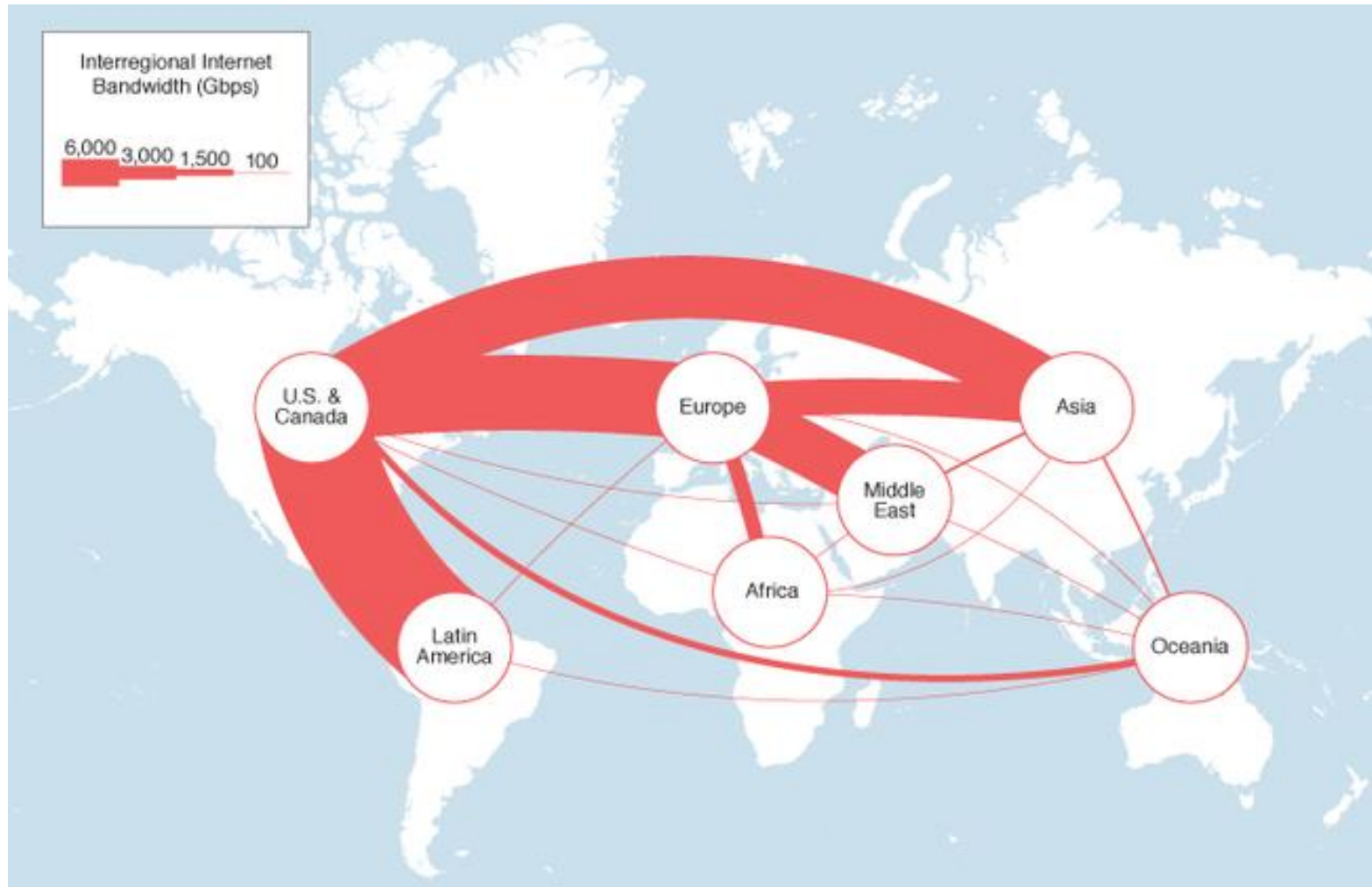


# International Internet Bandwidth and Pricing Trends in Africa

Patrick Christian  
August 30, 2016

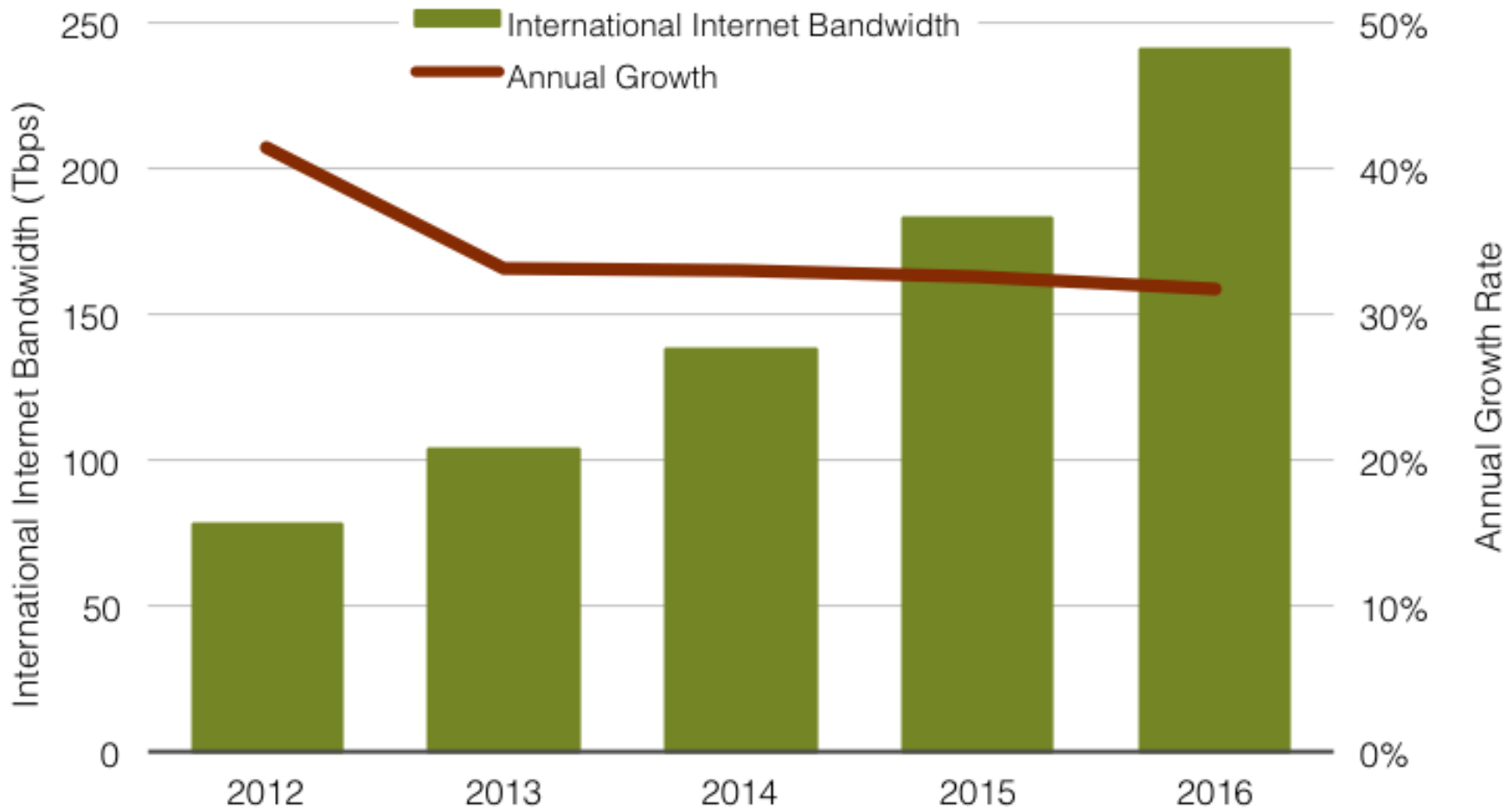
# The Global Picture

Inter-Regional Internet Bandwidth, 2016



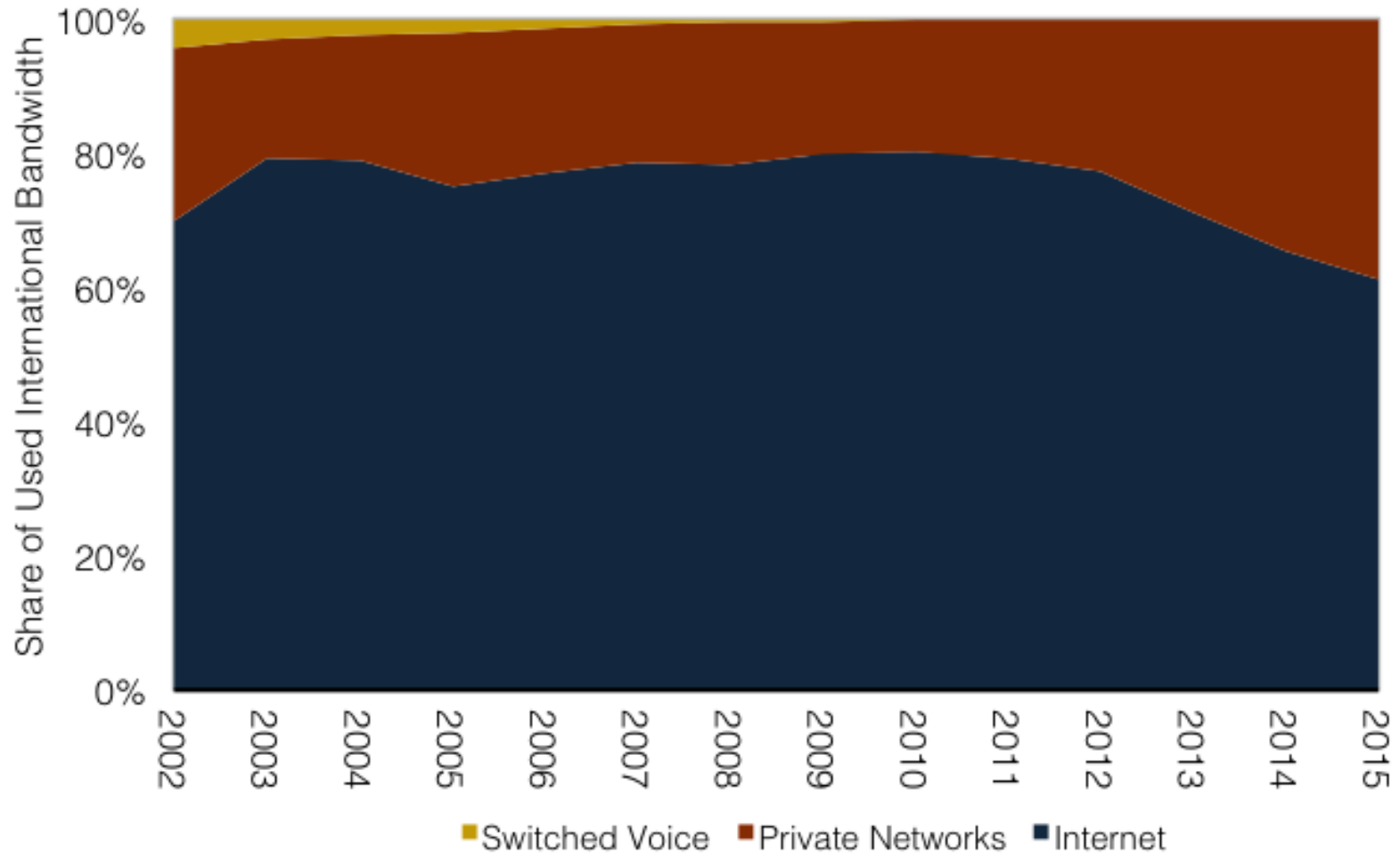
# Global Growth Has (Barely) Slowed

## International