



**Jim Seymour**  
**Senior Director**  
**Wireless CTO Organization**  
**February, 2012**

# Tackling Capacity, Coverage, & User Experience Requires Flexible Radio Access Network Options



Heterogeneous Network required to address wireless data growth

# Introduction to Small Cells Portfolio



## HOME CELLS

- 3G technologies
- Integrated omni directional antenna
- 4 to 8 users



## ENTERPRISE CELLS

- Multiple technologies (3G, Wi-Fi, 4G)
- Integrated or external omni directional antennas
- Small cell nets
- 8 to 64 users



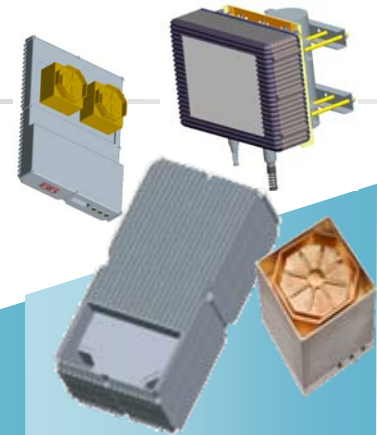
## INDOOR SMALL CELLS

- Multiple technologies (3G, Wi-Fi, 4G)
- Integrated or external omni directional antennas
- Rx div /MIMO
- Small cell nets
- 8 to 64 users



## OUTDOOR SMALL CELLS

- Ruggedized design
- Multiple technologies (3G, Wi-Fi, 4G)
- Range: about 2 KM at 120m/h
- 16 to 128 users



## INNOVATIVE TECHNOLOGY

- 3G/LTE/MIMO
- Outdoor for indoor coverage
- AAA with beam forming
- High average spectral efficiency (4 to 6 bits/s/Hz)
- Many users

An Evolution Toward Heterogeneous Networks

# SUMMARY

## PUT CAPACITY IN ITS PLACE - CLOSER TO THE USER

- Spot capacity where it's needed
- Significant increase in total capacity
- Re-use of valuable assets - SPECTRUM
- Higher data rates (closer user proximity)
- Flexible deployment (billboards, building facades)
- Adding metro improves TCO
- Time to Market

More Capacity, Higher QoE, Lower TCO

