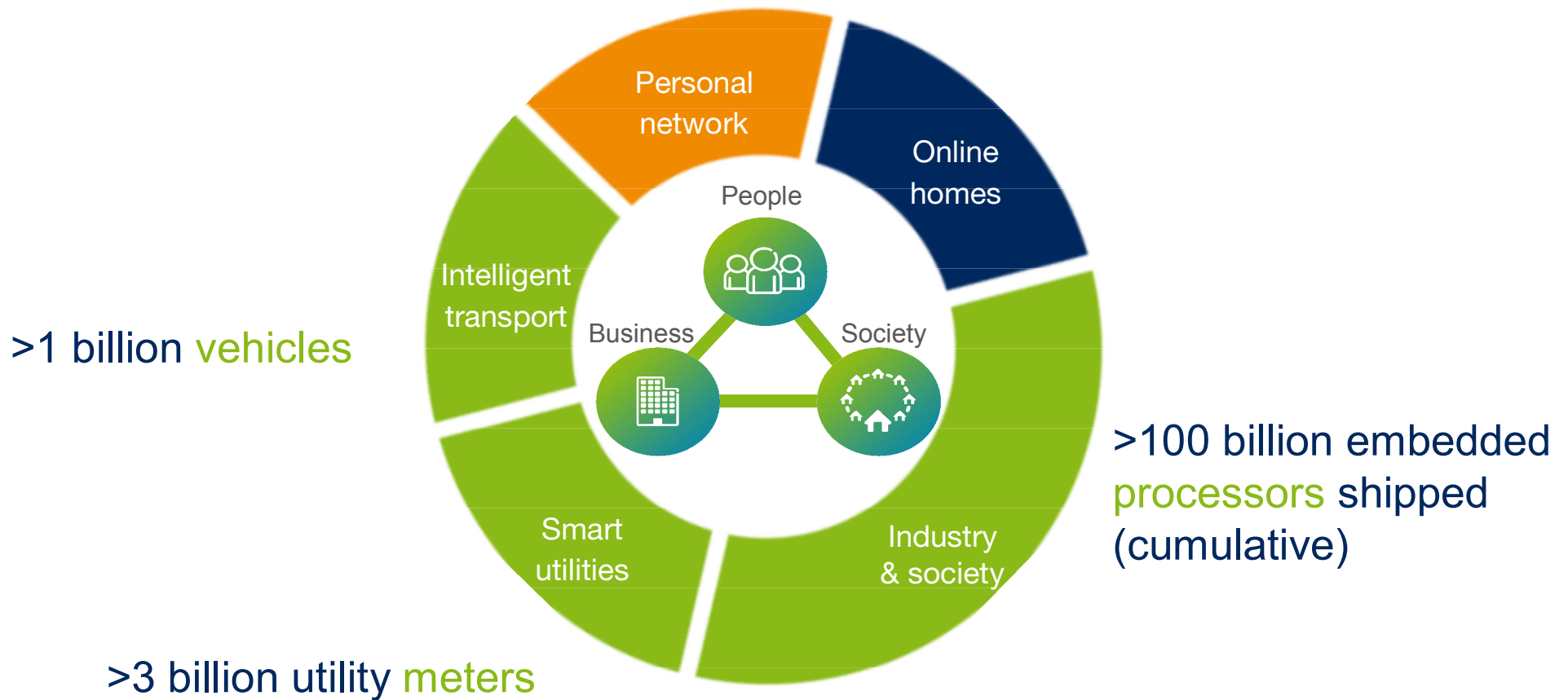


50 BILLION CONNECTED DEVICES 2020

3 billion middleclass consumers



THREE WAVES OF CONNECTED DEVICES

Increased proposition reach

Improved value propositions – consumer lifestyle

Increased process efficiency

Increased human effectiveness

Networked Everything
Networked Society

