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ETHIOPIAN
COMMUNICATIONS AUTHORITY

UNIVERSAL ACCESS AND SERVICE FRAMEWORK

DRAFT FOR STAKEHOLDER CONSULTATION

October 2020

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Universal Access & Service Framework

1 Introduction

The Government of the Federal Democratic Republic of Ethiopia (alternatively "the Government" or "GoE") is committed to ensuring that all its citizens have access to modern, high-quality communications services. Universal Access (alternatively "UA") means that all segments of Ethiopia's population, regardless of their geographic location, and socio-economic standing and situation, must have access to a full range of communications services at suitable (affordable) prices. Universal Service (alternatively "US") means that all citizens will ultimately be able to subscribe privately to a full range of affordable voice and data services. In general, this document shall use the term Universal Access as representing the overall strategy and objective of UA and of eventually US in Ethiopia.

On the way to achieving this objective, in 2018 the Government established a policy in favor of market liberalization and competition. This includes the opening of the market as well as restructuring of, and engaging private sector participation in, the incumbent telecommunications operator, ethio telecom. The following year, in 2019, the Government launched the Home-Grown Economic Reform Agenda which aims to expand Ethiopia's economic capabilities by giving particular emphasis to several sectors including information and communications technology. With the 2020 Ten-Year National Development Plan (2020-2030) and Digital Ethiopia Strategy 2025, Ethiopia stands poised to rapidly enter into a period of national development and growth.

The private sector, through these newly created market conditions in Ethiopia, will have an important role to play in meeting universal access targets and universal service by bringing increased investments, a broader range of ICT services and competition-induced lower prices to the country. Nevertheless, there is a need for the Government to ensure that the largest number of users possible receive the full socio-economic benefit of communications services. In particular, the promotion of communications service investments in rural and un-served areas is a high priority, and will be enhanced though provision of financial incentives to ensure the most extensive coverage and affordability.

The Communications Services Proclamation No. 1148/2019 ("the Proclamation"), established the Ethiopian Communications Authority (alternatively the "Authority" or "ECA") to, among other responsibilities, ensure that communications services are operated in a manner that will best serve and contribute to the nation's economic and social development. The Proclamation also established the Universal Access Fund (alternatively the "UAF" or "Fund") to support achievement of universal access. The Authority is charged with developing the objectives and goals for Universal Access and is mandated to manage and administer the Fund.

The amounts and sources of income to be made available to the Fund and its manner of administration is to be determined by the Universal Access Fund Regulation to be issued by the Council of Ministers. The Fund is primarily to be financed by mandatory annual contributions from all licensed operators that will provide services in the various Communications and Information market segments. The Fund will also have provisions for complementary financing from other sources.

In discharging its mandate, the Authority has prepared this Universal Access and Service Framework Five-Year Plan, to inform the public and all stakeholders about the key aspects, considerations and principles that the Authority shall uphold in promoting Universal Access and administering the Fund.

2 The Universal Access Objectives

2.1 General

Universal Access is the provision and availability to all users, regardless of their geographic location or economic level, of communications services of a defined type and quality specified by the Authority and at prices that are cost-based, non-discriminatory, and affordable.

The type of services made available in the next five (5) years shall include, at a minimum, voice, text and data, including broadband access to the Internet at a speed and facility that in universal for users located in urban and rural areas, and accessible to persons with disabilities who shall be progressively facilitated for better access in the universal access strategy:

- **Voice service coverage with call and text quality in accordance with the Quality of Service (QoS) Directive** shall reach *at least* 98% of the total population, including in excess of eighty (80%) of populations located in the least well-served rural Weredas and Kebeles nationwide;

- **The speed of Internet access services** shall be targeted at a minimum of 10 Mbps downlink and 500 Kbps uplink to be achievable by the year 2025, to cover the same high percentage of population in every Wereda of the country;

- Required service quality will be increased beyond 2025 in appropriately progressive increments.

This policy framework for universal access builds upon the extensive voice and broadband presence already achieved by the incumbent and the expectation for deep, competitive rollout from new licensees, which will naturally increase service quality and customer choice over the next five years.

The private sector, through the newly created liberalized market, will thus have an important part to play, largely by enabling and promoting both increased access as a result of more investments as well as customer take-up/penetration through bringing lower, competition-induced prices to the country.

The role of the Fund shall be to supplement commercial service provision by offering financial incentives, where judged necessary, to ensure that voice and broadband services will reach all targeted populations at the specified quality in a commercially sustainable manner.

2.2 Complementary Regulatory Support Measures

2.2.1 Frequency Spectrum

To ensure that the objectives for universal access to rural areas can be met and in particular that the minimum specified data speeds can be reached ubiquitously, the Authority shall consider making a full range of mobile service frequency

spectrum bands available[1]. Together with industry consultation, the Authority shall ensure that appropriate, non-discriminatory frequency spectrum allocations which match the requirements for optimal rural coverage are made available to operators.

2.2.2   Infrastructure Sharing and Roaming

Other supportive regulatory measures which complement the objective of universal access, such as the following have been enacted or shall be pursued and supported by the Authority:

a) *Passive infrastructure sharing and collocation* - including dark fiber, ducts, rights of way, towers, building space, on a non-discriminatory basis, in accordance with the Infrastructure and Collocation Directive. Open access shall be a mandatory condition for receiving subsidies from the Fund;

b) *Domestic roaming, in specified rural areas as a minimum* - roaming shall be encouraged or mandated as appropriate to ensure that a judicious and fair balance of competitive and collaborative forces are harnessed and incentivized to achieve universal access especially to rural areas;

c) *Active infrastructure network sharing* - the Authority shall also consider the potential for strategically encouraging commercial implementation of Multi-Operator Radio Access Networks (MORANs) - Radio Access Network sharing - as a way for operators to share radio access network infrastructure, especially in specified rural zones and areas.

2.2.3   Additional Areas of Interest

In order to support its objectives and to develop and maintain the strongest possible links between the universal access program and beneficiaries in the Ethiopian economy, and to disseminate an understanding of the universal access program, the Authority through the UAF shall continually pursue the following activities:

a) Monitor and promote research into the development and use of new communications techniques and technologies, especially those that improve the viability of rural communications and those that promote accessibility to communications services for persons with disability and other disadvantaged members of society;

b) Develop links and collaborate with educational institutions and relevant government sectoral agencies to promote both connectivity and technical education in the field of telecommunications and ICT. This shall focus on the objective of contributing to development of the ICT capacity of students and graduates at all levels of education, to develop user skills and economic opportunity in ICT related or enhanced economic activities;

c) Develop links and collaborate with Incubation Hubs, Start-ups and Private IT Training and Development Companies in capacity building, and promote content and application developments;

d) Monitor and promote, as needed and appropriate, the development of useable content and applications that increase the demand for and enrich users' experience of communications and information services.

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[1] As noted in the Stakeholder Consultation Public Notice dated October 22, 2019, allocations from ITU-R Recommendation M.1036-5 for mobile telecommunications services shall be considered.

