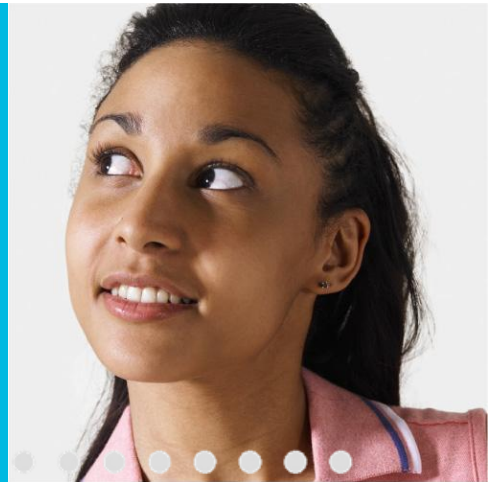


LTE, WiMAX, 4G.... Where is Wireless going?



Anthony Berkeley

November 2009

A demanding market reality for service providers...



Video & content consumption is booming...

Affordable broadband, proliferation of smart devices, multiplicity of multimedia/video applications



... but users expect more...

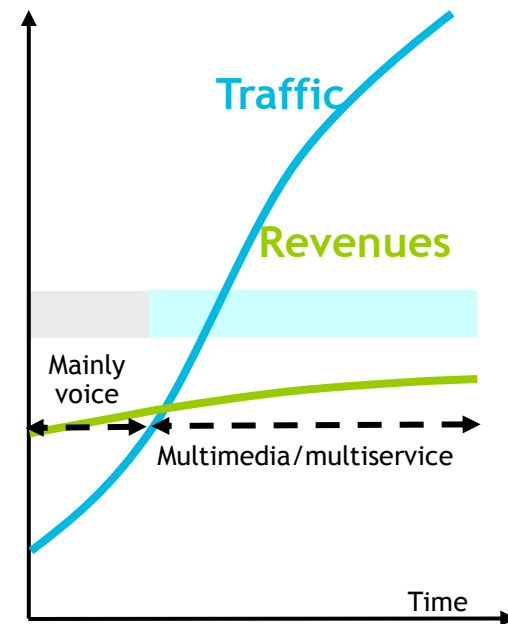
Simple, personalized access and interaction, across any device, any network, anytime, anywhere