Internet Bandwidth Global Growth



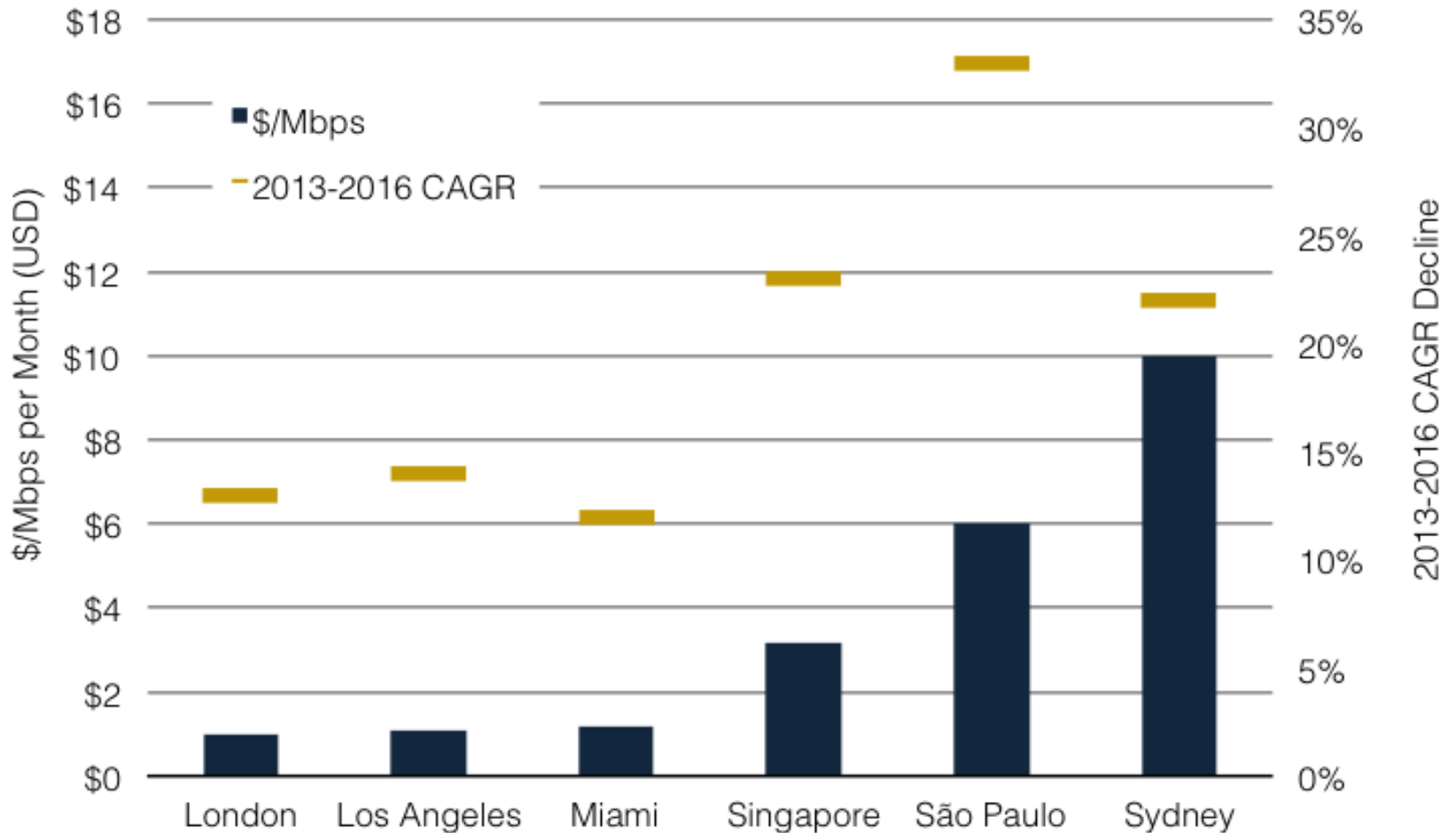
# Content Providers Getting Bigger

International Internet, Private Network, and Switched Voice Capacity



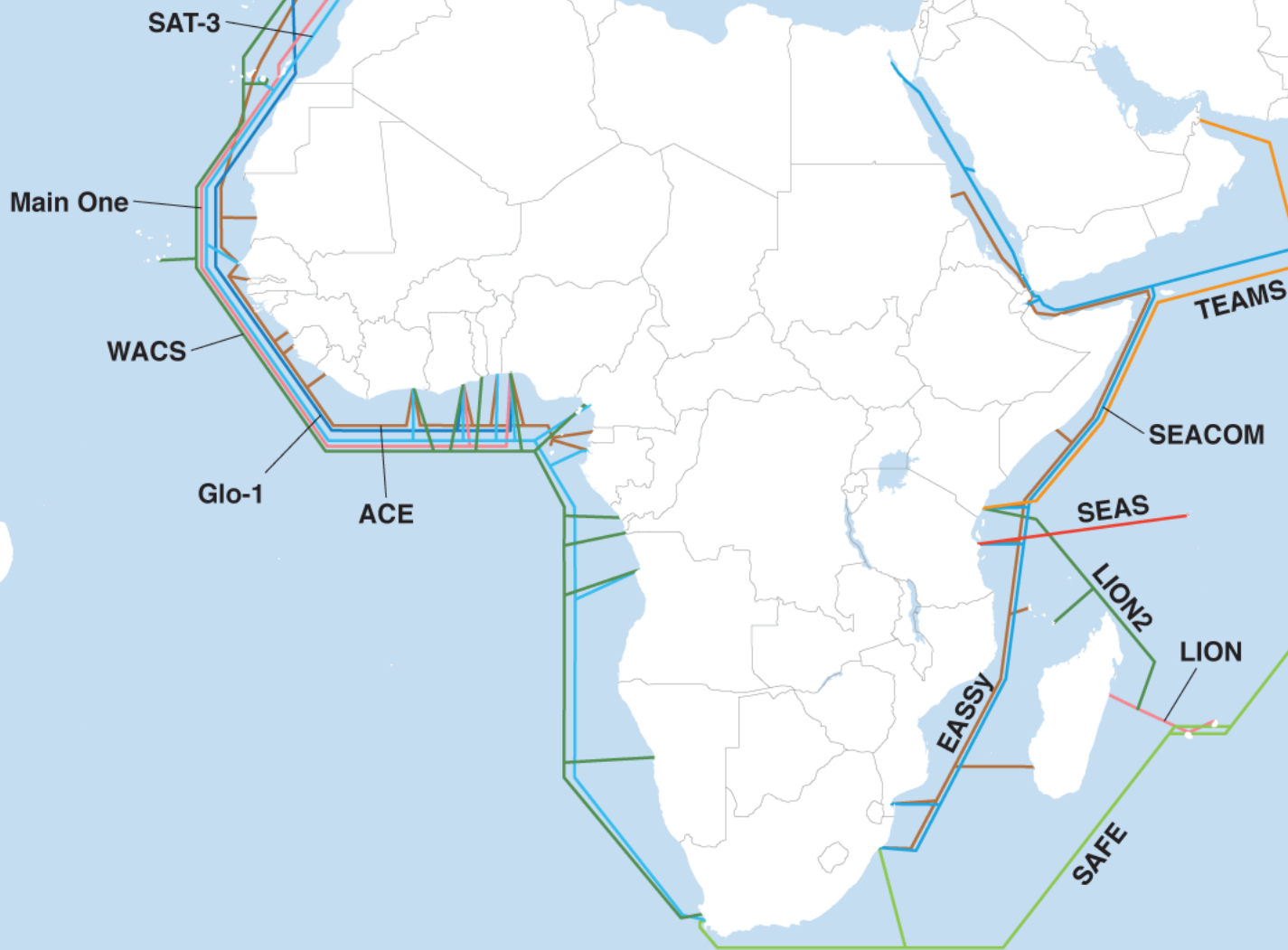
# IP Transit Prices Still Dropping

## Median 10 GigE IP Transit Prices in Major Global Cities

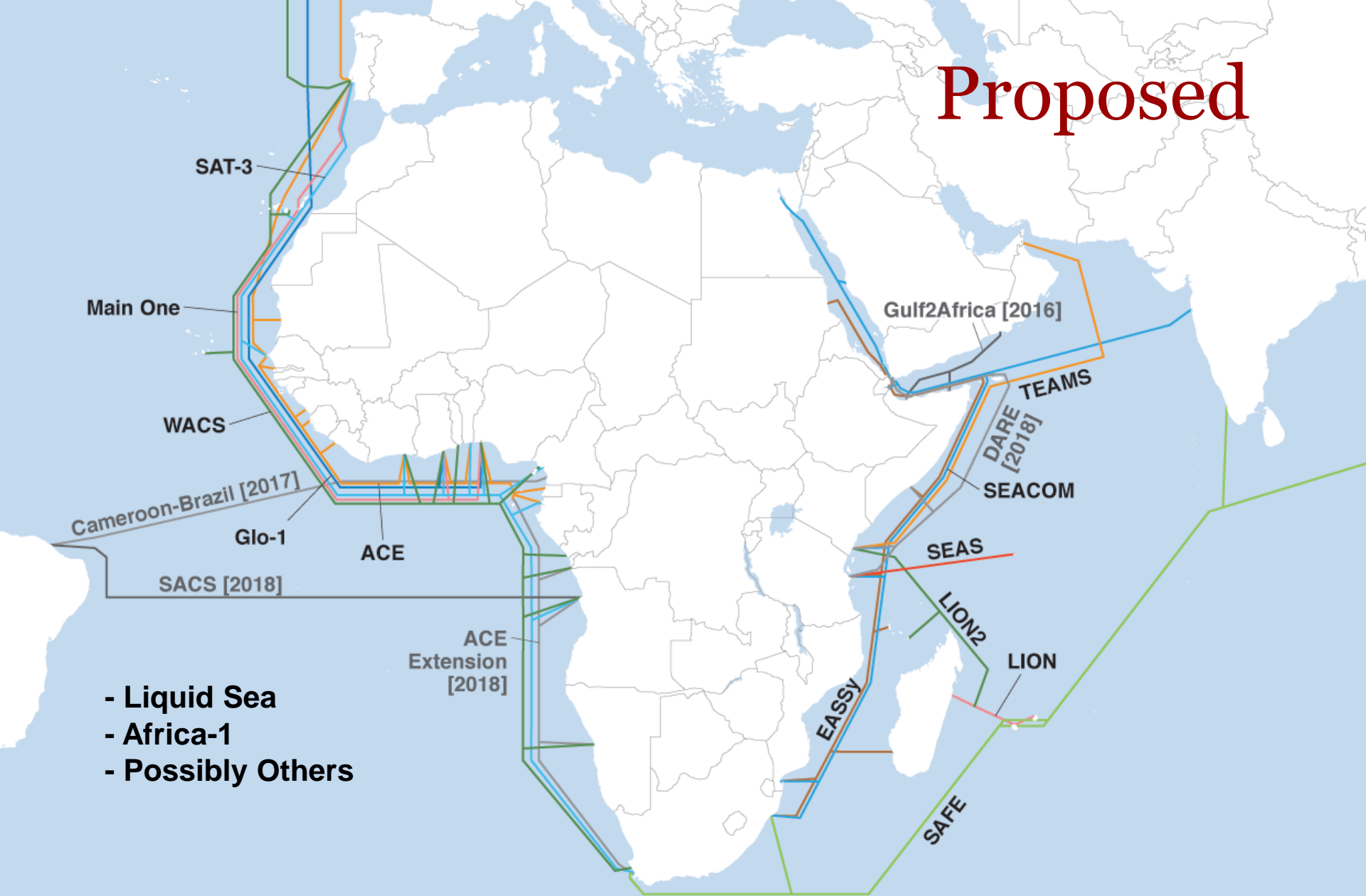