As the Fund's programs are developed, these interests shall be incorporated into the objectives, planning and approved activities of the Fund, as deemed necessary to support the achievement and benefits of universal access and service across the country.

3 Objectives of the Universal Access Fund

The objectives of the Fund as provided in the Proclamation shall include the following arranged into primary (highest priority) for immediate programming attention in Years 1-3, and secondary areas for evolution during the period of initial market development observation. These shall be developed and set out in the second phase of UAF operation, nominally commencing in Year 4.

3.1 Phase 1 - Primary Objectives

a) *Extend communications infrastructure and services* to all administrative levels of human population in Ethiopia, in particular to rural, remote and under-served Weredas and Kebeles;

b) *Facilitate the national integration of networks* and services – e.g., by the improvement of backbone facilities - to reach a more ubiquitous quality of service delivery deemed to be the minimum for achievement of universal access; and

c) *Promotion and support activities* assuring availability of services to all socio-economic segments of society, in particular persons with disabilities and other vulnerable or marginalized groups.

3.2 Phase 2 - Secondary Objectives

The following secondary areas, in particular the Ethiopian Education and Research Network (EthERNet) and SchoolNet, shall hold the Authority's interest from commencement, for consultation and encouragement. However, a strategy for needful financial involvement by the Fund in this and other areas shall sequentially follow initial achievements on the primary objectives. The Fund's Phase 2 strategy shall be formulated in Year 3, for commencement of execution following initial rollout of competitive services into the market. At this point, the needs, user demand and ICT skills and capacity characteristics of the Ethiopian context can be studied and will be better known and understood.

a) *Support sectoral expansion of ICT and e-services services – e.g.,* for schools and higher education, health facilities and other organizations serving public needs;

b) *Support the development of ICT skills, capacity building and technological innovation,* where gaps in skills and user capacity are observed and identified; and

c) *Facilitate content and application development* that will provide improved and beneficial access to under-represented people and socio-economic activities.

The secondary areas shall be formulated following initial rollout of competitive services into the market, when the user demand and ICT capacity characteristics in the unique Ethiopian context will be better known and understood.

3.3 Market Context – Current Coverage

3.3.1 Incumbent Basic (2G) and Broadband (3G) Reach

According to ethio telecom's mobile signal prediction maps and publicised documentation, the company has reached 85.5% of the country's geographical area with voice (2G) services, and 66% with broadband 3G service at better than -105 dBm signal level.

Maps of the current coverage have been made available by ethio telecom[2]. An Initial overlay of these maps against administrative boundaries and *WorldPop* population distribution for Ethiopia[3] indicate very extensive voice and broadband coverage, both well above 90%.

The interim analytical methodology has used a digitized version of the below maps for the Geographic Information System (GIS) process. The methodology will be updated using original Signal Projection Mapping, to undertake more detailed ICT Gap Study under the UAF planning process, when more accurate coverage indicators will be made available.

Coverage **85.5%**	Coverage **66%**
Offered Capacity (In Number of Subscribers) **51,103,495**	**Offered Capacity** (In Number of Subscribers) **11,206,008**
GSM Signal Strength	**UMTS Signal Strength**
■ -61.0000 dBm	■ -75.0000 dBm
■ -75.0000 dBm	■ -81.0000 dBm
■ -85.0000 dBm	■ -85.0000 dBm
■ -95.0000 dBm	■ -95.0000 dBm
□ -95.0100 dBm	■ -105.0000 dBm
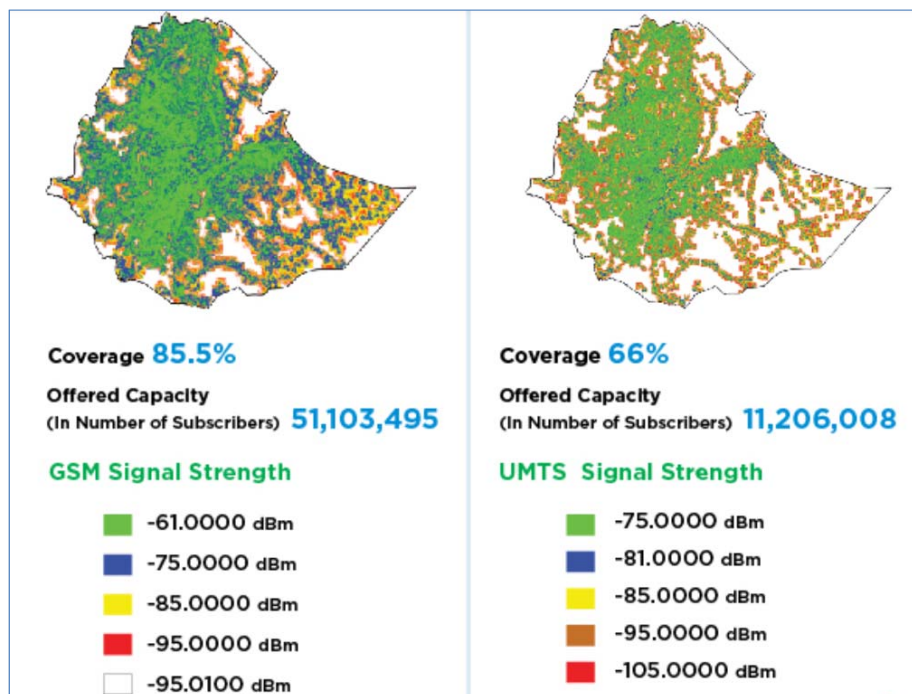
From the analysis as of issuance of this Framework, the National 2G coverage has been calculated to reach over 97% of the population, while 3G broadband national coverage is over 94%. Approximate regional population 3G coverages are indicated in the table below:

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[2] The above maps were initially available at https://www.ethiotelecom.et/teledensity-in-ethiopia/ (link currently not available). The documents were also made available in the report *entitled ethio telecom valuation and Ethiopia telecom market key takeaways: Synthesis Document* prepared by privatization audit consultant Roland Berger.

[3] The *WorldPop* population dataset is based on accurate 100m satellite imaging, referenced to the previous census but projected forward to 2019. Ref. https://www.worldpop.org/

ethio telecom Approximate 3G Broadband Coverage	
National total population coverage, estimated	94%
Regional population coverage	
• Somali	72%
• Gambela	78%
• Benishangul Gumuz	87%
• Afar	95%
• Amhara	96%
• Tigray	97%
• Oromia	97%
• Southern Nations Nationalities and Peoples (SNNPR)	98%
• Dire Dawa	100%
• Harari	100%
• Addis Ababa	100%

In summary, even allowing for some possible errors stemming from the approximation GIS methodology used to date, it is clear that ethio telecom has rolled out near ubiquitous voice services and a measure of broadband service extensively, reaching almost all rural population concentrations. It is estimated that around 94% of Weredas have over 50% population coverage and more than 70% have over 90% coverage. Even at the Kebele level, high percentages are indicated to have better than 50% coverage and a large majority more than 90% coverage.

