CAPITEL

SINGAPORE TELECOM

Network economics and business case for entrants

July 2016

Specialist advisors in Telecoms, Media and Internet

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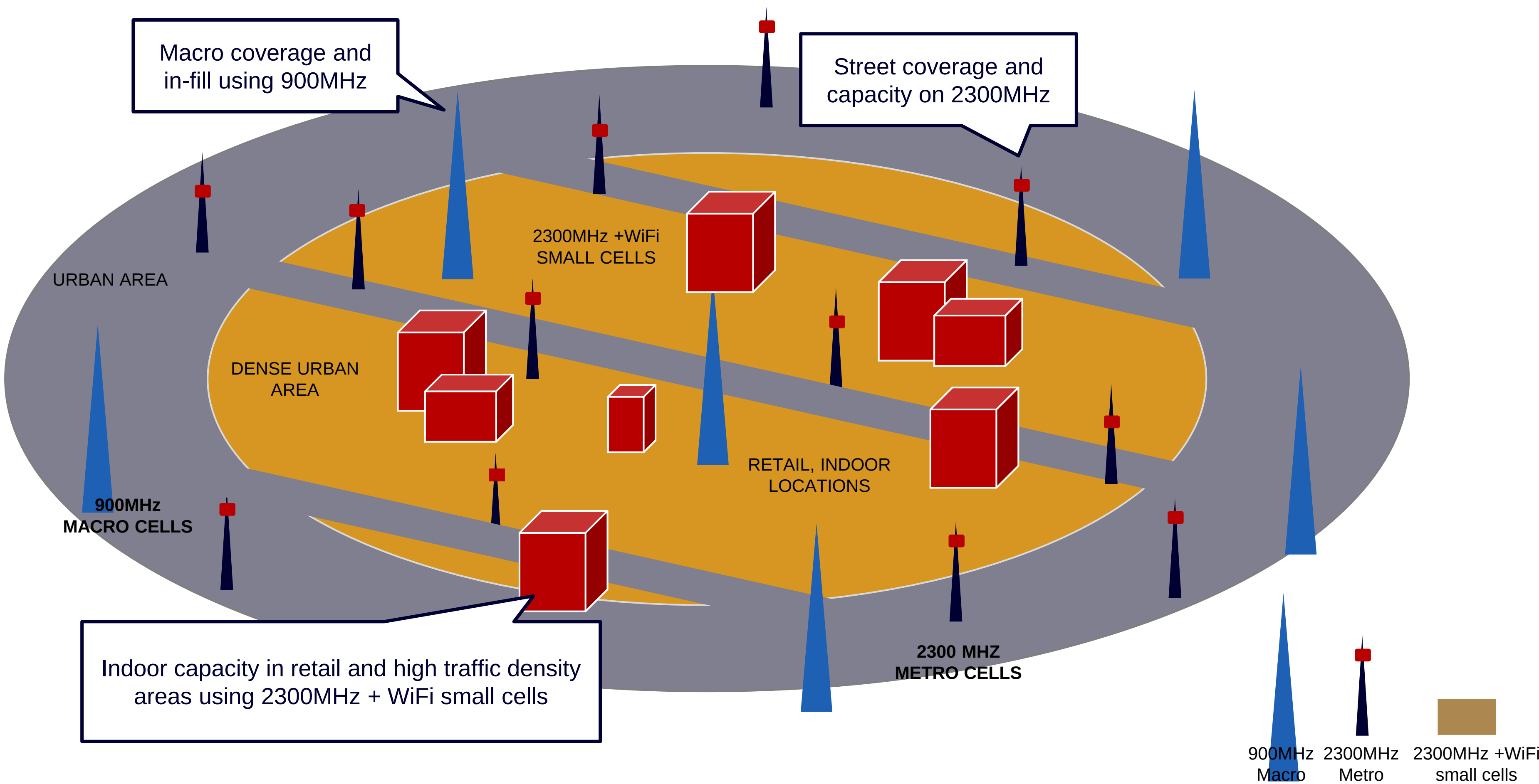
Entrant operators have a business case at ~10% share, with blended ARPU at SGD40+

