we will also maintain a section with current news about the use of technology in commercial and residential property management/marketing, as a benefit for our customers.

5.1 WEBSITE MARKETING STRATEGY

We will aggressively target managed property advice, information, and association sites with banner ads and pay-per-click links to our Website. We will also regularly submit a "technology" column to one of the better real estate management magazines, in order to become known as experts in this field, and build our reputation.

5.2 DEVELOPMENT REQUIREMENTS

The main phase of our Website development is already completed. We have assembled the service, pricing, and portal pages for our different target markets, and are compiling articles and useful links for the same groups. We are developing the site ourselves, and will contract with a hosting company for maintenance under our own domain name, once the site is established. Ongoing expenses for maintenance (exclusive of extra marketing, such as pay-per-clicks and banner ads designed to draw traffic) are listed under "Miscellaneous" expenses in the Profit and Loss statement.

6. STRATEGY AND IMPLEMENTATION SUMMARY

MWISP will focus on its strengths, and exploit the market opportunities, by offering a complete service package of wireless installation and management to property owners and ISPs.

6.1 VALUE PROPOSITION

For all market segments targeted, the MWISP Enterprise solution can provide value-added services to residential or commercial buildings. ."

Pre-built or "speculative" office suites offer a fast solution for tenants needing space right away. A tenant with only a month or two to find an office for a start-up business, or one who needs to relocate quickly, is much more likely to choose a pre-built suite with full amenities than to contract for renovation of an existing space.

MWISP offers property owners that extra edge in a competitive market, and offers ISPs a reliable partner in meeting the demands of an increasingly wireless customer base.

Why Wireless:	Managed Services:
• Secure • Lower costs • Value added • Quicker ROI • Competitive advantage • Low impact • Hands off management • Scalable and flexible • Potential revenue generator • Aggregate connection for tenants.	• Technology changes • Security • Guaranteed uptime • User support • Network administration • Network monitoring • Reporting and usage statistics • Scalable and flexible • Lower cost.

6.2 COMPETITIVE EDGE

MWISP will target the delivery of service over entire city of Saint-Louis du Senegal and the village within the range of the city limits, Governments building, businesses, hospital, the even larger multi-family housing market, as well as all the cyber café and new WISPs. The focus will be on expanding MWISP customers' available services by providing value-added features in the form of wireless Internet access to their current services or properties.

Worldwide, WiFi providers are a part of a very fragmented market, with many players all trying to find their niche. Currently there is a race going on to create public hotspots in an effort to control the largest international WiFi network.

Although this may be a sound business model in the long-term MWISP will not have the desire to provide these services nor does it have the resources to compete against the major players at this level.

Currently there are a few major providers making a name for them selves in the public hotspot arena, but this is a very speculative and costly process.

These access points are dependent upon subscribers signing up for a monthly plan or logging in and paying a site access fee.

Although this may prove to be a viable way to build a nationwide WiFi network, it is not MWISP main focus.

By focusing on the Metro area network (City size network), MWISP does not have to negotiate contracts with individual end-users, but can focus on installation and service of access for entire buildings, or let the ISP develop contracts and wholesale contract to do the installations.

This model gives us a huge advantage over the competitors, who are focused on creating geographical coverage, and then have to find ways to sell this existing utility to end-users, one by one.

Since MWISP will be a wholesale provider of WiFi networks, a new location is not installed until the hardware and installation costs are paid for, plus a 40% margin. Once installed, the wireless feed is provided and managed by MWISP, but the individual who requested the network to be installed is responsible for the promotion and user participation of the network.

Since the business model does not depend on individual users subscribing to the network, the risk/reward proposition is maximized. It is more effective to sell and maintain one large client and get paid up front, than depend on multiple users sold individually while covering the costs up front.

6.3 MARKETING STRATEGY

Although Wimax/Wi-Fi has been around for a while, it has just recently become known to the general public and many property owners are still unaware of what it is, much less how it can positively increase the services inside their buildings or municipalities. The largest marketing challenge will be trying to convey the vast benefits of using Wimax/Wi-Fi and how it works with a simple and easy to understand message.

Many traditional clients may not truly understand how the technology works and may shy away from looking at MWISP as a viable solution for their broadband needs. The educational materials produced will promote the industry as a whole; examples of the explanations are included below in Sales Literature.

6.3.1 SALES LITERATURE

Wimax / WiFi allow individual users to connect to the Internet via a high-speed connection without being tied to a phone line or broadband cable.

With recent advancements in WiFi technology, the speed, security and reliability are on par with traditional wired connections. Wireless connections have several advantages over traditional wired ones, including the low cost to connect large areas and the spatial flexibility of locating desktop or laptop computers within the connected area.

User Benefits

The benefits of a wireless network are still being realized everyday. Some of the many exciting benefits of Wimax / WiFi are:

- Freedom from wires
- Mobility
- Quick and unobtrusive network rollouts
- Lower cost than fiber or wired networks
- Easy to network many computers and appliances
- Available where cable and DSL are not
- Lower cost phone system, compared to switch phone networks
- Connect multiple buildings/locations efficiently
- Increased worker productivity
- Quicker return on investment

There are many small ways in which wireless is saving time and gaining efficiencies for people everyday. For instance, the ability to go through e-mail in the lobby, check your database during an appointment, or present networked data to colleagues in a meeting, all add up. Businesses and individuals are realizing every day how wireless connections can break down barriers for collaboration and introduce new ways to make the most of online time.

6.3.2 PRICING STRATEGY

SERVICE DESCRIPTION	BANDWIDTH	SETUP FEE	MONTHLY RECURING FEE
Residential Broadband			
Residential basic	1,024 Kbps	$ 30.00	$ 25.00
Residential advanced	2,048Kbps	$ 30.00	$ 35.00

SERVICE DESCRIPTION	BANDWIDTH	SETUP FEE	MONTHLY RECURING FEE
Residential Extreme	4,096Kbps	$ 30.00	$ 80.00
Business Broadband			
Business basic	4,096Kbps	$ 800.00	$ 130.00
Business Pros	8,192Kbps	$ 800.00	$ 200.00
Government Broadband			
0 to 50 users		$ 800.00	$ 1,250.00
51 to 100 users		$ 800.00	$ 2,500.00
100+		$ 1,600.00	on demand
IP Telephony			
Residential basic		$ 300.00	$ 60.00
Business		$ 400.00	$ 150.00
Government 0 to 24 lines		$ 2,400.00	$ 1,440.00
Government 25 to 50 lines		$ 3,500.00	$ 1,560.00
Government 51 to 100 lines		$ 5,000.00	$ 3,000.00
Government 100+ lines		on demand	on demand
Dedicated Lines			
VPN and Transparent LAN	256Kbps	$ 800.00	$ 400.00
VPN and Transparent LAN	512Kbps	$ 800.00	$ 800.00
VPN and Transparent LAN	1,024Kbps	$ 800.00	$ 2,000.00
VPN and Transparent LAN	2,048Kbps	$ 800.00	$ 4,000.00
VPN and Transparent LAN	4,096Kbps	$ 800.00	$ 8,500.00
VPN and Transparent LAN	8,192Kbps	$ 800.00	$ 18,000.00

6.3.3 PROMOTION STRATEGY

Our marketing objective is to quickly and aggressively establish MWISP's wireless "footprint." The executive management team will employ a low-key educational approach.

- First we will introduce MWISP to the potential prospect, setting an appointment to discuss Wimax/Wi-Fi and how it might benefit the prospect.
- We will gain buy-in from the prospect, then do a site assessment of the location to determine the cost associated with launching such a service.
- When the site assessment is made, the prospect may choose to survey his/her tenants to determine their interest in such a service within the building.
- Once the site assessment is done, the rep will return and do a question and answer session, hopefully including potentially-interested tenants.
- We will then present the site assessment and the detailed cost analysis for launching a wireless network.
- The rep will close the prospect, write up an order form, and establish an installation timeline together with the property owner.

6.3.4 DISTRIBUTION STRATEGY

Residential Division:

The residential division will have specific reps targeting apartment buildings, condos, residential

developments with an owners' association. The CRO will establish and define territories prior to hiring representatives.

Commercial Division:
The commercial division will include specific reps targeting Commercial buildings, such as office buildings, industrial parks, and general large-scale businesses and office buildings. Although "hotspot" implementation is not the primary focus, these may be a residual benefit as these commercial footprints are established.

Government Division:
The Government division will include specific reps targeting Government buildings, such as city-hall buildings, courthouse, and general large-scale government and office buildings. Although "hotspot" implementation is not the primary focus, these may be a residual benefit as these government footprints are established.

ISP Division:
The ISP division will be handled in the beginning by the Executive Management team. However, as Regional Sales Managers are employed, the responsibility for generating these ISP accounts will be transferred to them.

6.3.5 MARKETING PROGRAMS

The primary outlet for announcing information about the company will be through the use of press releases distributed on the AP wire and through our Website. MWISP will utilize PR Newswire in order to promote news and updated information about MWISP on an ongoing basis. The cost associated with the distribution of each press release is minimal when compared to the credibility and promotion these releases can produce.

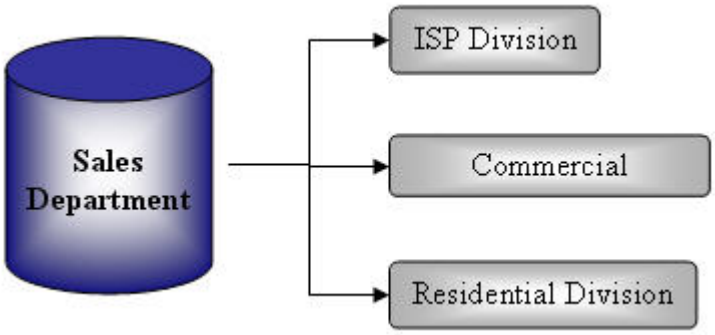
The marketing budget will increase as a result of increased sales (variable budget of 2% of revenue). As the company increase marketing monies, MWISP will introduce additional promotional initiatives to increase brand awareness in specific target markets. These opportunities will be evaluated on a quarterly basis as they come available. Promotional sponsorships of events may be of benefit in certain areas, based on the sales and marketing mix already used in a particular area.

6.4 SALES STRATEGY

Due to the competitive nature of this rapidly growing market it is necessary to expand and market MWISP services through the use of independent contractors.

This will allow the company to expand quickly without the added cost and liability of adding employees in-house. These positions will be paid 10% of the initial set-up and a 10% recurring fee based on the recurring revenue collected on a monthly basis. These contractors will solicit residential and commercial business through various forms of contact, i.e. telephone, personal contact, networking groups, etc. All of these independent contractors will report directly to a sales manager.

MWISP will rely on these reps to provide information about the service to both the initial client (landlords, municipalities, etc.) and the end-users. The Commercial division has a longer sales cycle than the Residential division, due to the contract situation of current tenants with their existing wired Internet providers. Commercial accounts are placed into a database with their current contract length and estimated time of expiration for follow-up by the reps at a later date.



The core sales focus, regardless of sales cycle, is equal across all three divisions. Each division will be set up quickly and simultaneously. The company will begin with independent contractors dedicated to these divisions within the specific markets. Although MWISP will be a citywide focused company, each division will be rolled out using a staged approach, entering by city blocks for maximum efficiency in installations and sales management.

Rollout will start on Saint-Louis Island, the center of the city, and will begin shortly throughout the SOR area and the *Langue de Barbarie* area, while keeping contractors within their specific divisions.

The first goal is to immediately make contact with the primary ISPs and other key accounts. These relationships will give MWISP instant credibility in the marketplace and will provide the company with an established business and sales team that will promote the service.

6.4.1 KEY ACCOUNT MANAGEMENT

The Executive Management Team will handle key accounts in the beginning; these key accounts will consist of Government, businesses, ISPs, hardware providers, and installers. Establishing relationships with these groups quickly and effectively will be vital to the success of the business.

As MWISP grow, the employed Managers will take on this responsibility. When entering a new market, we will focus immediately upon establishing these relationships.

6.4.2 SALES FORECAST

MWISP's sales objectives are to reach as many Government buildings, residential building owners, business building owners and ISP operators throughout Saint-Louis du Senegal as possible, quickly and for the least amount of capital outlay.

The sales department will grow and manage as many capable independent contractors as possible, while maintaining the high level of quality service and the good reputation of MWISP in the marketplace. Dedicated management and oversight of these contractors is critical to the success of the company as a whole.

Each territory is split up by specialty and certain metropolitan boundaries will be defined as each location is added to the sales team. The area in which the reps will be working will determine territories. Within each territory, the company will simultaneously target the government, commercial and residential divisions to gain maximum market share and market penetration as quickly as possible.

Sales growth shown in the table and chart below is based on solid industry data, as outlined in the Market Analysis.

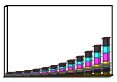
Sales Forecast

Unit Sales	Year 1	Year 2	Year 3
Broadband Basic R	542	678	847
Broadband Advanced R	542	678	847
Broadband Extreme R	542	678	847
Broadband setup fee	933	1,167	1,459
Broadband Basic B	271	339	423
Broadband Pros B	271	339	423
Broadband business setup fee	542	678	847
Broadband Government 0-50	54	68	85
Broadband Government 51-100	54	68	85
Broadband setup fee	108	136	169
IP Telephony Residential basic	813	1,016	1,270
IP telephony Residential setup fee	813	1,016	1,270
IP Telephony business Pros	542	678	847
IP Telephony Business basic setup fee	542	678	847
IP Telephony Government 0 to 24 lines	54	68	85
IP Telephony Government 25 to 50	54	68	85
IP Telephony Government 51 to 100 lines	0	0	0
IP Telephony Government setup fee	108	136	169
VPN and Transparent LAN 2,048Kbps	271	339	423
VPN and Transparent LAN 4,096Kbps	108	136	169
VPN and Transparent LAN 8,192Kbps	54	68	85
VPN and Transparent LAN setup fee	54	68	85
Total Unit Sales	7,276	9,095	11,368
Unit Prices	**Year 1**	**Year 2**	**Year 3**
Broadband Basic R	$25.00	$25.00	$25.00
Broadband Advanced R	$35.00	$35.00	$35.00
Broadband Extreme R	$80.00	$80.00	$80.00
Broadband setup fee	$30.00	$30.00	$30.00
Broadband Basic B	$130.00	$130.00	$130.00
Broadband Pros B	$200.00	$200.00	$200.00
Broadband business setup fee	$800.00	$800.00	$800.00
Broadband Government 0-50	$1,250.00	$1,250.00	$1,250.00
Broadband Government 51-100	$2,500.00	$2,500.00	$2,500.00
Broadband setup fee	$800.00	$800.00	$800.00
IP Telephony Residential basic	$60.00	$60.00	$60.00
IP telephony Residential setup fee	$300.00	$300.00	$300.00
IP Telephony business Pros	$150.00	$150.00	$150.00
IP Telephony Business basic setup fee	$400.00	$400.00	$400.00
IP Telephony Government 0 to 24 lines	$1,440.00	$1,440.00	$1,440.00
IP Telephony Government 25 to 50	$1,560.00	$1,560.00	$1,560.00
IP Telephony Government 51 to 100 lines	$0.00	$0.00	$0.00
IP Telephony Government setup fee	$3,500.00	$3,500.00	$3,500.00

VPN and Transparent LAN 2,048Kbps	$4,000.00	$4,000.00	$4,000.00
VPN and Transparent LAN 4,096Kbps	$8,500.00	$8,500.00	$8,500.00
VPN and Transparent LAN 8,192Kbps	$18,000.00	$18,000.00	$18,000.00
VPN and Transparent LAN setup fee	$800.00	$800.00	$800.00
Sales			
Broadband Basic R	$13,552	$16,940	$21,175
Broadband Advanced R	$18,973	$23,716	$29,645
Broadband Extreme R	$43,366	$54,208	$67,760
Broadband setup fee	$28,004	$35,005	$43,756
Broadband Basic B	$35,235	$44,044	$55,055
Broadband Pros B	$54,208	$67,760	$84,699
Broadband business setup fee	$433,661	$542,077	$677,596
Broadband Government 0-50	$67,760	$84,699	$105,874
Broadband Government 51-100	$135,519	$169,399	$211,749
Broadband setup fee	$86,732	$108,415	$135,519
IP Telephony Residential basic	$48,787	$60,984	$76,230
IP telephony Residential setup fee	$243,934	$304,918	$381,148
IP Telephony business Pros	$81,311	$101,639	$127,049
IP Telephony Business basic setup fee	$216,831	$271,038	$338,798
IP Telephony Government 0 to 24 lines	$78,059	$97,574	$121,967
IP Telephony Government 25 to 50	$84,564	$105,705	$132,131
IP Telephony Government 51 to 100 lines	$0	$0	$0
IP Telephony Government setup fee	$379,454	$474,317	$592,896
VPN and Transparent LAN 2,048Kbps	$1,084,153	$1,355,192	$1,693,989
VPN and Transparent LAN 4,096Kbps	$921,530	$1,151,913	$1,439,891
VPN and Transparent LAN 8,192Kbps	$975,738	$1,219,672	$1,524,590
VPN and Transparent LAN setup fee	$43,366	$54,208	$67,760
Total Sales	**$5,074,737**	**$6,343,421**	**$7,929,277**
Direct Unit Costs	**Year 1**	**Year 2**	**Year 3**
Broadband Basic R	$10.00	$9.50	$8.55
Broadband Advanced R	$15.00	$14.25	$12.83
Broadband Extreme R	$20.00	$19.00	$17.10
Broadband setup fee	$20.00	$19.00	$17.10
Broadband Basic B	$15.00	$14.25	$12.83
Broadband Pros B	$25.00	$23.75	$21.38
Broadband business setup fee	$349.00	$331.55	$298.40
Broadband Government 0-50	$800.00	$760.00	$684.00
Broadband Government 51-100	$1,200.00	$1,140.00	$1,026.00
Broadband setup fee	$349.00	$331.55	$298.40
IP Telephony Residential basic	$37.00	$35.15	$31.64
IP telephony Residential setup fee	$60.00	$57.00	$51.30
IP Telephony business Pros	$57.00	$54.15	$48.74
IP Telephony Business basic setup fee	$60.00	$57.00	$51.30
IP Telephony Government 0 to 24 lines	$800.00	$760.00	$684.00

IP Telephony Government 25 to 50	$1,000.00	$950.00	$855.00
IP Telephony Government 51 to 100 lines	$0.00	$0.00	$0.00
IP Telephony Government setup fee	$1,000.00	$950.00	$855.00
VPN and Transparent LAN 2,048Kbps	$2,500.00	$2,375.00	$2,137.50
VPN and Transparent LAN 4,096Kbps	$2,900.00	$2,755.00	$2,479.50
VPN and Transparent LAN 8,192Kbps	$8,000.00	$7,600.00	$6,840.00
VPN and Transparent LAN setup fee	$349.00	$331.55	$298.40
Direct Cost of Sales			
Broadband Basic R	$5,421	$6,437	$7,242
Broadband Advanced R	$8,131	$9,656	$10,863
Broadband Extreme R	$10,842	$12,874	$14,484
Broadband setup fee	$18,669	$22,170	$24,941
Broadband Basic B	$4,066	$4,828	$5,431
Broadband Pros B	$6,776	$8,046	$9,052
Broadband business setup fee	$189,185	$224,657	$252,739
Broadband Government 0-50	$43,366	$51,497	$57,934
Broadband Government 51-100	$65,049	$77,246	$86,902
Broadband setup fee	$37,837	$44,931	$50,548
IP Telephony Residential basic	$30,085	$35,726	$40,192
IP telephony Residential setup fee	$48,787	$57,934	$65,176
IP Telephony business Pros	$30,898	$36,692	$41,278
IP Telephony Business basic setup fee	$32,525	$38,623	$43,451
IP Telephony Government 0 to 24 lines	$43,366	$51,497	$57,934
IP Telephony Government 25 to 50	$54,208	$64,372	$72,418
IP Telephony Government 51 to 100 lines	$0	$0	$0
IP Telephony Government setup fee	$108,415	$128,743	$144,836
VPN and Transparent LAN 2,048Kbps	$677,596	$804,645	$905,226
VPN and Transparent LAN 4,096Kbps	$314,404	$373,355	$420,025
VPN and Transparent LAN 8,192Kbps	$433,661	$514,973	$579,344
VPN and Transparent LAN setup fee	$18,918	$22,466	$25,274
Subtotal Direct Cost of Sales	**$2,182,205**	**$2,591,369**	**$2,915,290**

