

# Lies, damn lies and mobile statistics: forecasting future demand for wireless spectrum

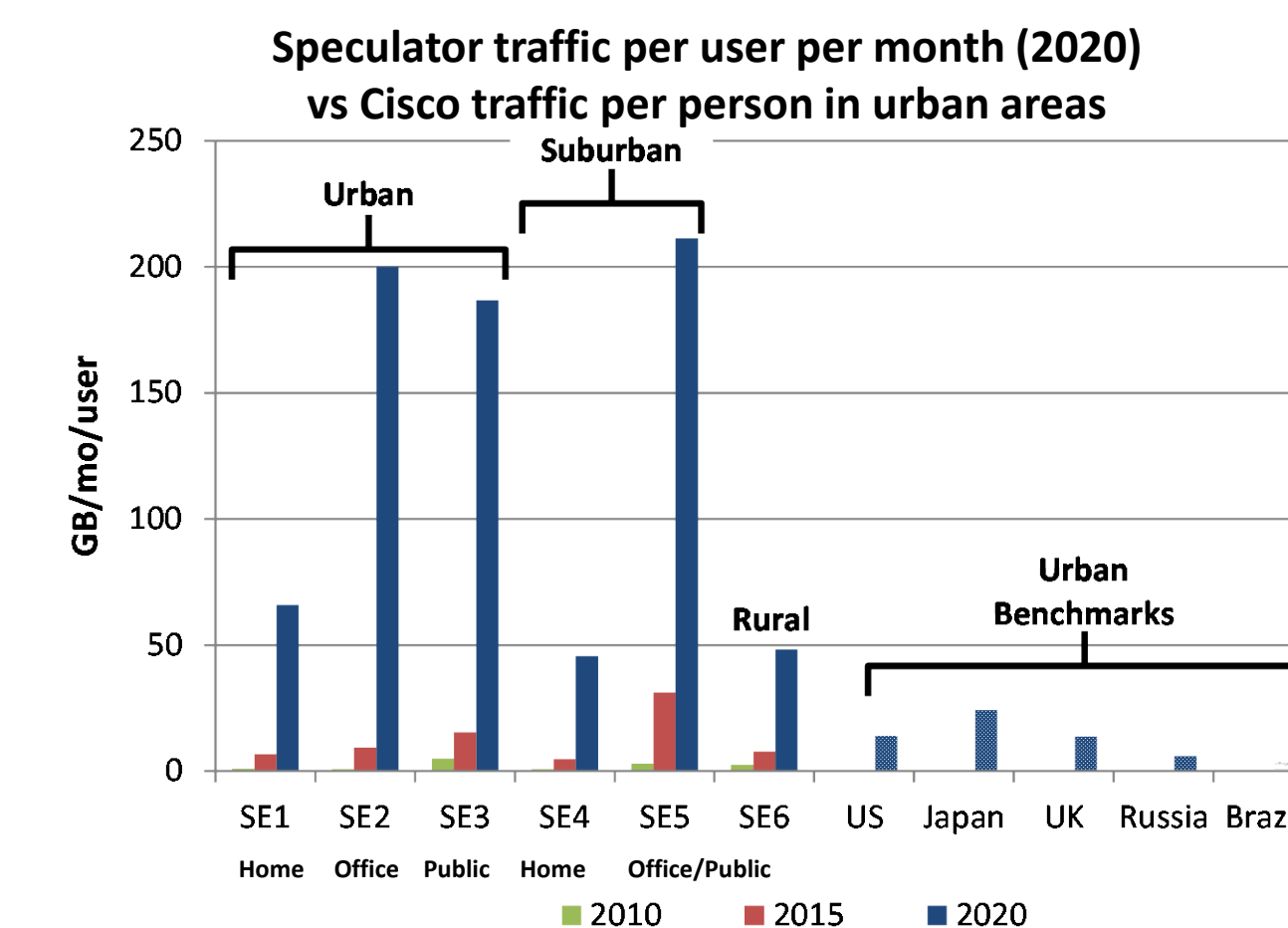