# Submarine Capacity

# 2016



# Proposed

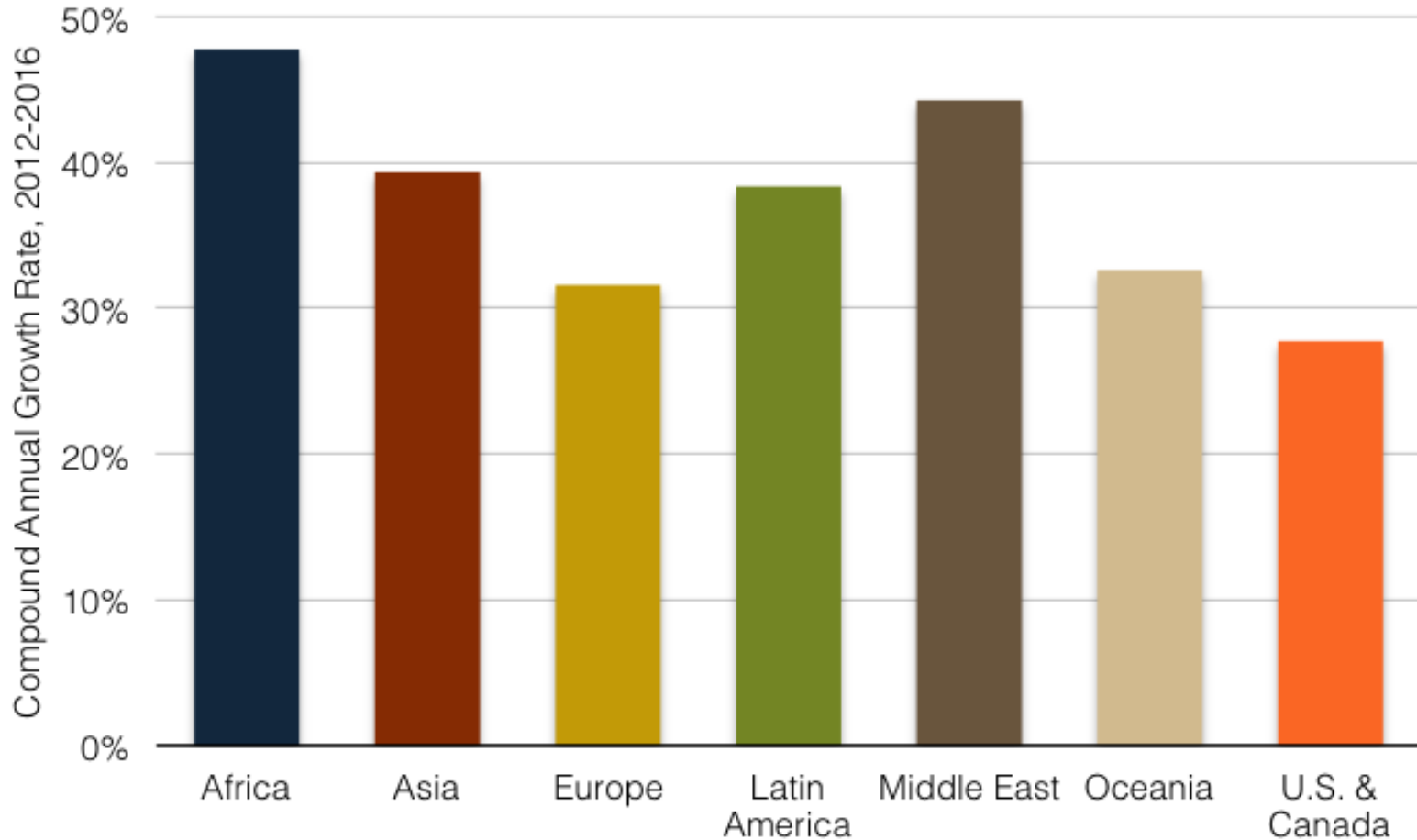


- Liquid Sea
- Africa-1
- Possibly Others



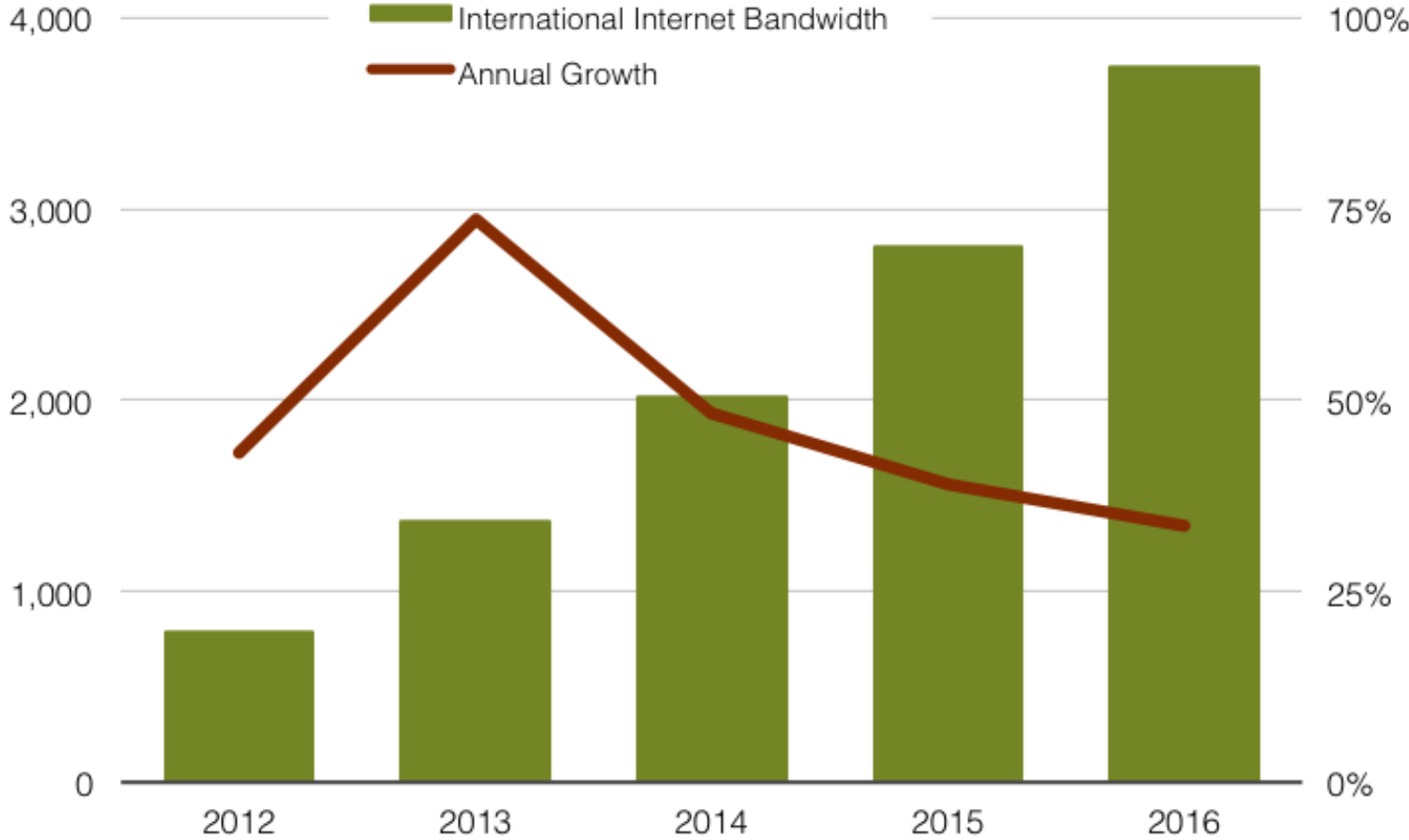
# Africa is the Fastest Growing Region

International Internet Bandwidth Growth by Region, 2012-2016



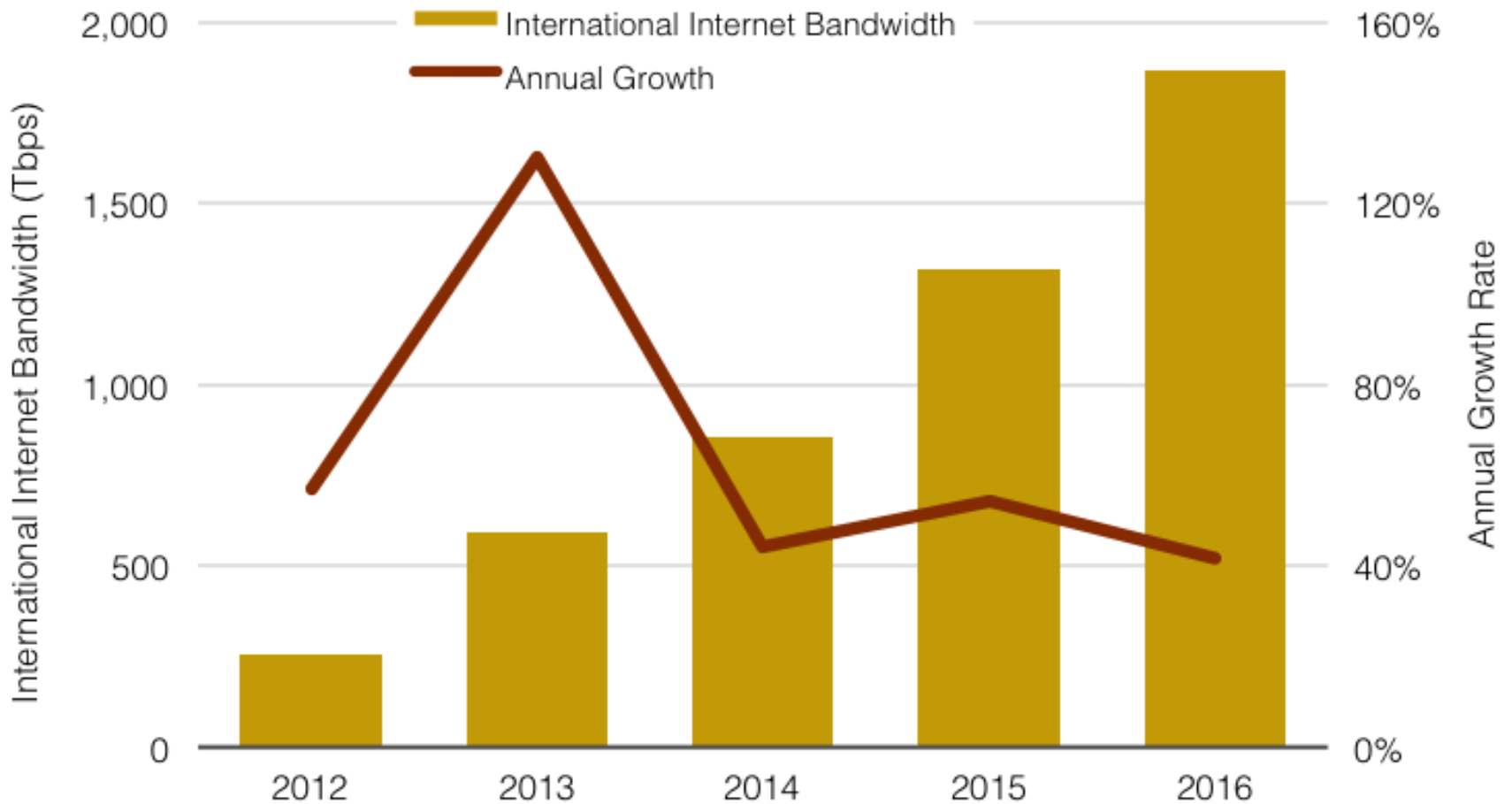