- We estimate Capex of SGD400mn+ for mobile services
  - We model coverage and capacity for each of the 55 planning areas of Singapore using population density, and traffic share data
  - The model estimates ~4700 sites for macro and street coverage, and ~9,000 small cells at high traffic density locations
  - We estimate network Capex to be ~SGD340mn for this coverage and capacity plan
  - The market price for spectrum is expected to be higher than the base price of SGD35mn - we use SGD50mn in the model
- Business case needs 10%+ market share, SGD40+ blended ARPU and efficient cost management
  - If the entrant operators can attract high usage S$80 plan subscribers, and gain close to 10% share, the returns are positive
  - If the blended ARPU falls below SGD40, either due to price competition, or a lower mix of SGD80 plan users, then the business case risks go up, especially if acquisition costs increase
  - The business case is sensitive to backhaul and Internet bandwidth – the existing fiber offerings to households, and the availability of NGNBN should help with the backhaul planning and expenses
- Cost of relevant content will be a key consideration for the future roadmap
  - Although entrant operators will have access to fiber and FTTx offerings, the currently targeted user base may not be relevant for purchase of bundles
  - The availability and cost of content to monetize bundles will also be a consideration
  - The future roadmap for entrants could be a ‘mobile-only’ play with FTTx business run separately or spun-off, or inorganic expansion to acquire assets and capabilities to develop a triple play service offiering

Network architecture: 900MHz for macro coverage, 2300MHz for street coverage/ and small cell capacity

