



QUALCOMM®



 1X Advanced
August 2011



1X Advanced—Natural Next Step for CDMA2000 1X

1
X

Up to 4x Increase in Voice Capacity

A
d

Frees Up Spectrum for EV-DO Data

v
a

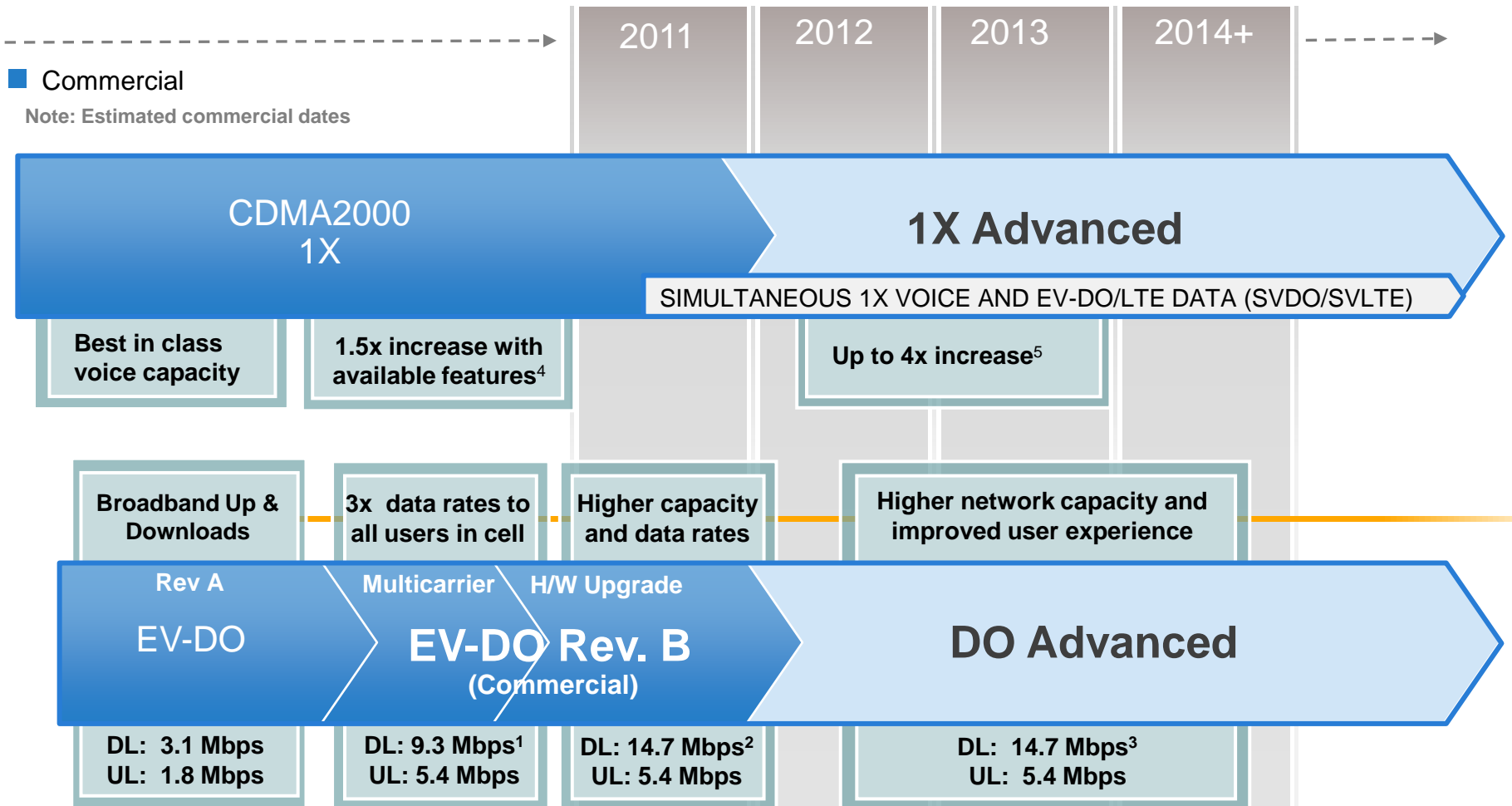
Up to 70% Increase in Coverage

n
c

Simple and Cost-Effective Upgrade