# Capacity Growth in Africa

## International Internet Bandwidth Growth - Africa

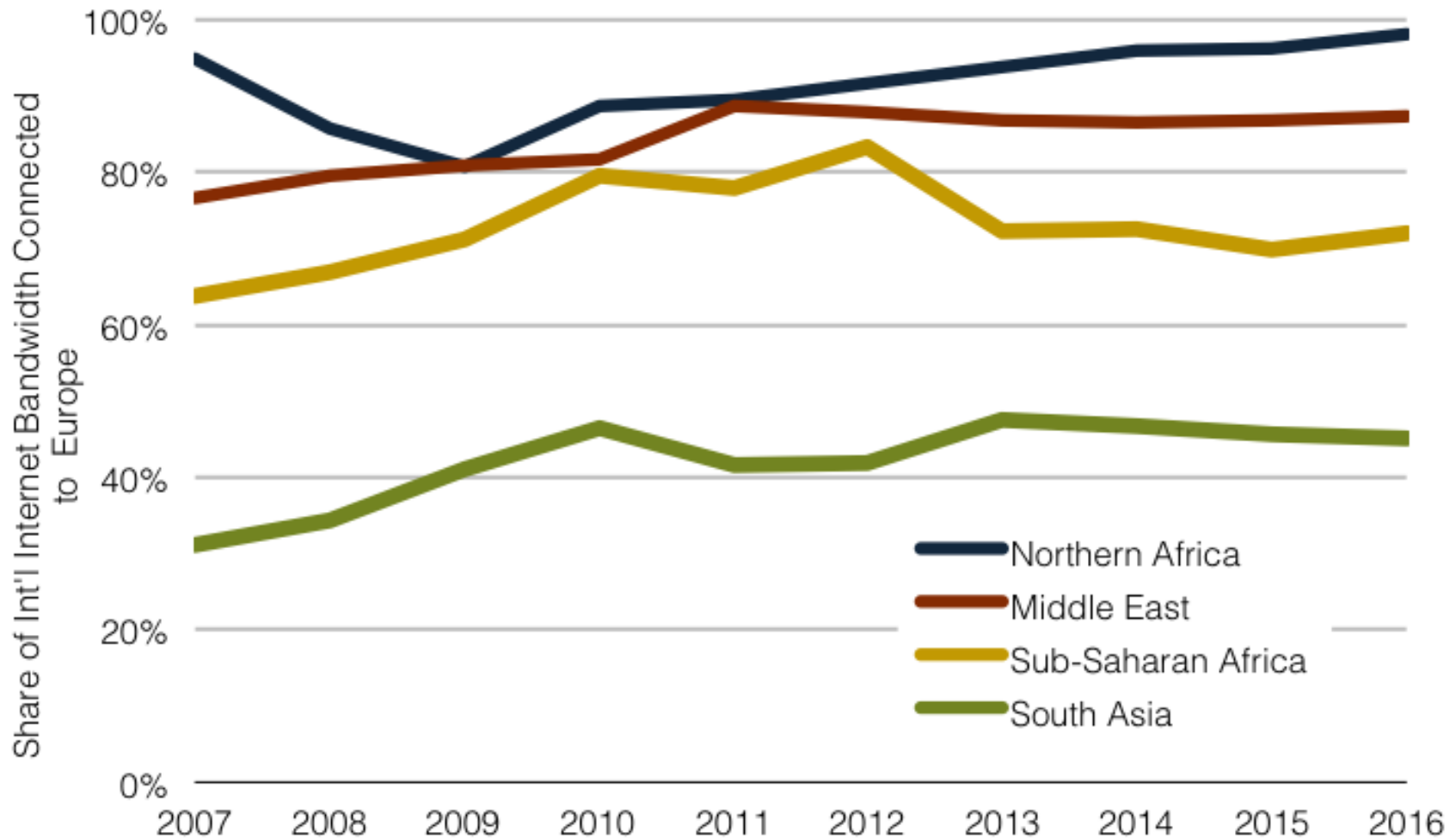


# Growth in Sub-Saharan Africa

## Int'l Internet Bandwidth Growth – Sub-Saharan Africa

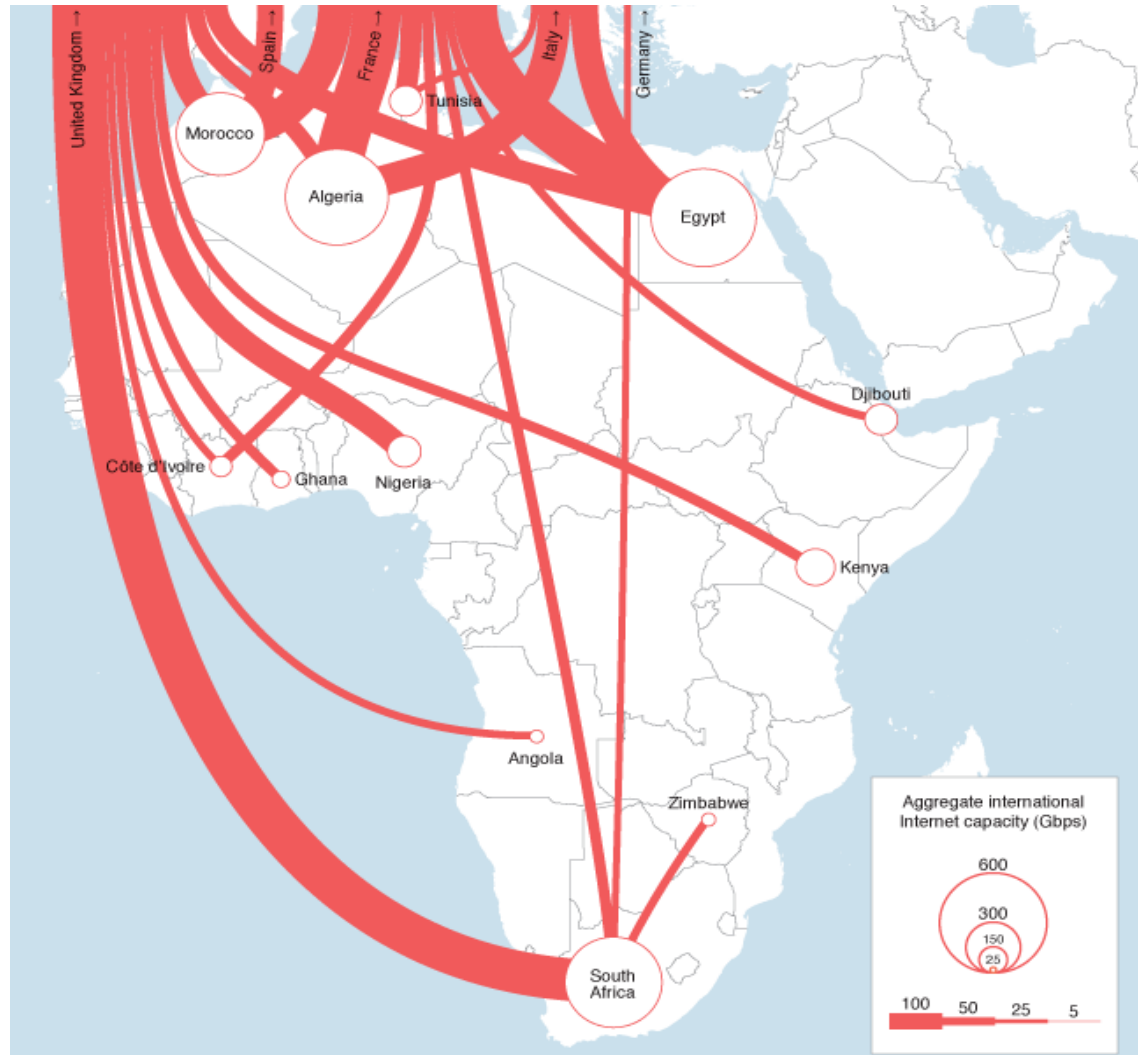


# Europe Hub Not Just for Africa



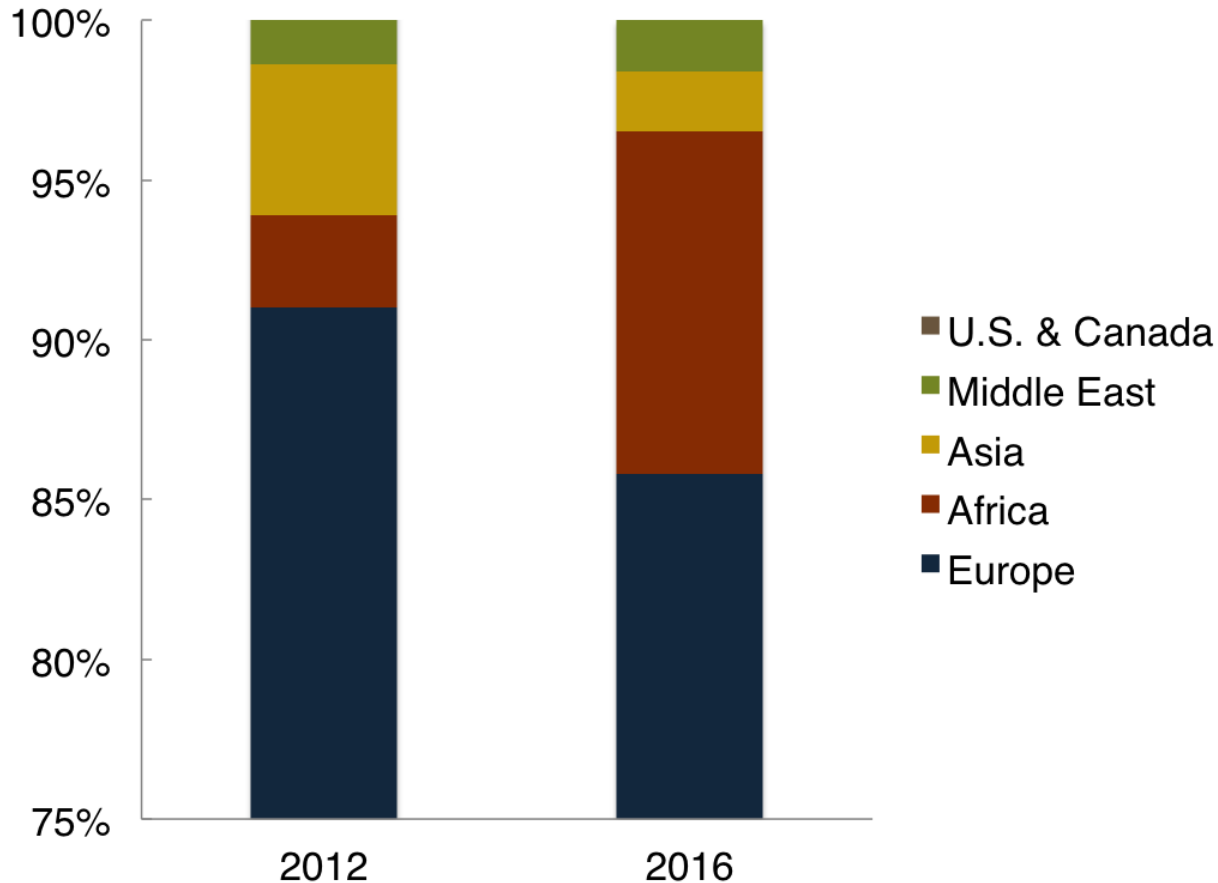