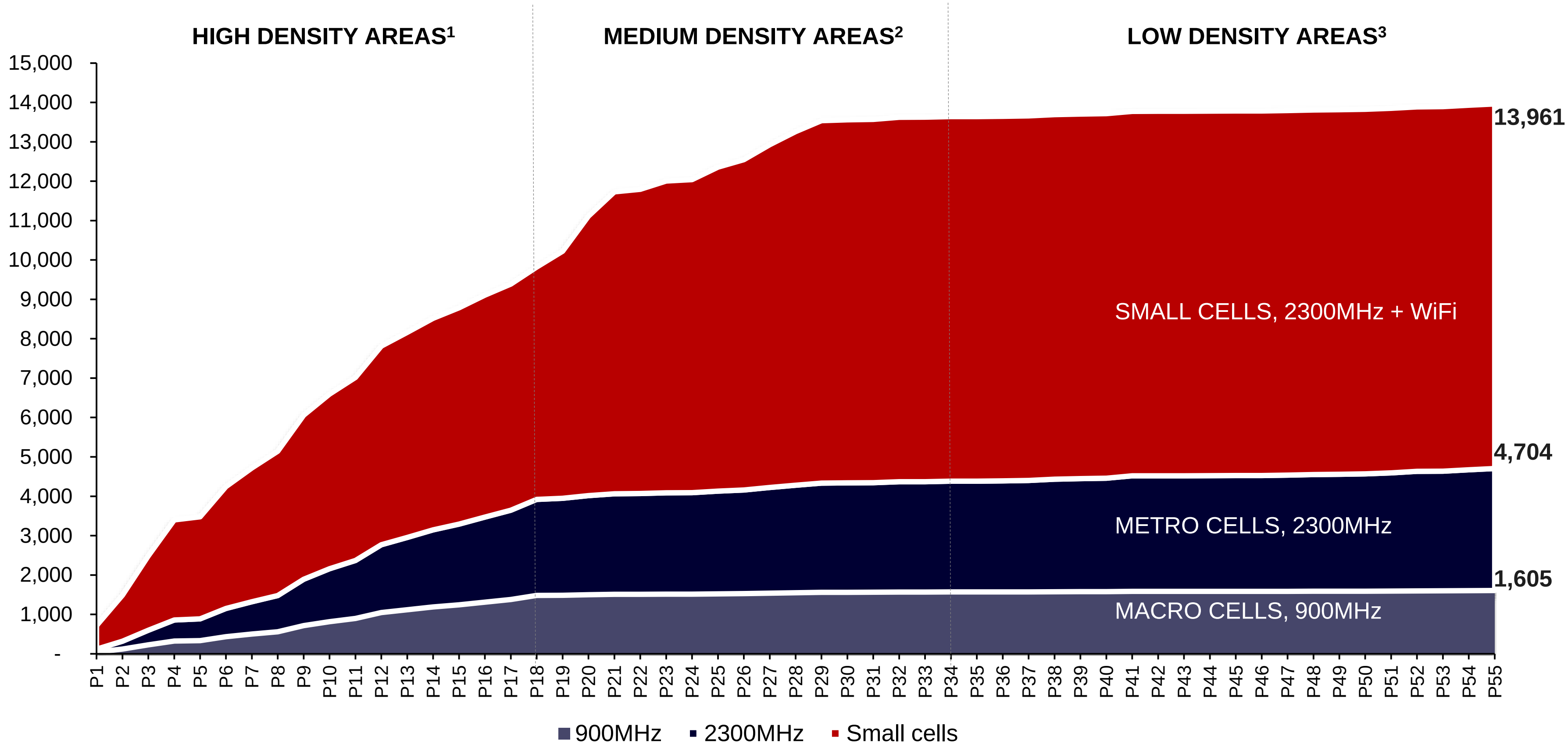


Source: Capitel

We estimate 4,500 macro BTS and 9,000 small cells for 55 planning areas[4] in Singapore

REQUIRED NUMBER OF BASE STATIONS BY FREQUENCY BAND AND PLANNING AREAS

Cumulative sites, nos.

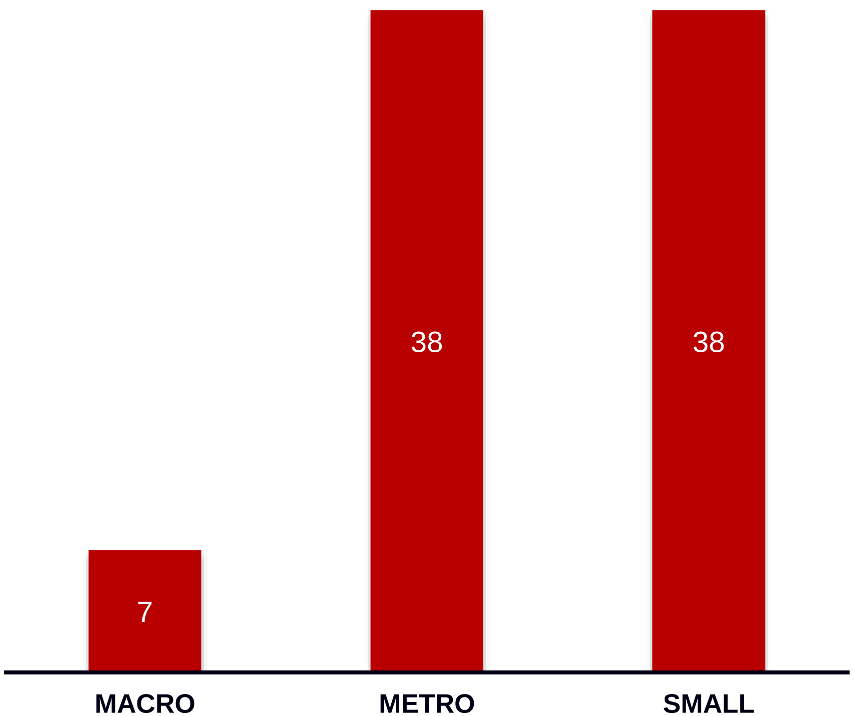


Note: 1. Areas with population density of 15,000/sq km and above 2. Areas with population density between 1,000/sq. km and 15,000/sq. km 3. Areas with population density below 1,000/sq km