e
d

1X and EV-DO Have Strong Evolution Paths



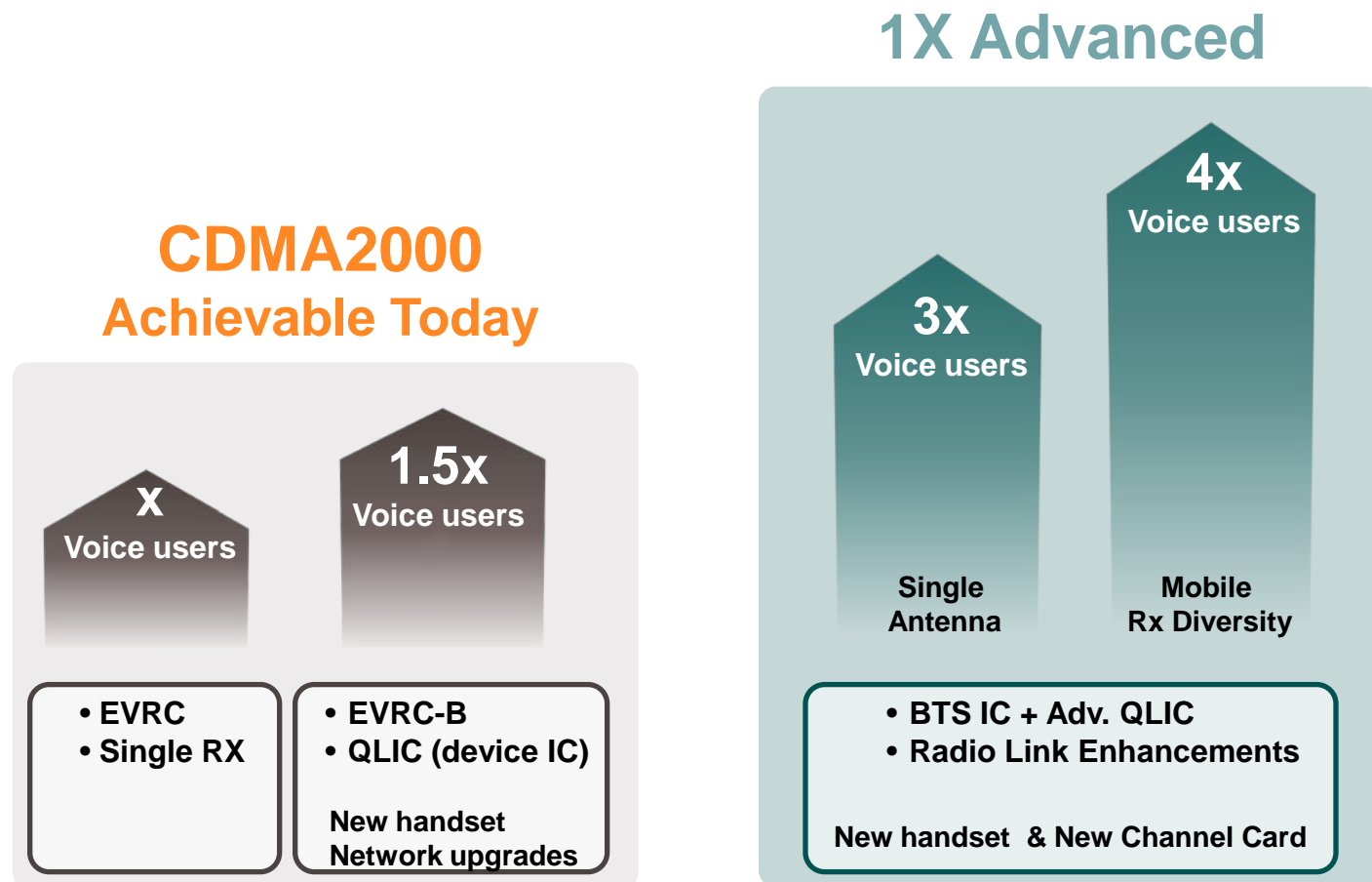
¹Peak rate for 3 EV-DO carriers supported by initial implementation.

²Peak rate for 3 EV-DO carriers with 64QAM in the DL. Rev. B standard supports up to 15 aggregated Rev. A carriers.