... and access to 3rd party apps & content

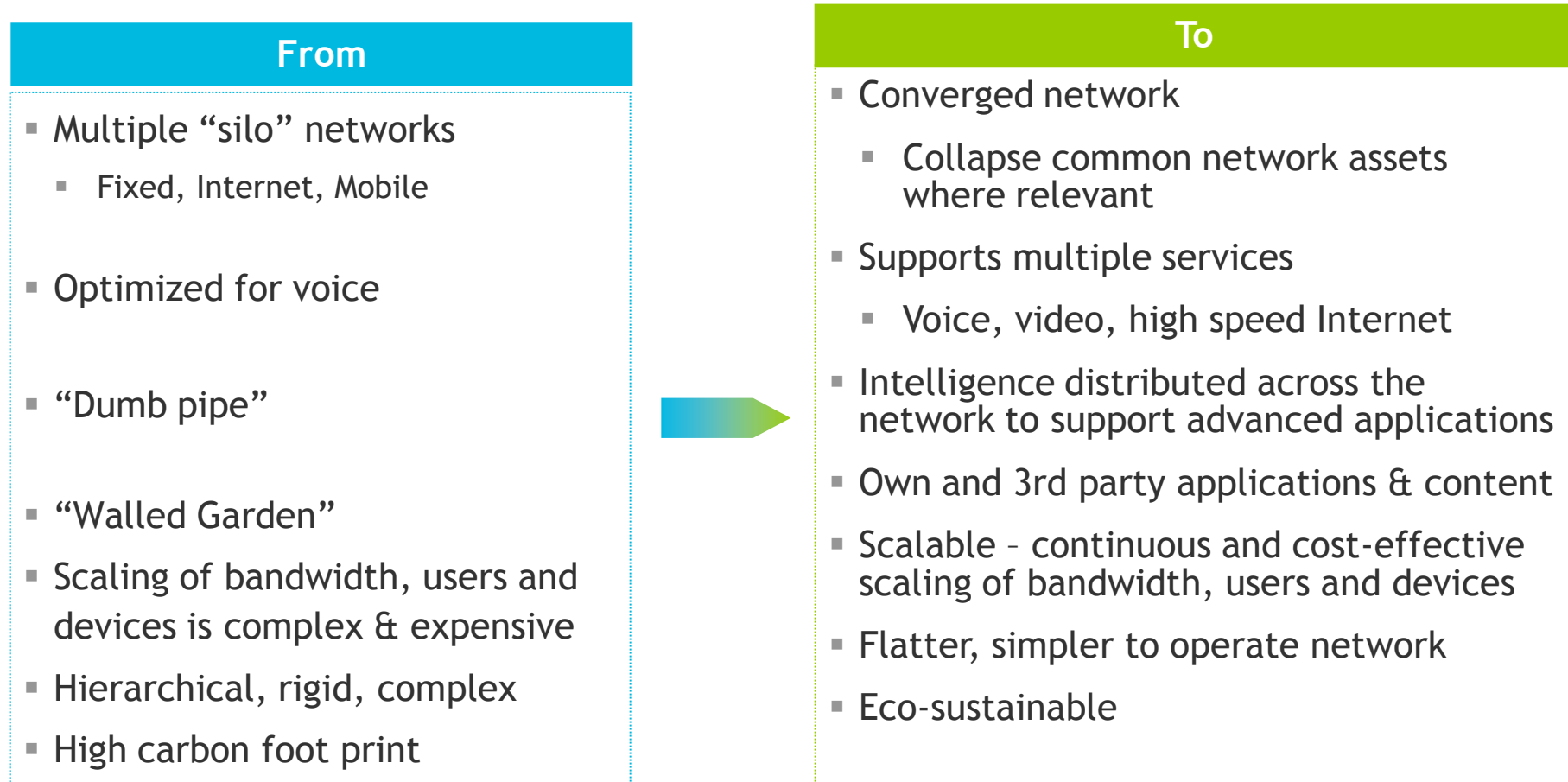
Paid for by advertisers, free to end-users - telcos extracting limited value

Cost Challenge



It becomes critical to accelerate the transition to
all-IP multiservice broadband networks

... makes network transformation a necessity today



Reducing complexity, cost and time to service - The High Leverage Network

What is the High-Leverage Network?

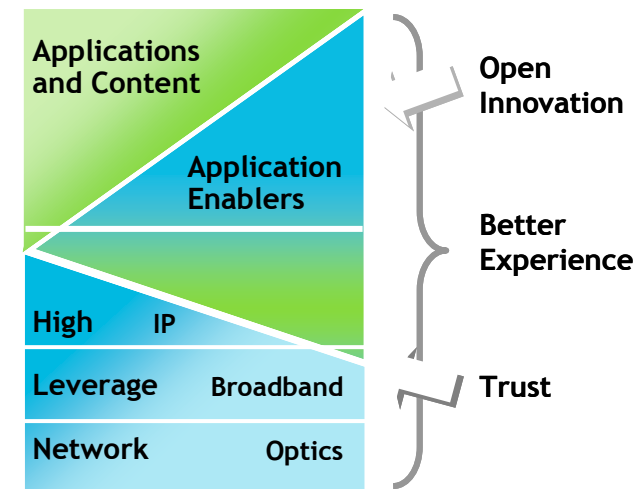
The network required to support:

1. Lowest cost bit delivery

- Continuous bandwidth scaling and automation - from the access to the transport layer
- Converged, carrier-grade scalability, quality and reliability
- Leading technologies in wireline and wireless Broadband Access, Optical and Routing