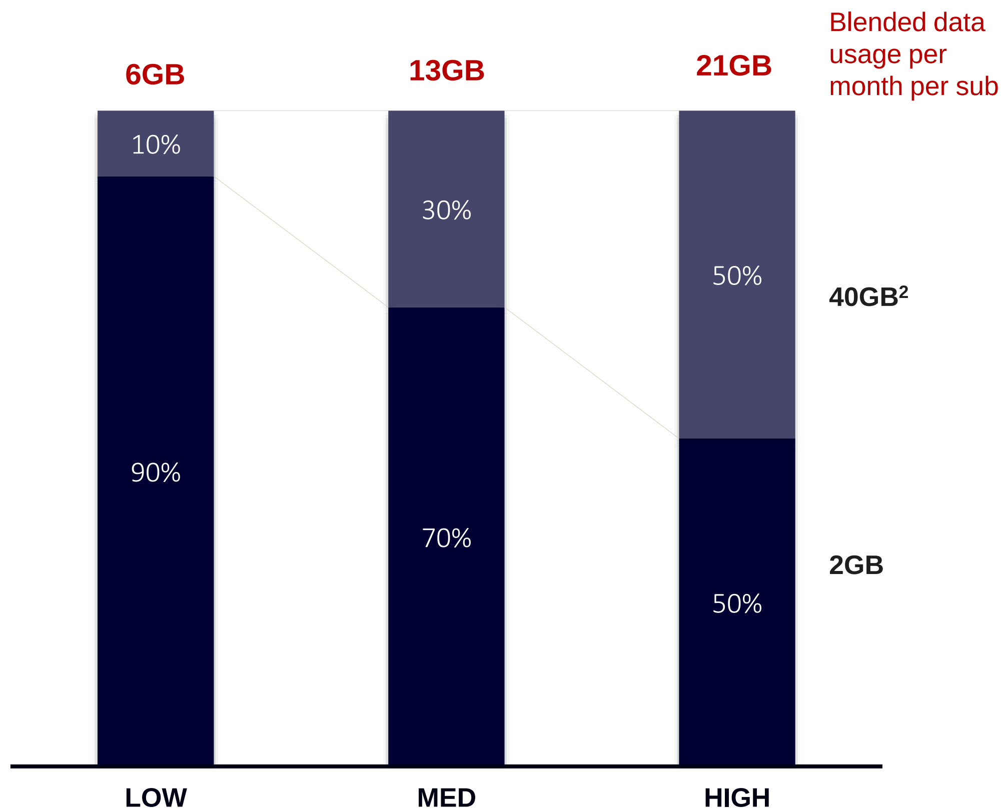
Source: Capitel network model, 4. Department of Statistics, Singapore