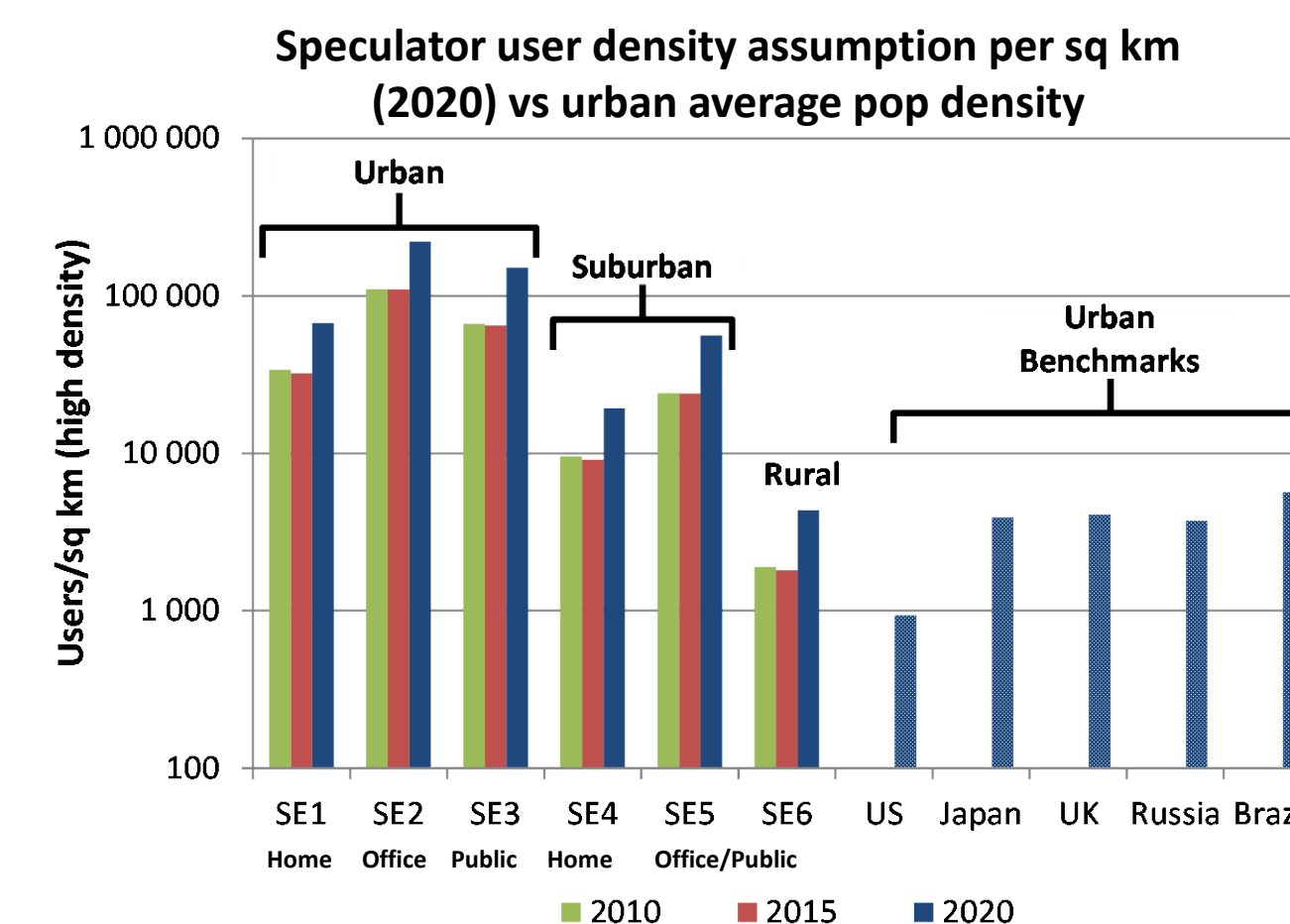
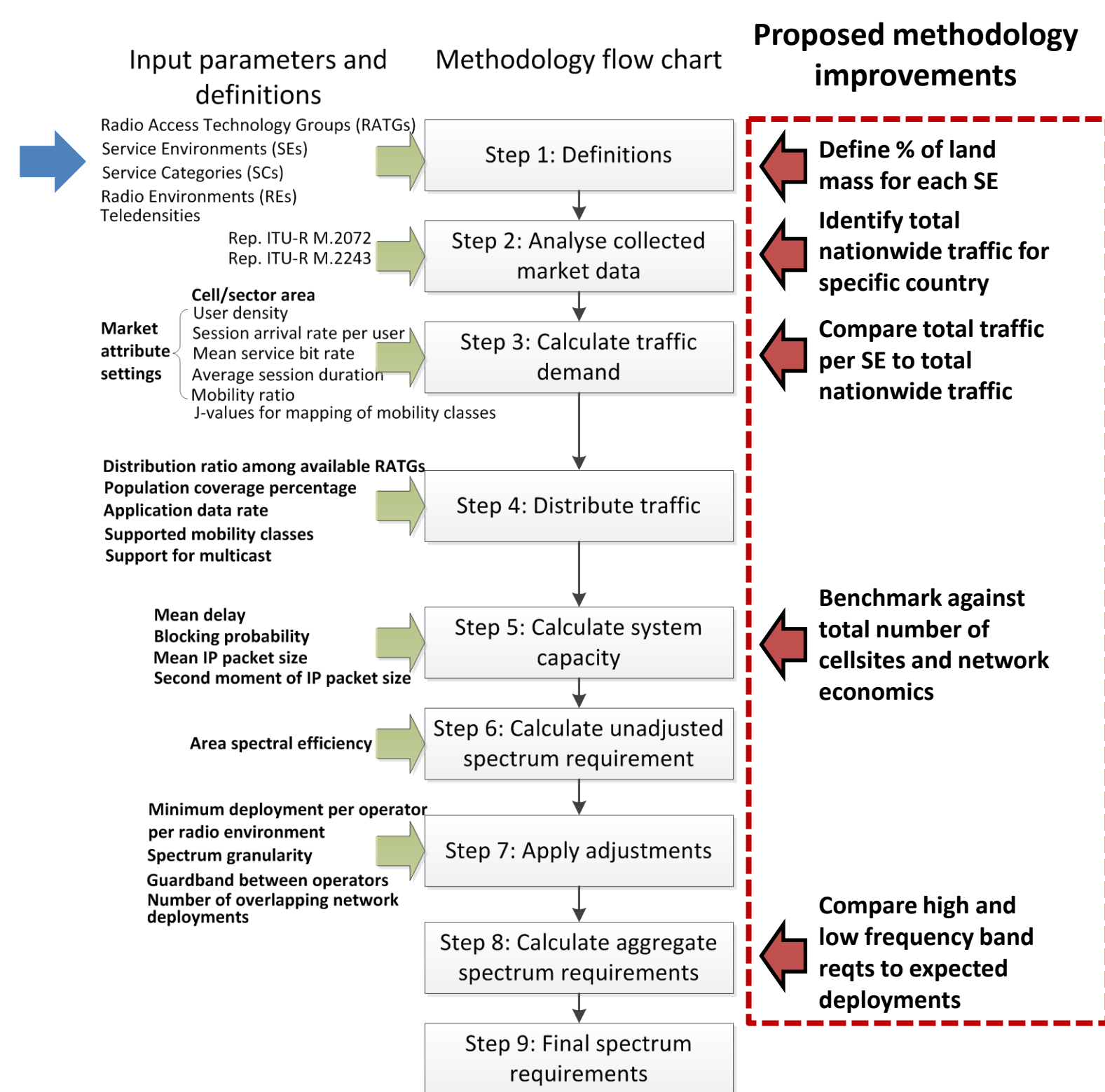
Tim Farrar  
Telecom, Media, and Finance Associates  
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## ITU Spectrum Demand Model ("Speculator") Report ITU-R M.2290