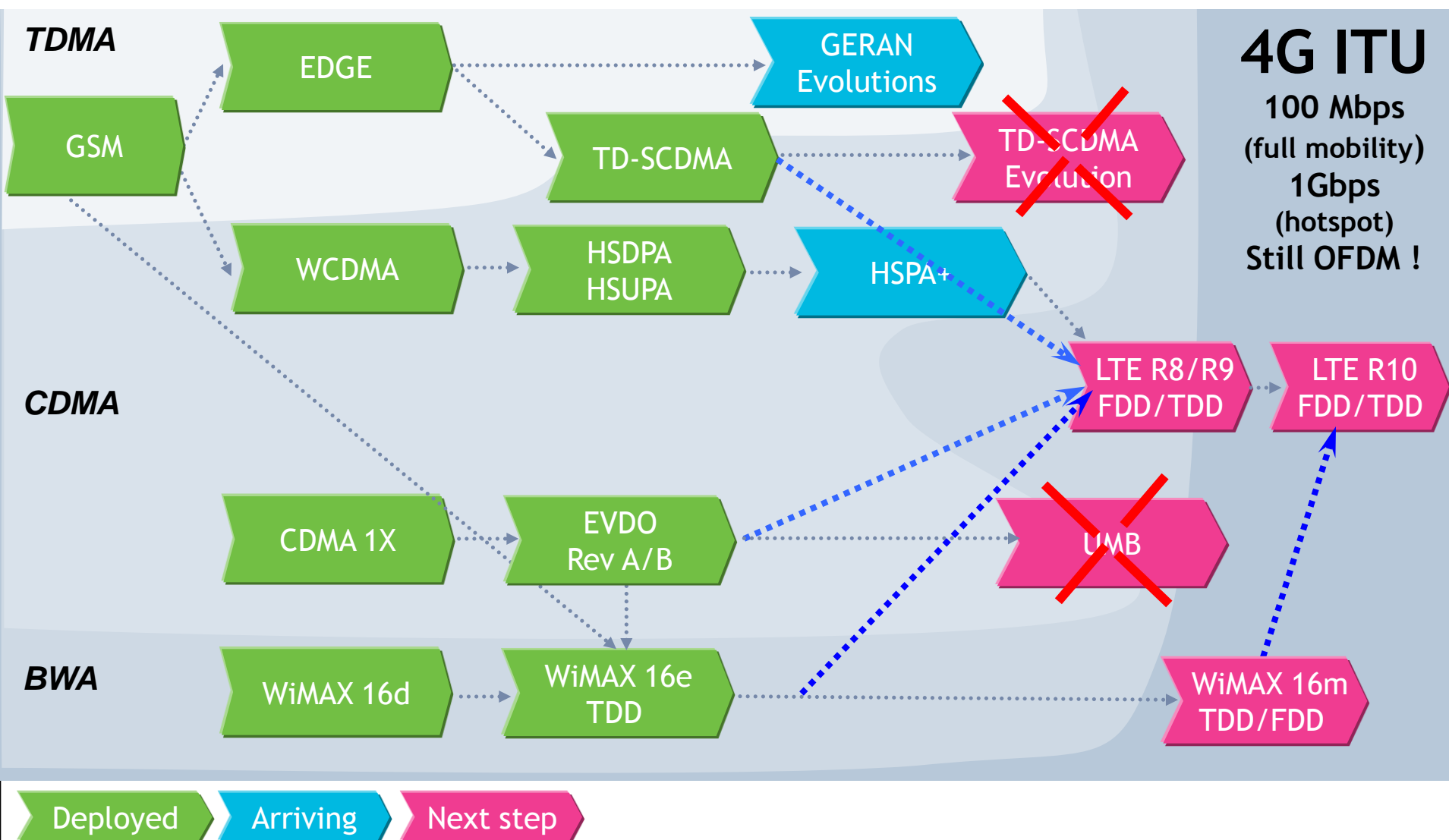
2. Application Enablement

- Highly instrumented to support advanced applications (own or 3rd party), residential, business and mobile
- Built-in quality of services and traffic optimization such as caching and bandwidth management
- Service and application aware for optimal Quality of Experience
- Secure, private, trusted