Sales Monthly



- Broadband Basic R
- Broadband Advanced R
- Broadband Extreme R
- Broadband setup fee
- Broadban Basic B
- Broadband Pros B
- Broadband business setup fee
- Broadband Government 0-50
- Broadband Government 51-100
- Broadband setup fee
- IP Telephony Residential basic
- IP telephony Residential setup fee
- IP Telephony business Pros
- IP Telephony Business basic setup fee
- IP Telephony Government 0 to 24 lines
- IP Telephony Government 25 to 50
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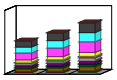
- IP Telephony Governement setup fee
- VPN and Transparent LAN 2,048Kbps
- VPN and Transparent LAN 4,096Kbps
- VPN and Transparent LAN 8,192Kbps
- VPN and Transparent LAN setup fee

Sales by Year



- Broadband Basic R
- Broadband Advanced R
- Broadband Extreme R
- Broadband setup fee
- Broadban Basic B
- Broadband Pros B
- Broadband business setup fee
- Broadband Government 0-50
- Broadband Government 51-100
- Broadband setup fee
- IP Telephony Residential basic
- IP telephony Residential setup fee
- IP Telephony business Pros
- IP Telephony Business basic setup fee
- IP Telephony Government 0 to 24 lines
- IP Telephony Government 25 to 50
- IP Telephony Government 51 to 100 lir
- IP Telephony Governement setup fee
- VPN and Transparent LAN 2,048Kbps
- VPN and Transparent LAN 4,096Kbps
- VPN and Transparent LAN 8,192Kbps
- VPN and Transparent LAN setup fee

6.5 MILESTONES

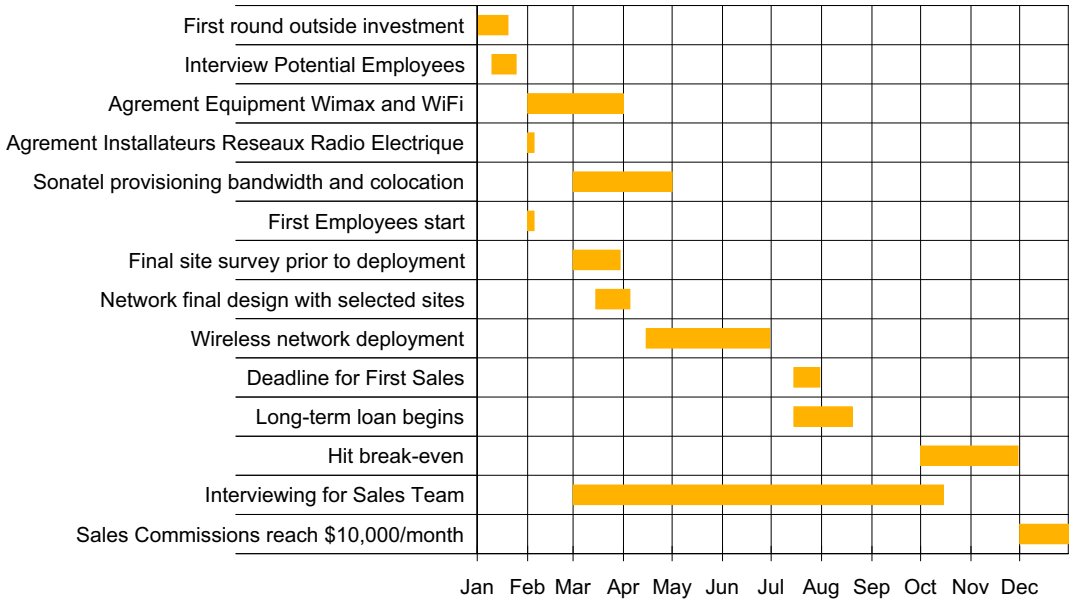
The management team has established some basic milestones to keep the business plan priorities in place. Responsibility for implementation falls on the shoulders of the founders fairly equally in the first year. This Milestones Table below will be updated as the year progresses using the actual tables. New milestones will be added as the first year of operations commences.

Milestones

Milestone	Start Date	End Date	Budget	Manager	Department
First round outside investment	1/1/2007	1/20/2007	$2,000,000	TBD	TBD
Interview Potential Employees	1/10/2007	1/25/2007	($5,000)	TBD	Human Resources
Agreement Equipment Wimax and WiFi	2/1/2007	4/1/2007	($6,000)	TBD	Legal
Agrément Installateurs Réseaux Radio Electrique	2/1/2007	2/5/2007	($4,000)	TBD	Legal
Sonatel provisioning bandwidth and collocation	3/1/2007	5/1/2007	($51,700)	TBD	Human Resources
First Employees start	2/1/2007	2/5/2007	$0	TBD	Human Resources

Milestone	Start Date	End Date	Budget	Manager	Department
Final site survey prior to deployment	3/1/2007	3/30/2007	($20,000)	TBD	Technical
Network final design with selected sites	3/15/2007	4/5/2007	($30,000)	TBD	Technical
Wireless network deployment	4/15/2007	6/30/2007	($1,030,600)	TBD	Technical
Deadline for First Sales	7/15/2007	7/31/2007	$0	TBD	Sales
Long-term loan begins	7/15/2007	8/20/2007	$0	TBD	Finance
Hit break-even	10/1/2007	11/30/2007	$0	TBD	Sales/Finance
Interviewing for Sales Team	3/1/2007	10/15/2007	$0	TBD	Human Resources
Sales Commissions reach $10,000/month	12/1/2007	12/31/2007	$0	TBD	Sales
Totals			$852,700		

Milestones



7. MANAGEMENT SUMMARY

The MWISP management team will be put together specifically for the purpose of building MWISP aggressively. This team made of public and private employees will learn to work together and will quickly adjust to maintain control, competitiveness and an undying desire to accomplish any challenge.

In addition to the diversified and competent management team, MWISP will create a Board of Advisors in an effort to lend additional experience and expertise to the company.

These individuals are not employees of the company, but rather an advisory group selected by the management team in order to assist with the execution of the business model moving forward. Members of the advisory board will be selected for their knowledge in the industry; experience and general interest in assisting the company to succeed.

7.1 PERSONNEL PLAN

Salesperson/Reseller Recruitment This is the great challenge, finding good sales people. Our ideal salesperson would be an outside "employed" rep; however, as the company is just beginning, MWISP will be required to start with independent contractors.

Initially, MWISP will use the CRO's pool of contacts for sales recruiting. MWISP may desire to do some advertising on such recruitment Websites and newspapers. MWISP will look for experience in sales, telecom, commercial or residential building management; professionalism with a willing attitude will be crucial. Commission payments for these independently contracted sales people can be found in the Profit and Loss Statement.

In-House Sales/Support Staff As MWISP will grow and MWISP sales team grows MWISP will hire sales field assistants for the city area managers; these assistants will work out of the corporate office, but will assist sales managers in the field. We plan to hire up to five in-house sales staff in the first year.

Personnel Plan

	Year 1	Year 2	Year 3
Internet Bandwidth and Collocation Personnel			
Chief Technical Officer	$24,000	$36,000	$45,000
Network Operating Center Engineer	$72,000	$108,000	$135,000
Technical support	$36,000	$54,000	$67,500
Field Engineer	$24,000	$36,000	$45,000
Subtotal	*$156,000*	*$234,000*	*$292,500*
Sales and Marketing Personnel			
Sales Manager	$12,000	$18,000	$22,500
Sales associates	$32,500	$48,750	$60,938
Subtotal	*$44,500*	*$66,750*	*$83,438*
General and Administrative Personnel			
President CEO	$42,000	$63,000	$78,750
Chief Financial Officer	$24,000	$36,000	$45,000
Human Resources Manager	$14,400	$21,600	$27,000
Legal counsel	$16,800	$25,200	$31,500
Office Assistant secretary	$24,000	$36,000	$45,000
Subtotal	*$121,200*	*$181,800*	*$227,250*
Other Personnel			
Security Agent	$6,600	$9,900	$12,375
Driver	$15,000	$22,500	$28,125
Cleaning and maintenance personnel	$7,200	$10,800	$13,500
Subtotal	*$28,800*	*$43,200*	*$54,000*
Total People	52	78	101
Total Payroll	$350,500	$525,750	$657,188

8. FINANCIAL PLAN

MWISP's establishment requires an investment of $2,000,000 during start-up, which will be provided by Donors. This capital is needed in order to build the base stations and the entire coverage wireless network to convert the Saint-Louis metropolitan area, all government buildings and municipal buildings, the village

within the 13km radius area, University Gaston Berger, all schools within the covered area and the sugar company through a point-to-point link. This is necessary for generating sales in the first year.

Based on solid market research, and known costs, MWISP will be able to grow the business rapidly over the first three years, if MWISP obtains this initial funding. The business will reach the break-even point early in the first year, and begin to generate reasonable profits for a venture of this kind.

After the first year, our Balance Sheet is quite positive. MWISP ratios will be good for the industry in which we are operating - data communications services.

8.1 START-UP FUNDING

The owners of the company will contribute $50,000 to begin operations in January. Although we will need additional funding within the first year (see Cash Flow for details), this amount should be enough to see us through the initial months, as we set up the office and begin to hire staff.

Start-up Funding

Start-up Expenses to Fund	**$1,121,100**
Start-up Assets to Fund	**$878,900**
Total Funding Required	**$2,000,000**
Assets	
Non-cash Assets from Start-up	$0
Cash Requirements from Start-up	$878,900
Additional Cash Raised	$0
Cash Balance on Starting Date	$878,900
Total Assets	*$878,900*
Liabilities and Capital	
Liabilities	
Current Borrowing	$0
Long-term Liabilities	$0
Accounts Payable (Outstanding Bills)	$0
Other Current Liabilities (interest-free)	$0
Total Liabilities	*$0*
Capital	
Planned Investment	
Owner	$50,000
Investor	$0
Additional Investment Requirement	$1,950,000
Total Planned Investment	*$2,000,000*
Loss at Start-up (Start-up Expenses)	($1,121,100)
Total Capital	*$878,900*
Total Capital and Liabilities	**$878,900**
Total Funding	**$2,000,000**

8.2 IMPORTANT ASSUMPTIONS

Sales: All base stations will be installed by MWISP, at no additional charge to the customer. The cost for this installation is figured into the Cost of Goods Sold.

Approximate costs used for planning purposes in this document are as follows:

- Per 1 square km, outdoor installation = $2,100 w/o base station
- Per 1 square km, outdoor installation = $2,900 w/o base station
- Per 1 square km, indoor installation = $5,500 w/o base station
- Per 1 square km, indoor installation = $4,300 w/o base station

Approximate pricing for each application is as follows. The price to the client remains the same with or without the base station in place:

- Per 100,000 square foot, outdoor installation = $6,000 w/ base station
- Per 100,000 square foot, indoor installation = $4,200 w/o base station

Accounts Receivable: The majority of the sales will be cash sales, with approximately 25% being sales on credit. We estimate, on average, AR collection in 45 days.

Accounts Payable: The average AP goal is no more than 30 days, with certain payments occurring sooner to take advantage of discounts where applicable.

Tax Rate: Tax rate is estimated at 19%.

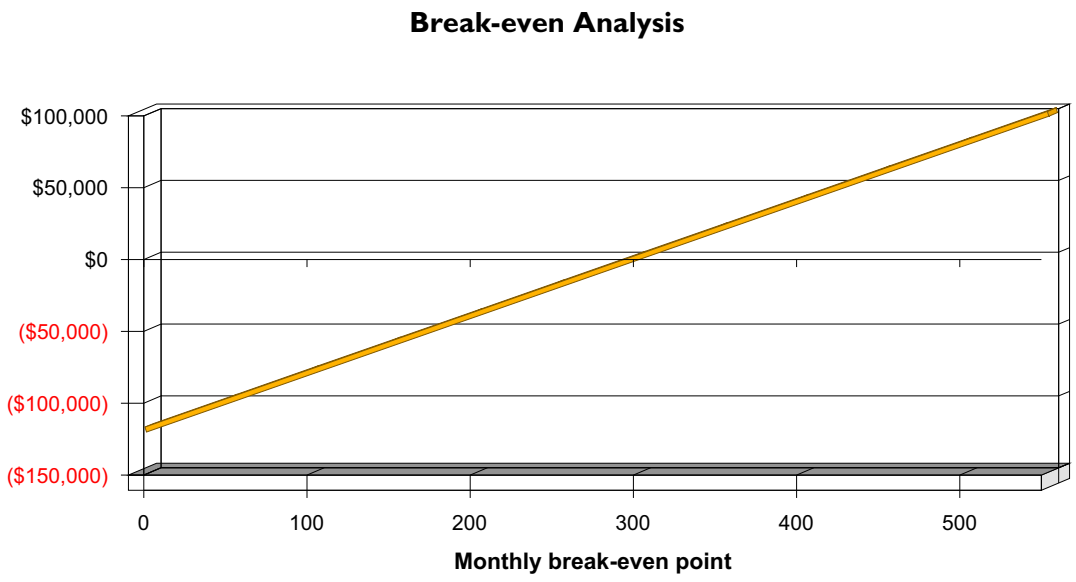
Personnel Burden: Personnel Burden is estimated at 15%. This includes taxes, benefits, vacation pay, etc.

8.3 BREAK-EVEN ANALYSIS

The following table and chart show a break-even analysis for the first year of business. With variable costs around 47%, our average monthly revenue break-even point is $208,809. We will pass this point in September, but by that point in the year, we will have hired the full complement of staff, and so the yearly average calculated in this table will be enough to actually break-even at the end of the year, with such high operating expenses.

Break-even Analysis

Monthly Units Break-even	299
Monthly Revenue Break-even	$208,809
Assumptions:	
Average Per-Unit Revenue	$697.46
Average Per-Unit Variable Cost	$299.92
Estimated Monthly Fixed Cost	$119,018



Break-even point = where line intersects with 0

8.4 PROJECTED PROFIT AND LOSS

The following table and chart show our projected Profit and Loss for the next three years.

Sales, which include all sales the enterprise and ISP plans are based on, the projected growth of the marketplace, the company's sales capacity and financial resources. MWISP's ability to install the number of networks listed depends on obtaining sufficient funding.

Expenses, which are comprised primarily of marketing, sales commissions, training and certification for installers, research and development, labor and general company overhead reflecting an aggressive posture to penetrate the market quickly in order to take advantage of the opportunity.

2007 will be the first reported fiscal year for MWISP. For the first year and as a start-up operation, MWISP will expect profit. Due to the infancy of the market and the current rush to supply the demand driven by wireless users, it is critical that MWISP dedicate the appropriate amount of resources and time to take advantage of any first mover advantages to be gained by this new market.

The first two quarters of the 2007 fiscal year will be dedicated to setting up the corporation.

5-Year Projected Income Statement

The long-term income estimate for MWISP is conservative, based on the projected growth rate of the wireless industry. By 2008, the total market for these services is expected to exceed $2 billion. The annual recurring revenue for access services based on unlicensed broadband wireless (UBW) technologies, currently at $250 million, will approach $2 billion by 2008.

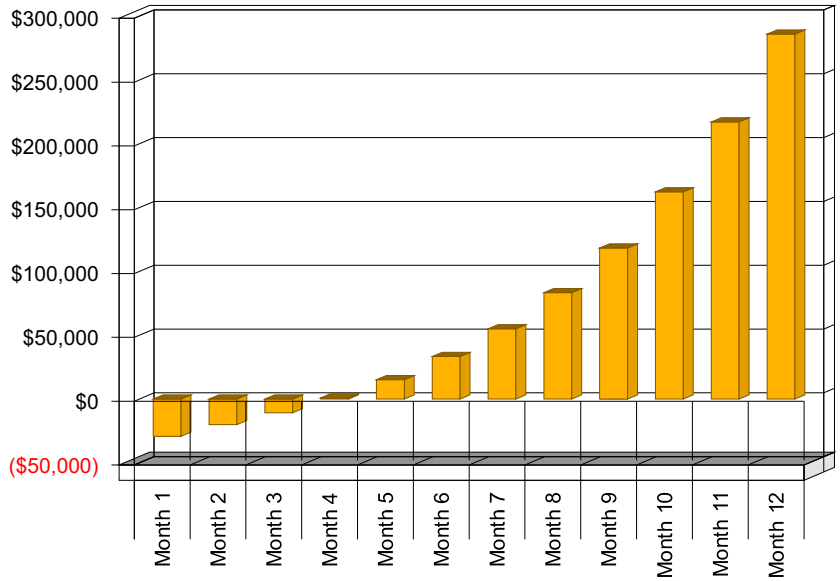
MWISP expect by 2008 to have revenues of $7.97 million with a profit of $2.34 million. MWISP's market share, based on industry projections, would be less than 80%. For planning purposes this estimate is intended to be conservative, as the market will not only be changing quickly over the next few years, but it is expected that the market will remain fairly fragmented during this same period. This fragmentation may limit total overall market share for MWISP. However, it is the fragmentation that also creates the initial opportunity for MWISP to enter markets with relative ease and will be of benefit when looking to execute the exit plan outlined above.

Pro Forma Profit and Loss

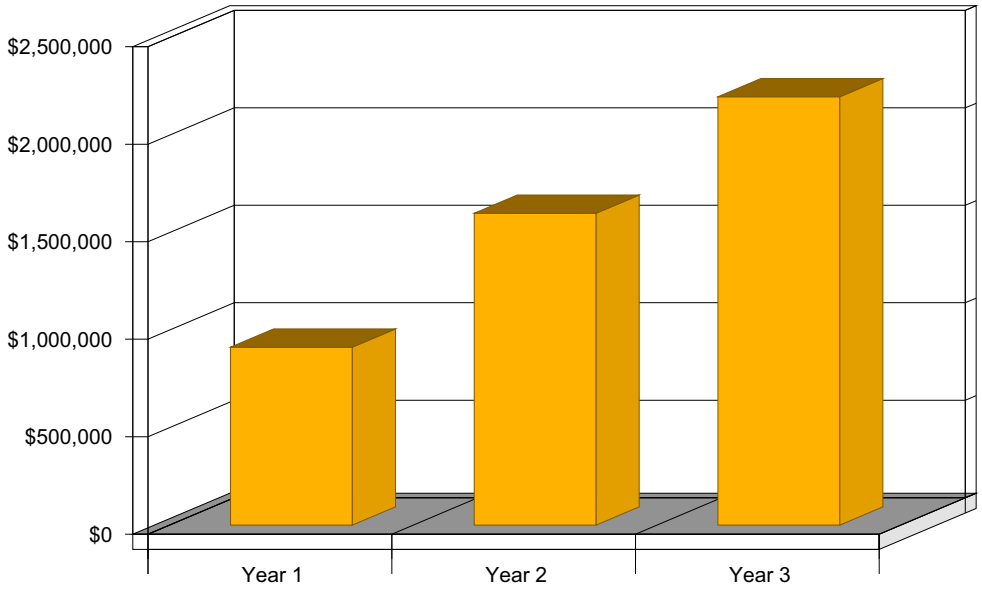
	Year 1	Year 2	Year 3
Sales	$5,074,737	$6,343,421	$7,929,277
Direct Cost of Sales	$2,182,205	$2,591,369	$2,915,290
Internet Bandwidth and Collocation Payroll	$156,000	$234,000	$292,500
Other Costs of Sales	$0	$0	$0
Total Cost of Sales	$2,338,205	$2,825,369	$3,207,790
Gross Margin	$2,736,532	$3,518,052	$4,721,487
Gross Margin %	53.92%	55.46%	59.54%
Operating Expenses			
Sales and Marketing Expenses			
Sales and Marketing Payroll	$44,500	$66,750	$83,438
Advertising/Promotion	$0	$0	$0
Other Sales and Marketing Expenses	$0	$0	$0
Total Sales and Marketing Expenses	$44,500	$66,750	$83,438
Sales and Marketing %	0.88%	1.05%	1.05%
General and Administrative Expenses			
General and Administrative Payroll	$121,200	$181,800	$227,250
Marketing/Promotion	$101,495	$126,868	$148,170
Depreciation	$0	$0	$0
Sales Commissions	$507,474	$634,342	$792,928
Payroll Taxes	$52,950	$78,863	$98,578
Office Rent	$0	$18,000	$36,000
Telephone	$600	$4,200	$8,400
Internet & Utilities	$6,000	$9,600	$14,400
Computer Supplies and Maintenance	$2,400	$18,000	$36,000
Travel	$12,000	$30,000	$60,000
Insurance	$12,000	$2,400	$4,800
Sonatel Collocation + Bandwidth 30 Mbps	$312,000	$9,000	$9,000
Senelec Power	$60,000	$0	$0
Car leasing	$72,000	$0	$0
Private Security for site surveillance	$24,000	$0	$0
Other utilities	$6,000	$0	$0
Gas Power generator	$4,800	$0	$0
Gas car	$12,000	$0	$0
Maintenance	$24,000	$0	$0
Miscellaneous	$24,000	$0	$0
	$0	$0	$0