This network should provide capacity for managing 10% to 15% subscriber share

INSTALLED CAPACITY BY TYPE OF CELLS
PB per month



SUBSCRIBER MIX BY MONTHLY MOBILE DATA USAGE

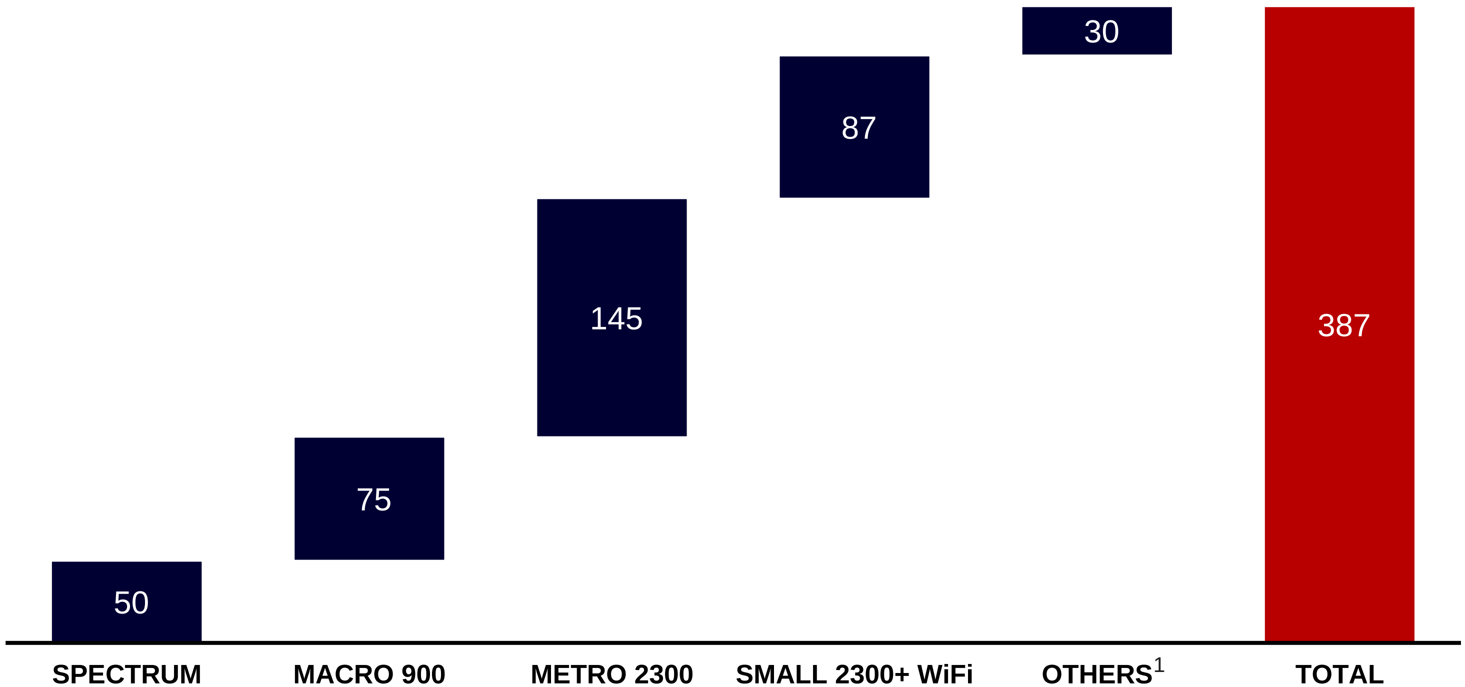


Note:1. Network utilization calculated at 15% subscriber share 2. Average data usage for subscribers on unlimited data plan

Source: Capitel network model

We estimate ~S$400mn as the starting Capex for mobile services

TOTAL CAPEX, BY COMPONENT
S$, Million



No. of sites	-	1,605	3,099	9,257	-	13,961

Note: 1. High level estimate, includes non-network and non-spectrum Capex for IT, billing and other areas
Source: Capitel network model

The business case works for 10%+ markets share and 40%+ high ARPU subscribers

EBITDA BY MARKET SHARE AND SUBSCRIBER MIX[1]

Market share	LOW 10:90	MED 30:70	HIGH 50:50
5%	-34%	2%	15%
10%	-12%	16%	26%
15%	-1%	25%	33%

