

# Radio access and Transmission models for universal service

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**Abstract**— This paper proposes two mathematical models as a decision tool for the choice of radio access and transmission solutions adapted to a geographical region through universal access. The first mathematical model integrates the formalism related to engineering radio network access in general as well as financial constraints imposed by the access and universal service funds. The second mathematical model is the equivalent of the first applied to radio transmission systems. Services considered are voice and data services. This approach has helped to derive two general expressions set for radio access and radio transmission technologies. The coverage and capacity deployment strategy has also been combined to clarify the optimal implementation based on financial constraints. A case study on the Ouaddai and Oura regions in Chad accompanied by simulations curves for wireless technologies as Wi-Fi, WiMAX, CDMA, and Open BTS for example has shown the efficiency of such approach.

**(P19)Keyword**— access network model, radio access, radio access model, radio transmission, radio transmission model, universal access, universal service.



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