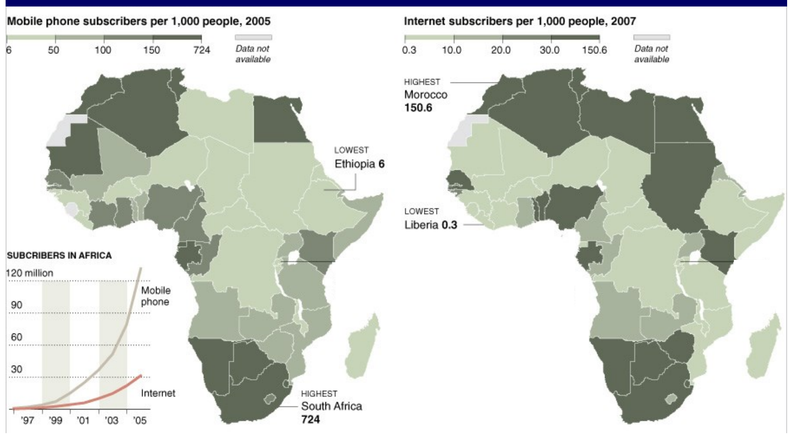
Access Denied in South Africa

The Need for New 3G+ Cell Phone Towers to Increase Internet Access

Lack of Internet Access in Africa



Information asymmetry is a major barrier to development, impacting everything from health to agriculture and education to business in marginalized communities. Today, **4.5 billion people are unable to access vital information on the Internet due to poverty, lack of internet infrastructure, and language constraints**, considering 54% of the internet is in English. Impact evaluation studies show that access to information can generate higher incomes and better standards of living. Hence, it is critical to bring Internet access to the off-net community and give them access to information that the rest of world takes for granted. One such way is to improve or build new infrastructure including 3G+ cell phone towers to increase data coverage and Internet access.

Project Goal and Spatial Questions

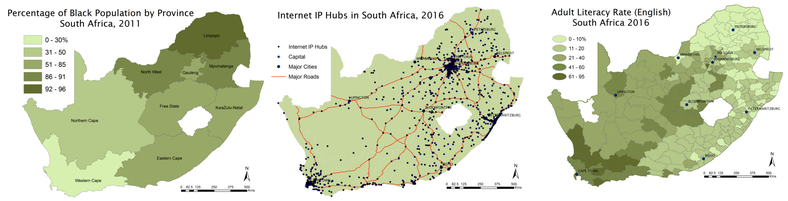
Using spatial analysis of the locations of 3G+ cell phone towers and their effective range, and IP addresses in South Africa , *identify*:

- **What is the current mobile internet and IP coverage?**
- **What regions require new infrastructure to connect the off-net population?**

New 3G+ Tower Placement Factors

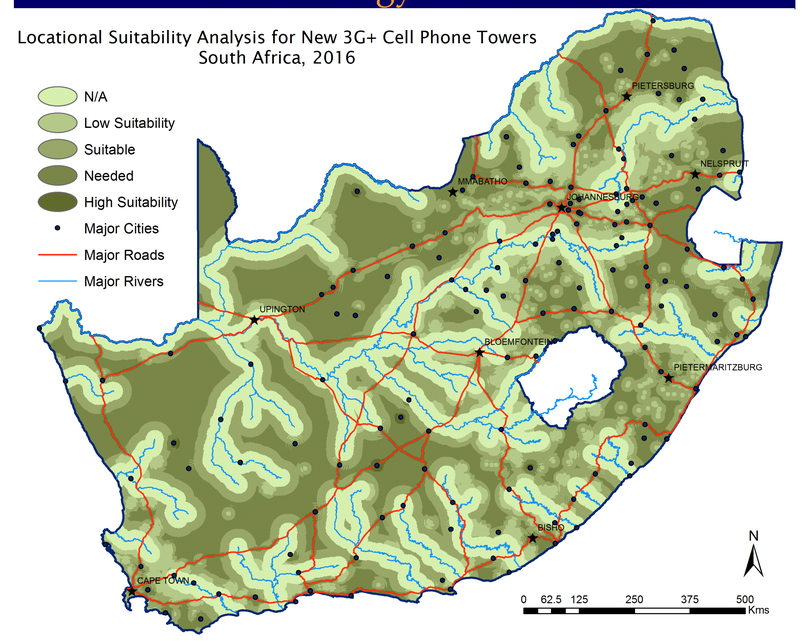
The placement of new towers should take into consideration:

- At ***least*** a 20 kilometers distance from river and water systems.
- At ***most*** 20 kilometers from a major road.
- At ***most*** 12 kilometers (average range) from a town.
- ***Not*** in the range of existing towers ***or*** on protected land.
- ***Target*** marginalized regions and unserved populations.