# Connected to Europe

## Major International Internet Routes in Africa, 2016



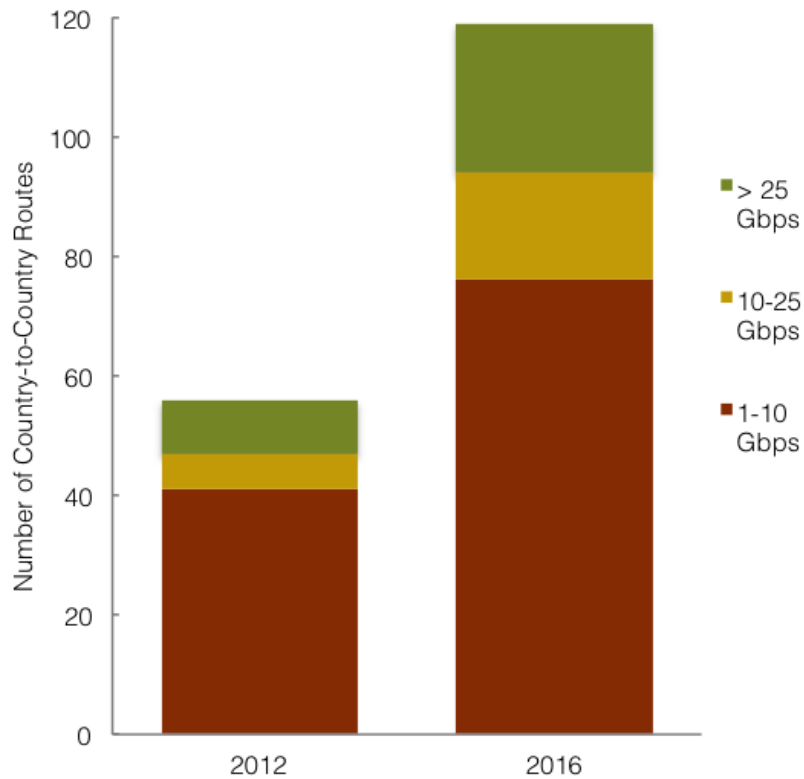
# Intra-Africa Connectivity Growth

Share of Africa Int'l Internet Bandwidth by Region, 2012 vs 2016

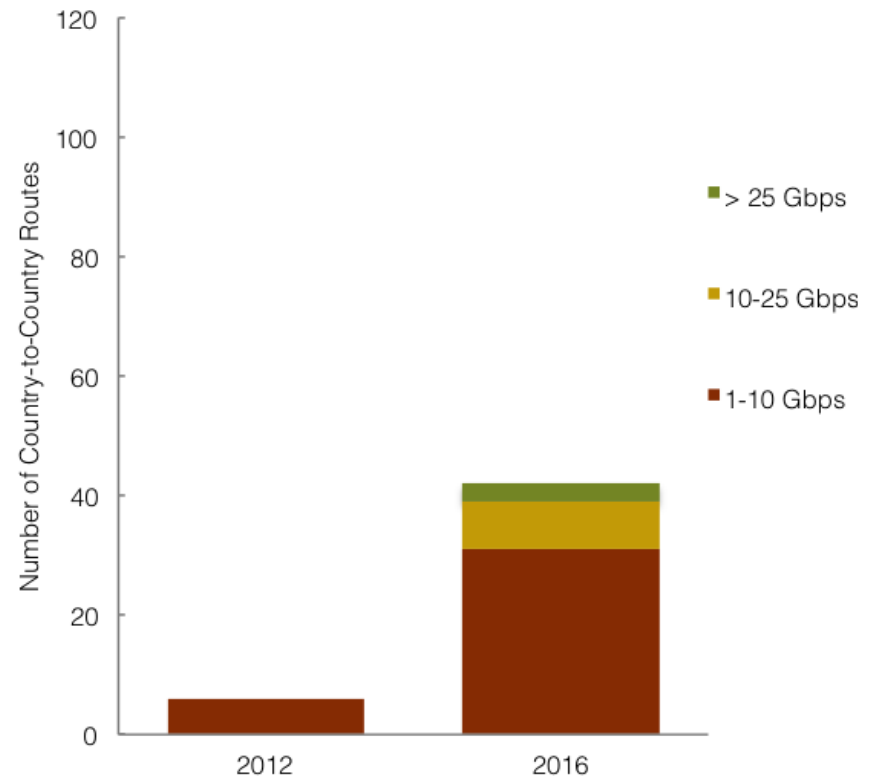


# Intra-African Route Growth

## Europe to Africa

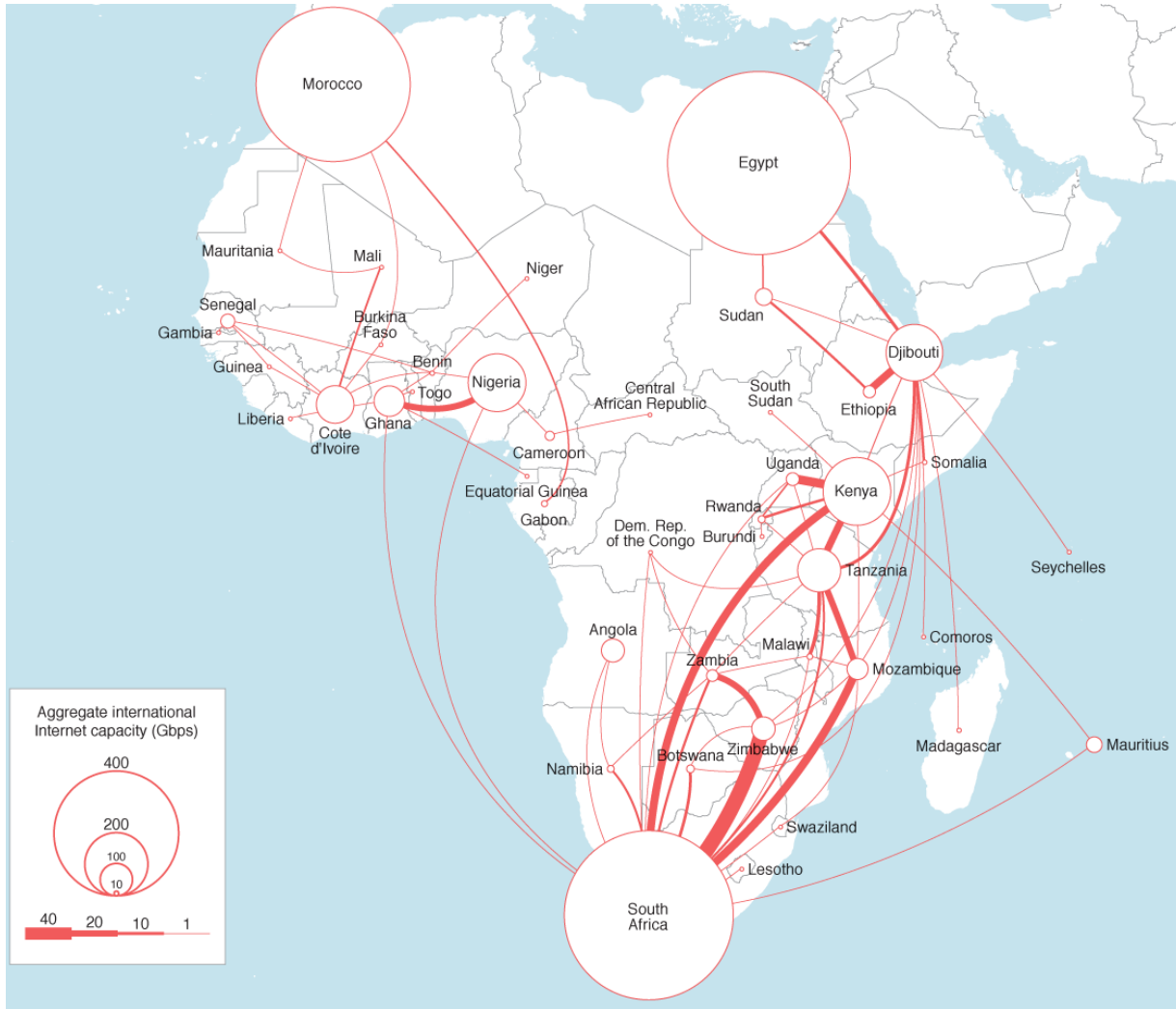