Subscriber mix

ROCE[2] BY MARKET SHARE AND SUBSCRIBER MIX

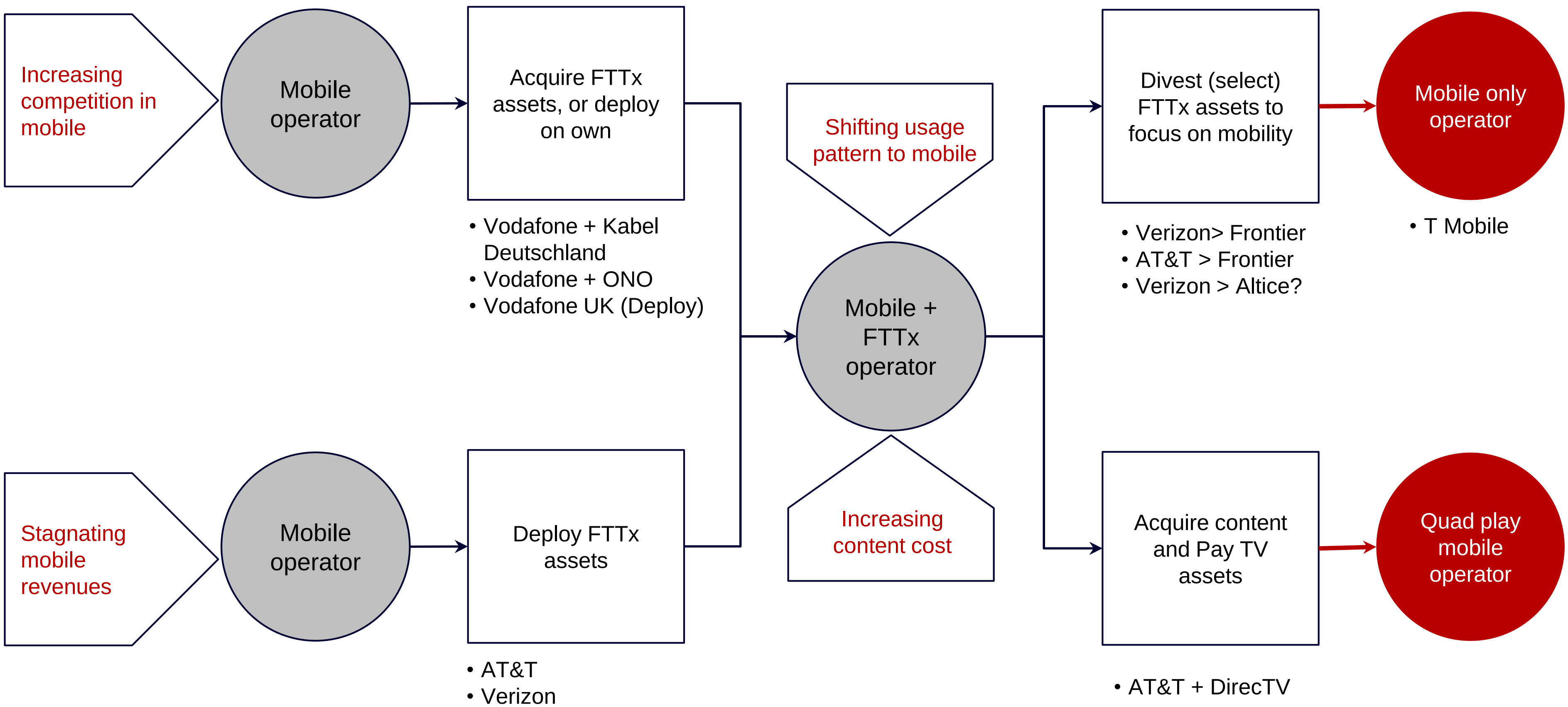
Market share	LOW 10:90	MED 30:70	HIGH 50:50
5%	-13%	-6%	2%
10%	-11%	6%	22%
15%	-7%	21%	49%

Subscriber mix

1. Subscriber mix refers to the mix of low ARPU S$8 and high ARPU S$80 subscribers as per representative plans of one new entrant used for illustrative calculations 2. EBIT as % of Capex

Source: Capitel network model

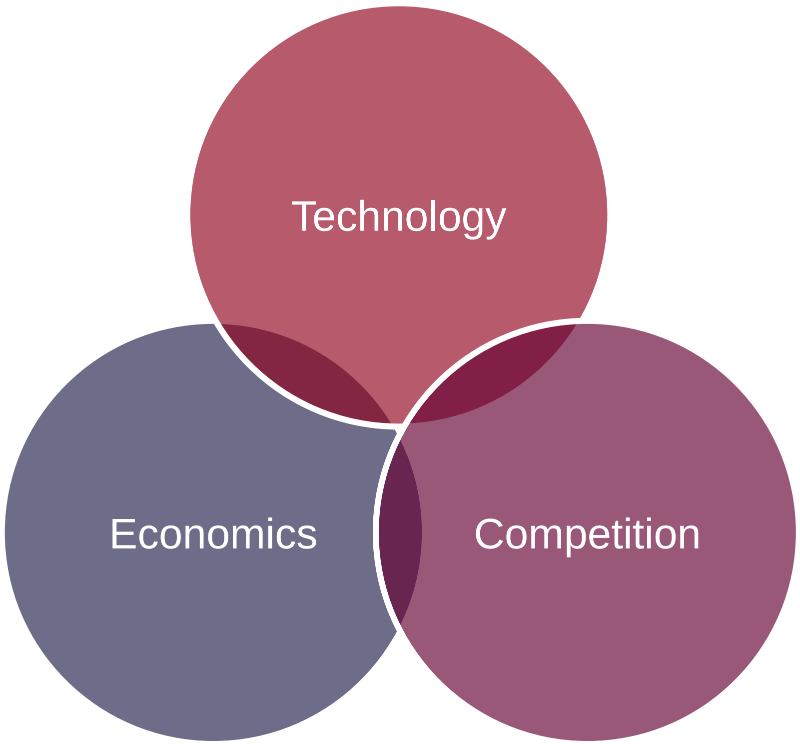
Similar to global operators, entrants will need to decide on a mobile vs. full service play