Teledensity	Dense urban	Suburban	Rural
Service usage pattern			
Home	SE1	SE4	SE6
Office	SE2		
Public area	SE3	SE5	

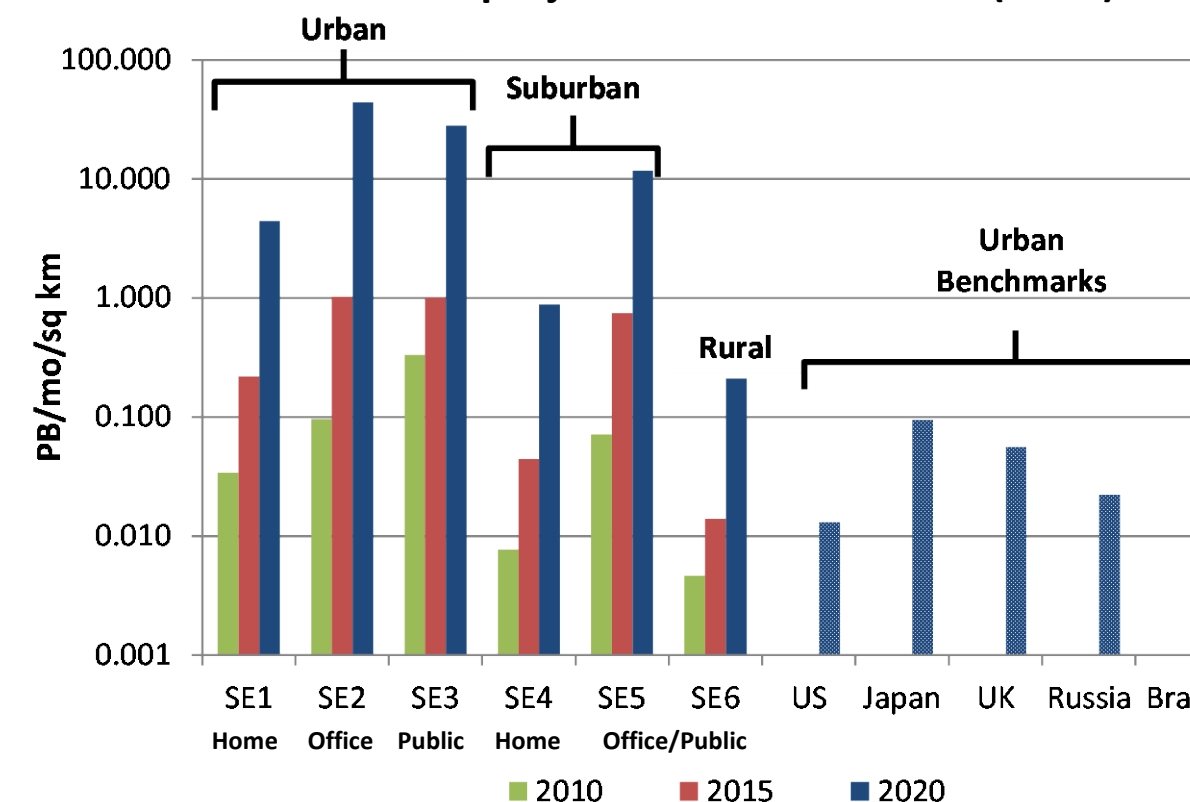
  

Traffic class	Conversational	Streaming	Interactive	Background
Service type				
Super high multimedia	SC 1	SC 6	SC 11	SC 16
High multimedia	SC 2	SC 7	SC 12	SC 17
Medium multimedia	SC 3	SC 8	SC 13	SC 18
Low rate data and low multimedia	SC 4	SC 9	SC 14	SC 19
Very low rate data <sup>(1)</sup>	SC 5	SC 10	SC 15	SC 20



$$\text{User density} \times \text{Traffic per user} = \text{Traffic per sq km}$$

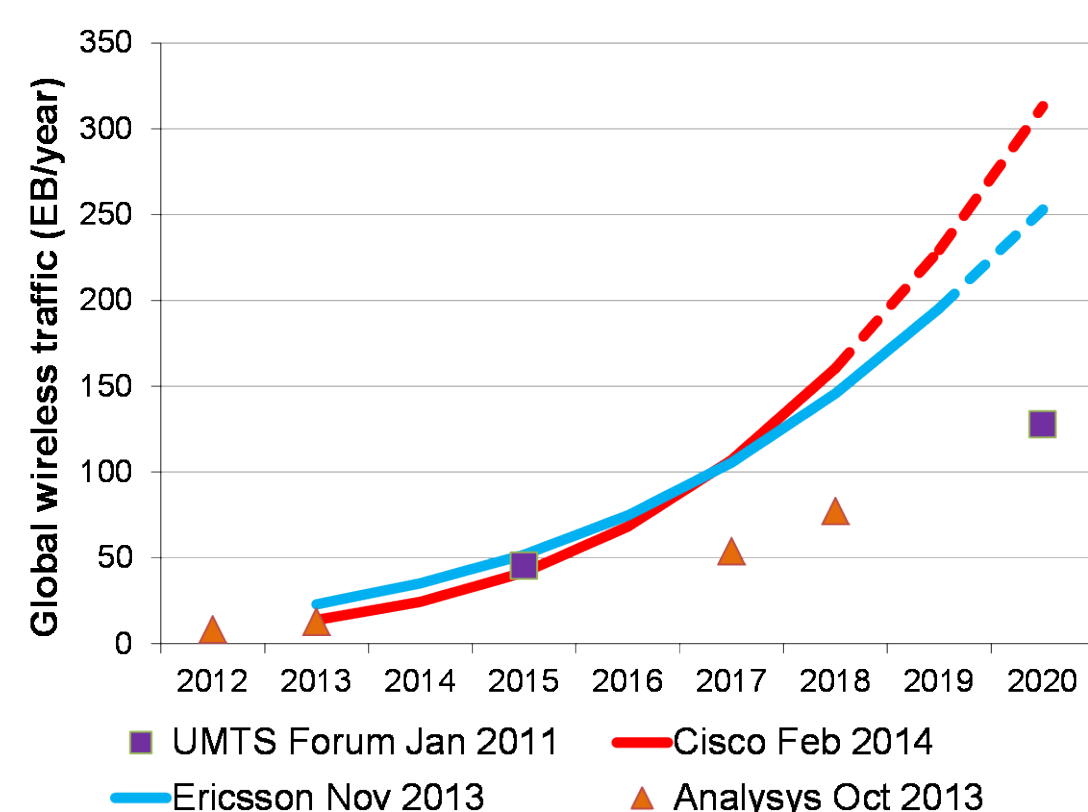
Speculator traffic assumption per sq km vs Cisco traffic projection in urban areas (2020)



