

# Developing Smart Public Wi-Fi

## Lessons from a natural experiment in South Africa

Free Public Wi-Fi Policy Brief

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Various local authorities in South Africa (SA) have recognised the social & public value of having their citizenry connected via Free Public Wi-Fi (FPW), and initiated deployments. As projects require considerable upfront & ongoing financial investment & management commitment in the face of stark alternative demands on public funds, policy decisions must be well-informed to maximise return on investment & ensure project success. Four major cities in SA, and two major metros in particular, Johannesburg & Cape Town, used different funding approaches to deploy FPW, providing a natural experiment from which major findings & learnings are listed here. There are no clear winners & losers within the experiment, with projects having different strengths & weaknesses. These research findings should encourage and inform FPW initiatives but also serve as a cautionary to decision-makers to ensure they are sustainable, as they soon become very popular with the public & several political & economic interests have emerge around them. Therefore they are not easily switched off.

Embed in national plans	Utilise USF funds	Prioritise Educational institutions	Deploy Open Access networks	Consider Public private interplays
FPW projects are best imbedded in a wider broadband strategy (rather than stand-alone), including government fibre connectivity project content & applications	Utilise existing USF to enable access to public websites, or data intensive applications & platforms not affordable to the poor, to improve intensity of use necessary for network effects associated with growth & development.	Schools are likely to produce the greatest & most immediate multipliers. They are numerous, well positioned within populations, provide broadband for learning, & target age groups most likely to adopt broadband.	Have the advantage of allowing competition by internet service providers but require more expensive equipment to facilitate than projects involving a single, exclusive service provider.	FPW should be innovatively deployed through various public-private interplays that can leverage private investment where public funding is constrained whilst ensuring social inclusivity.

### Policy problem and research question

Digital inequality is reflected as much in data usage as connectivity. High data costs in many African countries, including SA, mean that although people may have coverage & devices to connect, they can often not afford to be on-line or use data intensive applications or platforms to exploit fully the benefits of connectivity. The shift from PC based Internet access to mobile broadband, with increased smartphone penetration into lower income groups, has enabled shared access strategies that can spread the costs & opportunities amongst funders, suppliers & users. FPW is gaining traction as a bring-your-own device connectivity solution to socially inclusive broadband access. Traditional problems of funding universal access strategies remain but FPW can be deployed at a fraction of the cost of GSM which consumers cannot use optimally at current prices. Wi-Fi is actually also critical to mobile operators, as a means to offload surplus traffic in congested areas. SA's two wealthiest two provinces (Gauteng & Western Cape) & wealthiest four cities (Johannesburg, Cape Town, Tshwane & Ekurhuleni) all have FPW programs. Wi-Fi can reduce the digital divide only with investment in wider national coverage, but initiatives lag for the rest of the country & government (particularly the poorer local authorities) faces stark resource, capacity & infrastructure challenges.

### Exploiting a natural experiment

This research exploits a natural experiment resulting from the above-mentioned cities adopting different approaches & funding models to launch FPW. It investigates how successfully & at what cost these initiatives have met the primary goal of digital inclusion, what the primary policy learnings were, and whether it is feasible for FPW to extend beyond the major centres to leverage the extensive mobile broadband networks that exist across the country to become a component of the shared & complementary infrastructure investments envisaged in SAs broadband plan, SA Connect.

The literature review found that almost all existing literature on FPW pertained to the early 2000's (the pre-smartphone era) & related to wealthier countries. No actual evaluations of projects were done, meaning that no evaluative methodology had been built up.

Wi-Fi is never 'free': a basic taxonomy, adapted for the study, outlines different sponsoring parties and what each expects to gain (see Table below):

Sponsor	Value obtained
<b>Operator</b>	Gives away an initial free bundle (per venue) to entice the customer to buy additional access when the free bundle runs out. This business model depends on a certain uptake ratio being achieved beyond the free access.
<b>Venue owner</b>	The owner of a venue, such as a café or restaurant, sponsors Wi-Fi to attract or retain clientele. The Wi-Fi is seen as part of the value offered to the customer (for example, in a hotel or at a conference centre). The venue may be large (a shopping mall, public beach or tourist precinct, and be co-sponsored by a group of commercial interests.
<b>Advertiser</b>	The advertiser pays the operator to interact with customers, as a targeted audience who obtain free access in return for viewing advertisement or other interactions
<b>Analytics user</b>	A company pays for (legitimate) access to customer information, derived from sponsored Wi-Fi access systems. These systems can build sophisticated customer information and aggregate trends, based on variables, such as customer Internet usage behaviour and usage location information. Analytics are also used to enhance advertising
<b>Government</b>	Local, provincial or national government can sponsor Wi-Fi to promote socio-political or economic objectives at the level of a venue, city, province or country.

### Findings

Only one project studied enjoyed full government sponsorship (a situation now under review). Further innovation is needed around the interplay between the public & private sectors, to leverage private investment whilst ensuring social inclusivity.

FPW projects were found to emanate from authorities who had developed a more comprehensive broadband stimulation strategy, rather than being initiated within a policy vacuum. This finding makes sense, but also highlights that the greatest need is to be found in the local authorities lacking such a strategy.