3.3.2 Quality of Broadband Service

Internet availability on ethio telecom's broadband network is officially indicated at 97.1%. However, the degree to which the data throughput targeted for Universal Access by this UAS Framework is met is not known at this time. Whereas ethio telecom has around 22,000 Kms of optical fiber,[4] the number of its 7,100+ Node-B base station sites that are connected via microwave, rather than directly to fiber backbone nodes, is more than 90% outside of main cities.[5] Significant bandwidth capacity limitations may therefore occur in parts of the network.

3.3.3 Targeting Transmission and Backbone

Bringing existing rural area sites up to the broadband standard indicated in Section 2.1 and enabling ethio telecom, as well as enabling new licensees, who may share sites, to roll out more advanced technology (e.g., 4G) into rural areas will likely require extensive enhancements and optimization of the backbone connectivity. This may not be economically feasible in several regions[6]. The achievement of Universal Access in the context of a liberalized market will therefore require support for upgrading many transmission links to optical fiber, as a foundation for high quality universal broadband connectivity.

There is good international precedent, from best-case examples, for the UAF to provide financial support for optical fiber connectivity into all Zonal centers and onwards to Wereda-level and below[7].

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[4] According to information supplied by ethio telecom for the Valuation Audit, June 2019.
[5] Id.
[6] Afar, Benishagul Gumuz, Gambela and Somali Regions will have business viability issues to upgrade backbone connectivity.
[7] The USFs in India, Pakistan, Nepal, Indonesia, Chile, Nigeria, among others, have set and implemented fiber access to specified administrative levels (e.g., district). Reference data can be made available on request.

The specific and final target areas and detailed upgrade strategy will be established after a technical audit of existing backbone and transmission connectivity has been completed under the proposed UAF Stream 2 Investment Program described in Section 5.2.2.

4 Role of new Licensees in the Universal Access Regime

4.1 Objective overview

The ethio telecom network has reached a higher percentage of the country's geographical and population than normal in monopoly situations that have undergone liberalization. Therefore competitive entrants will largely play a role of deepening and market development that is adjunct to the achievement of universal access, as opposed to providing services into new, unreached areas of the country. In other markets, universal access interventions such as "smart subsidies" have typically been used at a much earlier stage to encourage all competing operators to reach new areas and close coverage gaps.

However, whereas coverage has already been technically provided to the extent described, market features such as consumer choice, competitive (affordable) pricing, product innovation and market-driven service quality have been inadequate to achieve a high level of penetration. As a result, Ethiopia lags behind its peers in mobile penetration, mobile applications (e.g., m-Money) and Internet usage. There is thus a market gap to be addressed, even though the physical coverage gap is small in terms of population.

To effect successful entry and to reflect this situation fairly, the new licensees will not be expected or obligated to match ethio telecom's physical network reach for at least the first five years of operation. By the same token, the new licensees will not have access to UAF funds to assist with reaching any areas where ethio telecom has already invested and is present, nor to support introduction of new or enhanced competitive services into those areas. However, access to UAF funds for participating in the UAF's universal access programs, as described in Section 6, will be open for competitive bidding by all licensed operators.

The setting and acceptance by industry, of aggressive yet practical and feasible rollout targets and coverage obligations is critical to the creation and emergence of a healthy national market. The market is expected to be sustained by competitive forces and high quality infrastructure capable of universal broadband services. These targets and obligations shall be enforced, through the license conditions, while physical expansion to underserved areas and augmentation of the national backbone for improved capacity shall be supported by the UAF.

4.2 Rollout Obligations

After consideration of industry comments following publication of the Stakeholder Consultation Public Notice in October 2019 and the Invitation for Expressions of Interest in May 2020, the coverage obligations required to ensure major investments and adequate market coverage nationally are the following:

4.2.1 Minimum National Population Coverage

Service	12 months	24 months	36 months	48 months	60 months	84 months	120 months	180 months
Voice text & the defined level of Broadband data	25%	40%	55%	70%	80%	90%	95%	97%

4.2.2 Minimum National infrastructure coverage requirement

Infrastructure	Description	Service	Within 12 months	Within 24 months	Within 36 months	Within 48 months	Within 60 months	Within 120 months
Highways/ major roads	All major TRUNK Roads (A), LINK Roads (B) and Main Access Roads (C)[8]	Voice service, text & the defined level of broadband data	35%	50%	65%	80%	95%	97%
Airports	Airports of cities with population > 100,000	Voice service, text & the defined level of broadband data	50%	75%	100%	100%	100%	100%
Special Economic Zones	All Industrial zones and Industrial parks[9]	Voice service, text & the defined level of broadband data	100%	100%	100%	100%	100%	100%

4.2.3 Geographical targets – Urban

Level	Description	Minimum Requirement	Geographic coverage by the end of Year 1	End of Year 2	End of Year 3	End of Year 4	End of Year 5
Large cities	Above 250,000 (8 cities) - Addis Ababa - Gondar - Mekelle - Adama - Hawassa - Bahir Dar - Dire Dawa - Wolayta Sodo	Geographic coverage for both voice and data services – full coverage for all land area	10 Km from city centre	20 Km from city center	30 Km from city center	30 Km from city center	30 Km from city centre

[8] TRUNK Road (A) means a road between main/capital cities, between regions, or that connects with neighboring countries; LINK Road (B) means a road that links or interconnects Trunk roads to each other; Main Access Road (C) means roads that lead or connect to Trunk roads, connecting Wereda cities to major cities or zones
Ref. https://sites.google.com/site/roadnumberingsystems/home/countries/ethiopia
[9] Eastern Industry Zone, Dukem Oromia; Industry Parks in Bole Lomi, Kilinto, Airlines & Logistics Park (Addis Abba), Hawassa (SNNPR), Mekelle (Tigray), Kombolcha (Amhara), Adama & Jimma (Oromia), Debre Birhan, Bahir Dar & Arerti (Amhara), Kingdom Linen (Dire Dawa).