	Year 1	Year 2	Year 3
Total General and Administrative Expenses	$1,354,918	$1,113,073	$1,435,526
General and Administrative %	26.70%	17.55%	18.10%
Other Expenses:			
Other Payroll	$28,800	$43,200	$54,000
Consultants	$0	$0	$0
Other Expenses	$0	$0	$0
Total Other Expenses	$28,800	$43,200	$54,000
Other %	0.57%	0.68%	0.68%
Total Operating Expenses	$1,428,218	$1,223,023	$1,572,963
Profit Before Interest and Taxes	$1,308,313	$2,295,029	$3,148,523
EBITDA	$1,308,313	$2,295,029	$3,148,523
Interest Expense	$5,000	$10,000	$10,000
Taxes Incurred	$390,994	$685,509	$941,557
Other Income			
Other Income Account Name	$0	$0	$0
Other Income Account Name	$0	$0	$0
Total Other Income	$0	$0	$0
Other Expense			
Other Expense Account Name	$0	$0	$0
Other Expense Account Name	$0	$0	$0
Total Other Expense	$0	$0	$0
Net Other Income	$0	$0	$0
Net Profit	$912,319	$1,599,521	$2,196,966
Net Profit/Sales	17.98%	25.22%	27.71%

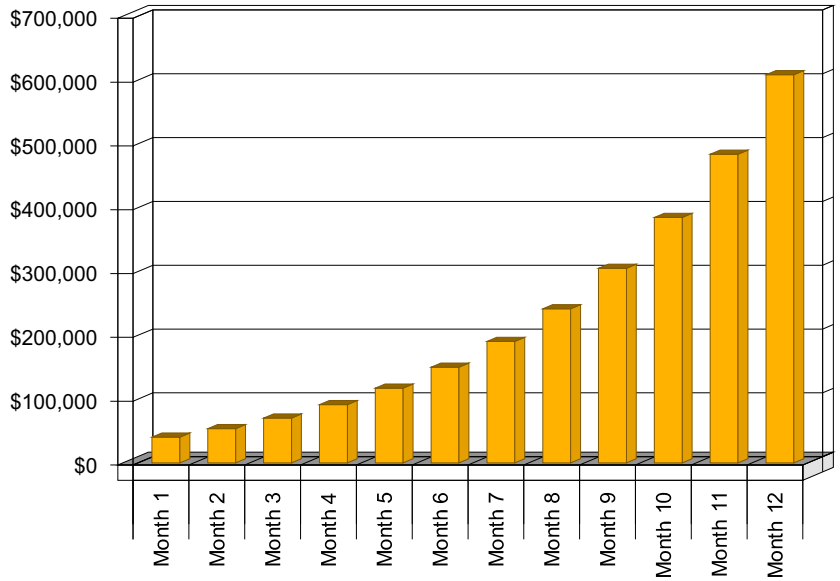
Profit Monthly



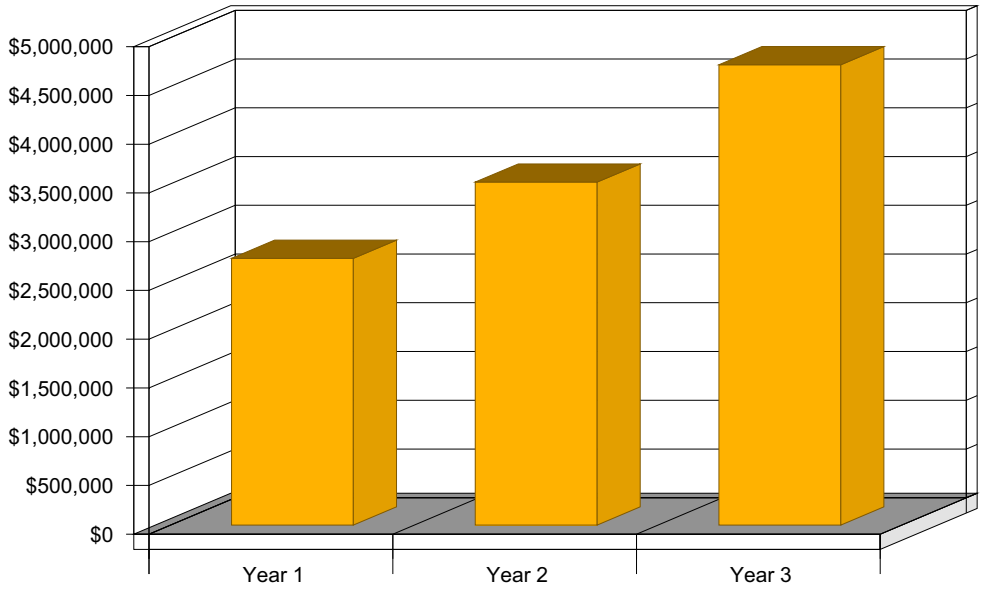
Profit Yearly



Gross Margin Monthly



Gross Margin Yearly



8.5 PROJECTED CASH FLOW

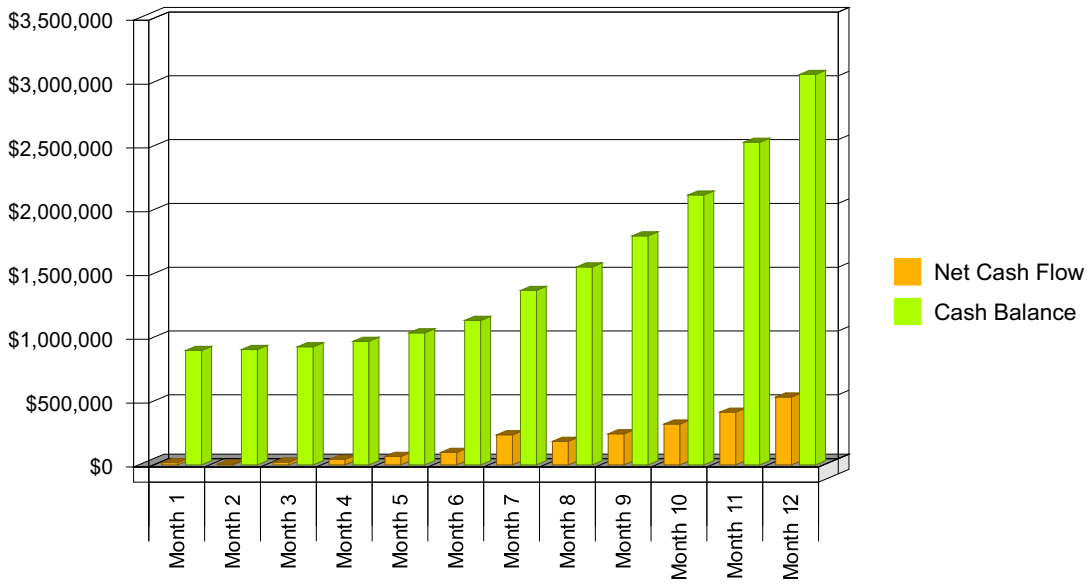
Cash flow is expected to be favorable, if MWISP can obtain sufficient funding, as noted in the table, below. It will be necessary to obtain outside funding for the venture two times during the first year.

The municipality management and MWISP's private partner will decide together of the amount dedicated of the annual dividend. This dividend will allow the municipality to expand the network to other area within the region of Saint-Louis, Richard-toll, Matam and Podor. After the second year the city's finance will benefits clearly from the joint-venture allocating this new source of revenues to the well-being of its population.

Pro Forma Cash Flow

	Year 1	Year 2	Year 3
Cash Received			
Cash from Operations			
Cash Sales	$4,313,527	$5,391,908	$6,739,885
Cash from Receivables	$603,139	$911,995	$1,139,994
Subtotal Cash from Operations	$4,916,666	$6,303,903	$7,879,879
Additional Cash Received			
Non Operating (Other) Income	$0	$0	$0
Sales Tax, VAT, HST/GST Received	$964,200	$1,205,250	$1,506,563
New Current Borrowing	$0	$0	$0
New Other Liabilities (interest-free)	$0	$0	$0
New Long-term Liabilities	$100,000	$0	$0
Sales of Other Current Assets	$0	$0	$0
Sales of Long-term Assets	$0	$0	$0
New Investment Received	$0	$0	$0
Subtotal Cash Received	$5,980,866	$7,509,154	$9,386,442
Expenditures	Year 1	Year 2	Year 3
Expenditures from Operations			
Cash Spending	$350,500	$525,750	$657,188
Bill Payments	$3,450,207	$4,406,513	$5,039,905
Subtotal Spent on Operations	$3,800,707	$4,932,263	$5,697,092
Additional Cash Spent			
Non Operating (Other) Expense	$0	$0	$0
Sales Tax, VAT, HST/GST Paid Out	$0	$0	$0
Principal Repayment of Current Borrowing	$0	$0	$0
Other Liabilities Principal Repayment	$0	$0	$0
Long-term Liabilities Principal Repayment	$0	$0	$0
Purchase Other Current Assets	$0	$0	$0
Purchase Long-term Assets	$0	$0	$0
Dividends	$0	$0	$0
Subtotal Cash Spent	$3,800,707	$4,932,263	$5,697,092
Net Cash Flow	$2,180,159	$2,576,890	$3,689,350
Cash Balance	$3,059,059	$5,635,949	$9,325,299

Cash



8.6 PROJECTED BALANCE SHEET

After the first year, when we invest heavily in establishing MWISP's staff, contacts, infrastructure and reputation, our Balance Sheet will become increasingly solid.

Pro Forma Balance Sheet

	Year 1	Year 2	Year 3
Assets			
Current Assets			
Cash	$3,059,059	$5,635,949	$9,325,299
Accounts Receivable	$158,071	$197,589	$246,987
Other Current Assets	$0	$0	$0
Total Current Assets	$3,217,130	$5,833,539	$9,572,286
Long-term Assets			
Long-term Assets	$0	$0	$0
Accumulated Depreciation	$0	$0	$0
Total Long-term Assets	$0	$0	$0
Total Assets	$3,217,130	$5,833,539	$9,572,286
Liabilities and Capital	Year 1	Year 2	Year 3
Current Liabilities			
Accounts Payable	$358,906	$173,349	$208,567
Current Borrowing	$0	$0	$0

	Year 1	Year 2	Year 3
Other Current Liabilities	$964,200	$2,169,450	$3,676,013
Subtotal Current Liabilities	$1,323,106	$2,342,799	$3,884,579
Long-term Liabilities	$100,000	$100,000	$100,000
Total Liabilities	$1,423,106	$2,442,799	$3,984,579
Paid-in Capital	$2,000,000	$2,000,000	$2,000,000
Retained Earnings	($1,121,100)	($208,781)	$1,390,740
Earnings	$912,319	$1,599,521	$2,196,966
Total Capital	$1,791,219	$3,390,740	$5,587,706
Total Liabilities and Capital	$3,214,325	$5,833,539	$9,572,286
Net Worth	$1,794,025	$3,390,740	$5,587,706

8.7 BUSINESS RATIOS

The following table outlines some of the more important ratios from the Data Communications Services industry. The final column, Industry Profile, details specific ratios based on the industry as it is classified by the Standard Industry Classification (SIC) code, 4899.

Ratio Analysis

	Year 1	Year 2	Year 3	Industry Profile
Sales Growth	0.00%	25.00%	25.00%	1.63%
Percent of Total Assets				
Accounts Receivable	4.91%	3.39%	2.58%	13.44%
Other Current Assets	0.00%	0.00%	0.00%	54.99%
Total Current Assets	100.00%	100.00%	100.00%	72.36%
Long-term Assets	0.00%	0.00%	0.00%	27.64%
Total Assets	100.00%	100.00%	100.00%	100.00%
Current Liabilities	41.13%	40.16%	40.58%	18.73%
Long-term Liabilities	3.11%	1.71%	1.04%	21.60%
Total Liabilities	44.24%	41.88%	41.63%	40.33%
Net Worth	55.76%	58.12%	58.37%	59.67%
Percent of Sales				
Sales	100.00%	100.00%	100.00%	100.00%
Gross Margin	53.92%	55.46%	59.54%	57.81%
Selling, General & Administrative Expenses	35.95%	30.24%	31.84%	34.36%
Advertising Expenses	0.00%	0.00%	0.00%	1.02%
Profit Before Interest and Taxes	25.78%	36.18%	39.71%	5.81%
Main Ratios				

	Year 1	Year 2	Year 3	Industry Profile
Current	2.43	2.49	2.46	2.18
Quick	2.43	2.49	2.46	1.76
Total Debt to Total Assets	44.24%	41.88%	41.63%	49.82%
Pre-tax Return on Net Worth	72.65%	67.39%	56.17%	7.28%
Pre-tax Return on Assets	40.51%	39.17%	32.79%	14.51%
Additional Ratios	Year 1	Year 2	Year 3	
Net Profit Margin	17.98%	25.22%	27.71%	n.a
Return on Equity	50.85%	47.17%	39.32%	n.a
Activity Ratios				
Accounts Receivable Turnover	4.82	4.82	4.82	n.a
Collection Days	29	68	68	n.a
Accounts Payable Turnover	10.62	24.33	24.33	n.a
Payment Days	13	23	14	n.a
Total Asset Turnover	1.58	1.09	0.83	n.a
Debt Ratios				
Debt to Net Worth	0.79	0.72	0.71	n.a
Current Liab. to Liab.	0.93	0.96	0.97	n.a
Liquidity Ratios				
Net Working Capital	$1,894,025	$3,490,740	$5,687,706	n.a
Interest Coverage	261.66	229.50	314.85	n.a
Additional Ratios				
Assets to Sales	0.63	0.92	1.21	n.a
Current Debt/Total Assets	41%	40%	41%	n.a
Acid Test	2.31	2.41	2.40	n.a
Sales/Net Worth	2.83	1.87	1.42	n.a
Dividend Payout	0.00	0.00	0.00	n.a

9. REFERENCES

Tech Knowledge Strategies, June 2003

The Strategis Group, predicts that wireless broadband revenues will increase at a 418% compound annual rate over the next five years

Parks Associates

wirelessnewsfactor.com

January 2004 - Fast Company: Wireless in San Diego

US Department of Agriculture, Rural Development Rural Utilities Service: Hilda Gay Legg

Wall Street Journal, Building Owners Finish Offices to Lure Tenants, December 24, 2003

Wall Street Journal, Building Owners Finish Offices to Lure Tenants, December 24, 2003

See appendix I for region breakdowns

Wireless access firms place Net bets, Yuki Noguchi, WASHINGTON POST 1/29/04

Peace, Love & WiFi, BY DAN O'SHEA, Telephony, Mar 18, 2002

http://doc.advisor.com/doc/11165

Unlicensed Broadband Wireless: Solutions and Applications, Parks Associates

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Reality Wireless Networks, Investor Relations

Wall Street Journal, January 20, 2004. "Now Comes the Hard Part" http://zdnet.com.com/2100-1105-983099.html

New happy hour, December 26, 2003 Silicon Valley/San Jose Business Journal

9.1 ADDITIONAL QUOTES

- "WiFi is going to get cheaper and easier to deploy," said Schmidt of NYCWireless. "As people encounter these networks increasingly for free, they are going to expect them for free – as a facility service, just like AC, heating or water."
- "We needed it to provide what the customers were telling us they wanted – they wanted wireless," says Axel Suray, general manager at the hotel.
- The total number of enterprise mobile Internet users will grow more than 218% in the next five years. "The greatest percentage of growth will take place in Africa," Chamberlain continued. "Businesses today are the predominant subscribers to mobile voice services and they will lead the adoption of wireless Internet as well."
- Enterprise Wireless Internet Users to Exceed 160 Million worldwide by 2008 - from Parks Associates
- Fixed Wireless Broadband Represents Target Market of 200 Million Households in the next five years worldwide - Strategy Analytics
- Sixty-four percent of US households have at least one mobile phone. A growing number of consumers – 9% of mobile users – subscribe to a carrier's branded data service. But many basic phone and network features go unused. - Forrester Research
- According to IDC, the number of wireless subscribers in Africa will increase at a whopping compound annual growth rate (CAGR) of 200%, from approximately 50,000 in 2004 to more than 1.6 million in 2010.
- According to primary IDC research, the number of business wireless Internet users will grow from 2.6 million in 2000 to more than 49 million in 2005, just in the US.
- "Wireless Internet in the Enterprise 10 Years On," a new report from Probe Group, reviews the history of wireless data services and forecasts the worldwide number of enterprise users of wireless Internet services will exceed 160 million by 2008.
- IDC said it expects worldwide information security services (ISS) spending to increase to more than $23.5 billion by 2007, or at a compound annual growth rate (CAGR) of 29.9%.

- Total spending in the US on WiFi will grow in 2004 by 7.6% for a total of $144.7 billion, and spending last year totaled $134.5 billion, up 7.9% from 2002, says a new report.
- A TIA (Telecommunications Industry Association) Market Review and Forecast predicts the wireless market will reach $190.8 billion by 2007, with a 9.1% compound annual growth rate from 2004 to 2007.