Source: Capitel analysis, company reports, engagement experience

We are specialist, techno-commercial advisors in Telecoms, Media and Internet

We leverage our strong techno-commercial and market understanding …



… to assist clients with key investment and planning decisions within Telecoms, Media and Internet

Service providers and regulators

- Spectrum planning and strategy
- Technology planning and strategy
- Network planning and Capex optimization
- Market planning and go-to-market strategy

Financial and strategic investors

- Investment evaluation
- Commercial due diligence
- Technical due diligence
- Post investment planning support

We address complex techno-commercial questions for service providers and regulators

	FOCUS AREAS	ENGAGEMENT AREAS
SERVICE PROVIDERS AND REGULATORS	SPECTRUM	Spectrum planning and valuation • Network traffic forecasting, alignment with spectrum availability from auctions and secondary markets • Evaluation of regulatory interventions such as re-farming, sharing and trading • Valuation of spectrum using DCF, technical efficiency and global benchmarks for client and competitors Auction advisory • Pre-auction support for evaluating competitor bidding strategy and spectrum need • Evaluation of bid range for competitors
	TECHNOLOGY	Technology roadmap and network economics • Economic comparison of fixed and mobile broadband technologies such as FTTx, Cable, LTE, MeshWiFi • Current and future traffic demand from consumer base, and target cost per MB to ensure profitability Network planning and Capex optimization • Key decisions on network parameters including roll-out trade-offs, timing of launch of networks, and the capacity required across all layers to support traffic and voice support models • Cluster planning based on RoI analysis for fixed line operators
	MARKETS	Business planning • Subscriber and device demand projections at a circle level, by technology and spectrum bands, evolution of price per min, revenue per MB and other growth metrics, share of WiFi, IBS and small cells • Network Capex projections for coverage and capacity deployment, by technology options Proposition development • Identification of key clients and their most important needs – development of product, pricing, channels • Competitive strategy on pricing, cost, channels, devices and partnerships

We advise investors on major investments, and help portfolios with operational planning

	FOCUS AREAS	ENGAGEMENT AREAS
FINANCIAL AND STRATEGIC INVESTORS	INVESTMENT EVALUATION	Public equities • Techno-commercial planning and market analysis support for hedge funds and Institutional investors evaluating major investments in public equity markets Private firms • Techno-commercial planning and market analysis support for PE funds considering stressed asset situations, participating in competitive bids, and proactively evaluating investment areas/firms
	DUE DILIGENCE	Commercial due diligence • Meeting with client teams and data requests • Industry inputs and feedback • Proprietary models and analysis • Business plan validation, and • Assessment of key regulatory risks and their impact on business viability Technical due diligence • Assessment of per unit economics for technology, design and planning assumptions and scalability • Field visits by Capitel team, supported by our partner networks for technical due diligence of telecoms infrastructure including fixed asset verification
	POST-INVESTMENT SUPPORT	Operational planning • Operational planning for geographical markets, service launch and other GTM activities • Decision support on competitive situation, service offerings and pricing • Revision of technology and spectrum roadmaps based on above Acquisition and spin-off decisions • Support with spectrum sale, valuation, asset sale based on operational planning results

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