Results exceed average urban benchmarks by two or three orders of magnitude

NEVER CROSS-REFERENCED

Forecasts of global wireless traffic growth

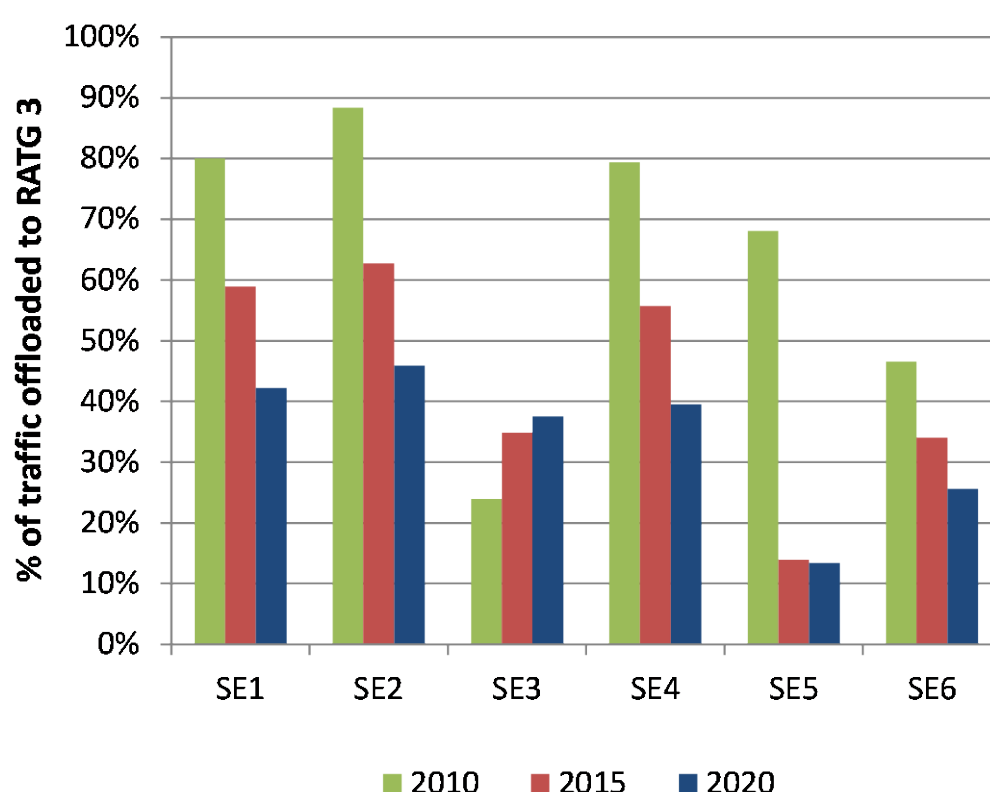


300EB in 2020 used as benchmark for WPSD "Beyond 2020" Vision

44x-80x data growth from 2010 to 2020 BUT There is no cross-referencing of demand by SE/SC to the 300EB global forecast!

INCOMPATIBLE

Share of total traffic offloaded to WiFi (RATG3)



WiFi Offload declines from 80% to 40% (SE1) Implies traffic carried on mobile networks increases 3 times faster than total traffic

44x-80x data growth => 132x-240x mobile traffic growth!

BUT UNDERLYING FORECASTS ARE FOR MOBILE TRAFFIC NOT INCLUDING WIFI!

### Other issues considered

- 1) Simplified methodologies (FCC 2010, Russia 2013) which assume "Spectrum growth required = Traffic growth/(base station growth x spectral efficiency improvement)" are vulnerable to inaccuracies:
  - a) Base station growth non-uniform (addresses hotspots)
  - b) Spectral efficiency improvement also non-uniform (sectorization, small cells, offloading all preferentially deployed at hotspots)
- 2) Counter-argument that Speculator only intended to represent extreme hotspots never made clear in documentation
  - a) Should global allocation be based on the Superbowl or World Cup Final stadium?
  - b) Traffic projected for 2020 in dense urban public area (stadium) still exceeds Superbowl traffic by ~100x (51TB/sq km/hour in low growth case vs 500-600GB in busiest hour)

Contact us for more information

Tim Farrar  
TMF Associates Inc.  
3705 Haven Ave, Suite 113  
Menlo Park CA 94025, USA  
tim@tmfassociates.com



Poster session