ANNEX I: SALES FORECAST (IN MONTHS)

		M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
Unit Sales													
Broadband Basic R	25%	10	13	16	20	24	31	38	48	60	75	93	116
Broadband Advanced R	25%	10	13	16	20	24	31	38	48	60	75	93	116
Broadband Extreme R	25%	10	13	16	20	24	31	38	48	60	75	93	116
Broadband setup fee	25%	30	38	9	49	24	68	47	96	83	141	139	211
Broadband Basic B	25%	5	6	8	10	12	15	19	24	30	37	47	58
Broadband Pros B	25%	5	6	8	10	12	15	19	24	30	37	47	58
Broadband business setup fee	25%	10	13	16	20	24	31	38	48	60	75	93	116
Broadband Government 0-50	25%	1	1	2	2	2	3	4	5	6	7	9	12
Broadband Government 51-100	25%	1	1	2	2	2	3	4	5	6	7	9	12
Broadband setup fee	25%	2	3	3	4	5	6	8	10	12	15	19	23
IP Telephony Residential basic	25%	15	19	23	29	37	46	57	72	89	112	140	175
IP telephony Residential setup fee	25%	15	19	23	29	37	46	57	72	89	112	140	175
IP Telephony business Pros	25%	10	13	16	20	24	31	38	48	60	75	93	116
IP Telephony Business basic setup fee	25%	10	13	16	20	24	31	38	48	60	75	93	116
IP Telephony Government 0 to 24 lines	25%	1	1	2	2	2	3	4	5	6	7	9	12
IP Telephony Government 25 to 50	25%	1	1	2	2	2	3	4	5	6	7	9	12
IP Telephony Government 51 to 100 lines	25%	0	0	0	0	0	0	0	0	0	0	0	0
IP Telephony Government setup fee	25%	2	3	3	4	5	6	8	10	12	15	19	23
VPN and Transparent LAN 2,048Kbps	25%	5	6	8	10	12	15	19	24	30	37	47	58
VPN and Transparent LAN 4,096Kbps	25%	2	3	3	4	5	6	8	10	12	15	19	23
VPN and Transparent LAN 8,192Kbps	25%	1	1	2	2	2	3	4	5	6	7	9	12
VPN and Transparent LAN setup fee	25%	1	1	2	2	2	3	4	5	6	7	9	12
Total Unit Sales		147	184	192	278	310	425	493	654	780	1,013	1,228	1,573
Unit Prices		**M1**	**M2**	**M3**	**M4**	**M5**	**M6**	**M7**	**M8**	**M9**	**M10**	**M11**	**M12**
Broadband Basic R		$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00
Broadband Advanced R		$35.00	$35.00	$35.00	$35.00	$35.00	$35.00	$35.00	$35.00	$35.00	$35.00	$35.00	$35.00
Broadband Extreme R		$80.00	$80.00	$80.00	$80.00	$80.00	$80.00	$80.00	$80.00	$80.00	$80.00	$80.00	$80.00

		M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
Broadband setup fee		$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00
Broadband Basic B		$130.00	$130.00	$130.00	$130.00	$130.00	$130.00	$130.00	$130.00	$130.00	$130.00	$130.00	$130.00
Broadband Pros B		$200.00	$200.00	$200.00	$200.00	$200.00	$200.00	$200.00	$200.00	$200.00	$200.00	$200.00	$200.00
Broadband business setup fee		$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00
Broadband Government 0-50		$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00
Broadband Government 51-100		$2,500.00	$2,500.00	$2,500.00	$2,500.00	$2,500.00	$2,500.00	$2,500.00	$2,500.00	$2,500.00	$2,500.00	$2,500.00	$2,500.00
Broadband setup fee		$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00
IP Telephony Residential basic		$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00
IP telephony Residential setup fee		$300.00	$300.00	$300.00	$300.00	$300.00	$300.00	$300.00	$300.00	$300.00	$300.00	$300.00	$300.00
IP Telephony business Pros		$150.00	$150.00	$150.00	$150.00	$150.00	$150.00	$150.00	$150.00	$150.00	$150.00	$150.00	$150.00
IP Telephony Business basic setup fee		$400.00	$400.00	$400.00	$400.00	$400.00	$400.00	$400.00	$400.00	$400.00	$400.00	$400.00	$400.00
IP Telephony Government 0 to 24 lines		$1,440.00	$1,440.00	$1,440.00	$1,440.00	$1,440.00	$1,440.00	$1,440.00	$1,440.00	$1,440.00	$1,440.00	$1,440.00	$1,440.00
IP Telephony Government 25 to 50		$1,560.00	$1,560.00	$1,560.00	$1,560.00	$1,560.00	$1,560.00	$1,560.00	$1,560.00	$1,560.00	$1,560.00	$1,560.00	$1,560.00
IP Telephony Government 51 to 100 lines		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
IP Telephony Government setup fee		$3,500.00	$3,500.00	$3,500.00	$3,500.00	$3,500.00	$3,500.00	$3,500.00	$3,500.00	$3,500.00	$3,500.00	$3,500.00	$3,500.00
VPN and Transparent LAN 2,048Kbps		$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00
VPN and Transparent LAN 4,096Kbps		$8,500.00	$8,500.00	$8,500.00	$8,500.00	$8,500.00	$8,500.00	$8,500.00	$8,500.00	$8,500.00	$8,500.00	$8,500.00	$8,500.00
VPN and Transparent LAN 8,192Kbps		$18,000.00	$18,000.00	$18,000.00	$18,000.00	$18,000.00	$18,000.00	$18,000.00	$18,000.00	$18,000.00	$18,000.00	$18,000.00	$18,000.00
VPN and Transparent LAN setup fee		$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00
Sales													
Broadband Basic R		$250	$313	$391	$488	$610	$763	$954	$1,192	$1,490	$1,863	$2,328	$2,910
Broadband Advanced R		$350	$438	$547	$684	$854	$1,068	$1,335	$1,669	$2,086	$2,608	$3,260	$4,075
Broadband Extreme R		$800	$1,000	$1,250	$1,563	$1,953	$2,441	$3,052	$3,815	$4,768	$5,960	$7,451	$9,313
Broadband setup fee		$900	$1,125	$281	$1,477	$721	$2,026	$1,407	$2,884	$2,480	$4,225	$4,157	$6,321
Broadband Basic B		$650	$813	$1,016	$1,270	$1,587	$1,984	$2,480	$3,099	$3,874	$4,843	$6,054	$7,567
Broadband Pros B		$1,000	$1,250	$1,563	$1,953	$2,441	$3,052	$3,815	$4,768	$5,960	$7,451	$9,313	$11,642
Broadband business setup fee		$8,000	$10,000	$12,500	$15,625	$19,531	$24,414	$30,518	$38,147	$47,684	$59,605	$74,506	$93,132
Broadband Government 0-50		$1,250	$1,563	$1,953	$2,441	$3,052	$3,815	$4,768	$5,960	$7,451	$9,313	$11,642	$14,552
Broadband Government 51-100		$2,500	$3,125	$3,906	$4,883	$6,104	$7,629	$9,537	$11,921	$14,901	$18,626	$23,283	$29,104
Broadband setup fee		$1,600	$2,000	$2,500	$3,125	$3,906	$4,883	$6,104	$7,629	$9,537	$11,921	$14,901	$18,626

		M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
IP Telephony Residential basic		$900	$1,125	$1,406	$1,758	$2,197	$2,747	$3,433	$4,292	$5,364	$6,706	$8,382	$10,477
IP telephony Residential setup fee		$4,500	$5,625	$7,031	$8,789	$10,986	$13,733	$17,166	$21,458	$26,822	$33,528	$41,910	$52,387
IP Telephony business Pros		$1,500	$1,875	$2,344	$2,930	$3,662	$4,578	$5,722	$7,153	$8,941	$11,176	$13,970	$17,462
IP Telephony Business basic setup fee		$4,000	$5,000	$6,250	$7,813	$9,766	$12,207	$15,259	$19,073	$23,842	$29,802	$37,253	$46,566
IP Telephony Government 0 to 24 lines		$1,440	$1,800	$2,250	$2,813	$3,516	$4,395	$5,493	$6,866	$8,583	$10,729	$13,411	$16,764
IP Telephony Government 25 to 50		$1,560	$1,950	$2,438	$3,047	$3,809	$4,761	$5,951	$7,439	$9,298	$11,623	$14,529	$18,161
IP Telephony Government 51 to 100 lines		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
IP Telephony Government setup fee		$7,000	$8,750	$10,938	$13,672	$17,090	$21,362	$26,703	$33,379	$41,723	$52,154	$65,193	$81,491
VPN and Transparent LAN 2,048Kbps		$20,000	$25,000	$31,250	$39,063	$48,828	$61,035	$76,294	$95,367	$119,209	$149,012	$186,265	$232,831
VPN and Transparent LAN 4,096Kbps		$17,000	$21,250	$26,563	$33,203	$41,504	$51,880	$64,850	$81,062	$101,328	$126,660	$158,325	$197,906
VPN and Transparent LAN 8,192Kbps		$18,000	$22,500	$28,125	$35,156	$43,945	$54,932	$68,665	$85,831	$107,288	$134,110	$167,638	$209,548
VPN and Transparent LAN setup fee		$800	$1,000	$1,250	$1,563	$1,953	$2,441	$3,052	$3,815	$4,768	$5,960	$7,451	$9,313
Total Sales		$94,000	$117,500	$145,750	$183,313	$228,016	$286,145	$356,556	$446,820	$557,399	$697,874	$871,218	$1,090,147
Direct Unit Costs		**M1**	**M2**	**M3**	**M4**	**M5**	**M6**	**M7**	**M8**	**M9**	**M10**	**M11**	**M12**
Broadband Basic R	0.00%	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00
Broadband Advanced R	0.00%	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00
Broadband Extreme R	0.00%	$20.00	$20.00	$20.00	$20.00	$20.00	$20.00	$20.00	$20.00	$20.00	$20.00	$20.00	$20.00
Broadband setup fee	0.00%	$20.00	$20.00	$20.00	$20.00	$20.00	$20.00	$20.00	$20.00	$20.00	$20.00	$20.00	$20.00
Broadband Basic B	0.00%	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00
Broadband Pros B	0.00%	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00
Broadband business setup fee	0.00%	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00
Broadband Government 0-50	0.00%	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00
Broadband Government 51-100	0.00%	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00
Broadband setup fee	0.00%	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00
IP Telephony Residential basic	0.00%	$37.00	$37.00	$37.00	$37.00	$37.00	$37.00	$37.00	$37.00	$37.00	$37.00	$37.00	$37.00
IP telephony Residential setup fee	0.00%	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00
IP Telephony business Pros	0.00%	$57.00	$57.00	$57.00	$57.00	$57.00	$57.00	$57.00	$57.00	$57.00	$57.00	$57.00	$57.00
IP Telephony Business basic setup fee	0.00%	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00
IP Telephony Government 0 to 24 lines	0.00%	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00

		M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
IP Telephony Government 25 to 50	0.00%	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00
IP Telephony Government 51 to 100 lines	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
IP Telephony Government setup fee	0.00%	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00
VPN and Transparent LAN 2,048Kbps	0.00%	$2,500.00	$2,500.00	$2,500.00	$2,500.00	$2,500.00	$2,500.00	$2,500.00	$2,500.00	$2,500.00	$2,500.00	$2,500.00	$2,500.00
VPN and Transparent LAN 4,096Kbps	0.00%	$2,900.00	$2,900.00	$2,900.00	$2,900.00	$2,900.00	$2,900.00	$2,900.00	$2,900.00	$2,900.00	$2,900.00	$2,900.00	$2,900.00
VPN and Transparent LAN 8,192Kbps	0.00%	$8,000.00	$8,000.00	$8,000.00	$8,000.00	$8,000.00	$8,000.00	$8,000.00	$8,000.00	$8,000.00	$8,000.00	$8,000.00	$8,000.00
VPN and Transparent LAN setup fee	0.00%	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00
Direct Cost of Sales													
Broadband Basic R		$100	$125	$156	$195	$244	$305	$381	$477	$596	$745	$931	$1,164
Broadband Advanced R		$150	$188	$234	$293	$366	$458	$572	$715	$894	$1,118	$1,397	$1,746
Broadband Extreme R		$200	$250	$313	$391	$488	$610	$763	$954	$1,192	$1,490	$1,863	$2,328
Broadband setup fee		$600	$750	$188	$984	$480	$1,351	$938	$1,923	$1,653	$2,817	$2,771	$4,214
Broadband Basic B		$75	$94	$117	$146	$183	$229	$286	$358	$447	$559	$698	$873
Broadband Pros B		$125	$156	$195	$244	$305	$381	$477	$596	$745	$931	$1,164	$1,455
Broadband business setup fee		$3,490	$4,363	$5,453	$6,816	$8,521	$10,651	$13,313	$16,642	$20,802	$26,003	$32,503	$40,629
Broadband Government 0-50		$800	$1,000	$1,250	$1,563	$1,953	$2,441	$3,052	$3,815	$4,768	$5,960	$7,451	$9,313
Broadband Government 51-100		$1,200	$1,500	$1,875	$2,344	$2,930	$3,662	$4,578	$5,722	$7,153	$8,941	$11,176	$13,970
Broadband setup fee		$698	$873	$1,091	$1,363	$1,704	$2,130	$2,663	$3,328	$4,160	$5,201	$6,501	$8,126
IP Telephony Residential basic		$555	$694	$867	$1,084	$1,355	$1,694	$2,117	$2,646	$3,308	$4,135	$5,169	$6,461
IP telephony Residential setup fee		$900	$1,125	$1,406	$1,758	$2,197	$2,747	$3,433	$4,292	$5,364	$6,706	$8,382	$10,477
IP Telephony business Pros		$570	$713	$891	$1,113	$1,392	$1,740	$2,174	$2,718	$3,397	$4,247	$5,309	$6,636
IP Telephony Business basic setup fee		$600	$750	$938	$1,172	$1,465	$1,831	$2,289	$2,861	$3,576	$4,470	$5,588	$6,985
IP Telephony Government 0 to 24 lines		$800	$1,000	$1,250	$1,563	$1,953	$2,441	$3,052	$3,815	$4,768	$5,960	$7,451	$9,313
IP Telephony Government 25 to 50		$1,000	$1,250	$1,563	$1,953	$2,441	$3,052	$3,815	$4,768	$5,960	$7,451	$9,313	$11,642
IP Telephony Government 51 to 100 lines		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
IP Telephony Government setup fee		$2,000	$2,500	$3,125	$3,906	$4,883	$6,104	$7,629	$9,537	$11,921	$14,901	$18,626	$23,283
VPN and Transparent LAN 2,048Kbps		$12,500	$15,625	$19,531	$24,414	$30,518	$38,147	$47,684	$59,605	$74,506	$93,132	$116,415	$145,519
VPN and Transparent LAN 4,096Kbps		$5,800	$7,250	$9,063	$11,328	$14,160	$17,700	$22,125	$27,657	$34,571	$43,213	$54,017	$67,521

		M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
VPN and Transparent LAN 8,192Kbps		$8,000	$10,000	$12,500	$15,625	$19,531	$24,414	$30,518	$38,147	$47,684	$59,605	$74,506	$93,132
VPN and Transparent LAN setup fee		$349	$436	$545	$682	$852	$1,065	$1,331	$1,664	$2,080	$2,600	$3,250	$4,063
Subtotal Direct Cost of Sales		$40,512	$50,640	$62,550	$78,938	$97,922	$123,152	$153,190	$192,238	$239,548	$300,184	$374,481	$468,851

ANNEX II: PRO FORMA PROFIT AND LOSS

		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
Sales		$94,000	$117,500	$145,750	$183,313	$228,016	$286,145	$356,556	$446,820	$557,399	$697,874	$871,218	$1,090,147
Direct Cost of Sales		$40,512	$50,640	$62,550	$78,938	$97,922	$123,152	$153,190	$192,238	$239,548	$300,184	$374,481	$468,851
Internet Bandwidth and Collocation Payroll		$13,000	$13,000	$13,000	$13,000	$13,000	$13,000	$13,000	$13,000	$13,000	$13,000	$13,000	$13,000
Other Costs of Sales		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
		———	———	———	———	———	———	———	———	———	———	———	———
Total Cost of Sales		$53,512	$63,640	$75,550	$91,938	$110,922	$136,152	$166,190	$205,238	$252,548	$313,184	$387,481	$481,851
Gross Margin		$40,488	$53,860	$70,200	$91,375	$117,094	$149,992	$190,365	$241,582	$304,852	$384,690	$483,737	$608,297
Gross Margin %		43.07%	45.84%	48.16%	49.85%	51.35%	52.42%	53.39%	54.07%	54.69%	55.12%	55.52%	55.80%
Operating Expenses													
Sales and Marketing Expenses													
Sales and Marketing Payroll		$6,000	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500
Advertising/Promotion		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other Sales and Marketing Expenses		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
		———	———	———	———	———	———	———	———	———	———	———	———
Total Sales and Marketing Expenses		$6,000	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500	$3,500
Sales and Marketing %		6.38%	2.98%	2.40%	1.91%	1.53%	1.22%	0.98%	0.78%	0.63%	0.50%	0.40%	0.32%
General and Administrative Expenses													
General and Administrative Payroll		$10,100	$10,100	$10,100	$10,100	$10,100	$10,100	$10,100	$10,100	$10,100	$10,100	$10,100	$10,100
Marketing/Promotion	2%	$1,880	$2,350	$2,915	$3,666	$4,560	$5,723	$7,131	$8,936	$11,148	$13,957	$17,424	$21,803

		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
Depreciation	0%	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sales Commissions	10 %	$9,400	$11,750	$14,575	$18,331	$22,802	$28,614	$35,656	$44,682	$55,740	$69,787	$87,122	$109,015
Payroll Taxes	15 %	$4,725	$4,725	$4,350	$4,350	$4,350	$4,350	$4,350	$4,350	$4,350	$4,350	$4,350	$4,350
Office Rent		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Telephone		$50	$50	$50	$50	$50	$50	$50	$50	$50	$50	$50	$50
Internet & Utilities		$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500
Computer Supplies and Maintenance		$200	$200	$200	$200	$200	$200	$200	$200	$200	$200	$200	$200
Travel		$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000
Insurance		$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000
Sonatel Collocation + Bandwidth 30 Mbps		$26,000	$26,000	$26,000	$26,000	$26,000	$26,000	$26,000	$26,000	$26,000	$26,000	$26,000	$26,000
Senelec Power		$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000
Car leasing		$6,000	$6,000	$6,000	$6,000	$6,000	$6,000	$6,000	$6,000	$6,000	$6,000	$6,000	$6,000
Private Security for site surveillance		$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000
Other utilities		$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500
Gas Power generator		$400	$400	$400	$400	$400	$400	$400	$400	$400	$400	$400	$400
Gas car		$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000
Maintenance		$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000
Miscellaneous		$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000
		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
		———	———	———	———	———	———	———	———	———	———	———	———
Total General and Administrative Expenses		$73,755	$76,575	$79,590	$84,098	$89,462	$96,437	$104,887	$115,718	$128,988	$145,845	$166,646	$192,918
General and Administrative %		78.46%	65.17%	54.61%	45.88%	39.23%	33.70%	29.42%	25.90%	23.14%	20.90%	19.13%	17.70%
Other Expenses:													
Other Payroll		$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400

		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
Consultants		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other Expenses		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Other Expenses		$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400
Other %		2.55%	2.04%	1.65%	1.31%	1.05%	0.84%	0.67%	0.54%	0.43%	0.34%	0.28%	0.22%
Total Operating Expenses		$82,155	$82,475	$85,490	$89,998	$95,362	$102,337	$110,787	$121,618	$134,888	$151,745	$172,546	$198,818
Profit Before Interest and Taxes		($41,667)	($28,615)	($15,290)	$1,378	$21,732	$47,655	$79,579	$119,963	$169,964	$232,945	$311,191	$409,479
EBITDA		($41,667)	($28,615)	($15,290)	$1,378	$21,732	$47,655	$79,579	$119,963	$169,964	$232,945	$311,191	$409,479
Interest Expense		$0	$0	$0	$0	$0	$0	$833	$833	$833	$833	$833	$833
Taxes Incurred		($12,500)	($8,585)	($4,587)	$413	$6,520	$14,296	$23,624	$35,739	$50,739	$69,633	$93,107	$122,594
Other Income													
Other Income Account Name		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other Income Account Name		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Other Income		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other Expense													
Other Expense Account Name		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other Expense Account Name		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Other Expense		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Other Income		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Profit		($29,167)	($20,031)	($10,703)	$964	$15,212	$33,358	$55,122	$83,391	$118,391	$162,478	$217,251	$286,052
Net Profit/Sales		-31.03%	-17.05%	-7.34%	0.53%	6.67%	11.66%	15.46%	18.66%	21.24%	23.28%	24.94%	26.24%

ANNEX III: PRO FORMA CASH FLOW

		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
Cash Received													
Cash from Operations													
Cash Sales		$79,900	$99,875	$123,888	$155,816	$193,813	$243,223	$303,072	$379,797	$473,790	$593,193	$740,535	$926,625
Cash from Receivables		$470	$14,218	$17,766	$22,050	$27,720	$34,493	$43,274	$53,935	$67,576	$84,312	$105,548	$131,777
Subtotal Cash from Operations		$80,370	$114,093	$141,654	$177,866	$221,534	$277,716	$346,346	$433,731	$541,365	$677,505	$846,083	$1,058,403
Additional Cash Received													
Non Operating (Other) Income		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sales Tax, VAT, HST/GST Received	19.00%	$17,860	$22,325	$27,693	$34,829	$43,323	$54,367	$67,746	$84,896	$105,906	$132,596	$165,531	$207,128
New Current Borrowing		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
New Other Liabilities (interest-free)		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
New Long-term Liabilities		$0	$0	$0	$0	$0	$0	$100,000	$0	$0	$0	$0	$0
Sales of Other Current Assets		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sales of Long-term Assets		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
New Investment Received		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Subtotal Cash Received		$98,230	$136,418	$169,346	$212,695	$264,857	$332,083	$514,092	$518,627	$647,271	$810,102	$1,011,615	$1,265,531
Expenditures		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
Expenditures from Operations													

		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
Cash Spending		$31,500	$29,000	$29,000	$29,000	$29,000	$29,000	$29,000	$29,000	$29,000	$29,000	$29,000	$29,000
Bill Payments		$48,889	$100,661	$118,623	$141,264	$169,591	$205,127	$249,732	$305,498	$374,738	$461,415	$569,634	$705,036
Subtotal Spent on Operations		$80,389	$129,661	$147,623	$170,264	$198,591	$234,127	$278,732	$334,498	$403,738	$490,415	$598,634	$734,036
Additional Cash Spent													
Non Operating (Other) Expense		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sales Tax, VAT, HST/GST Paid Out		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Principal Repayment of Current Borrowing		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other Liabilities Principal Repayment		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Long-term Liabilities Principal Repayment		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Purchase Other Current Assets		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Purchase Long-term Assets		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Dividends		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Subtotal Cash Spent		$80,389	$129,661	$147,623	$170,264	$198,591	$234,127	$278,732	$334,498	$403,738	$490,415	$598,634	$734,036
Net Cash Flow		$17,841	$6,757	$21,724	$42,432	$66,266	$97,956	$235,360	$184,129	$243,534	$319,687	$412,980	$531,495
Cash Balance		$896,741	$903,498	$925,221	$967,653	$1,033,919	$1,131,874	$1,367,234	$1,551,364	$1,794,897	$2,114,584	$2,527,564	$3,059,059