Level	Description	Minimum Requirement	Geographic coverage by the end of Year 1	End of Year 2	End of Year 3	End of Year 4	End of Year 5
Medium Cities	Between 100,000 and 250,000 - 14 cities[10]	Geographic coverage for both voice and data services – full coverage for all land area	5 Km from city center	5 Km from city center	10 Km from city center	15 Km from city center	15 Km from city centre
Small cities	Between 20,000 and 100,000 - 131 cities[11]	Geographic coverage for both voice and data services – full coverage for all land area	No minimum requirement	5 Km from city centre	5 Km from city centre	10 Km from city centre	10 Km from city centre

4.2.4 Regional and Rural Targets

Operators must be present from Year 1 in all of the nation's Regions and Administrations and shall have a presence in all Zones within the first five (5) years, in accordance with the requirements of the following table:

Region[12]	Urbanization (%)	Population density	No. Zones	Min. Zone presence at end of Year 1	Min. Zone presence at end of Year 2	Min. Zone presence at end of Year 3	Min. Zone presence at end of Year 4	Zone presence at end of Year 5
1. Gambela	33.9	14.6	3	1	1	2	2	3
2. Somali	14.6	20.6	9	1	3	5	7	9
3. Benishangul Gumuz	21.6	21.0	3	1	1	2	2	3
4. Afar	19,1	25.1	5	1	2	3	4	5
5. Tigray	27.0	61.9	5	1	2	3	4	5
6. Oromia	15.1	124.6	17	5	8	12	15	17
7. Amhara	17.4	136.6	11	3	6	8	10	11
8. SNNPR	16.6	181,7	14	3	5	8	11	14
9. Sidama	n/a	n/a	1	1				
10. Dire Dawa	62.8	298.9	1	1	1	1	1	1
11. Harari	55.7	736.5	1	1	1	1	1	1
12. Addis Ababa	100	6,516	1	1	1	1	1	1
Total			**69**	**19**	**32**	**47**	**59**	**69**

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[10] Dessie, Jimma, Jigjiga, Shashamane, Bishoftu, Arba Minch, Hosaena, Harar, Dilla, Nekemte, Debre Birhan, Debre Markos, Assella, Kombolcha.
[11] Names to be referenced to Central Statistics Agency. Lists for this purpose are available at the following site: http://www.ethiovisit.com/ethiopia/ethiopia-regions-and-cities.html
[12] This Framework and tables lists those Regions that are in existence at the time of issuance of this document.

4.2.5   Quality of Service Requirements

The key performance indicators to be met in rolling out infrastructure services according to the above milestones shall be as established by the Quality of Service Directive and adopted into the License Agreements.

4.2.6   Enforcement

The terms of agreement, monitoring and reporting requirements and penalties for failure to comply with the rollout obligations shall be enshrined in the License Agreements.

5   Fund Governance and Management

5.1   Governance

The Fund shall be governed by the Authority through an operating Directorate with oversight by the Authority's Board of Management.

The functions of the Authority related to the UAF shall be carried out through its Universal Access and Service Directorate. The functions shall include collection and accounting for the funds as provided by the Universal Access Fund Regulation, the Development of UAS Policy and Funding Strategy, Program and project development and disbursement of the funds within the provisions of this Universal Access Framework, and Monitoring of Programs and Projects.

The UAS Directorate shall be headed by a UAS and Fund Director and staffed by a minimum of nine (9) senior and qualified individuals in two Divisions, namely: i) UAS Policy and Strategy Division, and (ii) UAS Fund Division, responsible for UAF Project Management, Monitoring and Statistical analysis and support. Certain functions such as financial levy collection, account management, legal advice, and some technical field support activities shall be undertaken through other ECA departments and/or seconded staff, to be determined by the Director General.

The ECA Board of Management shall ensure the Fund resources are properly used for the intended purpose in accordance with the UAF Regulation and will be the approval body for UAF strategic plans, program and project implementation plans, and major Fund disbursement decisions.

The Fund shall also have an Advisory Committee, which shall have representation from key stakeholders such as government, industry, consumer and regional organisations. The "Universal Access Advisory Committee" shall be consulted, be invited to review and provide inputs on UAF Fund Strategy and Programs, as well as feature its presence in public consultation events. The Advisory Committee members shall be nominated by the Director General and approved by the Board of Management for definite time-limited terms. The constitutional rules and regulations of the Committee and its membership shall be provided in the UAF Manual of Operating Procedures.

5.2   Fund Resource Collection and Disbursement

A Universal Access Levy, set at the authorized one and one-half per cent (1½%) of gross revenue, shall be annually collected from all licensees offering communications system infrastructure and/or services on a commercial basis,

including but not limited to, the three main full-service licensees and broadcasting licensees. All licensees will be obligated to support the UAF. The rationale and justification of the levy charge is provided in Section 6.

Other sources of funding shall include:
• Government appropriations,
• Income from investments by the ECA, and/or
• Gifts, donations, grants or endowments from public and international institutions

The Authority shall ensure that utilization of the Fund is transparent to the public and to the sector industry, and shall be subject to independent audit.

The award of disbursements shall be conducted through a transparent, non-discriminatory, and competitive process. It is the Authority's intention to disburse funds in the form of non-reimbursable grants and credits for the purpose of underwriting or subsidising the capital and operating costs of projects to be implemented by Fund recipients, who shall be industry entities or related service provision organisations, in accordance with the framework described herein.

The primary objective of the Fund shall be to disburse "smart subsidies" as one-time financial contributions which shall catalyze the provision of infrastructure or services in otherwise financially unviable situations, but will be commercially sustainable in the long run.

5.3   Grace Period and Pay-or-Play Accounting

The Authority may, at its own discretion, and following finalization of the UAF Regulation, institute variations in the Fund collection and disbursement regime, such as:

a) Setting a grace period during initial rollout of the new licensees network services, prior to which the universal access charge is not levied; and/or

b) Establishing a mechanism for granting a form of "Pay-or-Play" UAF Credits that are grant or subsidy amounts attached to project rollouts agreed by operators (e.g., open-access backbone fiber links). These amounts shall be credited against the operators' UAF obligation to reduce the amount owed annually after levies begin.

5.4   Management of the Finances of the Fund

The UAF Regulation shall lay down the guidelines according to which the UAF accounts shall be prepared and maintained. The Authority shall have custody of the account books, cheque books, securities, investment instruments and other documents and papers pertaining to the Fund and the Fund Account.

The books of accounts of the Fund shall be always open for inspection by the members of the appointed Management or Advisory Board and by licensees.

The UAF accounts shall be audited once a year by accredited professional auditors appointed by the Authority, through an open and transparent process. In addition, consistent with the statutory audit requirements, a Government audit shall also be undertaken.

In the course of managing the Fund, the Authority may make and liquidate investments of unused/surplus sums. The amounts from the Fund shall be invested only in Government risk-free financial securities or schemes. Any interest/profits shall be credited to the UAF account.

6 Scope of the UAF

6.1 General

The UAF will devote its resources toward achieving the Universal Access Objectives set out in Section 2 and the UAF Objectives in Section 3. The Authority has responsibility to define the UAF's Programs and to set priorities on an annual basis. The UAF will implement specific projects under each program during each Fund operating year. Industry and public stakeholders will be consulted in the development of the goals, scope, and details of program and project design.

The Fund will seek to balance its activities and financing between the program and project initiatives within the limitations of available budget and administrative capacity. For each year's operating plan, the Fund will determine, based upon consultations and market assessment, the appropriate allocation of funding for each program. The program allocations shall be approved by the ECA Board of Management. Priority areas and locations will be determined according to agreed, transparent criteria.