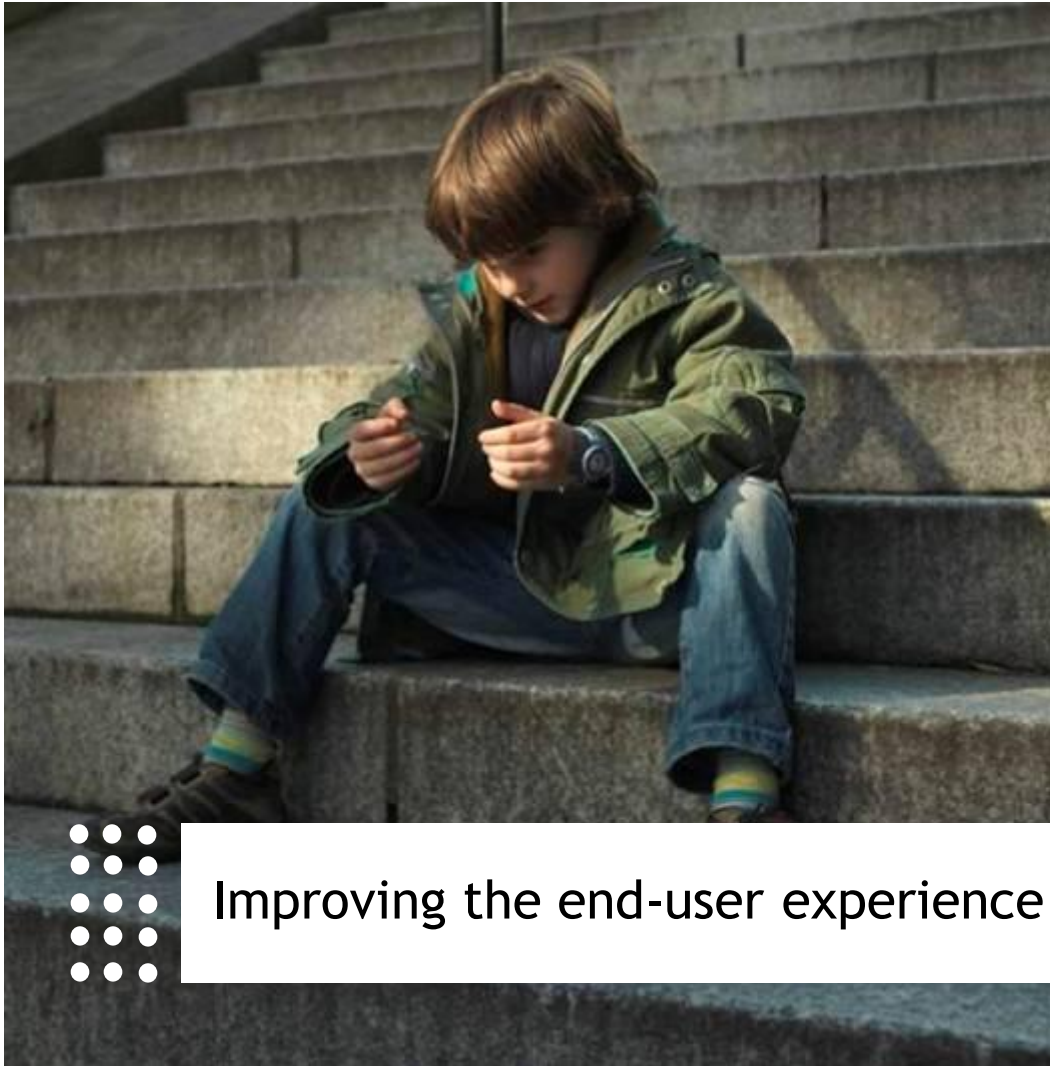


One converged, scalable, multi-access IP network allowing dynamic service creation and delivery

Air Interface evolutions: All technologies have path to LTE



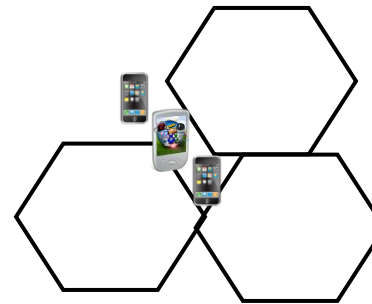
Transforming Deployment models to handle data services expansion