Networked Consumer Electronics



1ST WAVE

Networked Verticals 2.0 Industries

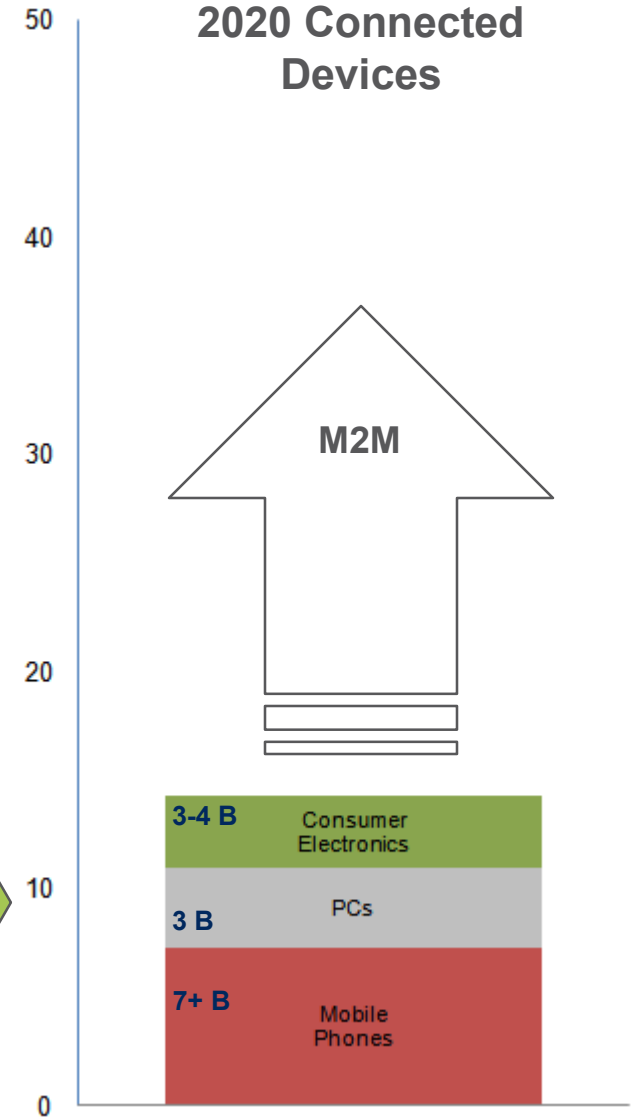
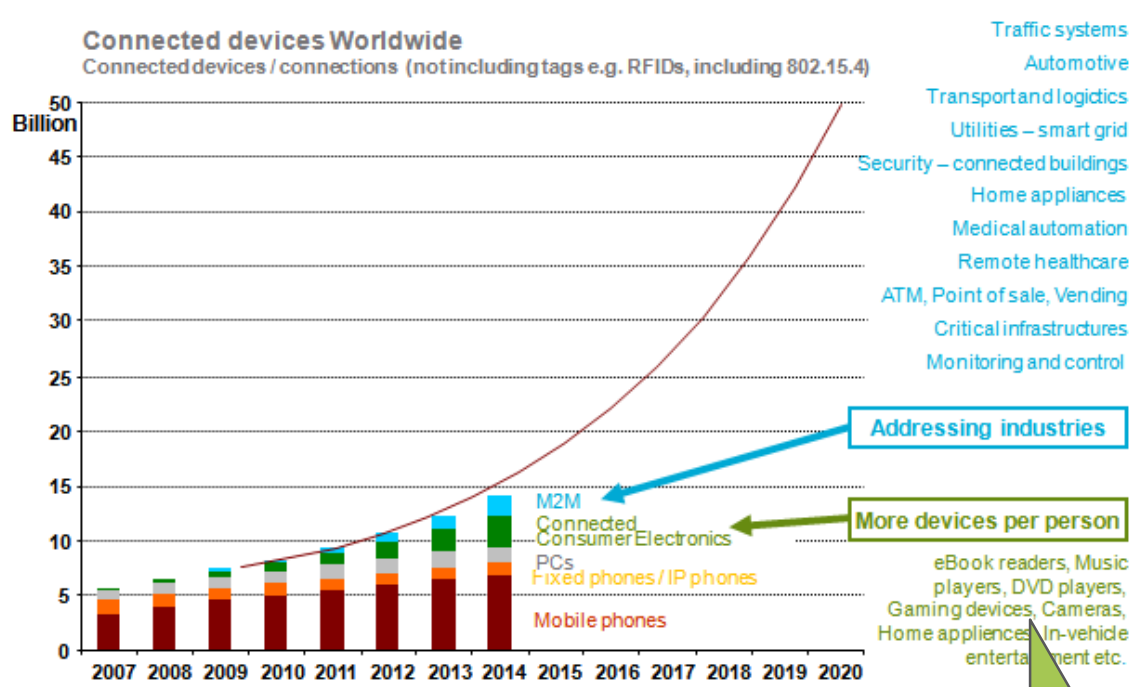


2ND WAVE

3RD WAVE



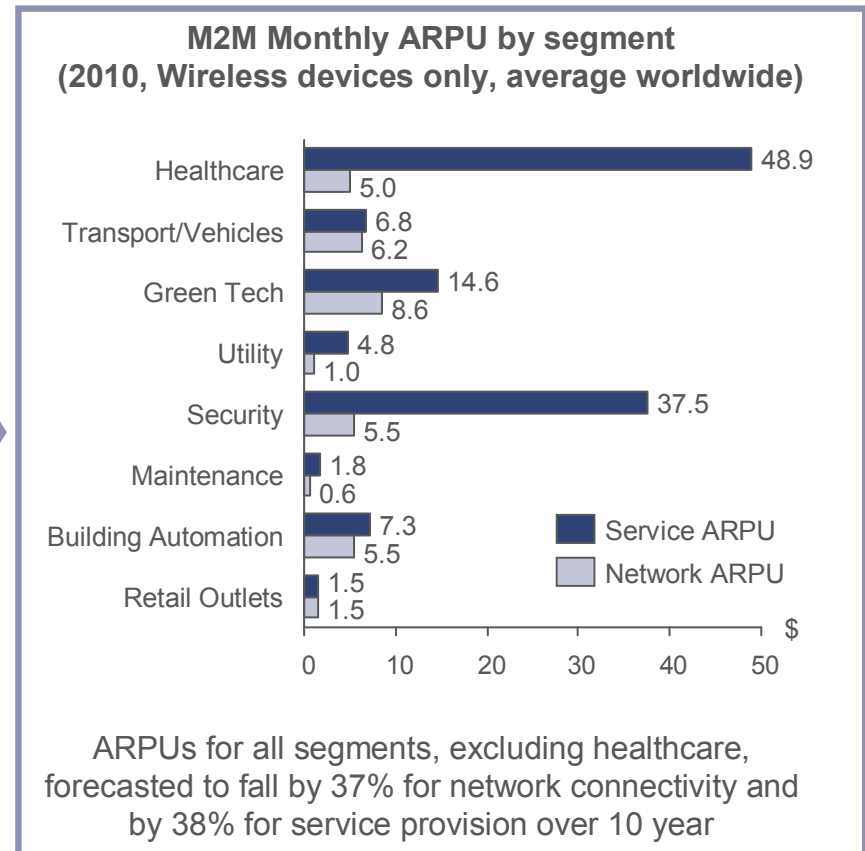
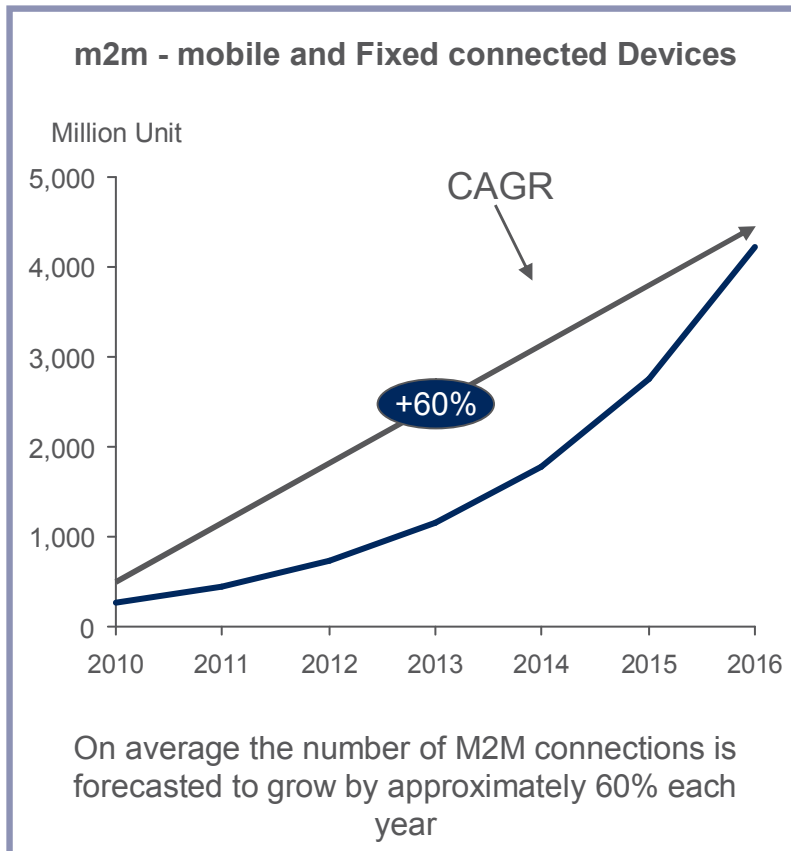
WHERE THE THIRD WAVE OF CONNECTIONS WILL COME FROM?