³ Same peak rates as Rev. B, but with new dimension of enhancements

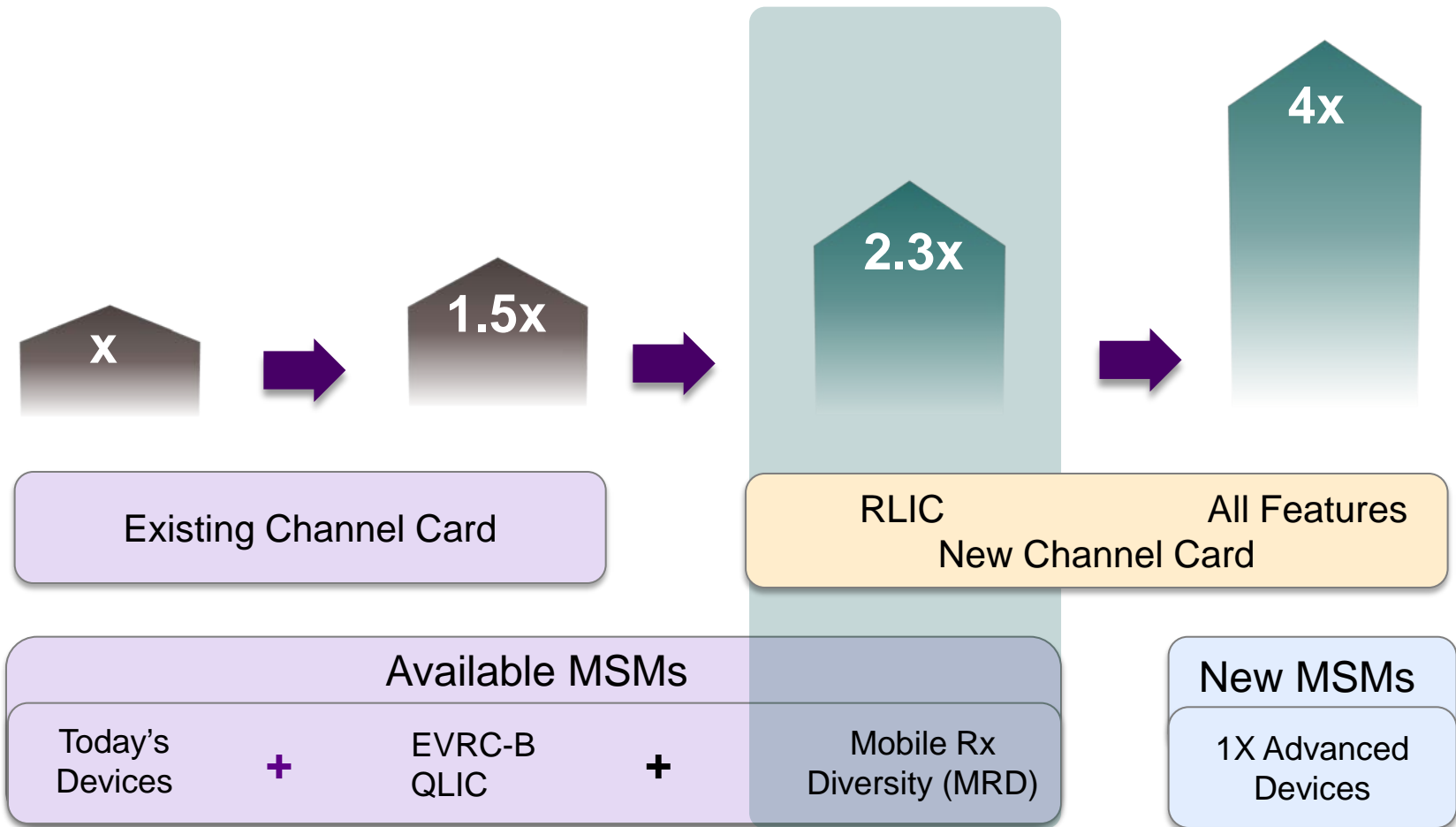
⁴Capacity increase possible with new codec (EVRC-B) and handset interference cancellation (QLIC). ⁵4x increase with receive diversity; 3x without