Results show that available FPW is widely used. Users' interviews indicated they benefit from it & come to appreciate it to the point where it builds sufficient political capital to form part of the election manifesto to the governing party in municipal local elections.

Government buildings proved ideal for deployment, as they allow high

sites with electric power & security at marginal cost. If buildings are already connected by fibre, adding FPW service costs only marginally more. *Education sites were a clear priority*, as students proved to be early adopters of technology, were able to take their learning & experience back into the home, showed immediate application of the internet to their studies & homework & (in one key project) showed roughly equal male/female uptake of the service. Education ministries should therefore be included in the planning. Public libraries were also popular sites selected (in line with international findings). Health service sites (hospital & clinics) & community halls were also popular, as were public open spaces (supported by international surveys which promote such coverage to augment the utility of such spaces & the public interaction they afford). Buildings (regardless of government function) are ideally located in areas where they best serve those most in need of FPW. FPW requires authorities to have operational capacity. Although projects in SA were implemented by the wealthiest provinces & cities, operational ability varied considerably. Clearly FPW can only be cost-effective if implemented by capable authorities – either directly or by tender. The character of fibre deployment by the authority seemed to be a predictor of that of the FPW deployment - authorities showing good governance & initiative with fibre showed positive results with FPW, and the converse also applied. FPW requires considerable capital investment by authorities who face competing demands for basic infrastructure & essential services. Therefore *the investment model is very important & in particular, the interplay between public capital & private investment*. If government does not invest, current access issues persist, whereas full government sponsorship diverts critical funds & may even discourage existing private investment in an area. *The most promising business model reviewed was a public-private partnership (PPP) where government could leverage its investment to incentivize a private partner to invest in a previously marginal area.*

There are multiple sources of return for an investment in Wi-Fi services, whether the investment is by government or private sector sponsors. A simplified return model would include the following:

**Economic growth.** All projects (local & international) promote the view that the economic growth of an area will create more value than is spent on a project (an economic return). The benefits might be enhanced economic well-being, job creation, local competitiveness, attracting skills, bringing tourists & businesses to an area or creating an economic growth hub. For a local authority, economic growth should lead to an increase in taxable activity.

**Digital inclusion.** A demand-side value analysis of infrastructure development recognises the public & social value generated by information infrastructure that generate positive externalities that benefit society. All projects promote the view of including a higher percentage of citizens in the benefits of the digital age & providing improved communication & access to information on, for example, health, education & job opportunities and crime reporting.

**Advertising Sponsored Wi-Fi** has considerable growth potential, with the differentiator being that it is highly targeted – being more personalised & allowing a higher level of customer interaction than traditional media, such as radio & TV. The Western Cape encouraged its FPW providers to explore such options, & Tshwane recently decided to implement this approach later in 2017.

**Analytics.** Wi-Fi offers rich analytics capabilities, which can be used to enhance the targeting in advertising; to enhance government planning (for example, to understand routes used on public transport & at transport nodes); & by the private sector (such as to understand behaviour at shopping centres).

The opportunity is not well developed in SA, but has been developed internationally by companies such as Google & definitely needs further consideration. Due attention should be given to the privacy rights of individuals, especially when analytics are used for individual customer interaction. Aggregated analytic data is often useful (without needing to know details of individuals).

Freemium service for paying customers. The conventional Public Wi-Fi model (common amongst commercial operators) is to offer a free bundle & charge for additional usage. This approach was supported in all the Western Cape models. Isizwe originally resisted, but is now open to this approach.

## Evaluation and Recommendations

These research findings should encourage free public Wi-Fi initiatives but also ensure they are sustainable (as they are not easily switched off) without incurring the wrath of the public .

**Additional research & evaluation.** At a policy level, there is a need to identify *replicable, scalable and sustainable business models* to reduce access costs and maximise private sector investment.

SA policy makers, seeking to extend FPW to all public buildings (in terms of SA Connect), need to develop an *evaluative methodology*, including *costing detail and analytical capability* so that the beneficiary experience (transfer speeds, latencies & coverage) & behaviour (what they are doing) can be understood & improved (whilst protecting the privacy rights of users). *Minimum technical standards need to be in place* to ensure the FPW delivers on the expected user experience. *Resources are required to survey beneficiaries*, to better understand beneficiary demographics & measure user adoption, attitudes, preferences & benefits of the FPW intervention, dis-aggregated by demographic dimension.

**Universal Service Fund Deployment.** Funds from the Universal Service & Access Agency of South Africa (USSASA) should be used to extend FPW to municipalities beyond the major centres in line with SA Connect. This will require a clear rollout plan & funding model that has yet to be devised. Treasury has allotted funds for the connection of 8000 clinics (& any other public buildings that are nearby) but the operational costs & capacity to run these have not been developed. The Fund has been ineffectively deployed in the past & funds are currently frozen while the case between the Minister of Communications & the free to air broadcaster over the standard of the boxes that the universal service funds have been redirected to for the subsidisation of set top boxes which provides a case in point. Putting these funds to use to enable access to public websites, or data intensive applications & platforms not affordable to the poor, would improve the intensity of use that is now understood to be a factor in addition to connectivity necessary for network effects associated with growth & development to prevail.

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