50 BILLION CONNECTED DEVICES:

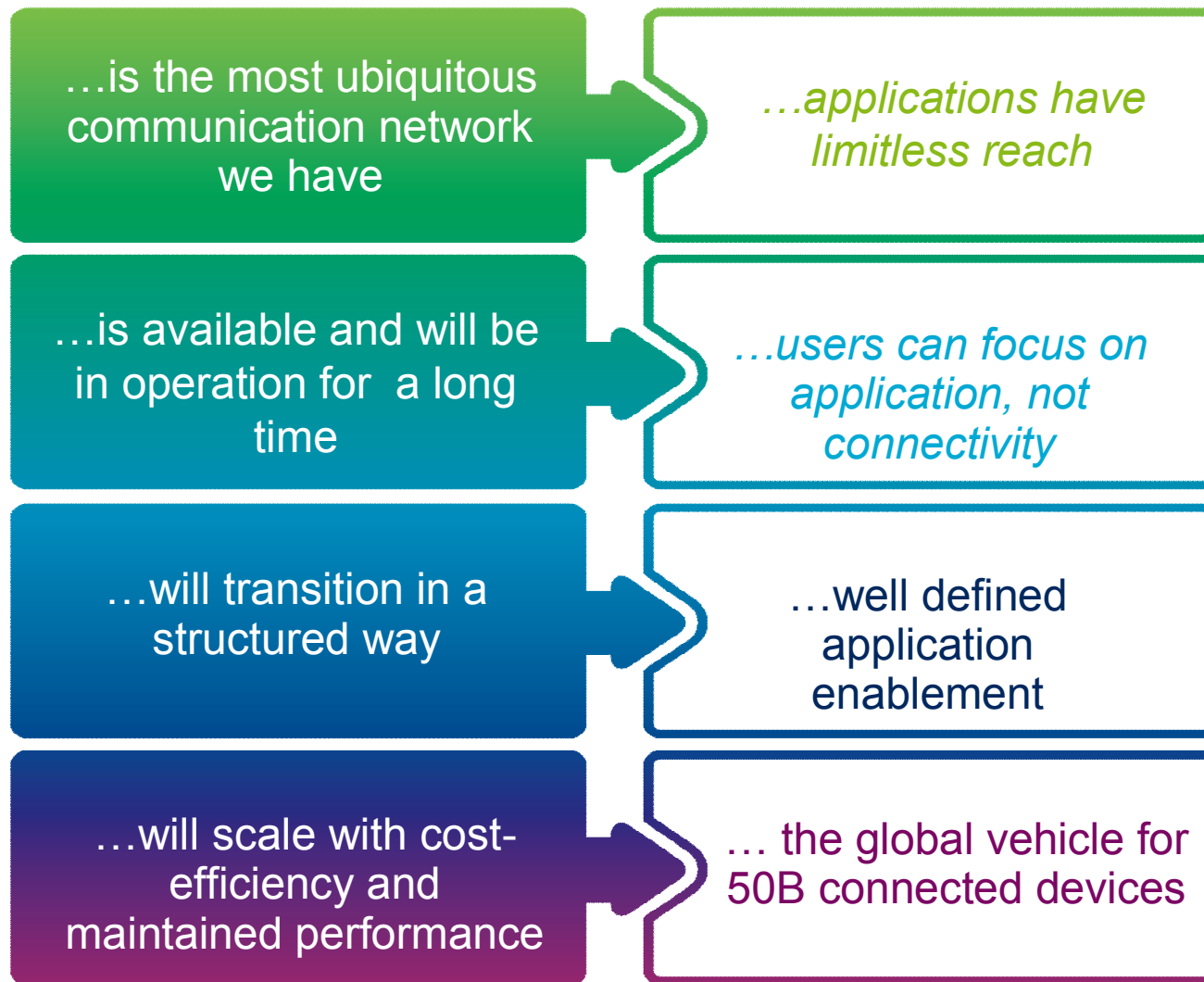
- ~10 billion connections are assumed to come from phones and mobile broadband.
- The remainder must come from new categories - connected devices beyond people.

M2M MARKET EXPLOSION



M2M opportunities for operators in variety of roles
Efficiency and simple business model are critical to grow with good margins

THE MOBILE NETWORK...