1X Advanced: Up to 4x Increase Over CDMA2000's Excellent Capacity



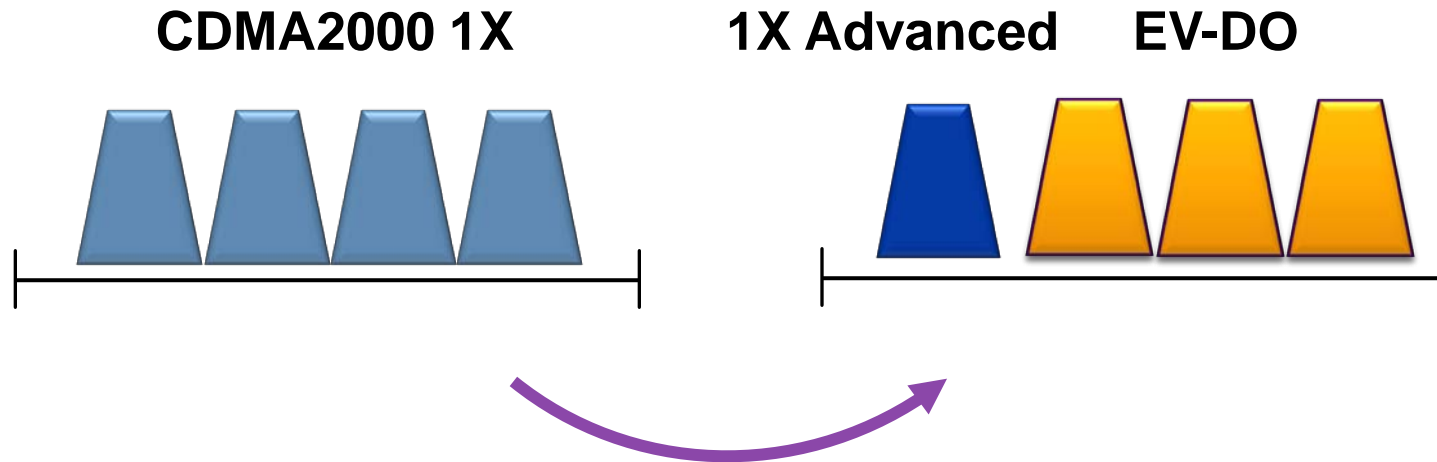
Leveraging Proven CDMA2000 Technology

Early Time-to-Market by Leveraging Available MSMs with MRD



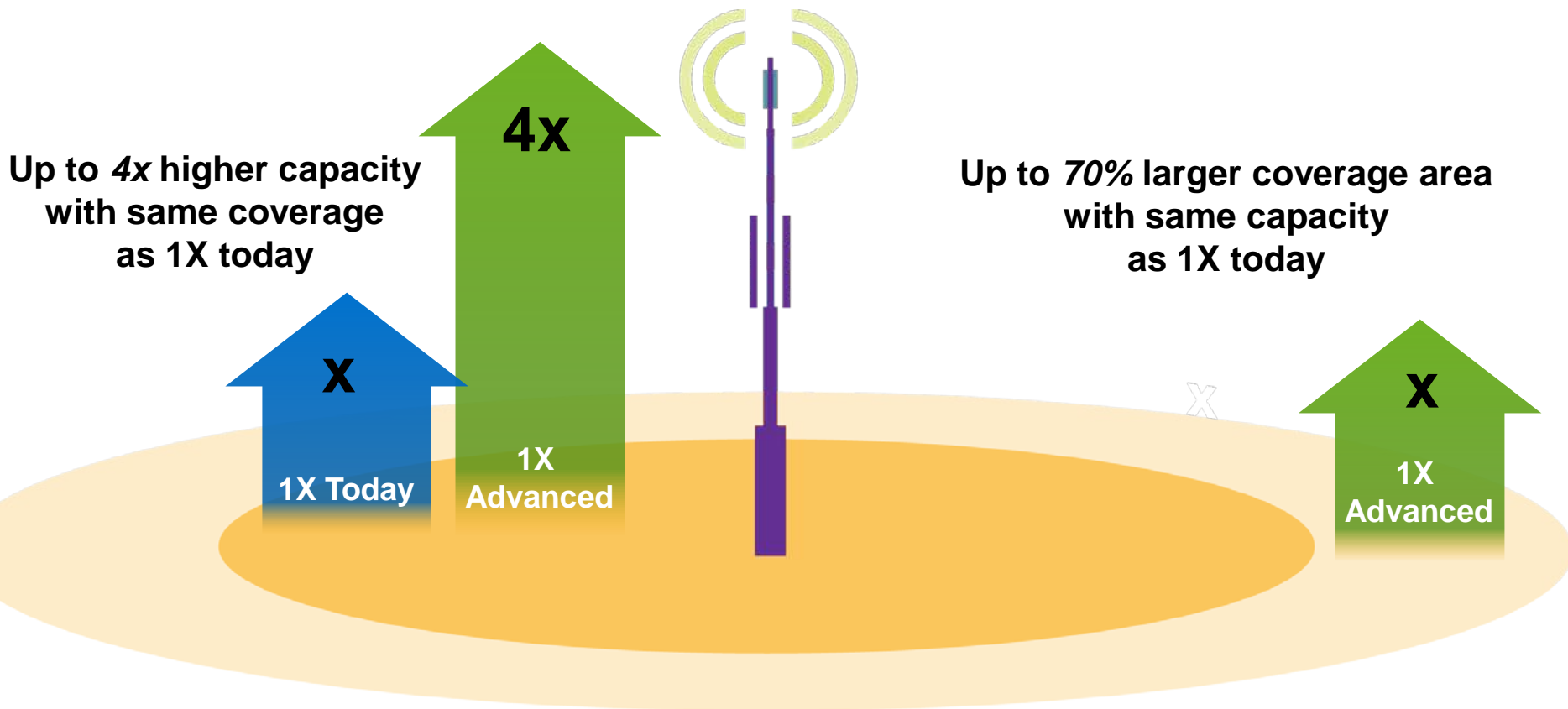
Relative capacity/sector (1.25 MHz)
RLIC – Reverse Link Interference Cancellation