Improving the end-user experience



Poor high-speed data coverage on voice-optimized networks

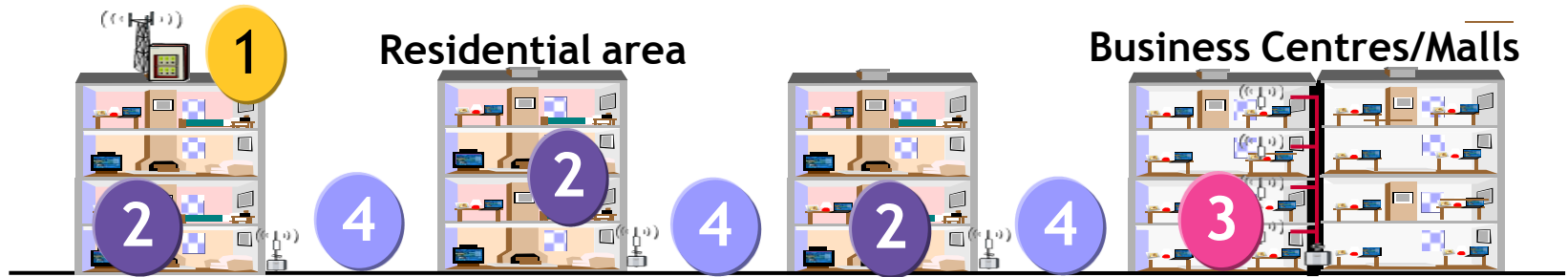


Holes in basic radio coverage requiring further granularity



Data loads can exceed capacity given only limited macro expansion

How to deploy future networks for Data Success?



1 Macro-layer

- Coverage continuity



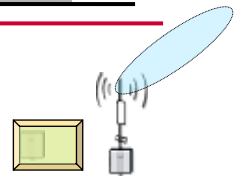
2 Residential : Femto small cell

- High quality indoor user experience



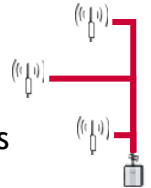
4 Outdoor small cells layer

- High capacity cost optimised layer
- Hot spot coverage



3 Indoor Pico small cells

- Solution tailored to need
- Business femto, indoor hot spot or panels



Today's deployment:
mainly macro-layer



$$1 + 2$$

Tomorrow's recommended
deployments: multiform



$$1 + 2 + 3 + 4$$

How to optimize the network for broadband and multimedia?

Dynamic not Static Networks

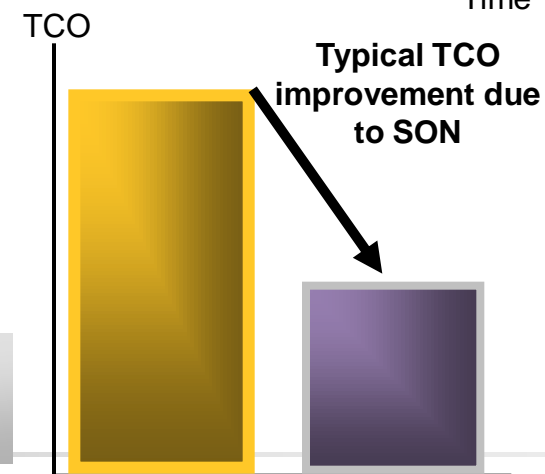
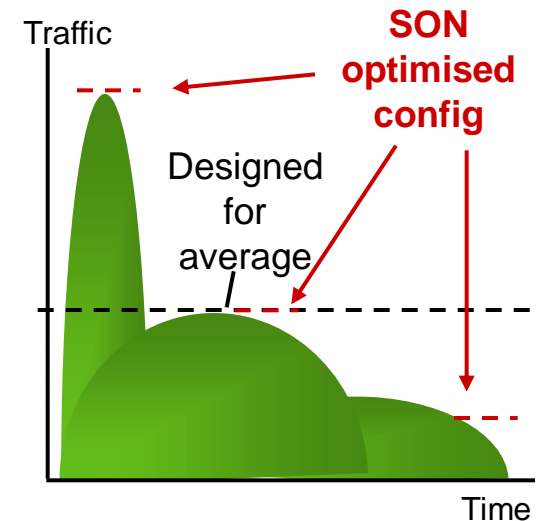
Designing networks for the average or the peak busy hour means wasting resources