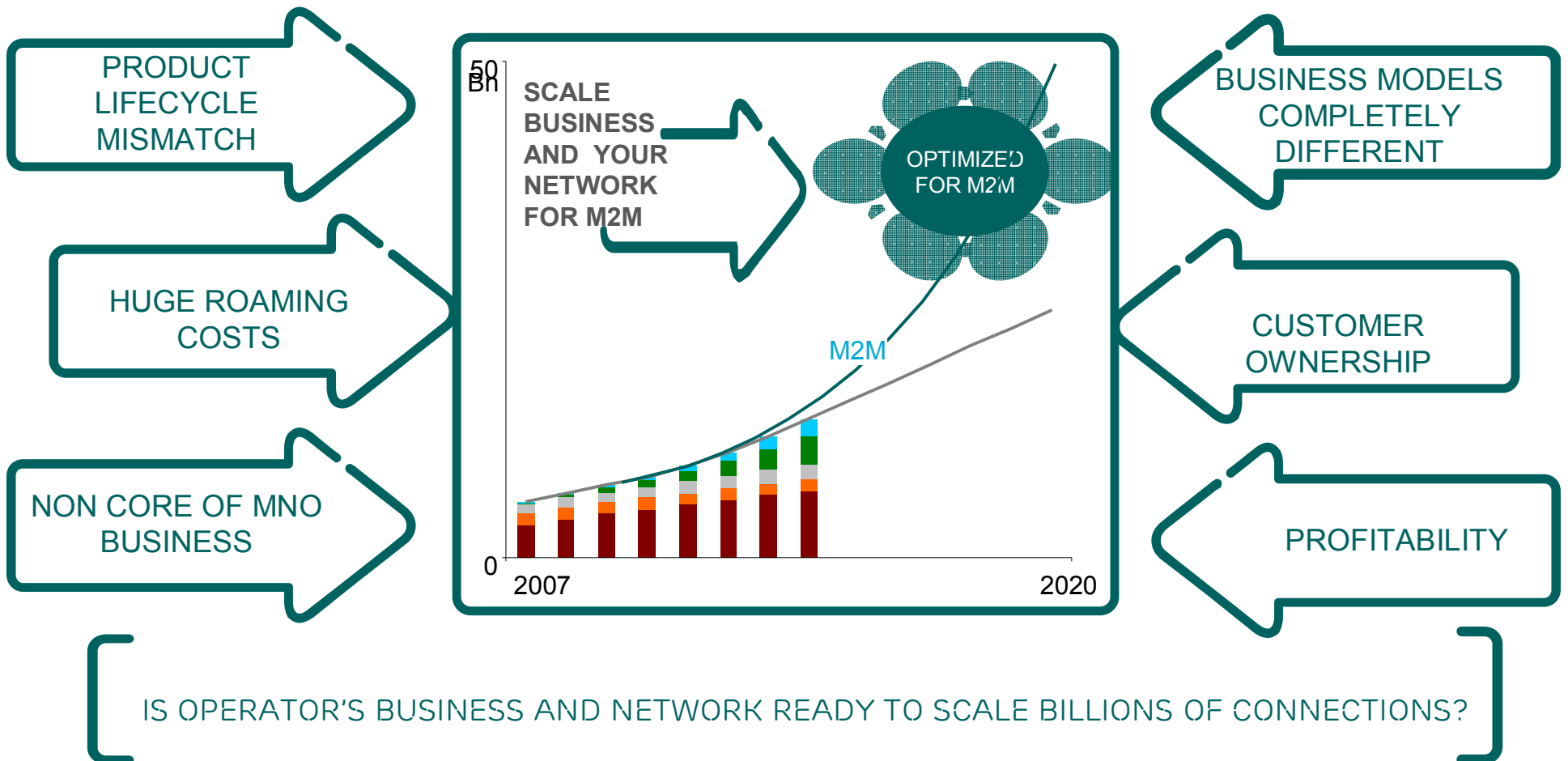


MARKET PERCEPTION M2M CHALLENGES

MARKET PERCEPTION CHALLENGES

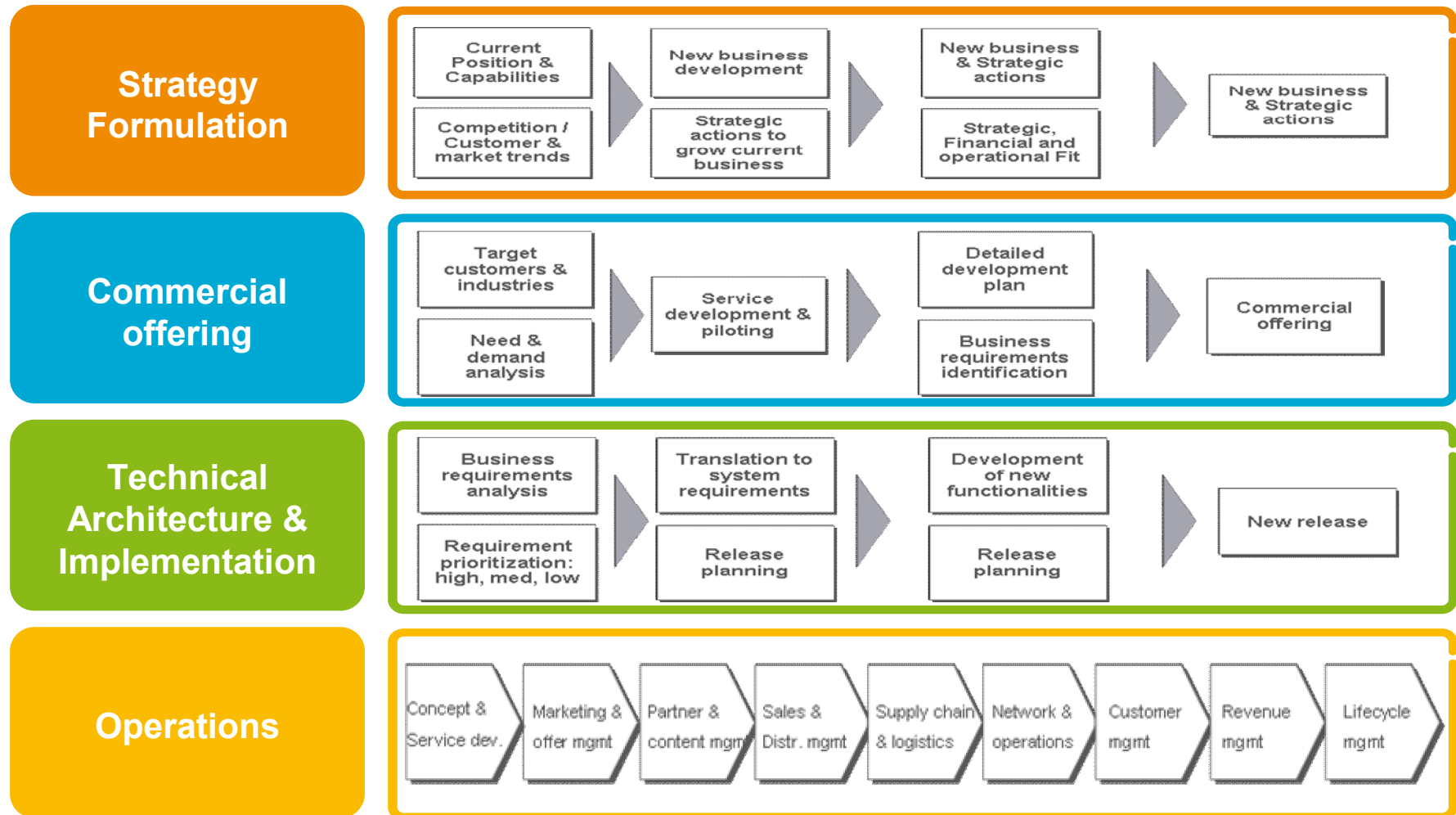
OPTIMIZED M2M STRATEGY

BUSINESS MODEL CHALLENGES



KEY OPERATIONAL PROCESSES, FROM BUSINESS STRATEGY TO SYSTEM SUPPORT

Conceptual overview of operational processes –varies operator-by-operator basis



TECHNICAL ARCHITECTURE & IMPLEMENTATION

Solution diversity

Customization

Complex integrations

New requirements

Considerations –vertical business:

- > Vertical solutions are often very diverse:
 - > Consists of various technologies & applications
- > Customization & complex integration:
 - > Long integration time, typically 6-24 months per customer
- > New requirements:
 - > Billing, provisioning, roaming etc.
 - > E.g. devices & SIM cards to tolerate vibration, humidity and high temperatures

What are the current technical capabilities and do they fulfill the customers needs?

OPERATIONS

High volume, low ARPU business

Operational efficiency

End-to-end support

Partner management

Considerations –vertical business:

- > M2M ARPU often 10% of mobile ARPU:
 - > Challenge to cut & maintain low OPEX
- > Process optimization through outsourcing
- > Business critical solutions:
 - > 7/24 hour support required end-to-end
- > Solutions have to work end-to-end:
 - > Management of 3rd party solutions

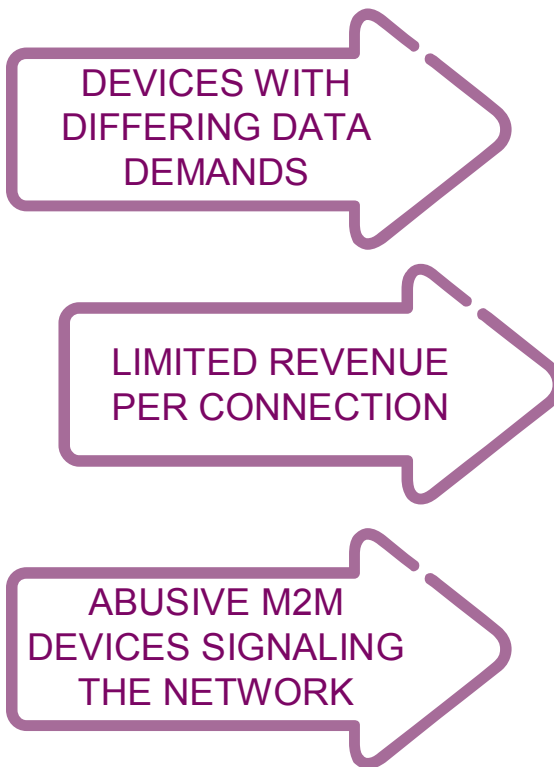
Many choices in complex operational environment, which are the key opportunities for you to improve operational efficiency?