Free Up Spectrum for EV-DO Data



- Same voice capacity in quarter of the spectrum
- Freed-up spectrum can be used for EV-DO data

Up to 70% Increase in Coverage



Capacity and coverage tradeoff

Notes: Based on Qualcomm simulations, coverage is defined as the maximum area with less than 1% of the users in outage; Assumptions : 3GPP2 simulation frame work, embedded sector, with all the 1X Advanced features considered including MRD, FL and RL Interference Cancellation, new RC

Simple and Cost-Effective Upgrade

- Leverages existing assets
- Simple channel card upgrade
- Standards published in June 2009



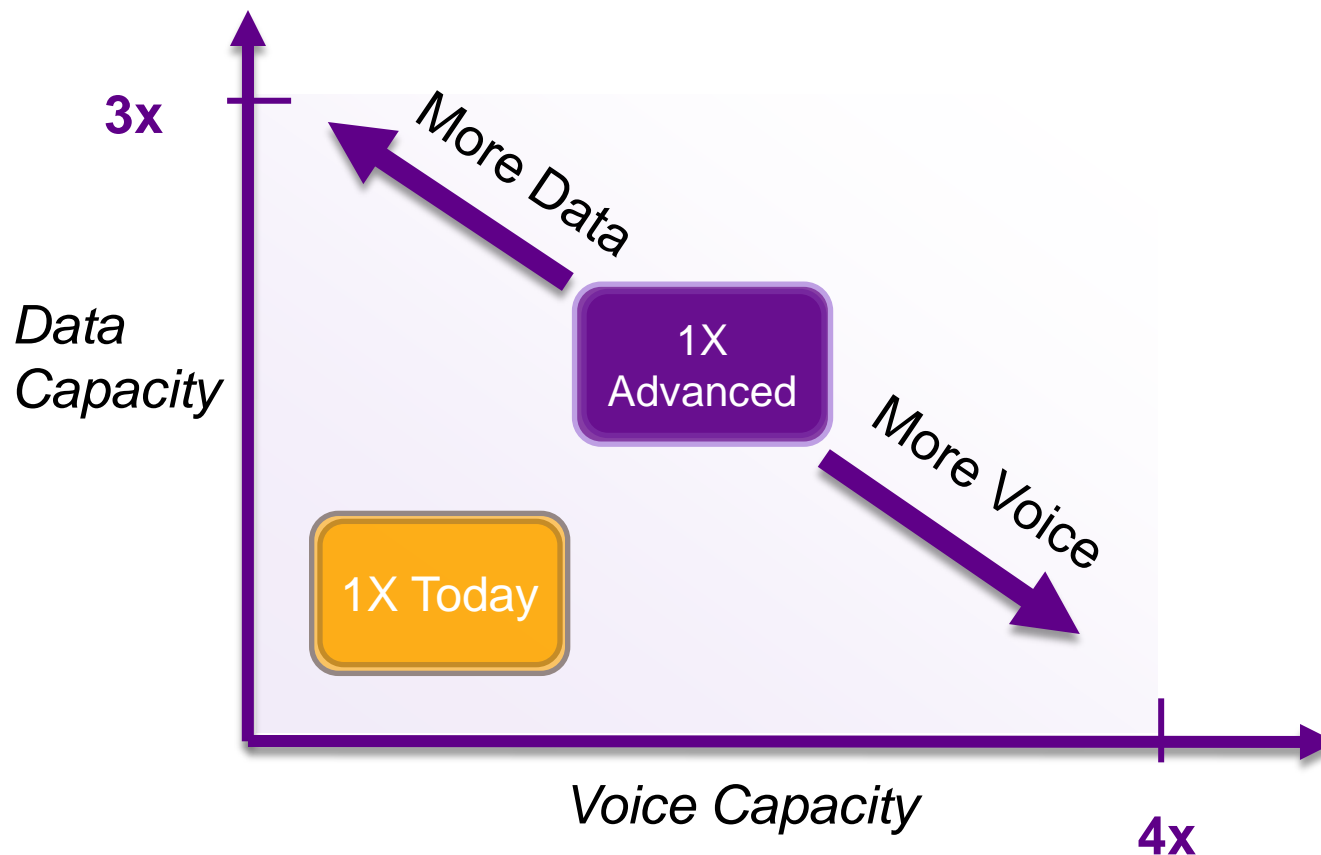
- Interference Cancellation
- Radio Link Enhancements
- Mobile Receive Diversity