## Africa to Africa



# Intra-African Routes

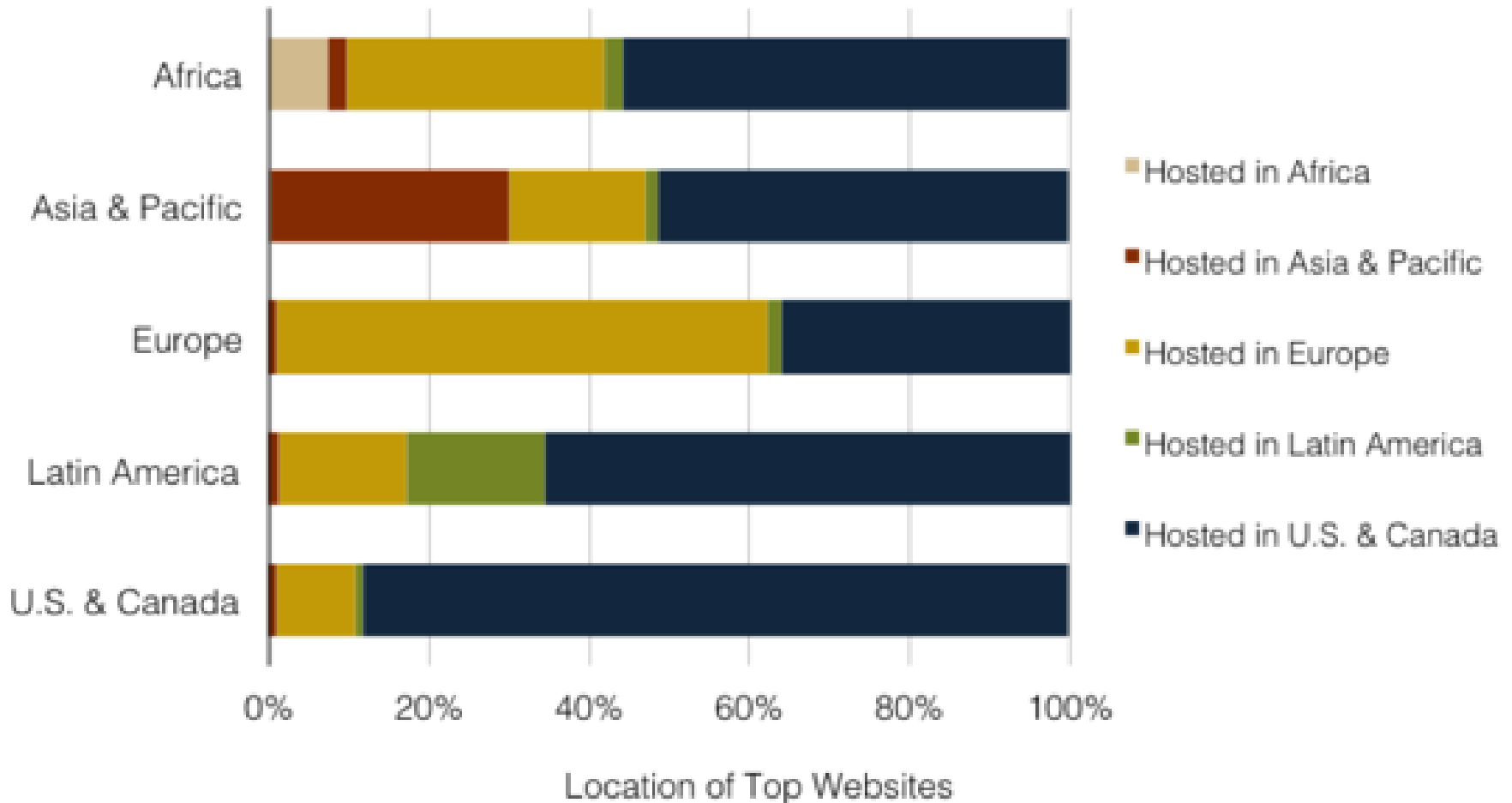
## Major International Internet Routes within Africa, 2016





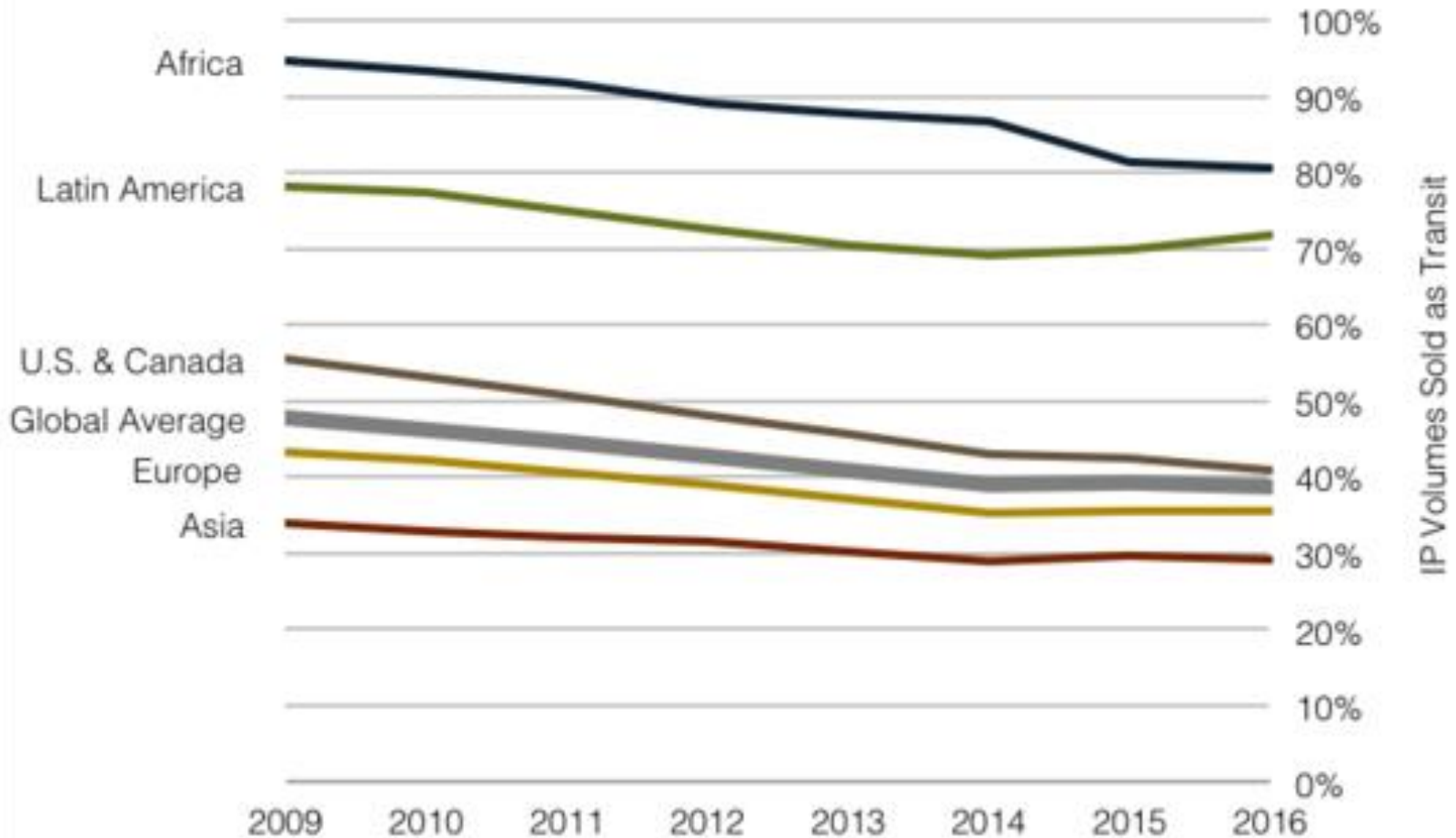
# Geography of Content

Websites by User Region, 2016



# Share of Transit Dropping

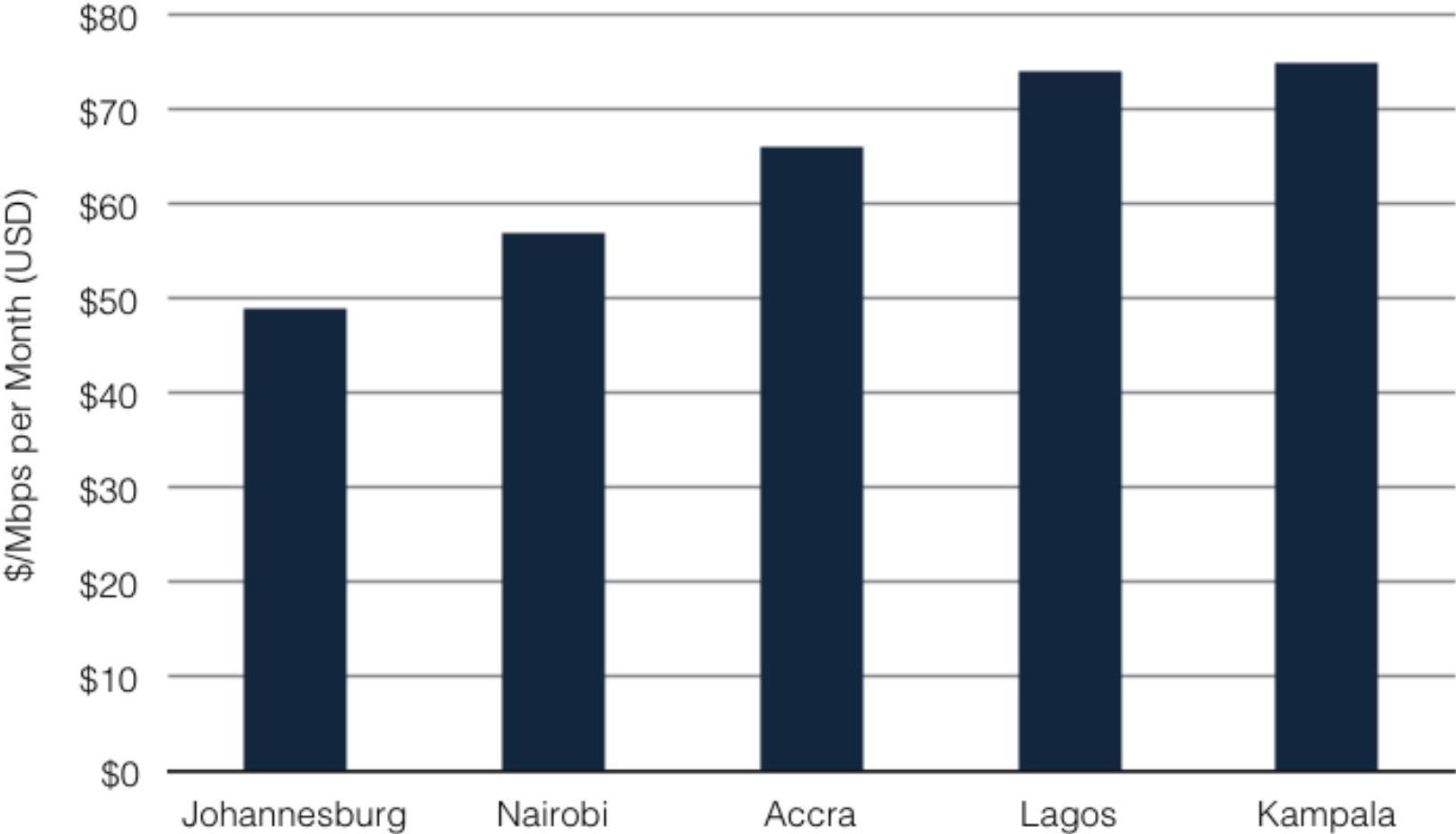
Transit as a Share of Total IP Volumes, 2009-2016