HANDLE DEVICE SCALE

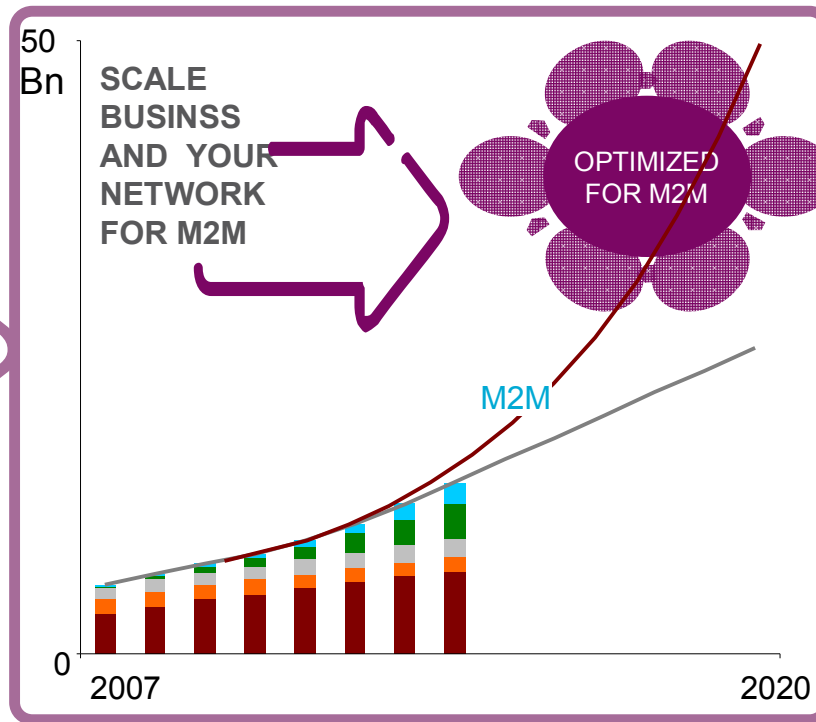


M2M SCALING CHALLENGES

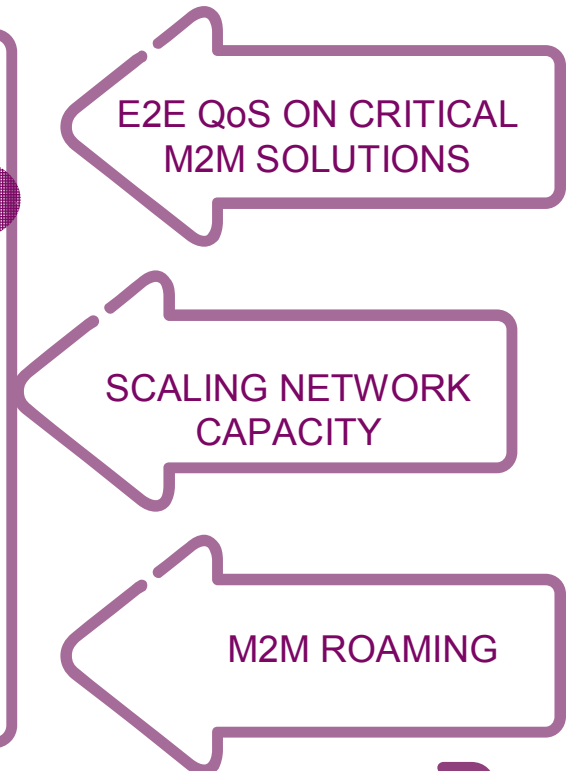
M2M DEMANDS



OPTIMIZED M2M STRATEGY

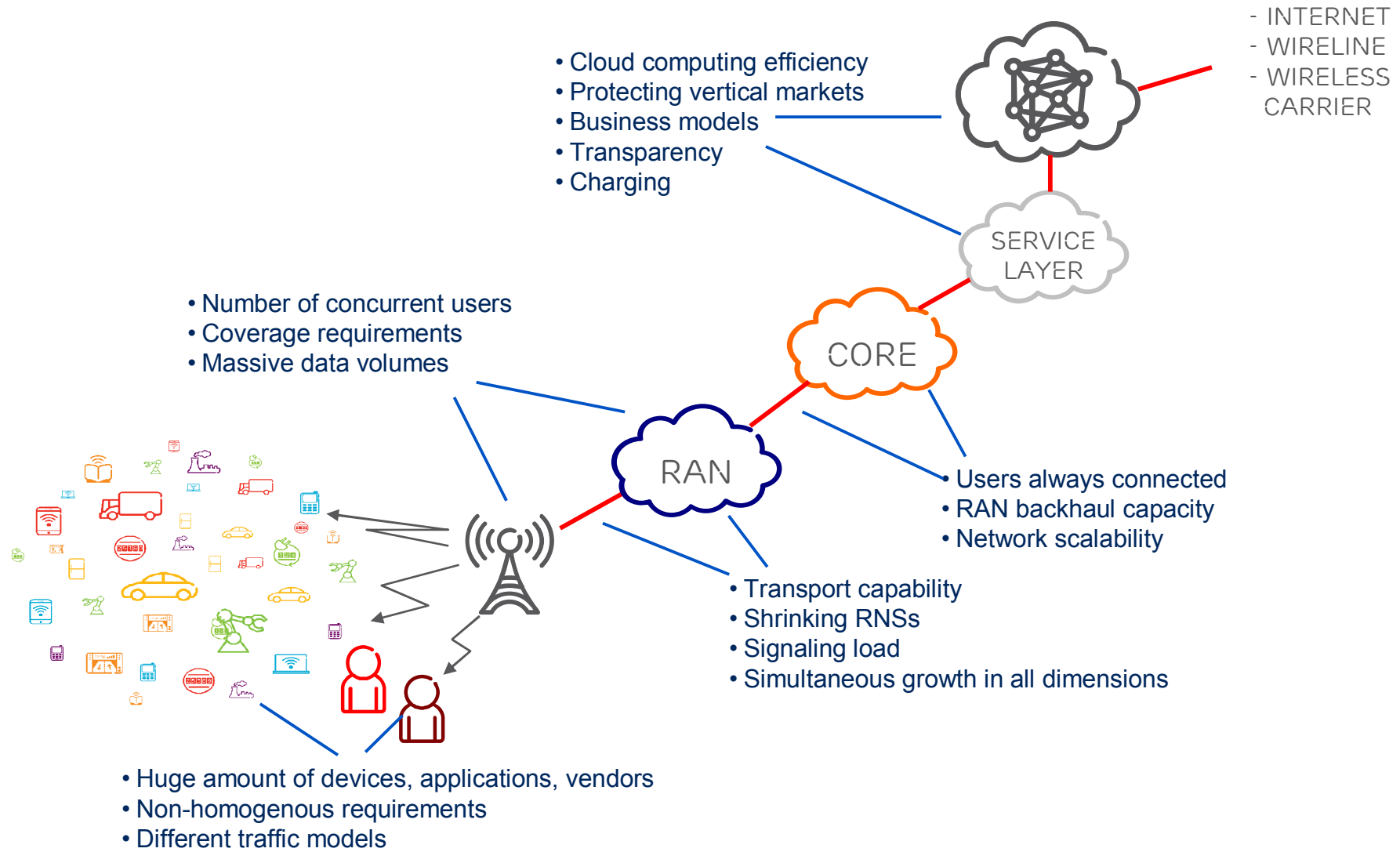


WHERE ARE THE CHALLENGES?



IS YOUR BUSINESS AND NETWORK READY TO SCALE BILLIONS OF CONNECTIONS?

MOBILE NETWORKS MEET THE DEMANDS OF 50B



M2M NETWORK CAPACITY

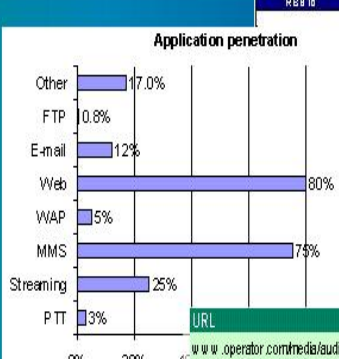
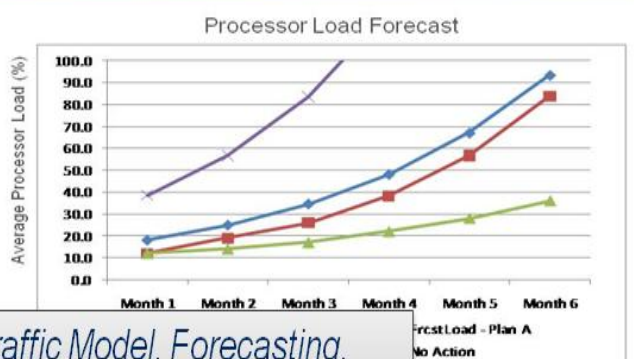
	P2P (6B)	M2M (50B)
Forecast	Terminal Distribution, User Pattern, Trends & Application Characteristics	Device Characteristics & Growth, Application Characteristics & Traffic Model
Plan & Design	Long term planning, Optimal Design & End-User Performance	Optimal Network Utilization, Key Capacity Indicators & In-service Perf.
Deploy	Secure E2E Network Capacity, Quality Focus & Flawless Execution	Secure E2E Network Capacity, Adherence to Methods & Procedures
Measure & Tune	Monitor alignment to predicted result, Update model & ensure capacity margin	Monitor resource utilization, tune based on trends & intelligent mgmt. of devices