1X Advanced

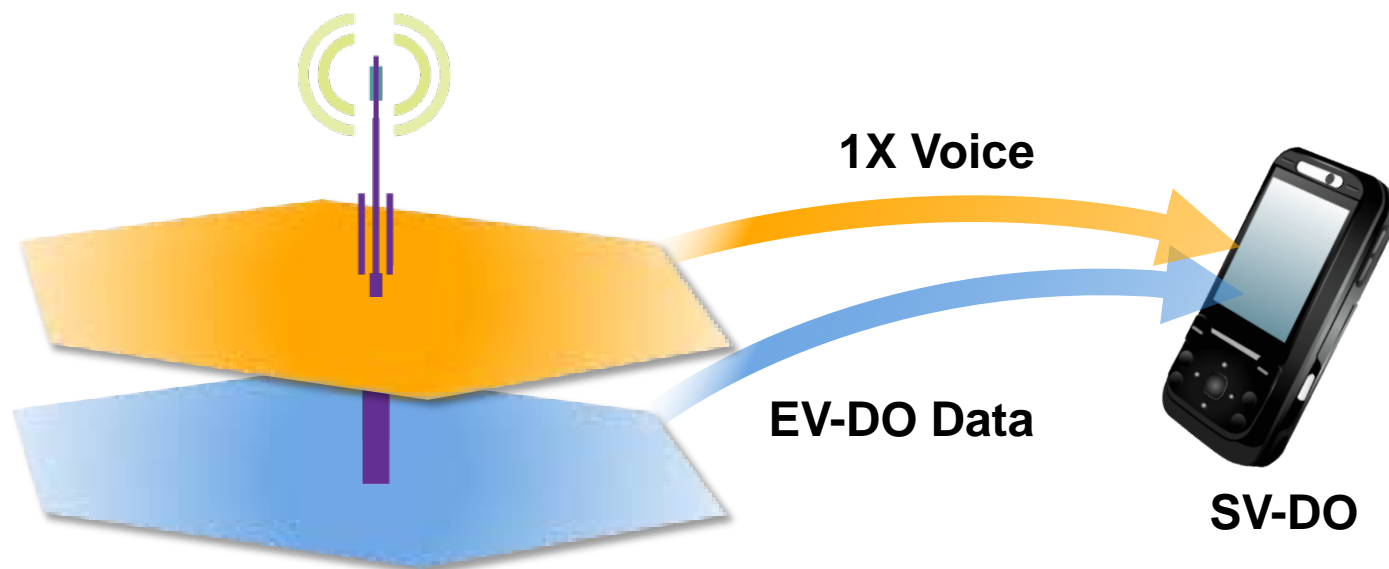
4x Voice Capacity

Increased Data Capacity Where EV-DO is Not Available



- Up to 3x data capacity increase with 1X Advanced

Simultaneous 1X Voice and EV-DO Data



- Handset feature with no network impact
- Independent of the air link standard
 - Voice using 1X or 1X Advanced
 - EV-DO Rev. A or Rev. B
- Commercial in 2011

1X Advanced and Rev. B: Strong Chipset Support

Devices

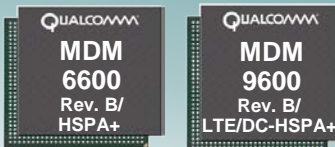
Smartphones/
Tablets & other
Smart Devices