# Transit and Transport Pricing

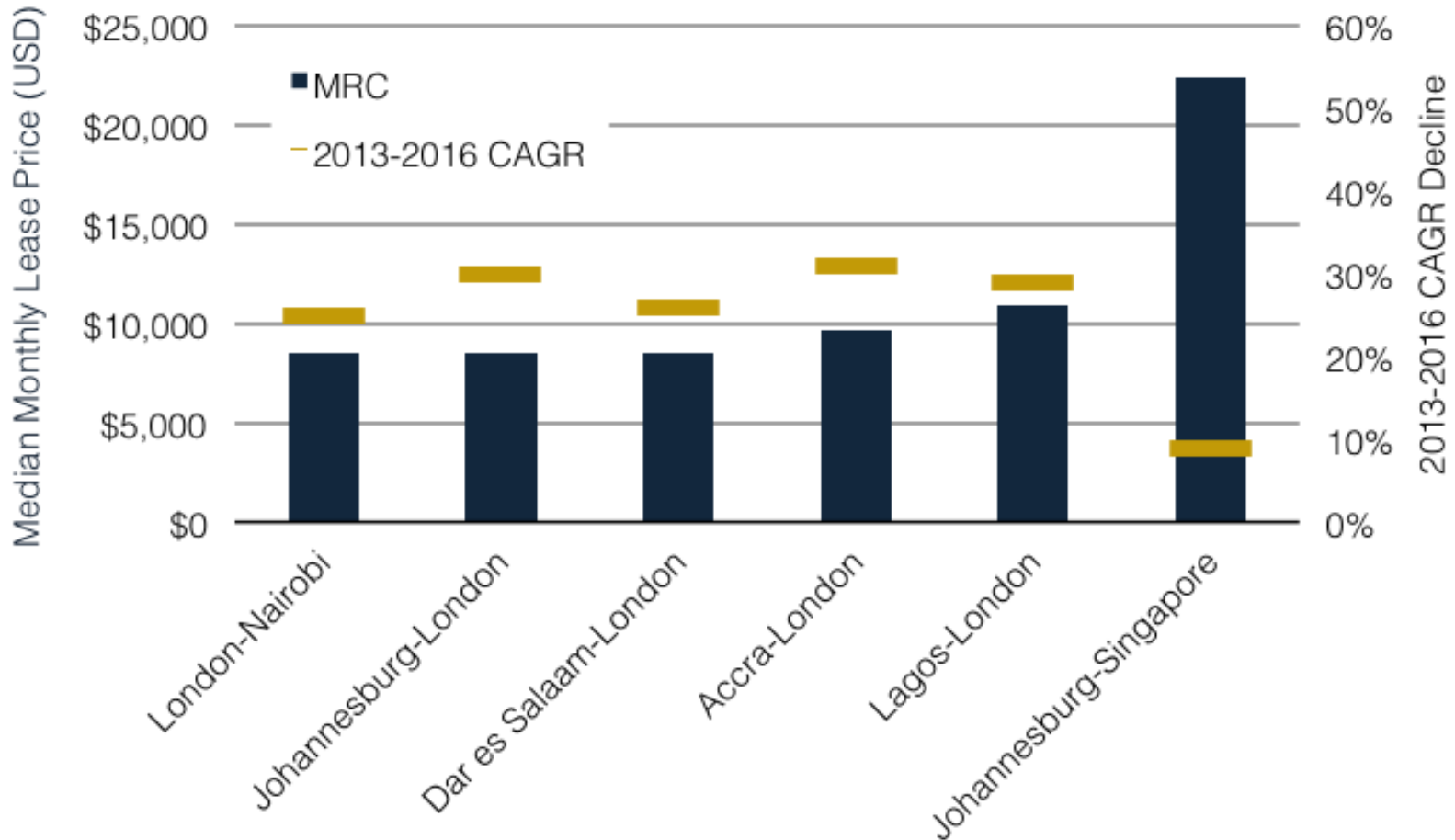
# IP Transit Port Prices Q2 2016

Median STM-1 IP Transit Prices in Africa, Q2 2016



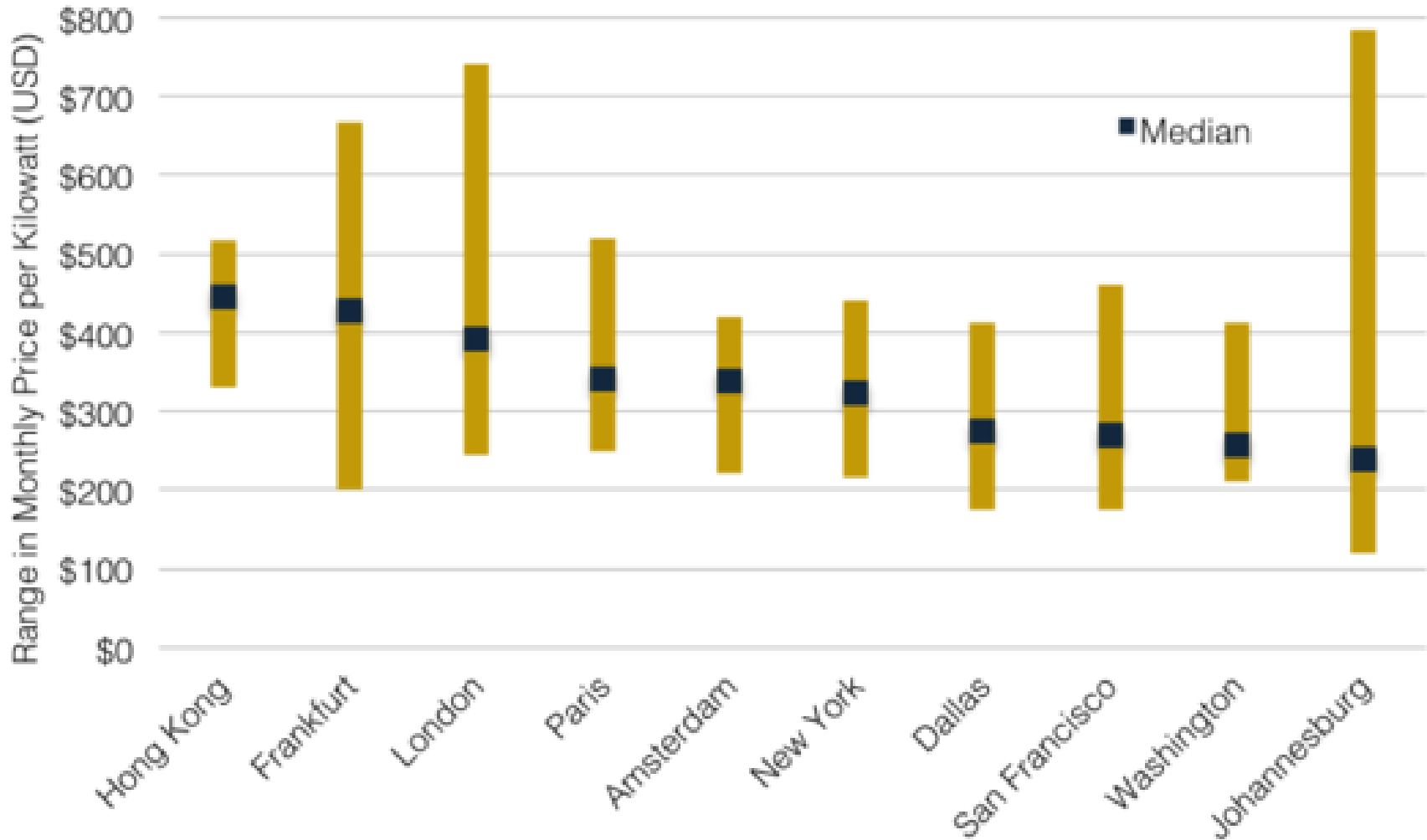
# Transport Prices Rapidly Decreasing

Median STM-1 Monthly Lease Prices in Africa, 2013-2016

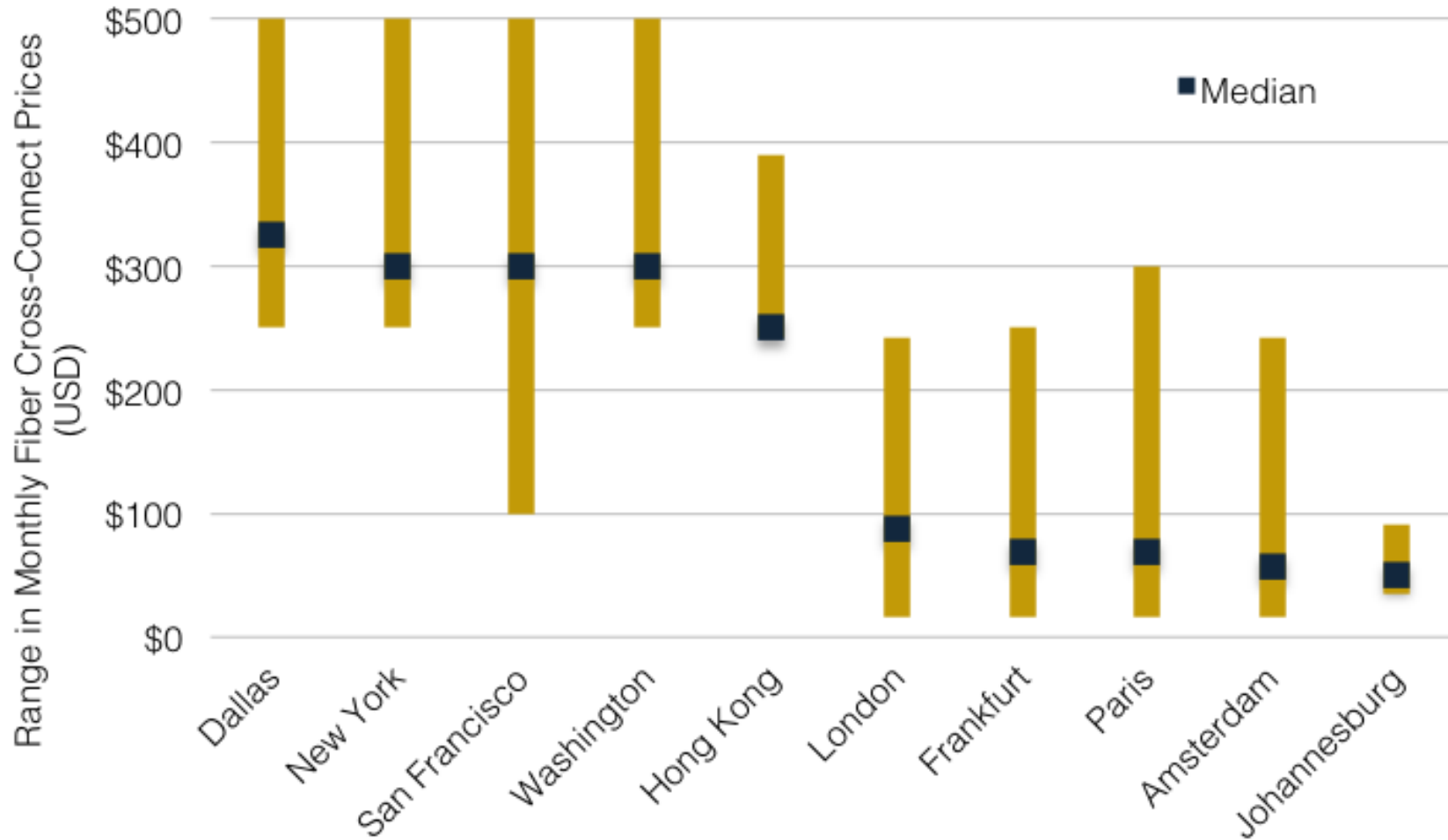


# Colocation

# Range in Price per Kilowatt at 4-Kilowatt Density, H1 2016

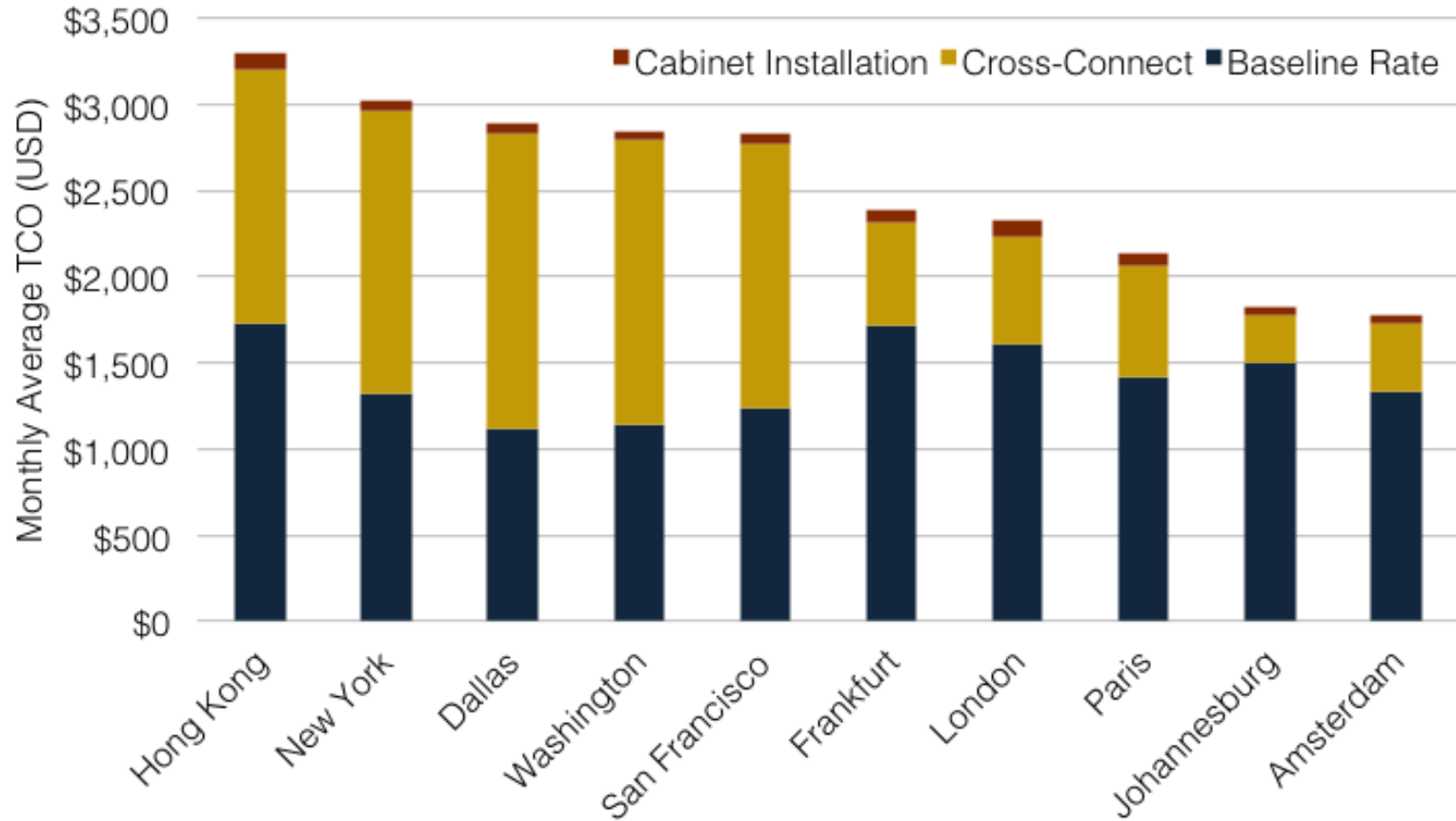