The UAF Program has been developed to address the phased priorities. Phase 1, the sole focus in years 1-3, addresses gaps identified in the current network infrastructure and main services. Phase 2 addresses the certain need to support sectoral ICT and e-services, ICT skills and capacity building, innovation, content and application development. However, identifying the gaps for these areas and creating programs for UAF intervention need to wait until the characteristics of the market and user needs can be observed in the context of the broader proliferation of services, applications and provider activities that will emerge with the market liberalization process.

6.2 Phase 1 – Addressing Existing Network and Service Gaps

6.2.1 Stream 1 – Reaching the Most Under-Served Communities

This program will target provision of subsidies for new infrastructure build-out to Weredas, and to specific Kebeles within each Wereda, that are beyond the level of effective coverage already reached by ethio telecom. Approximately 68% of all Weredas are estimated to have 100% population coverage and 78% have more than 90% coverage. Only around 155 Weredas have less than 90% coverage and are distributed as follows:

Region[13]	Population Coverage			
	0-25%	25-50%	50-70%	70-90%
Afar	3	8	4	7
Somali	4	10	18	16
Gambela	2	1	2	4
Oromia	1	8	8	13

[13] This Framework and tables lists those Regions that are existing at the time of issuance of this document.

Region[13]	Population Coverage			
	0-25%	25-50%	50-70%	70-90%
Amhara	1	-	3	9
Southern Nations Nationalities and Peoples (SNNPR)	-	3	2	11
Benishangul Gumuz	-	1	6	5
Addis Ababa	-	-	-	-
Tigray	-	1	2	2
Total for 3G (155)	**11**	**32**	**45**	**67**
Totals for 2G (77)	7	4	14	52

Figure 5-1 indicates the location of Weredas that have less than: (i) 50%, (ii) 50-70%, and (iii) 70-90% population coverage respectively. It will be noted that all underserved areas are largely in regions of low population density, the most underserved areas (i.e., less than 50% coverage) are almost all in the border regions of the country.

Figure 5-1: 3G Broadband Wereda Coverage Analysis
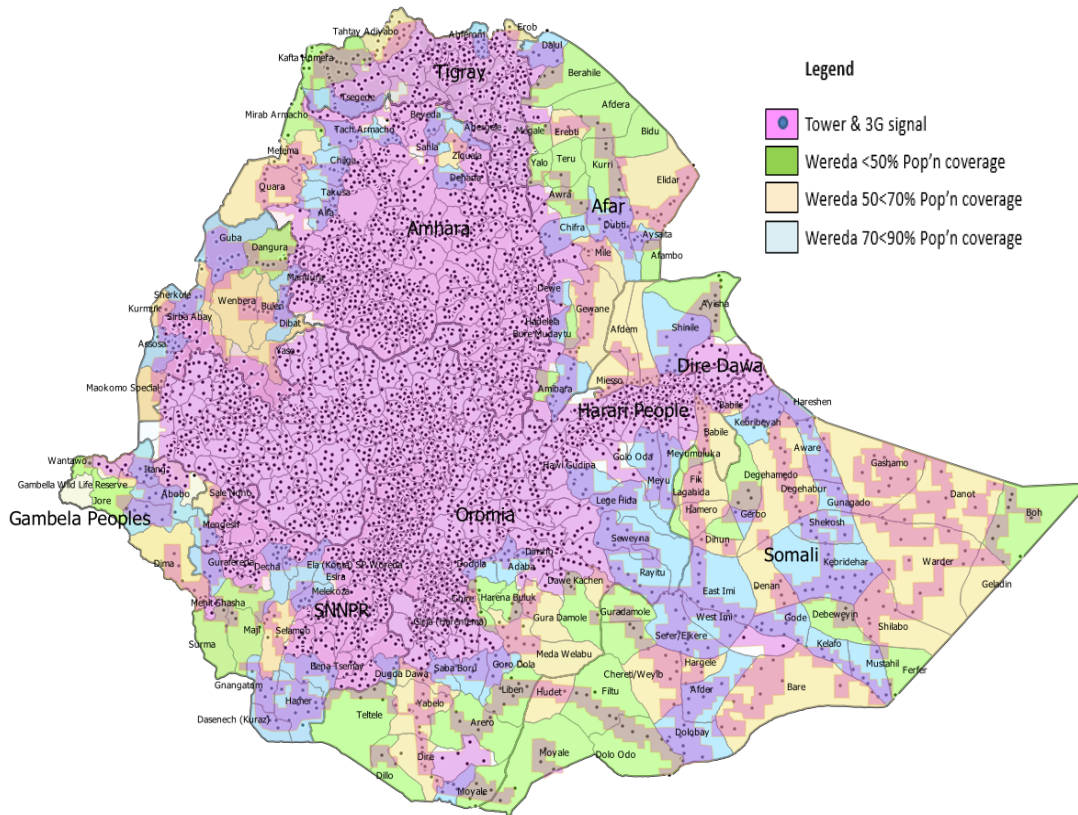
Since it is unlikely that either of the new licensees will reach or exceed the furthest coverage boundaries of ethio telecom's network in many zones, even by their fifth year of rollout, it is possible that ethio telecom could be the sole operator interested or capable of responding to the opportunities in this program.

However, it is expected that the backhaul upgrade program (Stream 2) may have the effect of speeding up new licensees' rollout in some areas, enabling them to compete for some Stream 1 target areas in combination with competing for backbone subsidies.

Total subsidies for the program have been estimated in the range US$ 45-68 million, though considerable consultation will be required to determine the degree of coverage feasible in many areas where it will not be economically feasible to reach even 80% of the uncovered populations. In these cases, the project specification and consultation shall identify specific Kebeles that are the least covered in each Wereda and shall seek to develop targets for subsidized coverage that meet the most pressing needs within the economic constraints and challenges of these largely low-density areas.

6.2.2   Stream 2 - Mobile Network Backbone Enhancement and Expansion

The Fund shall target backbone augmentation, specifically a large-scale program of fiber connectivity to those existing 3G Node-B sites which are primarily located in rural areas and currently connected by microwave, as well as to new sites proposed by any operator. All links and all sites benefitting from the UAF funded upgrade must provide open access as also envisaged by the Authority's Infrastructure Sharing and Collocation Directive.

The objectives and benefits of a widespread fiber transmission upgrade program to all market participants are the following:

1. Removal of transmission-related data throughput constraints on the existing network, enabling all sites to meet forward-looking targeted data speeds of 10 Mbps before 2025, for any operator using the sites;

2. Prepare the way for ethio telecom to upgrade its sites to 4G to meet these reasonable targets, which will inevitably also be necessary to compete technically and commercially with new licensees;

3. Provide a high performance, advanced technology transmission backbone for tower sharing and open access in the liberalized market. The existing extensive network of ethio telecom sites is a national asset which needs to be upgraded and made available.

The UAF will provide subsidies for optical fiber deployment to mobile sites in specified rural operating zones, to both incumbent and new licensee applicants. These subsidy contracts shall be initiated through a form of open competition, commencing even before the UAF receives income from operator levies. The subsidies shall therefore become UAF credits (effectively Pay-or-Play investments in kind) to reduce the balance of UAF levies to be paid on licensee annual accounts.