ANNEX IV: PRO FORMA BALANCE SHEET

		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
Assets	Starting Balances												
Current Assets													
Cash	$878,900	$896,741	$903,498	$925,221	$967,653	$1,033,919	$1,131,874	$1,367,234	$1,551,364	$1,794,897	$2,114,584	$2,527,564	$3,059,059
Accounts Receivable	$0	$13,630	$17,038	$21,134	$26,580	$33,062	$41,491	$51,701	$64,789	$80,823	$101,192	$126,327	$158,071
Other Current Assets	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Current Assets	$878,900	$910,371	$920,535	$946,355	$994,233	$1,066,981	$1,173,365	$1,418,935	$1,616,152	$1,875,720	$2,215,776	$2,653,891	$3,217,130
Long-term Assets													
Long-term Assets	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Accumulated Depreciation	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Long-term Assets	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Assets	$878,900	$910,371	$920,535	$946,355	$994,233	$1,066,981	$1,173,365	$1,418,935	$1,616,152	$1,875,720	$2,215,776	$2,653,891	$3,217,130
Liabilities and Capital		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
Current Liabilities													
Accounts Payable	$0	$42,778	$50,648	$59,478	$71,563	$85,775	$104,434	$126,483	$155,087	$189,949	$234,501	$289,392	$358,906
Current Borrowing	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other Current Liabilities	$0	$17,860	$40,185	$67,878	$102,707	$146,030	$200,397	$268,143	$353,039	$458,945	$591,541	$757,072	$964,200

		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
Subtotal Current Liabilities	$0	$60,638	$90,833	$127,356	$174,269	$231,805	$304,831	$394,625	$508,125	$648,893	$826,042	$1,046,464	$1,323,106
Long-term Liabilities	$0	$0	$0	$0	$0	$0	$0	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000
Total Liabilities	$0	$60,638	$90,833	$127,356	$174,269	$231,805	$304,831	$494,625	$608,125	$748,893	$926,042	$1,146,464	$1,423,106
Paid-in Capital	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000
Retained Earnings	($1,121,100)	($1,121,100)	($1,121,100)	($1,121,100)	($1,121,100)	($1,121,100)	($1,121,100)	($1,121,100)	($1,121,100)	($1,121,100)	($1,121,100)	($1,121,100)	($1,121,100)
Earnings	$0	($29,167)	($49,197)	($59,900)	($58,936)	($43,724)	($10,365)	$44,756	$128,147	$246,539	$409,017	$626,267	$912,319
Total Capital	$878,900	$849,733	$829,703	$819,000	$819,964	$835,176	$868,535	$923,656	$1,007,047	$1,125,439	$1,287,917	$1,505,167	$1,791,219
Total Liabilities and Capital	$878,900	$910,371	$920,535	$946,355	$994,233	$1,066,981	$1,173,365	$1,418,282	$1,615,172	$1,874,332	$2,213,958	$2,651,632	$3,214,325
Net Worth	$878,900	$849,733	$829,703	$819,000	$819,964	$835,176	$868,535	$924,310	$1,008,027	$1,126,827	$1,289,734	$1,507,426	$1,794,025

MUNICIPALITY WIRELESS ISP TEMPLATE (BUSINESS PLAN – WORST CASE SCENARIO)

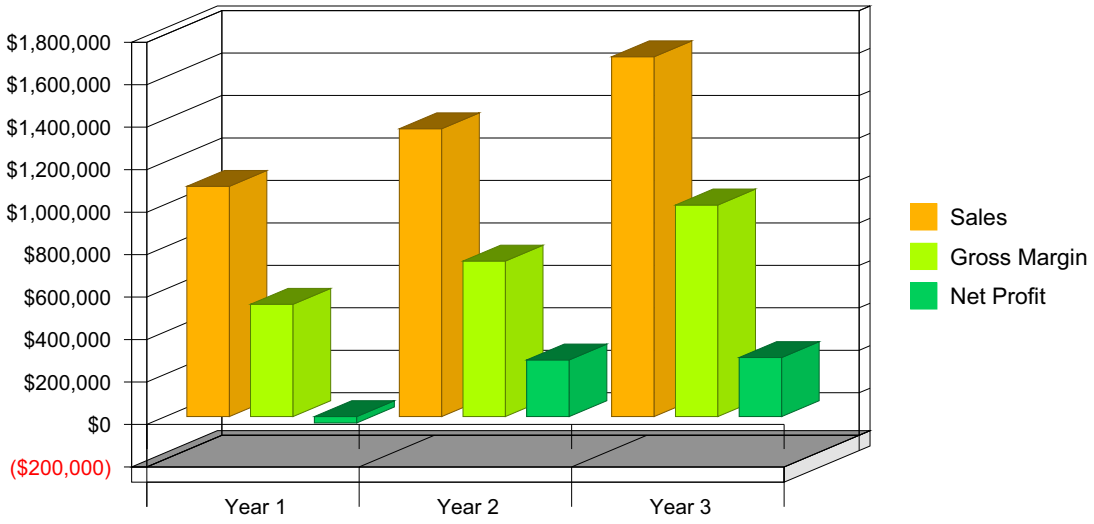
1. Executive Summary

Municipality Wireless Internet Service Provider (MWISP) will be a Saint-Louis du Senegal based corporation to be created in 200_ that will specialize in the setup, delivery, operation, marketing and maintenance of secure wireless communications (Wimax and WiFi) for individuals, businesses, and entire communities. MWISP will offer custom, from the ground up, metropolitan-area data and VoIP installation and delivery.

Wimax/ WiFi are quickly becoming the standard in the delivery of Internet connectivity throughout many organizations, government agencies and businesses. MWISP is focused on the delivery of secure Wimax/ WiFi services to commercial and residential property owners, as well as traditional Internet service providers that are looking to improve the service offerings within their buildings and current services. The primary focus of MWISP is to provide full-service installation, support and management of wireless networks for individual building owners and municipalities. MWISP is a wholesale provider of services to businesses looking to improve their competitiveness and amenities in their commercial properties and townships.

The opportunity for wireless (Wimax / WiFi) installations and ongoing management of these networks has increased greatly in the past year and is projected to grow worldwide at an annual rate of no less than 50% a year. The total industry segment targeted specifically by MWISP is expected to grow to $2 billion annually by the year 2008. The Wimax / WiFi industry, as a whole, is on track to become a $190.8 billion powerhouse. The year 2004 was the beginning of a paradigm shift in how Internet services, hardware and security were all delivered to users throughout the world. MWISP has an opportunity to be the one of first movers in Senegal in this rapidly growing market. Because of the nature of the Senegalese market in its current state, the threat from competitors does not exist so far. Later, competitors in the market will help to increase industry awareness and drive sales within the industry. The overall opportunity in this industry is great. Due to the short-term opportunity to grab a foothold in this emerging market, MWISP is aggressively rolling out the services anywhere demands are generated. As demand increases, the innovative MWISP sales and installer management strategy will allow the company to take advantage of all opportunities in Saint-Louis du Senegal first and the other cities and village later.

Highlights



1.1. Objectives

- Sales over $1,000,000 in the first year
- Increase contracted sales force to 10 by year 3
- Net worth over $3,000,000 by year 3.
- Coverage 20% of the population par end of year 2.
- Services Penetration 15% of the population by end year 2.
- Services Penetration 15% of the business by end year 2.
- Services Penetration 15% local government by end year 2.

1.2. Mission

The company "Municipal Wimax/WiFi ISP" (MWISP) represents a partnership between the local government and a private partner with expertise in the field of Wimax/WiFi networks and good knowledge of the cultural, political and economic situation of Senegal. This partnership will be financially equal and allow the municipalities to improve their income and their communications in intra and extra city limits through this powerful tool called the Internet.

Everything in this business plan can be applied to other cities anywhere in Senegal, we just need to gather all the information related to your municipality and process them through our spreadsheets.

MWISP will make it easier and more affordable for government, businesses and residents to have Internet access and many other value-added services. We will decrease the costs of basic Internet access, basic IP phone services, allow for portability, and provide high-quality, ongoing customer service. For the government and private owner joint venture, MWISP will provide a ground-level entry port to the next high-impact technology trend, turning around high value returns every year.

1.3. Keys to Success

- Total commitment of the government authorities of the city and the region of Saint-Louis du Senegal and the Direction Informatique de l'Etat du Senegal, to provide access to government facilities, train employees to be prepared to take charge of the management of MWISP's network in the city of Saint-Louis du Senegal first and all other cities and villages of the region of Saint-Louis;

- Total commitment from the ART to accelerate the update of the Code des Telecoms to allow the municipalities and region of Senegal to become a Wireless Internet Service Provider and IP telephony operator everywhere in their region and in cities not yet served by the incumbent carrier Sonatel;

- Total commitment of Sonatel to facilitate the negotiations to sell to MWISP large Internet bandwidth connectivity, point-to-point dedicated lines to connect Saint-Louis and the submarine cable station of Dakar-Medina;

- Management skills;

- Total synergy between Universite Gaston Berger Direction de l'Informatique and MWISP to prepare the next generation of engineers, managers and users of the MWISP network;

- Work in partnership with expert Government authorities;
- Business, sales, technology, and branding expertise;

- First-mover advantage in an emerging market; and

- Detailed installer database, tracking performance and skill sets.

1.4. Risks

The risks involved with starting MWISP are:

1. Will the Senegal telecommunications authorities agree to change the Code of Telecoms license or agreement to allow the municipalities to become telecom operators and be authorized to provide all the services described in this business plan to allow a faster reduction of the "fracture numerique"?

2. Will the Senegal authorities understand that unless they use this cost-effective approach to close the "fracture numerique," it will take another 20 years?

3. Will Sonatel be cooperative enough to support this beneficial partnership that will bring more aggregated business on a B2B side to Sonatel?

4. Will the cost of accessing the Internet from home drop so significantly that there will not be a market for public Internet terminals?

2. Company Summary

Wimax / WiFi is quickly becoming the standard in the delivery of Internet connectivity throughout many organizations, government agencies and businesses.

MWISP will focus on the delivery of basic access to Internet and many other value-added services, through a Wimax and WiFi network which will cover the entire city of Saint-Louis, from the downtown area

all the way to the University Gaston Berger. The area that MWISP wireless network will cover is about a 13km radius. The primary function of MWISP will be to build, operate, and manage the Saint-Louis municipal wireless network. MWISP will operate in partnership with the city and region of Saint-Louis to create a municipal wireless network of services for organizations looking to improve their competitiveness and amenities in their cities, commercial properties and townships. MWISP charges a set-up fee and a monthly maintenance charge.

2.1. Company Ownership

Articles of Incorporation
Articles of Incorporation will be filed with the Registre de Commerce office in the city of Saint-Louis. MWISP, S.A. will file as a *société anonyme.*

Company Ownership
The Company will be a joint-venture between the city of Saint-Louis, the region of Saint-Louis and a private corporation with expertise in operating wireless Wimax/WiFi interested in deploying and operating networks to cover the city of Saint-Louis and villages around it. Later, this type of joint-venture can be expanded to other Senegalese cities, villages and the region.

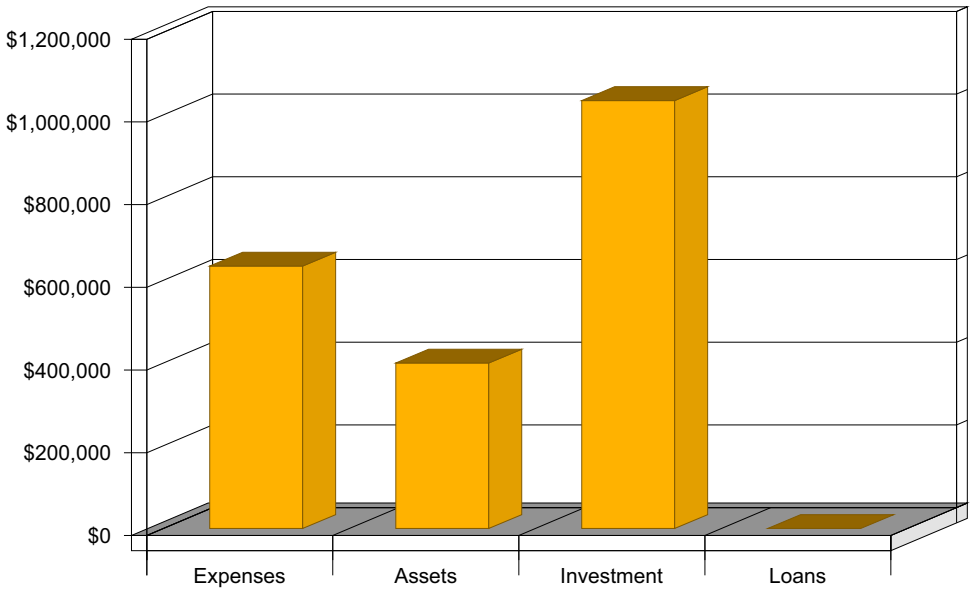
To guarantee that this network will last, it is important that the operational side of the venture stay under the supervision of the private partner and that the staff of the city will be trained in all aspects of network operations and maintenance.

2.2. Start-up Summary

The PPP founders will plan to handle all day-to-day operations of the business and will work with outside vendors and partners in order to ensure that this business venture is a success. It is estimated that the start-up expenses will be US $634,600 (including network equipment, deployment, legal costs, advertising, and related expenses). Total start-up requirements include an additional US $400,000 for cash on hand to cover the first year's operating expenses.

Start-up	
Requirements	
Start-up Expenses	
Autorization permit fee ART	$40,000
Legal	$10,000
Insurance	$5,000
Wireless Network hardware	$474,000
Network operating center	$103,600
Other	$2,000
Total Start-up Expenses	$634,600
Start-up Assets	
Cash Required	$400,000
Other Current Assets	$0
Long-term Assets	$0
Total Assets	$400,000
Total Requirements	$1,034,600

Start-up



2.2.1. Sales Forecast

MWISP's sales objectives are to reach as many Government building, residential building owners, business building owners and ISP operators throughout Saint-Louis du Senegal as possible, quickly and for the least amount of capital outlay.

The sales department will grow and manage as many capable independent contractors as possible, while maintaining the high level of quality service and the good reputation of MWISP in the marketplace. Dedicated management and oversight of these contractors is critical to the success of the company as a whole.

Each territory is split up by specialty and certain metropolitan boundaries will be defined as each location is added to the sales team. The area in which the reps will be working will determine territories. Within each territory, the company will simultaneously target the government, commercial and residential divisions to gain maximum market share and market penetration as quickly as possible.

Sales growth shown in the table and chart below is based on solid industry data, as outlined in the Market Analysis.

Sales Forecast

	Year 1	Year 2	Year 3
Unit Sales			
Broadband Basic R	102	127	159
Broadband Advanced R	102	127	159
Broadband Extreme R	102	127	159
Broadband setup fee	172	215	269
Broadban Basic B	128	160	200
Broadband Pros B	128	160	200

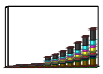
Broadband business setup fee	255	319	399
Broadband Government 0-50	43	53	67
Broadband Government 51-100	0	0	0
Broadband setup fee	43	53	67
IP Telephony Residential basic	43	53	67
IP telephony Residential setup fee	43	53	67
IP Telephony business Pros	85	106	133
IP Telephony Business basic setup fee	43	53	67
IP Telephony Government 0 to 24 lines	43	53	67
IP Telephony Government 25 to 50	15	19	24
IP Telephony Government 51 to 100 lines	15	19	24
IP Telephony Governement setup fee	30	38	47
VPN and Transparent LAN 2,048Kbps	15	19	24
VPN and Transparent LAN 4,096Kbps	15	19	24
VPN and Transparent LAN 8,192Kbps	15	19	24
VPN and Transparent LAN setup fee	45	57	71
Total Unit Sales	1,480	1,849	2,312
Unit Prices	Year 1	Year 2	Year 3
Broadband Basic R	$25.00	$25.00	$25.00
Broadband Advanced R	$35.00	$35.00	$35.00
Broadband Extreme R	$80.00	$80.00	$80.00
Broadband setup fee	$30.00	$30.00	$30.00
Broadban Basic B	$130.00	$130.00	$130.00
Broadband Pros B	$200.00	$200.00	$200.00
Broadband business setup fee	$800.00	$800.00	$800.00
Broadband Government 0-50	$1,250.00	$1,250.00	$1,250.00
Broadband Government 51-100	$0.00	$0.00	$0.00
Broadband setup fee	$800.00	$800.00	$800.00
IP Telephony Residential basic	$60.00	$60.00	$60.00
IP telephony Residential setup fee	$300.00	$300.00	$300.00
IP Telephony business Pros	$150.00	$150.00	$150.00
IP Telephony Business basic setup fee	$400.00	$400.00	$400.00
IP Telephony Government 0 to 24 lines	$1,440.00	$1,440.00	$1,440.00
IP Telephony Government 25 to 50	$1,560.00	$1,560.00	$1,560.00
IP Telephony Government 51 to 100 lines	$0.00	$0.00	$0.00
IP Telephony Governement setup fee	$3,500.00	$3,500.00	$3,500.00
VPN and Transparent LAN 2,048Kbps	$4,000.00	$4,000.00	$4,000.00
VPN and Transparent LAN 4,096Kbps	$8,500.00	$8,500.00	$8,500.00
VPN and Transparent LAN 8,192Kbps	$18,000.00	$18,000.00	$18,000.00
VPN and Transparent LAN setup fee	$800.00	$800.00	$800.00
Sales			
Broadband Basic R	$2,544	$3,180	$3,975
Broadband Advanced R	$3,562	$4,452	$5,565

Broadband Extreme R	$8,141	$10,176	$12,720
Broadband setup fee	$5,168	$6,460	$8,075
Broadban Basic B	$16,601	$20,751	$25,939
Broadband Pros B	$25,540	$31,925	$39,906
Broadband business setup fee	$204,317	$255,397	$319,246
Broadband Government 0-50	$53,208	$66,510	$83,137
Broadband Government 51-100	$0	$0	$0
Broadband setup fee	$34,053	$42,566	$53,208
IP Telephony Residential basic	$2,554	$3,192	$3,991
IP telephony Residential setup fee	$12,770	$15,962	$19,953
IP Telephony business Pros	$12,770	$15,962	$19,953
IP Telephony Business basic setup fee	$17,026	$21,283	$26,604
IP Telephony Government 0 to 24 lines	$61,295	$76,619	$95,774
IP Telephony Government 25 to 50	$23,515	$29,393	$36,742
IP Telephony Government 51 to 100 lines	$0	$0	$0
IP Telephony Governement setup fee	$105,514	$131,893	$164,866
VPN and Transparent LAN 2,048Kbps	$60,294	$75,367	$94,209
VPN and Transparent LAN 4,096Kbps	$128,125	$160,156	$200,195
VPN and Transparent LAN 8,192Kbps	$271,323	$339,153	$423,942
VPN and Transparent LAN setup fee	$36,176	$45,220	$56,526
Total Sales	**$1,084,495**	**$1,355,618**	**$1,694,523**

Direct Unit Costs	Year 1	Year 2	Year 3
Broadband Basic R	$10.00	$9.00	$8.10
Broadband Advanced R	$15.00	$13.50	$12.15
Broadband Extreme R	$20.00	$18.00	$16.20
Broadband setup fee	$20.00	$18.00	$16.20
Broadban Basic B	$15.00	$13.50	$12.15
Broadband Pros B	$25.00	$22.50	$20.25
Broadband business setup fee	$349.00	$314.10	$282.69
Broadband Government 0-50	$800.00	$720.00	$648.00
Broadband Government 51-100	$0.00	$0.00	$0.00
Broadband setup fee	$349.00	$314.10	$282.69
IP Telephony Residential basic	$37.00	$33.30	$29.97
IP telephony Residential setup fee	$60.00	$54.00	$48.60
IP Telephony business Pros	$57.00	$51.30	$46.17
IP Telephony Business basic setup fee	$60.00	$54.00	$48.60
IP Telephony Government 0 to 24 lines	$800.00	$720.00	$648.00
IP Telephony Government 25 to 50	$1,000.00	$900.00	$810.00
IP Telephony Government 51 to 100 lines	$0.00	$0.00	$0.00
IP Telephony Governement setup fee	$1,000.00	$900.00	$810.00
VPN and Transparent LAN 2,048Kbps	$2,500.00	$2,250.00	$2,025.00
VPN and Transparent LAN 4,096Kbps	$2,900.00	$2,610.00	$2,349.00
VPN and Transparent LAN 8,192Kbps	$8,000.00	$7,200.00	$6,480.00
VPN and Transparent LAN setup fee	$349.00	$314.10	$282.69