# Range Cross-Connect Price, H1 2016



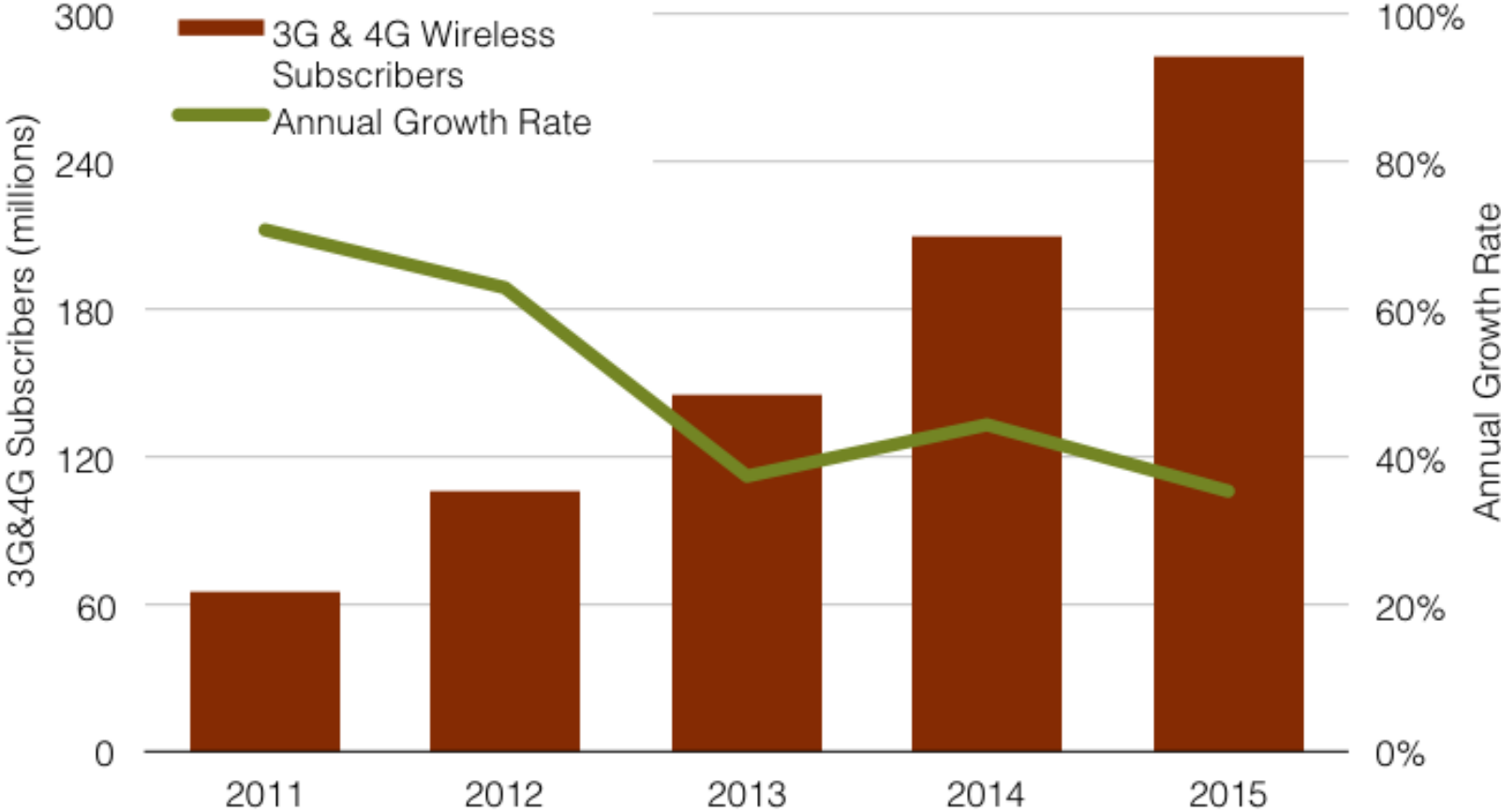


# Total Cost of Ownership per Month, Five Cross-Connects, H1 2016



# 3G Mobile Subs Growing

3G & 4G Mobile Subscribers in Africa, 2011-2015



# Outlook - Some Numbers

- 39% vs 30% - Int'l Internet bw CAGR 2015-2022
- 42% vs 28% 3G penetration
- 11% vs 1% LTE penetration
- -30.1% vs -27.8% - drop in IPT prices
- 51% vs 25% - peering vs transit growth

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