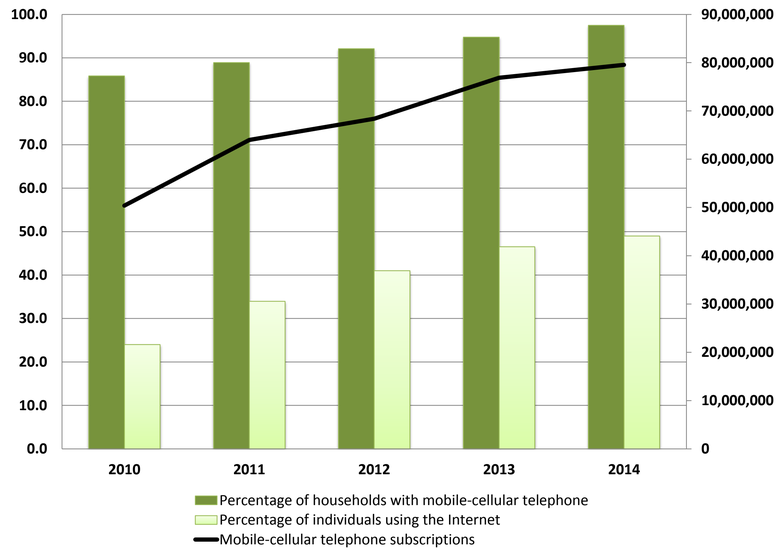
As of March 2016, the Internet IP hubs are mostly clustered around major urban cities. Regions with lower literacy and black populations are not as well connected—particularly the South West.

Methodology and Results

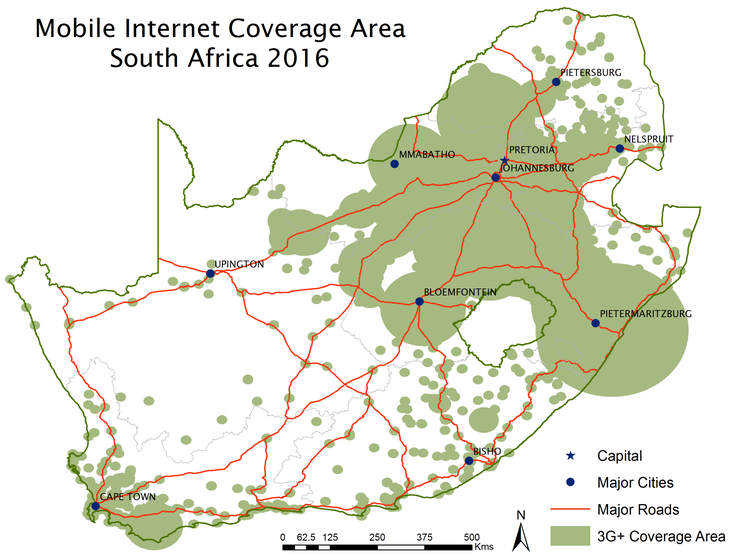


Based on the demographic factors, each municipality was given a score between 0 and 1 on a raster map and then along with the Euclidean distance algorithm of the placement factors, regions were identified where new Internet broadband and 3G+ infrastructure is required.

Mobile and Internet Use in South Africa



Existing 3G+ Coverage in South Africa



Conclusion

A visual analysis of the demographic distribution and the current 3G+ network coverage suggests that there is higher lack of Internet access in provinces with higher black population densities and lower education levels.

The study shows there is need for coverage along the major roads in the South Central and Western regions of South Africa.

While this study identifies potential locations for building new broadband towers, the specific site locations for the towers, requires more detailed analysis and location allocation optimization and understanding of local regulations and telecom laws.

Information

Cartographer: Abhishek Maity
DHP207: GIS for Global Applications
Projection: Africa Equidistant Conic
Sources: ESRI, Max Mind, 2011 Statistics South Africa, 2016 Open Cell ID South Africa, The World Bank, ITU

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