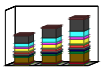
Direct Cost of Sales			
Broadband Basic R	$1,018	$1,145	$1,288
Broadband Advanced R	$1,526	$1,717	$1,932
Broadband Extreme R	$2,035	$2,290	$2,576
Broadband setup fee	$3,445	$3,876	$4,360
Broadban Basic B	$1,915	$2,155	$2,424
Broadband Pros B	$3,192	$3,592	$4,040
Broadband business setup fee	$89,133	$100,275	$112,810
Broadband Government 0-50	$34,053	$38,310	$43,098
Broadband Government 51-100	$0	$0	$0
Broadband setup fee	$14,856	$16,713	$18,802
IP Telephony Residential basic	$1,575	$1,772	$1,993
IP telephony Residential setup fee	$2,554	$2,873	$3,232
IP Telephony business Pros	$4,853	$5,459	$6,141
IP Telephony Business basic setup fee	$2,554	$2,873	$3,232
IP Telephony Government 0 to 24 lines	$34,053	$38,310	$43,098
IP Telephony Government 25 to 50	$15,073	$16,958	$19,077
IP Telephony Government 51 to 100 lines	$0	$0	$0
IP Telephony Governement setup fee	$30,147	$33,915	$38,155
VPN and Transparent LAN 2,048Kbps	$37,684	$42,394	$47,693
VPN and Transparent LAN 4,096Kbps	$43,713	$49,177	$55,324
VPN and Transparent LAN 8,192Kbps	$120,588	$135,661	$152,619
VPN and Transparent LAN setup fee	$15,782	$17,755	$19,974
Subtotal Direct Cost of Sales	$459,750	$517,218	$581,871

Sales Monthly



- Broadband Basic R
- Broadband Advanced R
- Broadband Extreme R
- Broadband setup fee
- Broadban Basic B
- Broadband Pros B
- Broadband business setup fee
- Broadband Government 0-50
- Broadband Government 51-100
- Broadband setup fee
- IP Telephony Residential basic
- IP telephony Residential setup fee
- IP Telephony business Pros
- IP Telephony Business basic setup fee
- IP Telephony Government 0 to 24 lines
- IP Telephony Government 25 to 50
- IP Telephony Government 51 to 100 lines
- IP Telephony Governement setup fee
- VPN and Transparent LAN 2,048Kbps
- VPN and Transparent LAN 4,096Kbps
- VPN and Transparent LAN 8,192Kbps
- VPN and Transparent LAN setup fee

Sales by Year



- Broadband Basic R
- Broadband Advanced R
- Broadband Extreme R
- Broadband setup fee
- Broadban Basic B
- Broadband Pros B
- Broadband business setup fee
- Broadband Government 0-50
- Broadband Government 51-100
- Broadband setup fee
- IP Telephony Residential basic
- IP telephony Residential setup fee
- IP Telephony business Pros
- IP Telephony Business basic setup fee
- IP Telephony Government 0 to 24 lines
- IP Telephony Government 25 to 50
- IP Telephony Government 51 to 100 lines
- IP Telephony Governement setup fee
- VPN and Transparent LAN 2,048Kbps
- VPN and Transparent LAN 4,096Kbps
- VPN and Transparent LAN 8,192Kbps
- VPN and Transparent LAN setup fee

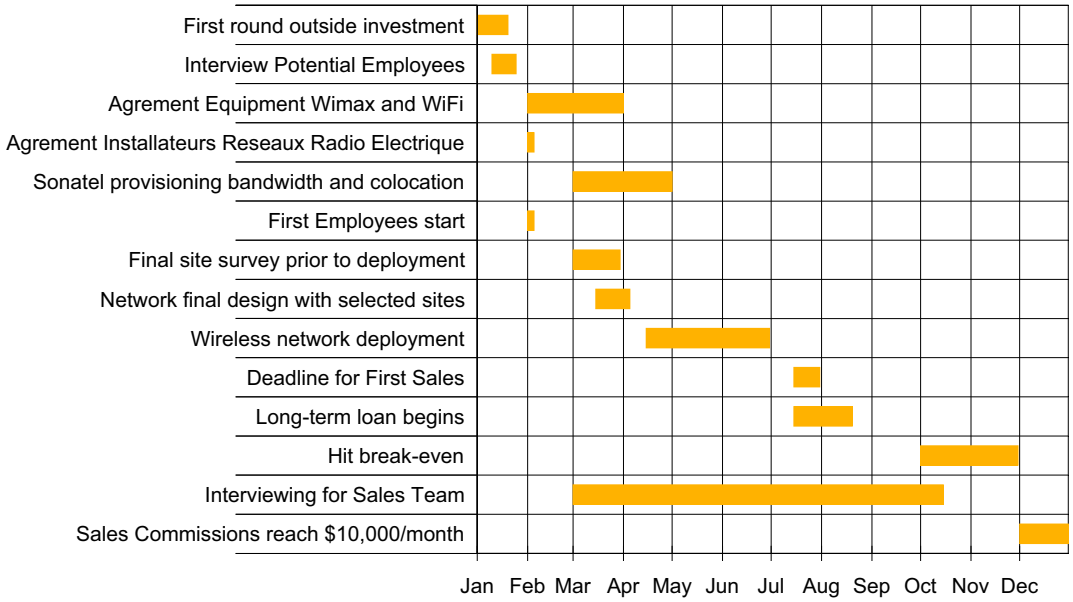
2.3. Milestones

The management team has established some basic milestones to keep the business plan priorities in place. Responsibility for implementation falls on the shoulders of the founders fairly equally in the first year. This Milestones Table below will be updated as the year progresses using the actual tables. New milestones will be added as the first year of operations commences.

Milestones

Milestone	Start Date	End Date	Budget	Manager	Department
First round outside investment	1/1/2007	1/20/2007	$1,034,600	TBD	TBD
Interview Potential Employees	1/10/2007	1/25/2007	($5,000)	TBD	Human Resources
Agrement Equipment Wimax and WiFi	2/1/2007	4/1/2007	($6,000)	TBD	Legal
Agrement Installateurs Reseaux Radio Electrique	2/1/2007	2/5/2007	($4,000)	TBD	Legal
Sonatel provisioning bandwidth and colocation	3/1/2007	5/1/2007	($51,700)	TBD	Human Resources
First Employees start	2/1/2007	2/5/2007	$0	TBD	Human Resources
Final site survey prior to deployment	3/1/2007	3/30/2007	($20,000)	TBD	Technical
Network final design with selected sites	3/15/2007	4/5/2007	($30,000)	TBD	Technical
Wireless network deployment	4/15/2007	6/30/2007	($1,030,600)	TBD	Technical
Deadline for First Sales	7/15/2007	7/31/2007	$0	TBD	Sales
Long-term loan begins	7/15/2007	8/20/2007	$0	TBD	Finance
Hit break-even	10/1/2007	11/30/2007	$0	TBD	Sales/Finance
Interviewing for Sales Team	3/1/2007	10/15/2007	$0	TBD	Human Resources
Sales Commissions reach $10,000/month	12/1/2007	12/31/2007	$0	TBD	Sales
Totals			$852,700		

Milestones



3. Management Summary

The MWISP management team will be put together specifically for the purpose of building MWISP aggressively. This team made of Public and private employee will learn to work together and will quickly adjust to maintain control, competitiveness and an undying desire to accomplish any challenge.

In addition to the diversified and competent management team, MWISP will create a Board of Advisors in an effort to lend additional experience and expertise to the company.

These individuals are not employees of the company, but rather an advisory group selected by the management team in order to assist with the execution of the business model moving forward. Members of the advisory board will be selected for their knowledge in the industry; experience and general interest in assisting the company succeed.

3.1. Personnel Plan

Salesperson/Reseller Recruitment This is the great challenge, finding good sales people. Our ideal salesperson would be an outside "employed" rep; however, because this company is in its beginning stages, MWISP will be required to start with independent contractors. **Initially, MWISP will use the CRO's pool of contacts for sales recruiting. MWISP may desire to do some advertising on such recruitment Websites and newspapers. MWISP will look for experience in sales, telecom, commercial or residential building management, professionalism with a willing attitude will be crucial. Commission payments for these independently contracted sales people can be found in the Profit and Loss Statement.**

In-House Sales/Support Staff As MWISP will grow and MWISP sales team grows, MWISP will hire sales field assistants for the city area managers; these assistants will work out of the corporate office, but will assist sales managers in the field. We plan to hire up to five in-house sales staff in the first year.

Personnel Plan

	Year 1	Year 2	Year 3
Internet Bandwidth and Collocation Personnel			
Chief Technical Officer	$12,000	$13,200	$14,520
Networkr Operationg Center Engineer	$48,000	$52,800	$58,080
Technical support	$24,000	$26,400	$29,040
Field Engineer	$12,000	$13,200	$14,520
Subtotal	*$96,000*	*$105,600*	*$116,160*
Sales and Marketing Personnel			
Sales Manager	$6,000	$6,600	$7,260
Sales associates	$28,500	$31,350	$34,485
Subtotal	*$34,500*	*$37,950*	*$41,745*
General and Administrative Personnel			
President CEO	$30,000	$33,000	$36,300
Chief Financial Officer	$18,000	$19,800	$21,780
Human Resources Manager	$12,000	$13,200	$14,520
Leagal counsel	$12,000	$13,200	$14,520
Office Assistant secretaire	$12,000	$13,200	$14,520
Subtotal	*$84,000*	*$92,400*	*$101,640*
Other Personnel			
Security Agent	$6,600	$7,260	$7,986
Driver	$15,000	$16,500	$18,150
Cleaning and maintenance personel	$7,200	$7,920	$8,712
Subtotal	*$28,800*	*$31,680*	*$34,848*
Total People	26	39	51
Total Payroll	$243,300	$267,630	$294,393

4. Financial Plan (Minimum investment)

MWISP's establishment requires an investment of $1,034,600 during start-up, which will be provided by Donors. This capital is needed in order to build the base stations and the entire coverage wireless network to covert Saint-Louis metropolitan area, all government building and municipal buildings and the university Gaston Berger. This is necessary for generating sales in the first year.

Based on solid market research, and known costs, MWISP will be able to grow the business rapidly over the first three years, if MWISP obtain this initial funding. The business will reach the break-even point early in the first year, and begin to generate reasonable profits for a venture of this kind.

After the first year, our Balance Sheet is quite positive. MWISP ratios will be good for the industry in which we are operating - data communications services.

4.1. Start-up Funding

The owners of the company will contribute $1,034,600 to begin operations. No additional funding will be needed for the first 18 months.

Start-up Funding	
Start-up Expenses to Fund	$634,600
Start-up Assets to Fund	$400,000
Total Funding Required	$1,034,600
Assets	
Non-cash Assets from Start-up	$0
Cash Requirements from Start-up	$400,000
Additional Cash Raised	$0
Cash Balance on Starting Date	$400,000
Total Assets	*$400,000*
Liabilities and Capital	
Liabilities	
Current Borrowing	$0
Long-term Liabilities	$0
Accounts Payable (Outstanding Bills)	$0
Other Current Liabilities (interest-free)	$0
Total Liabilities	*$0*
Capital	
Planned Investment	
Owner	$1,034,600
Investor	$0
Additional Investment Requirement	$0
Total Planned Investment	*$1,034,600*
Loss at Start-up (Start-up Expenses)	($634,600)
Total Capital	$400,000
Total Capital and Liabilities	$400,000
Total Funding	$1,034,600

4.2. Important Assumptions

Sales: All base stations will be installed by MWISP, at no additional charge to the customer. The cost for this installation is figured into the Cost of Goods sold.

Approximate costs used for planning purposes in this document are as follows:

- Per 1 square km, outdoor installation = $2,100 w/o base station
- Per 1 square km, outdoor installation = $2,900 w/o base station
- Per 1 square km, indoor installation = $5,500 w/o base station
- Per 1 square km, indoor installation = $4,300 w/o base station

Approximate pricing for each application is as follows. The price to the client remains the same with or without the base station in place:

- Per 100,000 square foot, outdoor installation = $6,000 w/ base station
- Per 100,000 square foot, indoor installation = $4,200 w/o base station

Accounts Receivable: The majority of the sales will be cash sales with approximately 25% being sales on credit. We estimate, on average, AR collection in 45 days.

Accounts Payable: The average AP goal is no more than 30 days, with certain payments occurring sooner to take advantage of discounts where applicable.

Tax Rate: Tax rate is estimated at 19%.

Personnel Burden: Personnel Burden is estimated at 15%. This includes taxes, benefits, vacation pay, etc.

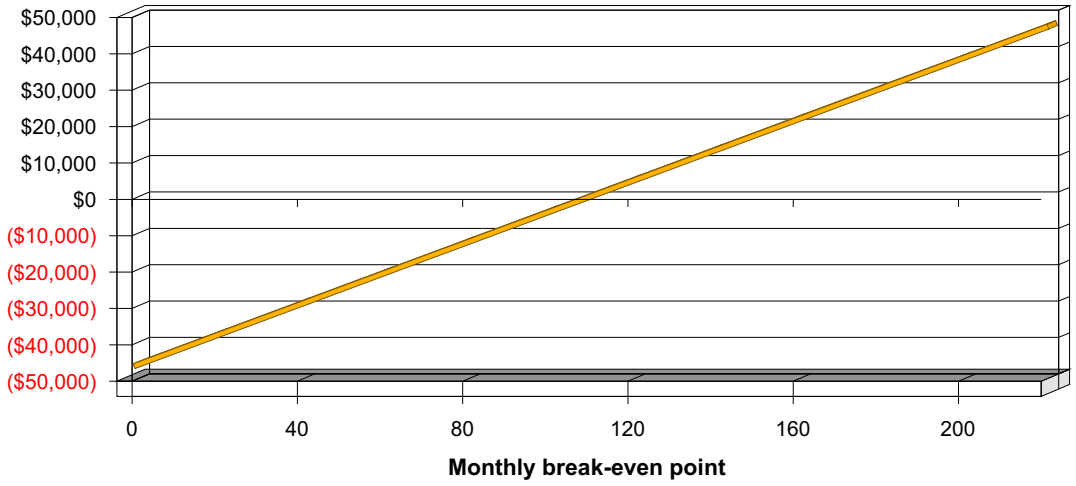
4.3. Break-even Analysis

The following table and chart show a break-even analysis for the first year of business. With variable costs around 47%, our average monthly revenue break-even point is $80,084

Break-even Analysis

Monthly Units Break-even	109
Monthly Revenue Break-even	$80,084
Assumptions:	
Average Per-Unit Revenue	$732.77
Average Per-Unit Variable Cost	$310.64
Estimated Monthly Fixed Cost	$46,134

Break-even Analysis



Break-even point = where line intersects with 0

4.4. Projected Profit and Loss

The following table and chart show our projected Profit and Loss for the next three years.

Sales, which include all sales the Enterprise and ISP plans are based on the projected growth of the marketplace, the company's sales capacity and financial resources. MWISP's ability to install the number of networks listed depends on obtaining sufficient funding.

Expenses, which are comprised primarily of marketing, sales commissions, training and certification for installers, research and development, labor and general company overhead reflect an aggressive posture to penetrate the market quickly in order to take advantage of the opportunity.

2007 will be the first reported fiscal year for MWISP. For the first year and a start-up operation, MWISP will expect profit. Due to the infancy of the market and the current rush to supply the demand driven by wireless users, it is critical that MWISP dedicate the appropriate amount of resources and time to take advantage of any first mover advantages to be gained by this new market.

The first two quarters of the 2007 fiscal year will be dedicated to setting up the corporation.

5-Year Projected Income Statement

The long-term income estimate for MWISP is conservative, based on the projected growth rate of the wireless industry. By 2008, the total market for these services is expected to exceed $2 billion. The annual recurring revenue for access services based on unlicensed broadband wireless (UBW) technologies, currently at $250 million, will approach $2 billion by 2008.

MWISP expect by 2008 to have revenues $1.8 million with a profit of $277,000. MWISP's market share, based on industry projections, would be less than 15%.

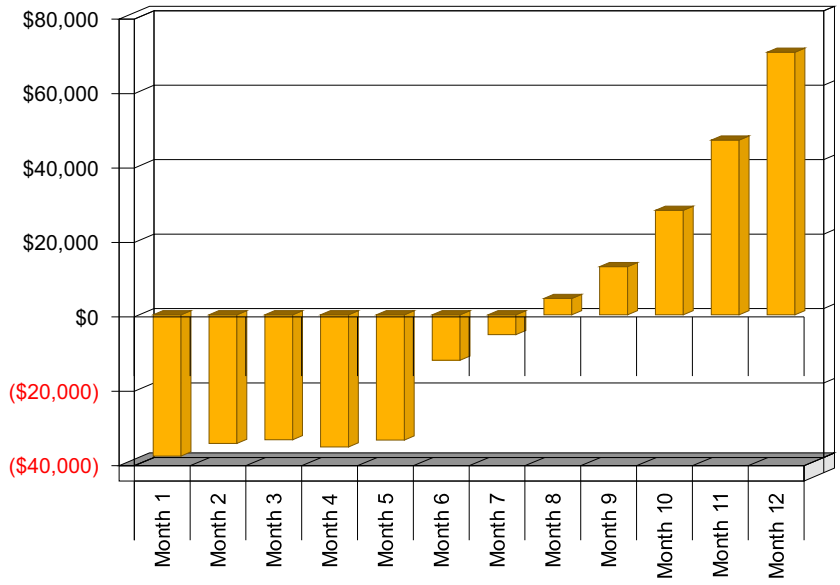
For planning purposes this estimate is intended to be ULTRA conservative, as the market will not only be changing quickly over the next few years, but it is expected that the market will remain fairly fragmented during this same period. This fragmentation may limit total overall market share for MWISP. However, it is the fragmentation that also creates the initial opportunity for MWISP to enter markets with relative ease and will be of benefit when looking to execute the exit plan outlined above.