Networks must become dynamic and adapt demands of users and the densification of networks

Self Optimising Networks (SON) will **simplify network operations** by allowing dynamic configuration **significantly improving TCO**

SON capability **will improve network performance and subscriber satisfaction** by adapting to changes in demand & reduce opex (e.g. powering down the BTS during quiet periods)

SON allows “plug-and-play” configuration and optimisation for easy network introduction



Crazy Ideas that might just make it

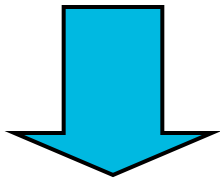
Sat Nav

Parking Cameras

Google Maps

Location Info

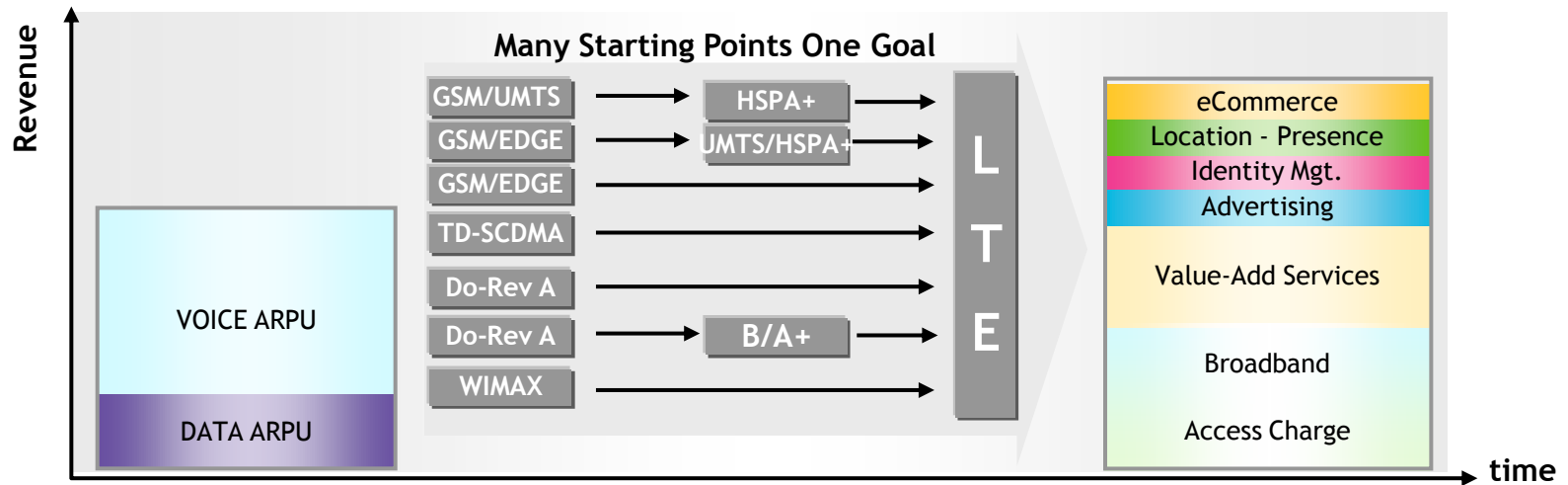
Heads Up Display



Intelligent Windscreen



Transformations for Network, Service and Business are Required for Next-gen Wireless



NETWORK

- highly efficient End-to-end IP infrastructure
- Service and user awareness
- Scalability and OAM streamlining
- Investment protection

SERVICE

- All-IP & Open Service Delivery Environment
- Rich subscriber data management and billing
- Multi-screen service; access & device aware

BUSINESS

- Business and technical partnerships beyond telecom
- Intangible asset monetization

**Transformation optimizes cost structure,
enables new QoE and revenue models**

www.alcatel-lucent.com