The Authority has estimated the notional maximum total route-kilometers of fiber upgrade required to connect up to 5,280 non-urban sites based on a step-by-step, least-distances to connect all sites to the nearest existing fiber node.   The calculation of new fiber distances for all regions yielded a total estimate of over 47,194 Kms, of which:

*   25,301 Kms will connect approximately 3,612 sites located less than 30 Km from the nearest fibre node;

*   21,894 Kms connects the remaining 1,668 sites that are located more than 30 Km away.

Based on an average, competitively supplied cost of US$10,000 per kilometer and subsiding 100% to the four least economic regions[14] and 50% elsewhere, the total

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[14] Afar, Benishagul Gumuz, Gambela and Somali Regions

cost is estimated at approximately US$ 180 million. This assumes that for practical purposes a maximum of only two-thirds of the total would actually require upgrade to fiber for efficient backhaul of broadband services.

6.3 Phase 2 – Subsequent Sectoral and Demand Side Needs

6.3.1 Stream 3 - Sector ICT Development Projects

The UAF shall consider adding to its program the provision of support to public institutions, i.e., to schools and higher education, health facilities and other organizations serving public socio-economic infrastructure needs and services, if they require support for ICT connectivity needs.

The UAF will not seek to create or financially support projects unless they originate from the sector organizations (i.e., Ministries and government agencies). These agencies themselves need to develop ICT strategies, curricula and facilities to fulfill their primary objectives.

Whereas the UAF shall initiate dialog, support will thus be in response to identified needs that relate primarily for provision and funding of communications, such as broadband Internet connectivity or specific user applications which support the agencies' prime objectives.

6.3.2 Stream 4 - Digital Literacy, ICT Capacity Building and Awareness

These initiatives are considered to be demand support and create increased market development and viability, as well as benefitting the users and potential users of ICT services.

After the first three years of UAF operation, during which the infrastructure rollout and state of the liberalized market shall be monitored, the UAF will likely expand its role to support capacity building projects, particularly in the field of education and community ICT awareness and sensitisation. For this purpose, the Fund administration will establish relationships with qualified private and public ICT training organizations, including university-based groups and non-government organizations with skills to offer for literacy and capacity building projects in identified under-served geographic areas of the country.

Projects may include hands-on training classes, public awareness raising events, assistance to local entrepreneurs, and/or both user and management training in public institutions. The goal will always be to ensure that new users in these communities and persons with disabilities have the best opportunity to benefit from technologies as they become available.

6.3.3 Stream 5 - ICT Content and Applications

The UAF will also monitor the perceived need for content and applications development and, as appropriate, will consider collaborating with other organizations and projects that focus on supporting development of content and applications of value to rural and underserved communities, especially in local languages.

These Phase 2 targets for support may include websites, mobile applications, educational and training materials, interactive and multimedia applications for special needs users and language groups, as well as other targeted ICT content.

The Fund will primarily look to co-finance development projects that arise from potential partner organizations, serve priority needs, and aim to become self-sustaining and commercially viable after UAF support.

6.3.4 Special Projects

Also in Phase 2, the Fund may undertake certain special projects not originated internally but arising from any source that merits financing through the UAF. These approaches, perceived to be from various sources, must be consistent with the Fund's priority objectives of overall communications network development and fulfillment of the demand and need for ICT services across the populace.

For each special project, prior to approval the Fund administration will solicit ideas, inputs, requests and business plans from stakeholders, and prepare a tentative project plan for public comment. Details of the proposed project(s) will be open to scrutiny, including locations, services, beneficiaries, other terms and conditions.

Every effort shall be made to put special projects to competitive auction, however if such an auction is not possible or feasible because of the nature of the special project, then this decision will also be subject to public input and comment.

The Fund administration shall set a maximum limit (percentage) of total Fund annual resources on the financial amount that can be assigned to special projects during any given year.

7 Financial Requirement and UAF Levy Plans

7.1 ICT Gap closure financial needs

The total five (5)-year program cost required primarily for the Stream 1 and 2 programs would reach US$ 200-250 million if all aspects of the investments are achieved in a timely fashion.

7.2 Financial Distribution Schedule

The total program roll-out for Years 1-5 is shown below. At Year 3, a first market assessment and interim evaluation of the Stream 1 and 2 Programs shall be carried out in order to develop initial activities in Stream 3, 4 and 5. A full Program Review shall be carried out in Year 5, to assess the results and impact of the priority programs and nascent secondary programs prior to planning for subsequent years.

	Allocation	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	→
Stream 1 - Wereda coverage	15-20%						
Stream 2 – Fiber backbone	70-80%						
Stream 3 – Sector ICT development	3-5%						
Stream 4 – Demand support	2%						
Stream 5 – Content support	2%						
Special Projects	1%						

## 7.3   ICT Market size and funding resource timescale

A conservative assessment of ethio telecom's 2019/2020 total revenue is approximately ETB 44 bn (USD 1.34 bn), which is the market's starting point and will grow modestly for the first year (assumed to be 8%). The overall ICT market revenues post-liberalization have been projected, from evidence-based research, to grow at a rate of 28% after market liberalization[15].

Taking this as the best estimate available, Figure 6-1 shows the market from which levies can be drawn. It is conservatively estimated that the total market will cross USD 2bn in 2022/23 fiscal year and likely reach US$ 3-3.5 bn by 2023/24.

Figure 6-1: Ethiopia ICT Market (USD Million)
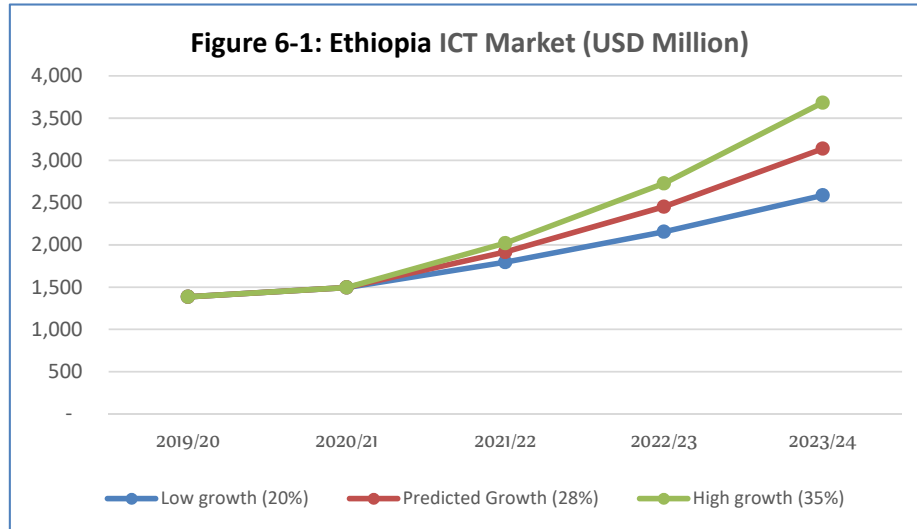
7.4   Projected UAF income and capacity to invest

Figure 6-2 shows financial accumulations at 1%, 1.5% and 2% of gross revenues using the most likely, mid-range predicted market growth rates.