Pro Forma Profit and Loss

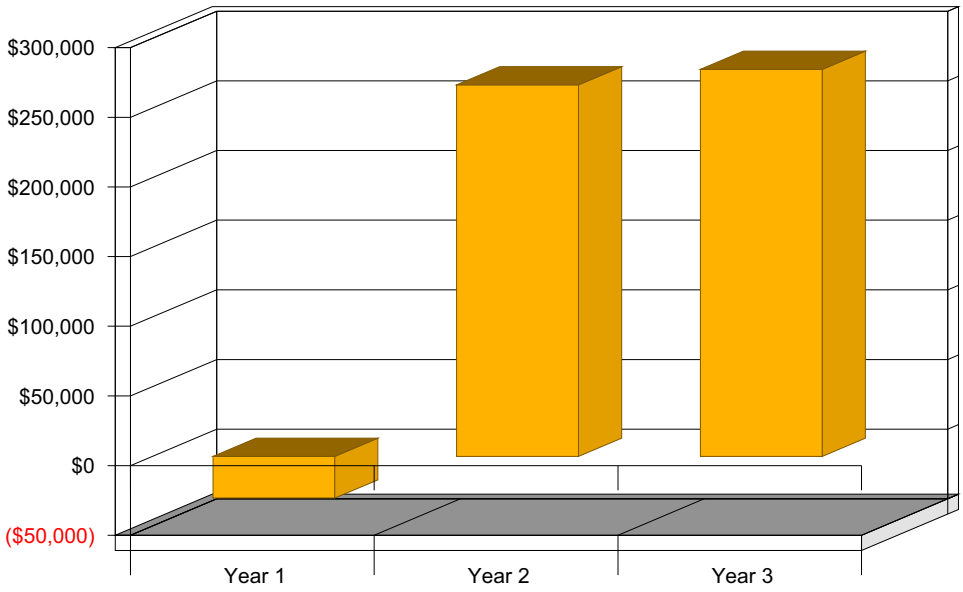
	Year 1	Year 2	Year 3
Sales	$1,084,495	$1,355,618	$1,694,523
Direct Cost of Sales	$459,750	$517,218	$581,871
Internet Bandwidth and Collocation Payroll	$96,000	$105,600	$116,160
Other Costs of Sales	$0	$0	$0
Total Cost of Sales	$555,750	$622,818	$698,031
Gross Margin	$528,745	$732,800	$996,492
Gross Margin %	48.75%	54.06%	58.81%
Operating Expenses			
Sales and Marketing Expenses			
Sales and Marketing Payroll	$34,500	$37,950	$41,745
Advertising/Promotion	$0	$0	$0
Other Sales and Marketing Expenses	$0	$0	$0
Total Sales and Marketing Expenses	$34,500	$37,950	$41,745
Sales and Marketing %	3.18%	2.80%	2.46%
General and Administrative Expenses			
General and Administrative Payroll	$84,000	$92,400	$101,640
Marketing/Promotion	$21,690	$27,112	$148,170
Depreciation	$0	$0	$0
Sales Commissions	$108,449	$135,562	$169,452
Payroll Taxes	$36,270	$40,145	$44,159
Office Rent	$0	$18,000	$36,000
Telephone	$600	$4,200	$8,400
Internet & Utilities	$6,000	$9,600	$14,400
Computer Supplies and Maintenance	$2,400	$18,000	$36,000
Travel	$12,000	$30,000	$60,000
Insurance	$12,000	$2,400	$4,800
Sonatel Collocation + Bandwidth	$87,500	$9,000	$9,000
Senelec Power	$36,000	$0	$0
Car leasing	$36,000	$0	$0
Private Security for site surveillance	$12,000	$0	$0
Other utilities	$3,000	$0	$0
Gas Power generator	$2,400	$0	$0
Gas car	$6,000	$0	$0
Maintenance	$12,000	$0	$0
Miscelleneous	$12,000	$0	$0
	$0	$0	$0

Total General and Administrative Expenses	$490,309	$386,419	$632,021
General and Administrative %	45.21%	28.50%	37.30%
Other Expenses:			
Other Payroll	$28,800	$31,680	$34,848
Consultants	$0	$0	$0
Other Expenses	$0	$0	$0
Total Other Expenses	$28,800	$31,680	$34,848
Other %	2.66%	2.34%	2.06%
Total Operating Expenses	$553,609	$456,049	$708,614
Profit Before Interest and Taxes	($24,864)	$276,751	$287,878
EBITDA	($24,864)	$276,751	$287,878
Interest Expense	$5,000	$10,000	$10,000
Taxes Incurred	$0	$0	$0
Other Income			
Other Income Account Name	$0	$0	$0
Other Income Account Name	$0	$0	$0
Total Other Income	$0	$0	$0
Other Expense			
Other Expense Account Name	$0	$0	$0
Other Expense Account Name	$0	$0	$0
Total Other Expense	$0	$0	$0
Net Other Income	$0	$0	$0
Net Profit	($29,864)	$266,751	$277,878
Net Profit/Sales	-2.75%	19.68%	16.40%

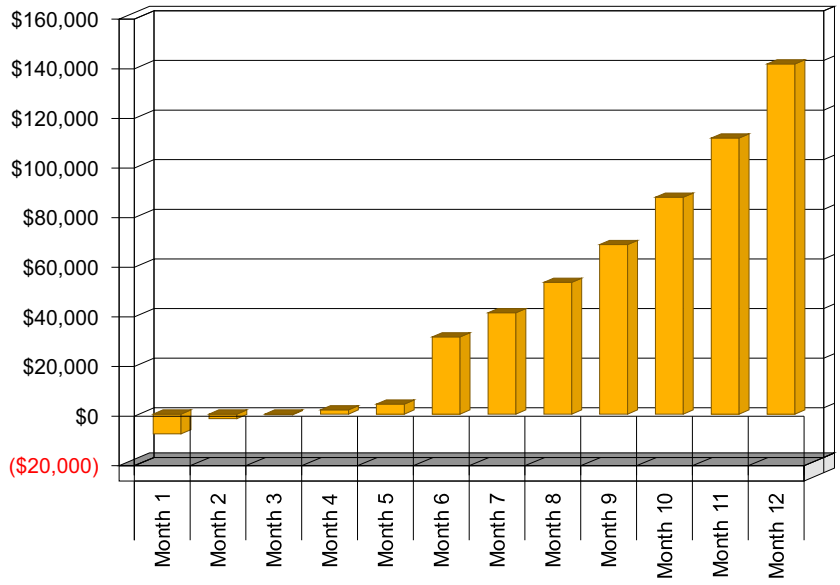
Profit Monthly



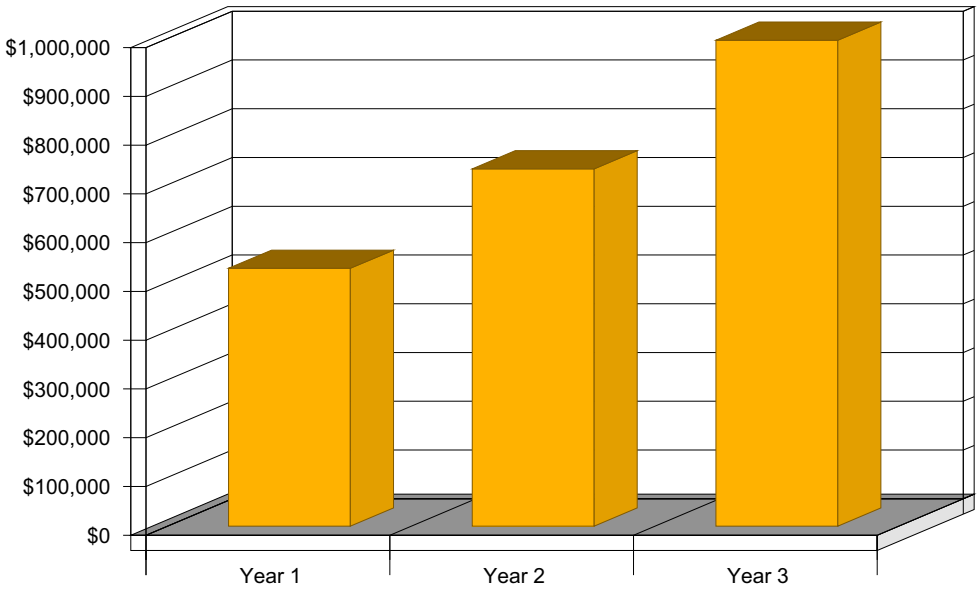
Profit Yearly



Gross Margin Monthly



Gross Margin Yearly



4.5. Projected Cash Flow

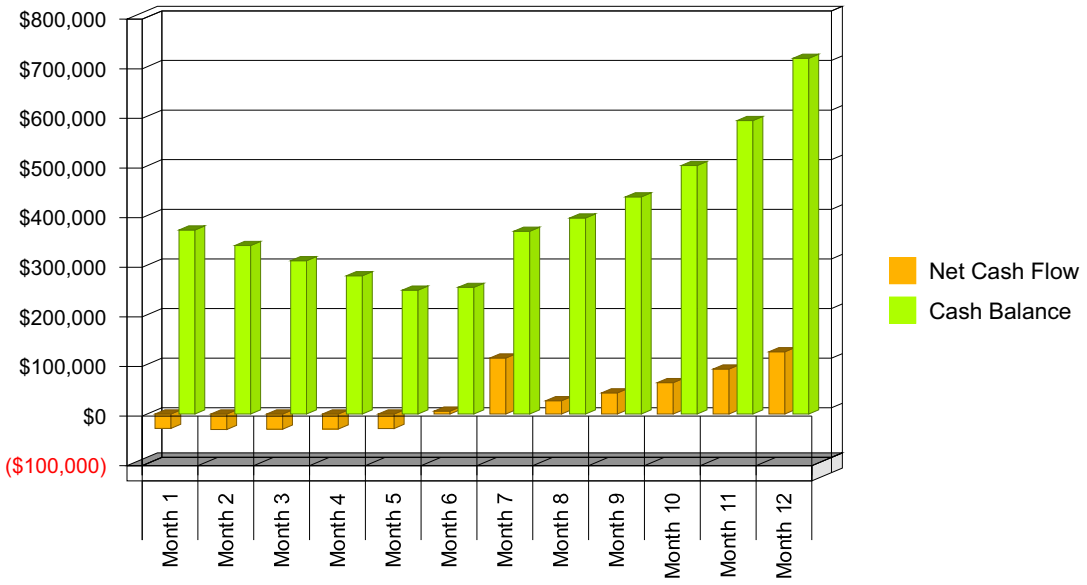
Cash flow is expected to be favorable, if MWISP can obtain sufficient funding, as noted in the table, below. It will be necessary to obtain outside funding for the venture two times during the first year.

The Municipality management and MWISP's private partner will decide together of the amount dedicated of the annual dividend. This dividend will allow the Municipality to expand the network to other area within the region of Saint-Louis, Richard-toll, Matam and Podor. After the second year the city's finance will benefits clearly from the joint-venture allocating this new source of revenues to the well-being of its population.

Pro Forma Cash Flow

	Year 1	Year 2	Year 3
Cash Received			
Cash from Operations			
Cash Sales	$921,820	$1,152,276	$1,440,344
Cash from Receivables	$125,154	$193,963	$242,453
Subtotal Cash from Operations	$1,046,974	$1,346,238	$1,682,798
Additional Cash Received			
Non Operating (Other) Income	$0	$0	$0
Sales Tax, VAT, HST/GST Received	$206,054	$257,567	$321,959
New Current Borrowing	$0	$0	$0
New Other Liabilities (interest-free)	$0	$0	$0
New Long-term Liabilities	$100,000	$0	$0
Sales of Other Current Assets	$0	$0	$0
Sales of Long-term Assets	$0	$0	$0
New Investment Received	$0	$0	$0
Subtotal Cash Received	$1,353,028	$1,603,806	$2,004,757
Expenditures	**Year 1**	**Year 2**	**Year 3**
Expenditures from Operations			
Cash Spending	$243,300	$267,630	$294,393
Bill Payments	$792,759	$865,788	$1,109,882
Subtotal Spent on Operations	$1,036,059	$1,133,418	$1,404,275
Additional Cash Spent			
Non Operating (Other) Expense	$0	$0	$0
Sales Tax, VAT, HST/GST Paid Out	$0	$0	$0
Principal Repayment of Current Borrowing	$0	$0	$0
Other Liabilities Principal Repayment	$0	$0	$0
Long-term Liabilities Principal Repayment	$0	$0	$0
Purchase Other Current Assets	$0	$0	$0
Purchase Long-term Assets	$0	$0	$0
Dividends	$0	$0	$0
Subtotal Cash Spent	$1,036,059	$1,133,418	$1,404,275
Net Cash Flow	$316,969	$470,388	$600,483
Cash Balance	**$716,969**	**$1,187,357**	**$1,787,839**

Cash



4.6. Projected Balance Sheet

After the first year, when we invest heavily in establishing MWISP's staff, contacts, infrastructure and reputation, our Balance Sheet will become increasingly solid.

Pro Forma Balance Sheet

	Year 1	Year 2	Year 3
Assets			
Current Assets			
Cash	$716,969	$1,187,357	$1,787,839
Accounts Receivable	$37,521	$46,901	$58,626
Other Current Assets	$0	$0	$0
Total Current Assets	$754,489	$1,234,258	$1,846,465
Long-term Assets			
Long-term Assets	$0	$0	$0
Accumulated Depreciation	$0	$0	$0
Total Long-term Assets	$0	$0	$0
Total Assets	$754,489	$1,234,258	$1,846,465
Liabilities and Capital	Year 1	Year 2	Year 3
Current Liabilities			
Accounts Payable	$78,300	$33,749	$46,120
Current Borrowing	$0	$0	$0
Other Current Liabilities	$206,054	$463,621	$785,581

Subtotal Current Liabilities	$284,354	$497,371	$831,701
Long-term Liabilities	$100,000	$100,000	$100,000
Total Liabilities	$384,354	$597,371	$931,701
Paid-in Capital	$1,034,600	$1,034,600	$1,034,600
Retained Earnings	($634,600)	($664,464)	($397,713)
Earnings	($29,864)	$266,751	$277,878
Total Capital	$370,136	$636,887	$914,765
Total Liabilities and Capital	$754,489	$1,234,258	$1,846,465
Net Worth	**$370,136**	**$636,887**	**$914,765**

4.7. Business Ratios

The following table outlines some of the more important ratios from the Data Communications Services industry. The final column, Industry Profile, details specific ratios based on the industry as it is classified by the Standard Industry Classification (SIC) code, 4899.

Ratio Analysis				
	Year 1	Year 2	Year 3	Industry Profile
Sales Growth	0.00%	25.00%	25.00%	1.63%
Percent of Total Assets				
Accounts Receivable	4.97%	3.80%	3.18%	13.44%
Other Current Assets	0.00%	0.00%	0.00%	54.99%
Total Current Assets	100.00%	100.00%	100.00%	72.36%
Long-term Assets	0.00%	0.00%	0.00%	27.64%
Total Assets	100.00%	100.00%	100.00%	100.00%
Current Liabilities	37.69%	40.30%	45.04%	18.73%
Long-term Liabilities	13.25%	8.10%	5.42%	21.60%
Total Liabilities	50.94%	48.40%	50.46%	40.33%
Net Worth	49.06%	51.60%	49.54%	59.67%
Percent of Sales				
Sales	100.00%	100.00%	100.00%	100.00%
Gross Margin	48.75%	54.06%	58.81%	57.81%
Selling, General & Administrative Expenses	51.51%	34.38%	42.41%	34.36%
Advertising Expenses	0.00%	0.00%	0.00%	1.02%
Profit Before Interest and Taxes	-2.29%	20.42%	16.99%	5.81%
Main Ratios				
Current	2.65	2.48	2.22	2.18
Quick	2.65	2.48	2.22	1.76

Total Debt to Total Assets	50.94%	48.40%	50.46%	49.82%
Pre-tax Return on Net Worth	-8.07%	41.88%	30.38%	7.28%
Pre-tax Return on Assets	-3.96%	21.61%	15.05%	14.51%
Additional Ratios	Year 1	Year 2	Year 3	
Net Profit Margin	-2.75%	19.68%	16.40%	n.a
Return on Equity	-8.07%	41.88%	30.38%	n.a
Activity Ratios				
Accounts Receivable Turnover	4.34	4.34	4.34	n.a
Collection Days	29	76	76	n.a
Accounts Payable Turnover	11.12	24.33	24.33	n.a
Payment Days	13	25	13	n.a
Total Asset Turnover	1.44	1.10	0.92	n.a
Debt Ratios				
Debt to Net Worth	1.04	0.94	1.02	n.a
Current Liab. to Liab.	0.74	0.83	0.89	n.a
Liquidity Ratios				
Net Working Capital	$470,136	$736,887	$1,014,765	n.a
Interest Coverage	-4.97	27.68	28.79	n.a
Additional Ratios				
Assets to Sales	0.70	0.91	1.09	n.a
Current Debt/Total Assets	38%	40%	45%	n.a
Acid Test	2.52	2.39	2.15	n.a
Sales/Net Worth	2.93	2.13	1.85	n.a
Dividend Payout	0.00	0.00	0.00	n.a

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Sales Forecast

		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
Unit Sales													
Broadband Basic R	25%	0	2	3	4	5	6	7	9	11	14	18	22
Broadband Advanced R	25%	0	2	3	4	5	6	7	9	11	14	18	22
Broadband Extreme R	25%	0	2	3	4	5	6	7	9	11	14	18	22
Broadband setup fee	25%	0	6	3	8	6	12	10	17	17	26	28	39
Broadban Basic B	25%	0	3	4	5	6	7	9	11	14	18	22	28
Broadband Pros B	25%	0	3	4	5	6	7	9	11	14	18	22	28
Broadband business setup fee	25%	0	6	8	9	12	15	18	23	29	36	45	56
Broadband Government 0-50	25%	0	1	1	2	2	2	3	4	5	6	7	9
Broadband Government 51-100	25%	0	0	0	0	0	0	0	0	0	0	0	0
Broadband setup fee	25%	0	1	1	2	2	2	3	4	5	6	7	9
IP Telephony Residential basic	25%	0	1	1	2	2	2	3	4	5	6	7	9
IP telephony Residential setup fee	25%	0	1	1	2	2	2	3	4	5	6	7	9
IP Telephony business Pros	25%	0	2	3	3	4	5	6	8	10	12	15	19
IP Telephony Business basic setup fee	25%	0	1	1	2	2	2	3	4	5	6	7	9
IP Telephony Government 0 to 24 lines	25%	0	1	1	2	2	2	3	4	5	6	7	9
IP Telephony Government 25 to 50	25%	0	0	0	0	0	1	1	2	2	2	3	4

		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
IP Telephony Government 51 to 100 lines	25%	0	0	0	0	0	1	1	2	2	2	3	4
IP Telephony Governement setup fee	25%	0	0	0	0	0	2	3	3	4	5	6	8
VPN and Transparent LAN 2,048Kbps	25%	0	0	0	0	0	1	1	2	2	2	3	4
VPN and Transparent LAN 4,096Kbps	25%	0	0	0	0	0	1	1	2	2	2	3	4
VPN and Transparent LAN 8,192Kbps	25%	0	0	0	0	0	1	1	2	2	2	3	4
VPN and Transparent LAN setup fee	25%	0	0	0	0	0	3	4	5	6	7	9	11
Total Unit Sales		0	32	37	51	59	88	106	137	166	212	261	331
Unit Prices		**Month 1**	**Month 2**	**Month 3**	**Month 4**	**Month 5**	**Month 6**	**Month 7**	**Month 8**	**Month 9**	**Month 10**	**Month 11**	**Month 12**
Broadband Basic R		$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00
Broadband Advanced R		$35.00	$35.00	$35.00	$35.00	$35.00	$35.00	$35.00	$35.00	$35.00	$35.00	$35.00	$35.00
Broadband Extreme R		$80.00	$80.00	$80.00	$80.00	$80.00	$80.00	$80.00	$80.00	$80.00	$80.00	$80.00	$80.00
Broadband setup fee		$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00
Broadban Basic B		$130.00	$130.00	$130.00	$130.00	$130.00	$130.00	$130.00	$130.00	$130.00	$130.00	$130.00	$130.00
Broadband Pros B		$200.00	$200.00	$200.00	$200.00	$200.00	$200.00	$200.00	$200.00	$200.00	$200.00	$200.00	$200.00
Broadband business setup fee		$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00
Broadband Government 0-50		$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00

		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
Broadband Government 51-100		$2,500.00	$2,500.00	$2,500.00	$2,500.00	$2,500.00	$2,500.00	$2,500.00	$2,500.00	$2,500.00	$2,500.00	$2,500.00	$2,500.00
Broadband setup fee		$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00
IP Telephony Residential basic		$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00
IP telephony Residential setup fee		$300.00	$300.00	$300.00	$300.00	$300.00	$300.00	$300.00	$300.00	$300.00	$300.00	$300.00	$300.00
IP Telephony business Pros		$150.00	$150.00	$150.00	$150.00	$150.00	$150.00	$150.00	$150.00	$150.00	$150.00	$150.00	$150.00
IP Telephony Business basic setup fee		$400.00	$400.00	$400.00	$400.00	$400.00	$400.00	$400.00	$400.00	$400.00	$400.00	$400.00	$400.00
IP Telephony Government 0 to 24 lines		$1,440.00	$1,440.00	$1,440.00	$1,440.00	$1,440.00	$1,440.00	$1,440.00	$1,440.00	$1,440.00	$1,440.00	$1,440.00	$1,440.00
IP Telephony Government 25 to 50		$1,560.00	$1,560.00	$1,560.00	$1,560.00	$1,560.00	$1,560.00	$1,560.00	$1,560.00	$1,560.00	$1,560.00	$1,560.00	$1,560.00
IP Telephony Government 51 to 100 lines		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
IP Telephony Governement setup fee		$3,500.00	$3,500.00	$3,500.00	$3,500.00	$3,500.00	$3,500.00	$3,500.00	$3,500.00	$3,500.00	$3,500.00	$3,500.00	$3,500.00
VPN and Transparent LAN 2,048Kbps		$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00
VPN and Transparent LAN 4,096Kbps		$8,500.00	$8,500.00	$8,500.00	$8,500.00	$8,500.00	$8,500.00	$8,500.00	$8,500.00	$8,500.00	$8,500.00	$8,500.00	$8,500.00
VPN and Transparent LAN 8,192Kbps		$18,000.00	$18,000.00	$18,000.00	$18,000.00	$18,000.00	$18,000.00	$18,000.00	$18,000.00	$18,000.00	$18,000.00	$18,000.00	$18,000.00