- INTERNET
- WIRELINE
- WIRELESS CARRIER

SECURE END-TO-END NETWORK CAPACITY

MANAGING THE SMART PHONE EXPERIENCE



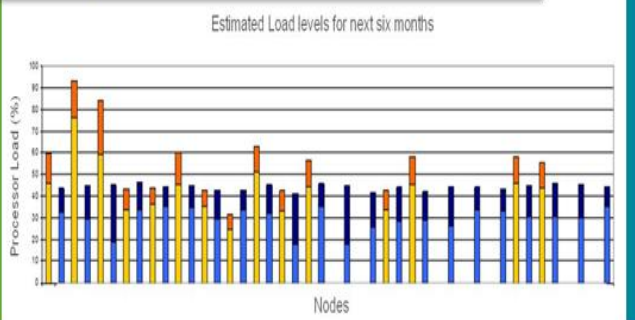
RBB ID	Rsg	Rsg Cc	Rsg Pk	LinkID/ChnCode	LinkID/Port	Rsg Cfg	R AddA#	LinkPortCode	BoardRtBite (Vec/No)
25542	1963	20858	11	1204	22621	63632	1215	1215	No
4131	4225	30107	0	822	34632	96913	822	822	No
421	3963	23496	12	425	21499	67905	437	437	Yes
453	3670	40699	1	362	44299	73030	363	363	Yes
397	4289	36252	33	179	40541	91478	212	212	No
124	4945	30968	1	200	39913	79209	204	204	Yes
850	4261	25594	0	166	29895	85916	165	165	Yes
630	4249	29376	98	55	33625	81135	163	163	Yes
675	3305	13673	0	152	16879	91853	162	162	No
600	3756	28182	0	148	31938	68782	148	148	No
697	2771	17638	0	144	20409	49967	144	144	Yes
698	3135	16808	1	137	19943	26933	138	138	No
672	3297	23696	0	126	27163	70714	126	126	Yes
676	3304	15395	0	120	19939	84743	120	120	Yes
297	4071	21156	0	118	25226	89465	118	118	Yes
672	4904	34672	0	111	39476	106200	111	111	No
747	2822	16128	0	104	19090	42952	104	104	Yes
677	4136	23551	0	104	37999	70966	104	104	No

Traffic Model, Forecasting, Smart Phone Impact Study, Network Strategy Consulting

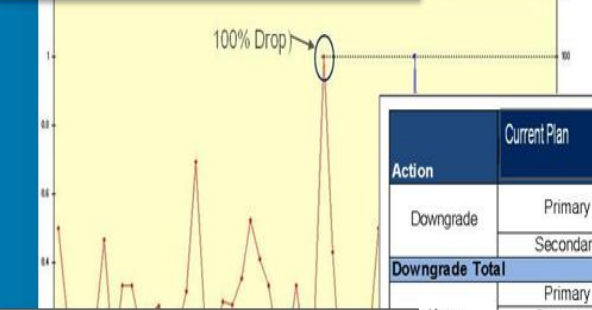


Traffic Profile is evolving due to launch of new services, devices and applications, in addition to the traffic growth.

Capacity Planning, Consulting and Optimization



Application Usage / Characteristics



Network Performance Analysis

Action	Current Plan	Recommended Plan	No. of Instances
Downgrade	Primary	Secondary	2
	Secondary	Tertiary	7
Downgrade Total	Secondary	Tertiary	6
	15		
Keep	Primary	Primary	6
	Secondary	Secondary	7
	Tertiary	Tertiary	10
Upgrade	Secondary	Primary	3
	Tertiary	Primary	2
	Tertiary	Secondary	1
Upgrade Total			6
	Grand Total		44

Network Audits & Performance investigations

Network Node and Interfaces



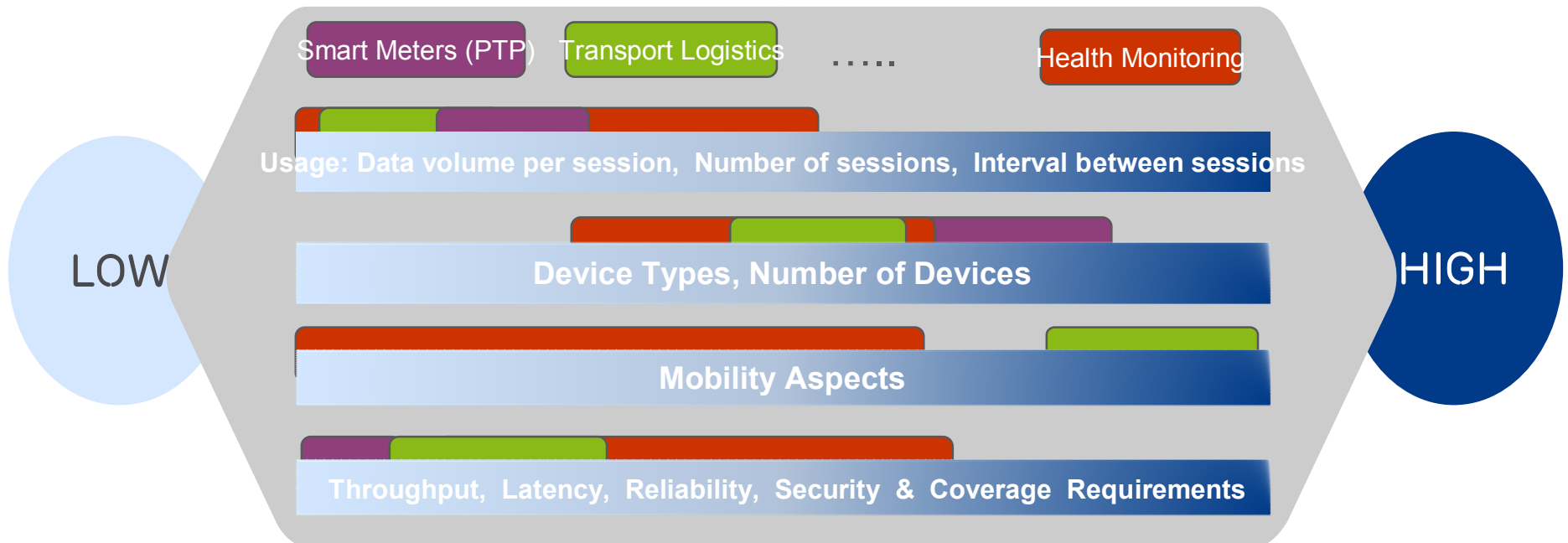
Mobility Analysis

BEYOND SMARTPHONE, MANAGING M2M PERFORMANCE

"THE HEART RATE MONITOR HAS TO WORK AT THE **SAME TIME** AS THE YOU TUBE VIDEO"