Feature &
Basic Phones

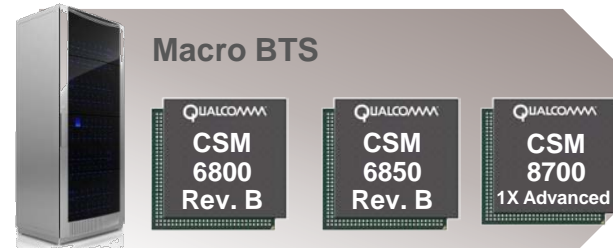


Modems &
Data Cards

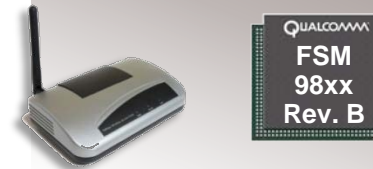


Infrastructure

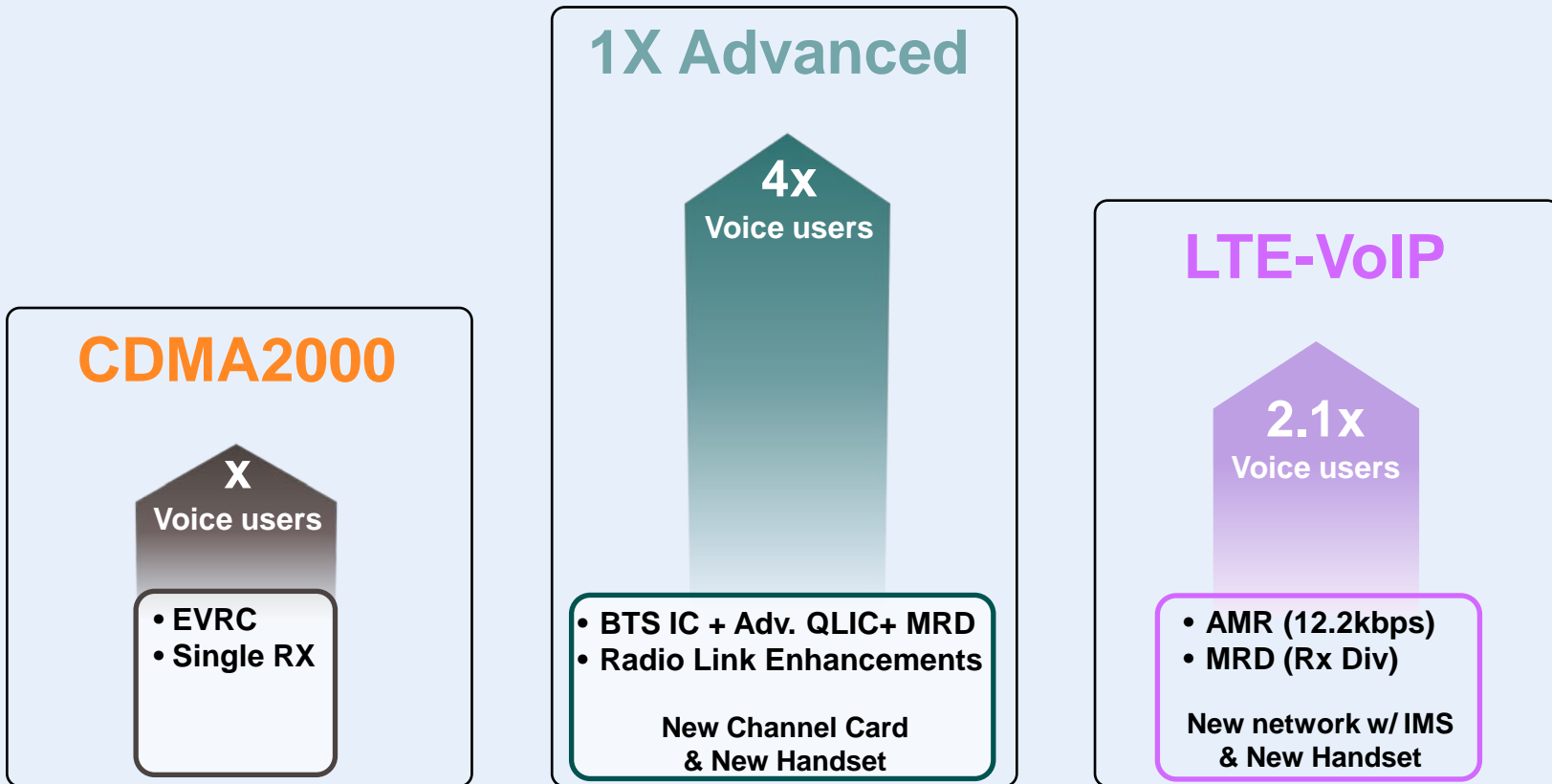
Macro BTS



Pico/ Femto



1X Advanced: Continuing the Voice Capacity Leadership



- Larger 1X Advanced UL coverage because of soft-handoff and continuous UL