Figure 6-2: UAF Resource Accumulation at Predicted Market Growth Rate (US$ Millions)

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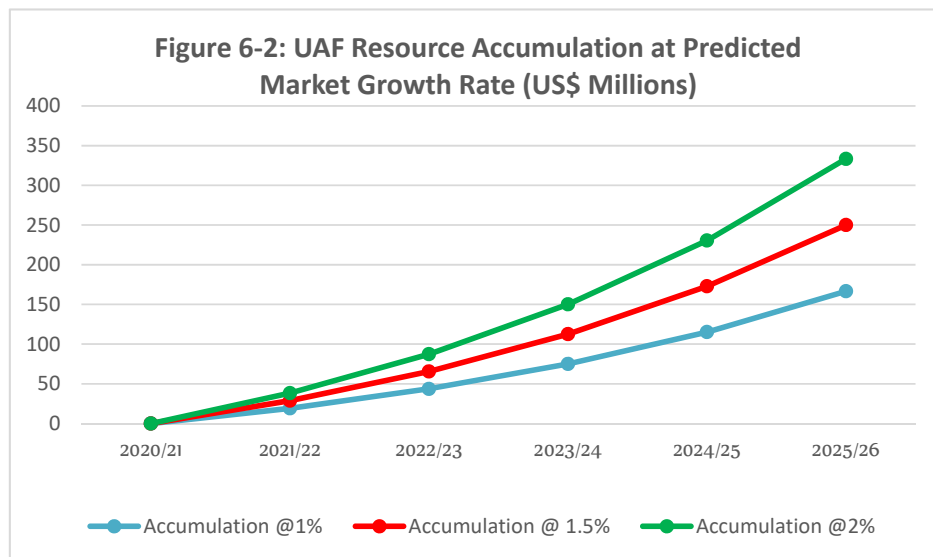
[15] See Privatization consultant Roland Berger's projection.

In summary, the options of 1%, 1.5% or 2% levy would yield 5-year UAF income ranging from US$ 166 to 333 million under the most likely market growth scenario. At 1.5%, the income profile under the full range of potential growth scenarios provides an income ranging between US$ 200 and 301 million, with US$ 250 million at year 5 assuming the most likely expected growth conditions.

	ICT market scenarios	2021/22	2022/23	2023/24	2024/25	2025/26
USF Levies @1.5%	1.5% Low growth	26.94	32.33	38.79	46.55	55.86
	1.5% Predicted growth	28.74	36.78	47.08	60.26	77.14
	1.5% High growth	30.31	40.92	55.24	74.57	100.67
Accumulation	1.5% Low growth	26.94	59.27	98.06	144.61	200.48
	1.5% Predicted growth	28.74	65.52	112.60	172.86	250.00
	1.5% High growth	30.31	71.22	126.46	201.03	301.69

7.5 Benchmarks and African experience

The public notice for the October 2019 Stakeholder Consultation noted that based on international benchmarks, the contribution to the UAF would likely be in the range of between 1.5% and 2.5% of gross revenues of licensees.

Subsequently the universal service advisor made an assessment of what level operator levy would fit with international and African benchmarks and best-case experience, provide a manageable income to the UAF, and meet reasonable projections for needed UAF investments. Based on evaluation of the most credible African benchmarks for successful performance, a level of one percent (1%) is the most supportable by best case examples.

However, based on the requirement to provide for Stream 1 and 2 program investments, if they can be rolled out to their maximum potential, the Authority is fixing the maximum levy at 1.5%, with provision to reduce the levy if the UAF programs are not meeting their distribution targets (See Section 6.7).

7.6 Commencement of UAF charges

No levy collections (from either ethio telecom or new licensees) will be charged until one year after competing operators have inaugurated their commercial operations and have a full year of operation to report. Thus the first year of UAF obligations is projected to be Fiscal 2021/22 based on current assumptions for effective liberalization and new license rollout.

7.7 Provision for future reduction

Irrespective of the levy rate authorized, the UAF Regulation provides for annual charges to be reduced proportionately if the UAF accounts record that the Fund is unable to sustain budgeted investment commitments or disbursements beyond seventy-five percent (75%) of the collected revenues into the USF for two consecutive years.

7.8   Pay-or-Play Options

A "Pay-or-Play" mechanism (UAF Credits for meeting specific targeted investments) is under consideration, in order to enable the Fund to initiate and rollout its program ahead of accumulation from levy collections. The scheme would be tied to both Stream 1 and Stream 2 investments, but would be especially crucial for implementing a broadband backbone transmission upgrade to facilitate an effective high-performance backbone for the anticipated liberalized market developments.

As an alternate to Pay-or-Play, the Government or the Authority could seed the first two years of operation through an appropriation, as a grant or short-term loan, from other sources of ICT Sector income (e.g., Bid fees received from new licensees).

On balance, it is recommended that the UAF Credit option is superior as it has the advantage of simplifying the subsidy contracting process and also provides credits to operators against future levies, which the Authority hopes will gain industry acceptance and have a positive impact on operator collaboration with the universal service strategy.

8   Guiding Principles of UAF Operation

8.1   General

The Authority shall operate the UAF under clear and public rules of procedure to be published in its *UAF Manual of Operating Procedures*, and according to a set of firm principles. The following describe some of these core principles that will inform and guide implementation of the UAF Programs.

8.2   Transparent Processes

All activities of the UAF shall be conducted in an open, transparent manner, and in consultation with private and public sector stakeholders. In developing program goals and project design, the Authority shall consult directly with affected parties, including potential service providers, end user communities and any other public and private sector organizations that may participate in the projects.

The Fund's accounts, including collections and spending, shall be publicly available on the Authority's website, along with the results of all procurements, credits and criteria for all decisions. All UAF rules and procedures shall also be open for public inspection and input.

8.3   Open, Competitive Procurements

The Authority shall award UAF project contracts only through open, competitive procedures. All eligible providers/UAF contributors will be allowed to bid for these contracts, following standard public rules and/or explicit procedures. To ensure transparency, all bidding documents will be made publicly available, along with other key information about the bidding processes and the projects to be awarded.

In the case of Pay-or-Play/UAF Credit procedures, the precise principles, calculation methodology and submission rules to be followed and the degree of

competition shall be explicitly and transparently made available to all eligible participants.

For example, subsidy contracts will be contracted through a formal, open and competitive "Request for Proposal" process but will not necessarily require competitive bids to be received from multiple bidders. The contracts will be negotiated as credits against UAF payment rather than as cash payments.

Proposals will need to demonstrate that competitive sub-contract/supplier bids have been secured to demonstrate least-cost solutions. In the case of the fiber program, proposals will also need to show that they are planning routes on an economic, site-by-site build-out from existing fiber nodes reaching out into strategic areas with sufficient demand for broadband services.