		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
VPN and Transparent LAN setup fee		$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00
Sales													
Broadband Basic R		$0	$50	$75	$94	$117	$146	$183	$229	$286	$358	$447	$559
Broadband Advanced R		$0	$70	$105	$131	$164	$205	$256	$320	$401	$501	$626	$782
Broadband Extreme R		$0	$160	$240	$300	$375	$469	$586	$732	$916	$1,144	$1,431	$1,788
Broadband setup fee		$0	$180	$90	$248	$174	$353	$306	$518	$512	$775	$834	$1,178
Broadban Basic B		$0	$390	$488	$609	$762	$952	$1,190	$1,488	$1,860	$2,325	$2,906	$3,632
Broadband Pros B		$0	$600	$750	$938	$1,172	$1,465	$1,831	$2,289	$2,861	$3,576	$4,470	$5,588
Broadband business setup fee		$0	$4,800	$6,000	$7,500	$9,375	$11,719	$14,648	$18,311	$22,888	$28,610	$35,763	$44,703
Broadband Government 0-50		$0	$1,250	$1,563	$1,953	$2,441	$3,052	$3,815	$4,768	$5,960	$7,451	$9,313	$11,642
Broadband Government 51-100		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Broadband setup fee		$0	$800	$1,000	$1,250	$1,563	$1,953	$2,441	$3,052	$3,815	$4,768	$5,960	$7,451
IP Telephony Residential basic		$0	$60	$75	$94	$117	$146	$183	$229	$286	$358	$447	$559
IP telephony Residential setup fee		$0	$300	$375	$469	$586	$732	$916	$1,144	$1,431	$1,788	$2,235	$2,794
IP Telephony business Pros		$0	$300	$375	$469	$586	$732	$916	$1,144	$1,431	$1,788	$2,235	$2,794
IP Telephony Business basic setup fee		$0	$400	$500	$625	$781	$977	$1,221	$1,526	$1,907	$2,384	$2,980	$3,725
IP Telephony Government 0 to 24 lines		$0	$1,440	$1,800	$2,250	$2,813	$3,516	$4,395	$5,493	$6,866	$8,583	$10,729	$13,411

		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
IP Telephony Government 25 to 50		$0	$0	$0	$0	$0	$1,560	$1,950	$2,438	$3,047	$3,809	$4,761	$5,951
IP Telephony Government 51 to 100 lines		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
IP Telephony Governement setup fee		$0	$0	$0	$0	$0	$7,000	$8,750	$10,938	$13,672	$17,090	$21,362	$26,703
VPN and Transparent LAN 2,048Kbps		$0	$0	$0	$0	$0	$4,000	$5,000	$6,250	$7,813	$9,766	$12,207	$15,259
VPN and Transparent LAN 4,096Kbps		$0	$0	$0	$0	$0	$8,500	$10,625	$13,281	$16,602	$20,752	$25,940	$32,425
VPN and Transparent LAN 8,192Kbps		$0	$0	$0	$0	$0	$18,000	$22,500	$28,125	$35,156	$43,945	$54,932	$68,665
VPN and Transparent LAN setup fee		$0	$0	$0	$0	$0	$2,400	$3,000	$3,750	$4,688	$5,859	$7,324	$9,155
Total Sales		$0	$10,800	$13,435	$16,929	$21,026	$67,877	$84,712	$106,025	$132,396	$165,630	$206,902	$258,763
Direct Unit Costs		**Month 1**	**Month 2**	**Month 3**	**Month 4**	**Month 5**	**Month 6**	**Month 7**	**Month 8**	**Month 9**	**Month 10**	**Month 11**	**Month 12**
Broadband Basic R	10.00%	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00
Broadband Advanced R	10.00%	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00
Broadband Extreme R	10.00%	$20.00	$20.00	$20.00	$20.00	$20.00	$20.00	$20.00	$20.00	$20.00	$20.00	$20.00	$20.00
Broadband setup fee	10.00%	$20.00	$20.00	$20.00	$20.00	$20.00	$20.00	$20.00	$20.00	$20.00	$20.00	$20.00	$20.00
Broadban Basic B	10.00%	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00
Broadband Pros B	10.00%	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00

		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
Broadband business setup fee	10.00%	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00
Broadband Government 0-50	10.00%	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00
Broadband Government 51-100	10.00%	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00
Broadband setup fee	10.00%	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00
IP Telephony Residential basic	10.00%	$37.00	$37.00	$37.00	$37.00	$37.00	$37.00	$37.00	$37.00	$37.00	$37.00	$37.00	$37.00
IP telephony Residential setup fee	10.00%	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00
IP Telephony business Pros	10.00%	$57.00	$57.00	$57.00	$57.00	$57.00	$57.00	$57.00	$57.00	$57.00	$57.00	$57.00	$57.00
IP Telephony Business basic setup fee	10.00%	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00	$60.00
IP Telephony Government 0 to 24 lines	10.00%	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00	$800.00
IP Telephony Government 25 to 50	10.00%	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00
IP Telephony Government 51 to 100 lines	10.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
IP Telephony Governement setup fee	10.00%	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00
VPN and Transparent LAN 2,048Kbps	10.00%	$2,500.00	$2,500.00	$2,500.00	$2,500.00	$2,500.00	$2,500.00	$2,500.00	$2,500.00	$2,500.00	$2,500.00	$2,500.00	$2,500.00
VPN and Transparent LAN 4,096Kbps	10.00%	$2,900.00	$2,900.00	$2,900.00	$2,900.00	$2,900.00	$2,900.00	$2,900.00	$2,900.00	$2,900.00	$2,900.00	$2,900.00	$2,900.00

		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
VPN and Transparent LAN 8,192Kbps	10.00%	$8,000.00	$8,000.00	$8,000.00	$8,000.00	$8,000.00	$8,000.00	$8,000.00	$8,000.00	$8,000.00	$8,000.00	$8,000.00	$8,000.00
VPN and Transparent LAN setup fee	10.00%	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00	$349.00
Direct Cost of Sales													
Broadband Basic R		$0	$20	$30	$38	$47	$59	$73	$92	$114	$143	$179	$224
Broadband Advanced R		$0	$30	$45	$56	$70	$88	$110	$137	$172	$215	$268	$335
Broadband Extreme R		$0	$40	$60	$75	$94	$117	$146	$183	$229	$286	$358	$447
Broadband setup fee		$0	$120	$60	$165	$116	$235	$204	$345	$341	$517	$556	$785
Broadban Basic B		$0	$45	$56	$70	$88	$110	$137	$172	$215	$268	$335	$419
Broadband Pros B		$0	$75	$94	$117	$146	$183	$229	$286	$358	$447	$559	$698
Broadband business setup fee		$0	$2,094	$2,618	$3,272	$4,090	$5,112	$6,390	$7,988	$9,985	$12,481	$15,602	$19,502
Broadband Government 0-50		$0	$800	$1,000	$1,250	$1,563	$1,953	$2,441	$3,052	$3,815	$4,768	$5,960	$7,451
Broadband Government 51-100		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Broadband setup fee		$0	$349	$436	$545	$682	$852	$1,065	$1,331	$1,664	$2,080	$2,600	$3,250
IP Telephony Residential basic		$0	$37	$46	$58	$72	$90	$113	$141	$176	$221	$276	$345
IP telephony Residential setup fee		$0	$60	$75	$94	$117	$146	$183	$229	$286	$358	$447	$559
IP Telephony business Pros		$0	$114	$143	$178	$223	$278	$348	$435	$544	$679	$849	$1,062

		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
IP Telephony Business basic setup fee		$0	$60	$75	$94	$117	$146	$183	$229	$286	$358	$447	$559
IP Telephony Government 0 to 24 lines		$0	$800	$1,000	$1,250	$1,563	$1,953	$2,441	$3,052	$3,815	$4,768	$5,960	$7,451
IP Telephony Government 25 to 50		$0	$0	$0	$0	$0	$1,000	$1,250	$1,563	$1,953	$2,441	$3,052	$3,815
IP Telephony Government 51 to 100 lines		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
IP Telephony Governement setup fee		$0	$0	$0	$0	$0	$2,000	$2,500	$3,125	$3,906	$4,883	$6,104	$7,629
VPN and Transparent LAN 2,048Kbps		$0	$0	$0	$0	$0	$2,500	$3,125	$3,906	$4,883	$6,104	$7,629	$9,537
VPN and Transparent LAN 4,096Kbps		$0	$0	$0	$0	$0	$2,900	$3,625	$4,531	$5,664	$7,080	$8,850	$11,063
VPN and Transparent LAN 8,192Kbps		$0	$0	$0	$0	$0	$8,000	$10,000	$12,500	$15,625	$19,531	$24,414	$30,518
VPN and Transparent LAN setup fee		$0	$0	$0	$0	$0	$1,047	$1,309	$1,636	$2,045	$2,556	$3,195	$3,994
Subtotal Direct Cost of Sales		$0	$4,644	$5,738	$7,262	$8,987	$28,771	$35,874	$44,932	$56,076	$70,184	$87,641	$109,641

Pro Forma Profit and Loss

		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
Sales		$0	$10,800	$13,435	$16,929	$21,026	$67,877	$84,712	$106,025	$132,396	$165,630	$206,902	$258,763
Direct Cost of Sales		$0	$4,644	$5,738	$7,262	$8,987	$28,771	$35,874	$44,932	$56,076	$70,184	$87,641	$109,641
Internet Bandwidth and Collocation Payroll		$8,000	$8,000	$8,000	$8,000	$8,000	$8,000	$8,000	$8,000	$8,000	$8,000	$8,000	$8,000
Other Costs of Sales		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
		———	———	———	———	———	———	———	———	———	———	———	———
Total Cost of Sales		$8,000	$12,644	$13,738	$15,262	$16,987	$36,771	$43,874	$52,932	$64,076	$78,184	$95,641	$117,641
Gross Margin		($8,000)	($1,844)	($303)	$1,667	$4,039	$31,106	$40,838	$53,092	$68,320	$87,445	$111,262	$141,122
Gross Margin %		0.00%	-17.07%	-2.25%	9.85%	19.21%	45.83%	48.21%	50.08%	51.60%	52.80%	53.78%	54.54%
Operating Expenses													
Sales and Marketing Expenses													
Sales and Marketing Payroll		$1,500	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000
Advertising/Promotion		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other Sales and Marketing Expenses		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
		———	———	———	———	———	———	———	———	———	———	———	———
Total Sales and Marketing Expenses		$1,500	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000
Sales and Marketing %		0.00%	27.78%	22.33%	17.72%	14.27%	4.42%	3.54%	2.83%	2.27%	1.81%	1.45%	1.16%
General and Administrative Expenses													
General and Administrative Payroll		$7,000	$7,000	$7,000	$7,000	$7,000	$7,000	$7,000	$7,000	$7,000	$7,000	$7,000	$7,000
Marketing/Promotion	2%	$0	$216	$269	$339	$421	$1,358	$1,694	$2,120	$2,648	$3,313	$4,138	$5,175
Depreciation	0%	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
Sales Commissions	10%	$0	$1,080	$1,344	$1,693	$2,103	$6,788	$8,471	$10,602	$13,240	$16,563	$20,690	$25,876
Payroll Taxes	15%	$2,835	$2,835	$3,060	$3,060	$3,060	$3,060	$3,060	$3,060	$3,060	$3,060	$3,060	$3,060
Office Rent		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Telephone		$50	$50	$50	$50	$50	$50	$50	$50	$50	$50	$50	$50
Internet & Utilities		$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500
Computer Supplies and Maintenance		$200	$200	$200	$200	$200	$200	$200	$200	$200	$200	$200	$200
Travel		$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000
Insurance		$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000
Sonatel Collocation + Bandwidth		$3,500	$3,500	$3,500	$7,000	$7,000	$7,000	$7,000	$7,000	$10,500	$10,500	$10,500	$10,500
Senelec Power		$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000
Car leasing		$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000
Private Security for site surveillance		$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000
Other utilities		$250	$250	$250	$250	$250	$250	$250	$250	$250	$250	$250	$250
Gas Power generator		$200	$200	$200	$200	$200	$200	$200	$200	$200	$200	$200	$200
Gas car		$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500
Maintenance		$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000
Miscelleneous		$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000
		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
		———	———	———	———	———	———	———	———	———	———	———	———
Total General and Administrative Expenses		$26,035	$27,331	$27,872	$31,791	$32,283	$37,905	$39,925	$42,483	$49,148	$53,136	$58,088	$64,312
General and Administrative %		0.00%	253.06%	207.46%	187.80%	153.54%	55.84%	47.13%	40.07%	37.12%	32.08%	28.08%	24.85%
Other Expenses:													
Other Payroll		$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400
Consultants		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other Expenses		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
		———	———	———	———	———	———	———	———	———	———	———	———
Total Other Expenses		$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400
Other %		0.00%	22.22%	17.86%	14.18%	11.41%	3.54%	2.83%	2.26%	1.81%	1.45%	1.16%	0.93%
		———	———	———	———	———	———	———	———	———	———	———	———
Total Operating Expenses		$29,935	$32,731	$33,272	$37,191	$37,683	$43,305	$45,325	$47,883	$54,548	$58,536	$63,488	$69,712
Profit Before Interest and Taxes		($37,935)	($34,575)	($33,575)	($35,525)	($33,645)	($12,199)	($4,488)	$5,209	$13,773	$28,910	$47,773	$71,411
EBITDA		($37,935)	($34,575)	($33,575)	($35,525)	($33,645)	($12,199)	($4,488)	$5,209	$13,773	$28,910	$47,773	$71,411
Interest Expense		$0	$0	$0	$0	$0	$0	$833	$833	$833	$833	$833	$833
Taxes Incurred		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other Income													
Other Income Account Name		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other Income Account Name		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Other Income		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other Expense													
Other Expense Account Name		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other Expense Account Name		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Other Expense		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Other Income		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Profit		($37,935)	($34,575)	($33,575)	($35,525)	($33,645)	($12,199)	($5,321)	$4,376	$12,939	$28,076	$46,940	$70,577
Net Profit/Sales		0.00%	-320.14%	-249.90%	-209.85%	-160.01%	-17.97%	-6.28%	4.13%	9.77%	16.95%	22.69%	27.27%

Pro Forma Cash Flow

		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
Cash Received													
Cash from Operations													
Cash Sales		$0	$9,180	$11,420	$14,389	$17,872	$57,696	$72,005	$90,121	$112,537	$140,785	$175,867	$219,948
Cash from Receivables		$0	$54	$1,633	$2,033	$2,560	$3,388	$10,266	$12,813	$16,036	$20,026	$25,051	$31,295
Subtotal Cash from Operations		$0	$9,234	$13,053	$16,422	$20,432	$61,084	$82,271	$102,934	$128,572	$160,811	$200,918	$251,243
Additional Cash Received													
Non Operating (Other) Income		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sales Tax, VAT, HST/GST Received	19.00%	$0	$2,052	$2,553	$3,216	$3,995	$12,897	$16,095	$20,145	$25,155	$31,470	$39,311	$49,165
New Current Borrowing		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
New Other Liabilities (interest-free)		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
New Long-term Liabilities		$0	$0	$0	$0	$0	$0	$100,000	$0	$0	$0	$0	$0
Sales of Other Current Assets		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sales of Long-term Assets		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
New Investment Received		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Subtotal Cash Received		$0	$11,286	$15,606	$19,639	$24,427	$73,981	$198,366	$123,079	$153,727	$192,281	$240,229	$300,408

		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
Expenditures		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
Expenditures from Operations													
Cash Spending		$18,900	$20,400	$20,400	$20,400	$20,400	$20,400	$20,400	$20,400	$20,400	$20,400	$20,400	$20,400
Bill Payments		$10,152	$22,203	$25,847	$29,513	$33,236	$47,820	$64,986	$75,828	$90,746	$108,708	$129,105	$154,615
Subtotal Spent on Operations		$29,052	$42,603	$46,247	$49,913	$53,636	$68,220	$85,386	$96,228	$111,146	$129,108	$149,505	$175,015
Additional Cash Spent													
Non Operating (Other) Expense		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sales Tax, VAT, HST/GST Paid Out		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Principal Repayment of Current Borrowing		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other Liabilities Principal Repayment		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Long-term Liabilities Principal Repayment		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Purchase Other Current Assets		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Purchase Long-term Assets		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Dividends		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Subtotal Cash Spent		$29,052	$42,603	$46,247	$49,913	$53,636	$68,220	$85,386	$96,228	$111,146	$129,108	$149,505	$175,015
Net Cash Flow		($29,052)	($31,317)	($30,641)	($30,274)	($29,209)	$5,760	$112,980	$26,851	$42,581	$63,172	$90,725	$125,393
Cash Balance		$370,948	$339,631	$308,990	$278,715	$249,506	$255,267	$368,246	$395,097	$437,678	$500,851	$591,575	$716,969

Pro Forma Balance Sheet

		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
Assets	Starting Balances												
Current Assets													
Cash	$400,000	$370,948	$339,631	$308,990	$278,715	$249,506	$255,267	$368,246	$395,097	$437,678	$500,851	$591,575	$716,969
Accounts Receivable	$0	$0	$1,566	$1,948	$2,455	$3,049	$9,842	$12,283	$15,374	$19,197	$24,016	$30,001	$37,521
Other Current Assets	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Current Assets	$400,000	$370,948	$341,197	$310,938	$281,170	$252,555	$265,109	$380,529	$410,471	$456,876	$524,867	$621,576	$754,489
Long-term Assets													
Long-term Assets	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Accumulated Depreciation	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Long-term Assets	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Assets	$400,000	$370,948	$341,197	$310,938	$281,170	$252,555	$265,109	$380,529	$410,471	$456,876	$524,867	$621,576	$754,489
Liabilities and Capital		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
Current Liabilities													
Accounts Payable	$0	$8,883	$11,655	$12,418	$14,958	$15,993	$27,849	$32,495	$37,916	$46,226	$54,672	$65,129	$78,300
Current Borrowing	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

Other Current Liabilities	$0	$0	$2,052	$4,605	$7,821	$11,816	$24,713	$40,808	$60,953	$86,108	$117,578	$156,889	$206,054
Subtotal Current Liabilities	$0	$8,883	$13,707	$17,023	$22,779	$27,809	$52,562	$73,303	$98,869	$132,334	$172,249	$222,018	$284,354
Long-term Liabilities	$0	$0	$0	$0	$0	$0	$0	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000
Total Liabilities	$0	$8,883	$13,707	$17,023	$22,779	$27,809	$52,562	$173,303	$198,869	$232,334	$272,249	$322,018	$384,354
Paid-in Capital	$1,034,600	$1,034,600	$1,034,600	$1,034,600	$1,034,600	$1,034,600	$1,034,600	$1,034,600	$1,034,600	$1,034,600	$1,034,600	$1,034,600	$1,034,600
Retained Earnings	($634,600)	($634,600)	($634,600)	($634,600)	($634,600)	($634,600)	($634,600)	($634,600)	($634,600)	($634,600)	($634,600)	($634,600)	($634,600)
Earnings	$0	($37,935)	($72,510)	($106,085)	($141,609)	($175,254)	($187,453)	($192,774)	($188,398)	($175,458)	($147,382)	($100,442)	($29,864)
Total Capital	$400,000	$362,065	$327,490	$293,915	$258,391	$224,746	$212,547	$207,226	$211,602	$224,542	$252,618	$299,558	$370,136
Total Liabilities and Capital	$400,000	$370,948	$341,197	$310,938	$281,170	$252,555	$265,109	$380,529	$410,471	$456,876	$524,867	$621,576	$754,489
Net Worth	$400,000	$362,065	$327,490	$293,915	$258,391	$224,746	$212,547	$207,226	$211,602	$224,542	$252,618	$299,558	$370,136

APPENDIX E (PPP)

E-1. PROSPECTIVE PPP COMPANIES INTERVIEWED

	Name	Company
1.	Rogers Beall	Fortesa International Senegal
2.	Dunham Rowley	Suffolk University Dakar
3.	Simplice Nicoue	United Parcel Service
4.	Yacine Barro	Microsoft
5.	Makha Sy	Ernst & Young
6.	Christophe Rey	Silcar S.A. Chevrolet
7.	Yinka Abeioye	Exxon Mobil Senegal
8.	Fode Thiendella Fall	GTI Dakar
9.	Alioune P. Ndao	Afritrade Surl
10.	Papa M. Diakhate	Nera Tech Dakar
11.	Steve Danne	MDL Senegal SARL

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