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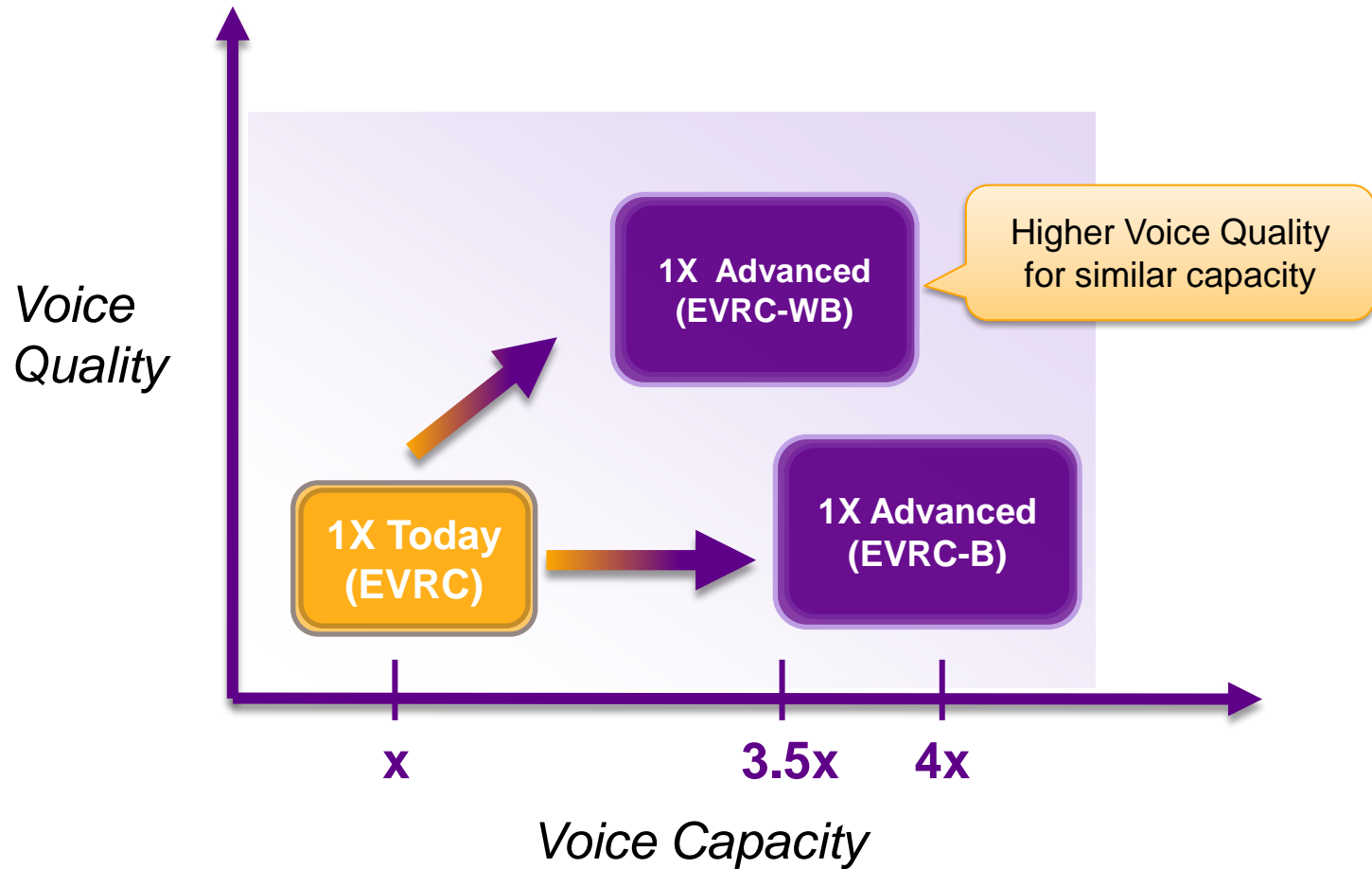
BLOG

<http://www.qualcomm.com/blog/contributors/prakash-sangam>



Additional Slide

Better Voice Quality for Similar Capacity



- EVRC-WB (4GVTM) provides clear and natural voice