At the conclusion of every project competition, a summary of the evaluation, containing the entire bidding/submission process, its history, bid prices and the result shall be publicized, including being posted on the UAF website. As projects are implemented, progress and monitoring reports, achievements and shortfalls will also be regularly updated on the Authority's and Fund website.

8.4 No Distortion of the Market

The Authority will always seek to ensure that the activities of the Fund do not distort or interfere with the development and operation of private sector market competition or commercial viability. The Fund will not be used to subsidize markets or services that can be served commercially without UAF support. All market players will have appropriate, fair and equal opportunities to compete for Fund resources, subject to additional criteria below.

8.5 Infrastructure Sharing

All service providers that receive UAF funds shall be required to allow open, cost-based (i.e., commercial) sharing of infrastructure on facilities built under UAF contracts to other licensed operators. Such sharing may include access to dark fiber, bandwidth services, ducts, masts, cables, physical structures, equipment enclosures and similar facilities.

General terms, conditions, principles and restrictions on such shared access shall be in accordance with the Infrastructure Sharing and Collocation Directive. Specific rules will also be part of the UAF project tender documentation and implementation rules. These will be developed with consultation with the industry to ensure fairness and technically reasonable requirements. These terms notwithstanding, the contracting of infrastructure sharing shall be accomplished through commercially negotiated contracts which are not in conflict with the Directive of UAF rules.

8.6 Criteria for Selection of Areas

The Authority shall develop clear and objective methods and criteria for prioritizing strategic investments and the geographic zones and routes where UAF projects will be implemented. In general, priority will be given to serve or support service provision to rural, remote, and small centers which are underserved or poorly

connected to the backbone, and for which commercial operators cannot provide the required facilities and/or required quality of service without support.

The factors that determine which specific areas and facilities will be chosen for any given projects will be determined on a transparent and fair basis. This shall include the evidence of census and economic data, consultations with local stakeholders, taking account of such criteria as access and proximity to existing network infrastructure, size of population and density, status of supporting infrastructure (energy, roads, etc.), socio-economic conditions and demographic diversity.

8.7   Choice of Technology

In awarding UAF projects, the Authority shall not expressly promote or disallow any particular technology platform, system, or architecture that can be demonstrated to achieve the required results, except in cases where there is clear general consensus on the type of technical solution required (e.g., fiber backbone).

Bidders will be encouraged to propose the most cost effective mix of technologies using any innovative and forward-looking, future-proof solutions, so long as the chosen solution has a proven record of service in the field, anywhere in the world.

8.8   Limitations on Subsidies to a Single Licensee

The Authority shall endeavor to ensure that all licensees contributing to the Fund have a fair and equal opportunity to receive subsidy funding under competitive project bids. The Authority may consider establishing maximum limits on the total number of projects or amount of payments from the Fund that any one licensee can receive during a given time period. The precise terms of such limits will be determined through a consultative rulemaking process.

8.9   Public Awareness

The Authority shall widely disseminate the purpose and objectives of the Fund through the media as well as by arranging public events, especially at places where UAF Projects are being planned or implemented.

9   Project Planning and Implementation

9.1   Project Development Criteria

The Authority will develop the scope, location, and details of specific projects to be implemented under the UAF programs, in consultation with industry and local stakeholders. The Fund will not finance projects in locations that can be commercially served by competitive market players on their own.

The Authority will regularly review the status of market development, plans and rollouts, and the scale and nature of gaps in network and service access, as an input to the UAF project planning process.

9.2 Project Plans

The Authority shall prepare annual project plans for each program, in consultation with potential beneficiaries and industry. Each plan shall include a clear description, applicable service requirements, specifications and standards, implementation timetable and any special commercial terms that would have an impact on the feasibility or business planning for the implementing contractor. Where the project is such that it would be auctioned with a reserve price, the project plan shall also identify the maximum subsidy amount.

9.3 Eligibility Criteria for Fund Applicants

In the bidding process for projects requiring provision of infrastructure, connectivity and service, only operators duly licensed by the Authority shall be eligible to participate in the competitions for the major Phase 1 competitions.

A licensee shall be disqualified from taking part in a tender if it:

a) Defaults in payment of its net UAF contribution owing; or
b) Has failed to complete previously awarded contracts.

Other specific eligibility and qualification criteria will apply to Phase 2 projects, to ensure that only well qualified participants may compete for UAF financed projects.

Public sector entities and other non-licensees may be eligible to bid for training, digital literacy, content development for Phase 2 program and special projects relating to ICT services and applications, if such systems or services do not require a license from the Authority.

9.4 Competitive Bidding Framework

Principles contained in the Federal Public Procurement Directive (2010) of Ethiopia or subsequent legislation shall inform or govern the competitive bidding process for UAF project contracts. However, where contracts could be categorized as Pay-or-Play, UAF credit or limited to specific players, the Authority shall identify the aspects that must be compliant with standard procurement rules and that are non-standard and justified under the specific objectives of the UAF.

The Authority shall prepare a Bidders' Information Package which shall be provided to all interested eligible bidders. The Package shall include detailed information about the project, instructions to potential bidders on how to participate, eligibility requirements, format of bid submissions, and amount of bid bond if appropriate, any applicable reserve price and any other requirement of the bid.

In accordance with the general guidelines and principles, UAF competitions are usually technology-neutral in setting out project requirements and evaluations. However, for Phase 1, in the case of backbone augmentation, there will be an expectation that optical fiber should take priority. Alternative technology such as broadband IP microwave links may be allowed where total potential bandwidth required clearly does not exceed capacity, or physical barriers such as terrain dictate the economic solutions.

Evaluation of bidders' technical submissions to ensure that proposed solutions comply with project requirements will rigorously consider delivery alternatives that meet the needs of specific network architecture and capacity definitions. In all UAF competitive procurements, including for UAF credits, only the technically qualified bidder submitting acceptable proposals and requiring the least subsidy shall be awarded UAF contracts.

If any collusion among bidders is suspected, the Authority shall have the right to cancel the bid and subsequently re-bid. If no bid is received, the Authority shall discuss with the licensees the reasons and review the bidding process and constraints accordingly.

9.5   Monitoring and Evaluation

The Authority shall implement a robust Monitoring and Evaluation Framework to oversee all UAF financed projects. This shall include regular onsite and offsite monitoring of all projects to make sure that the funding is being utilized in accordance with the contracts.

In addition, the Authority will undertake impact evaluation studies to assess the performance of UAF projects, and whether the UAF programs in general are meeting their objectives. A full Program Review shall be carried out in Year 5 to assess the results and impact of the priority programs and nascent secondary programs prior to developing the UAF investment plan for subsequent years.

Further, the evaluations will be used to assess the effectiveness and impact of UAF programs towards the achievement of the universal access goals and in helping to meet the ICT and economic growth targets of the Government of Ethiopia.