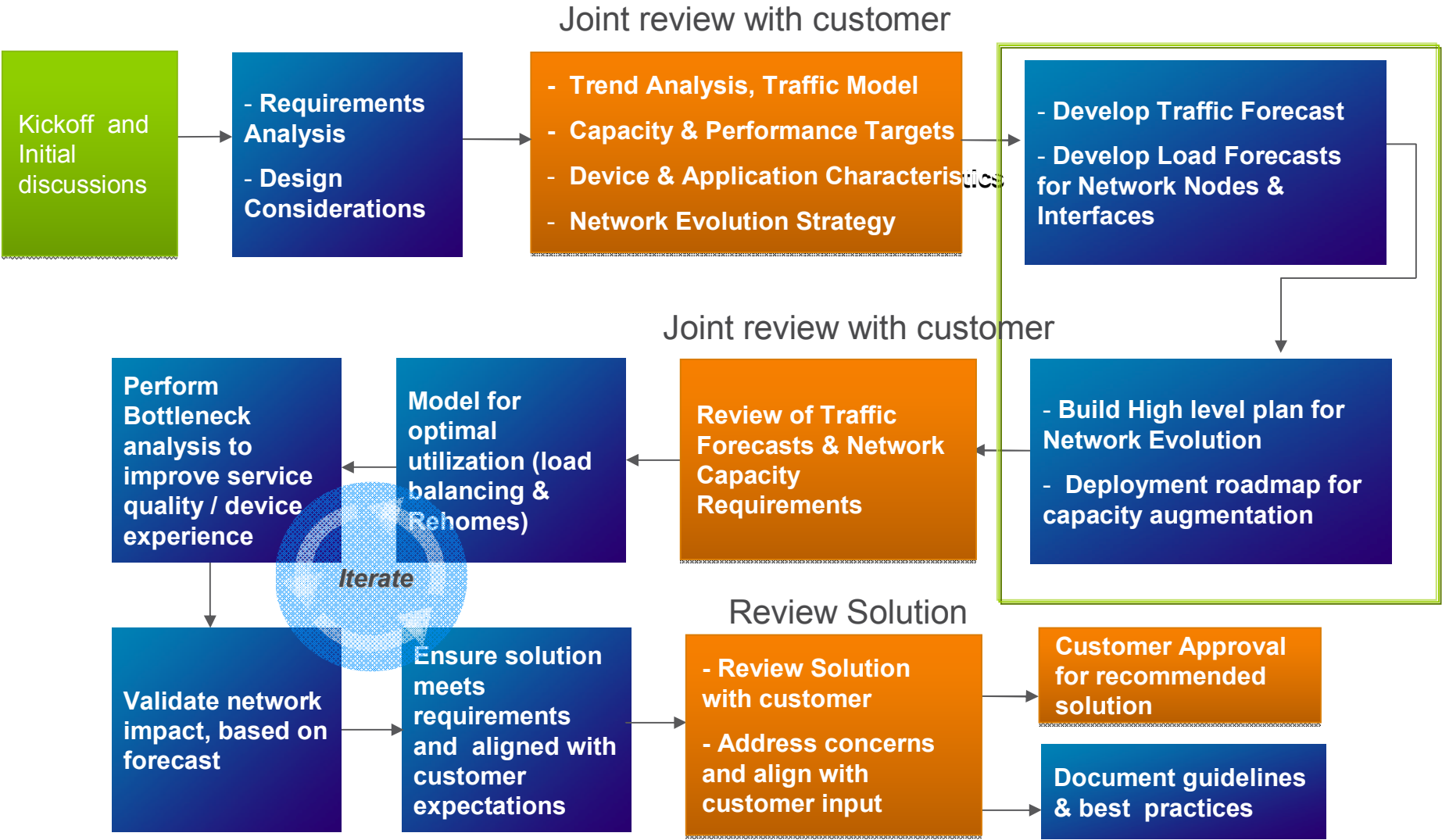
NETWORK PLANNING QOS

DEVICES WITH DIFFERING DATA DEMANDS (EXAMPLE)



LONG TERM FORECASTING CAN REDUCE WASTED SPEND!

GUARANTEEING THE DEVICE EXPERIENCE!



MANAGING DEVICE EXPERIENCE IS A CONTINUOUS BEST PRACTICE ACTIVITY

M2M SERVICE QUALITY OPTIMIZATION

Performance Issues

- > Like finding needle in a haystack.
- > A variety of devices with many different requirements

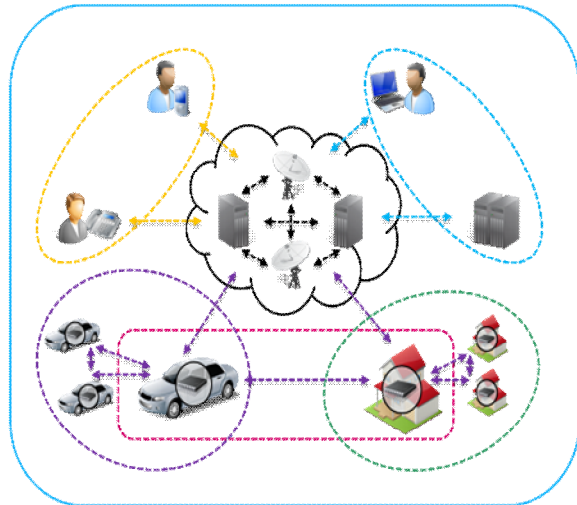


Our Approach

- > Passive probing: track each device/ application
- > Assess network performance vs. expectations

Value

- > Deliver *observability on device experience*
- > *Discover requirements of M2M*
- > Understand impact of network performance on device experience
- > Identify performance bottlenecks



MANAGING DEVICE EXPERIENCE IS THE KEY



ERICSSON