

# Potential Spectrum Sharing Approaches

CSMAC Spectrum Sharing Sub-Committee

October 26, 2011

This material is preliminary and for discussion purposes only. None of the material here is a final recommendation or conclusion from the sub-committee.

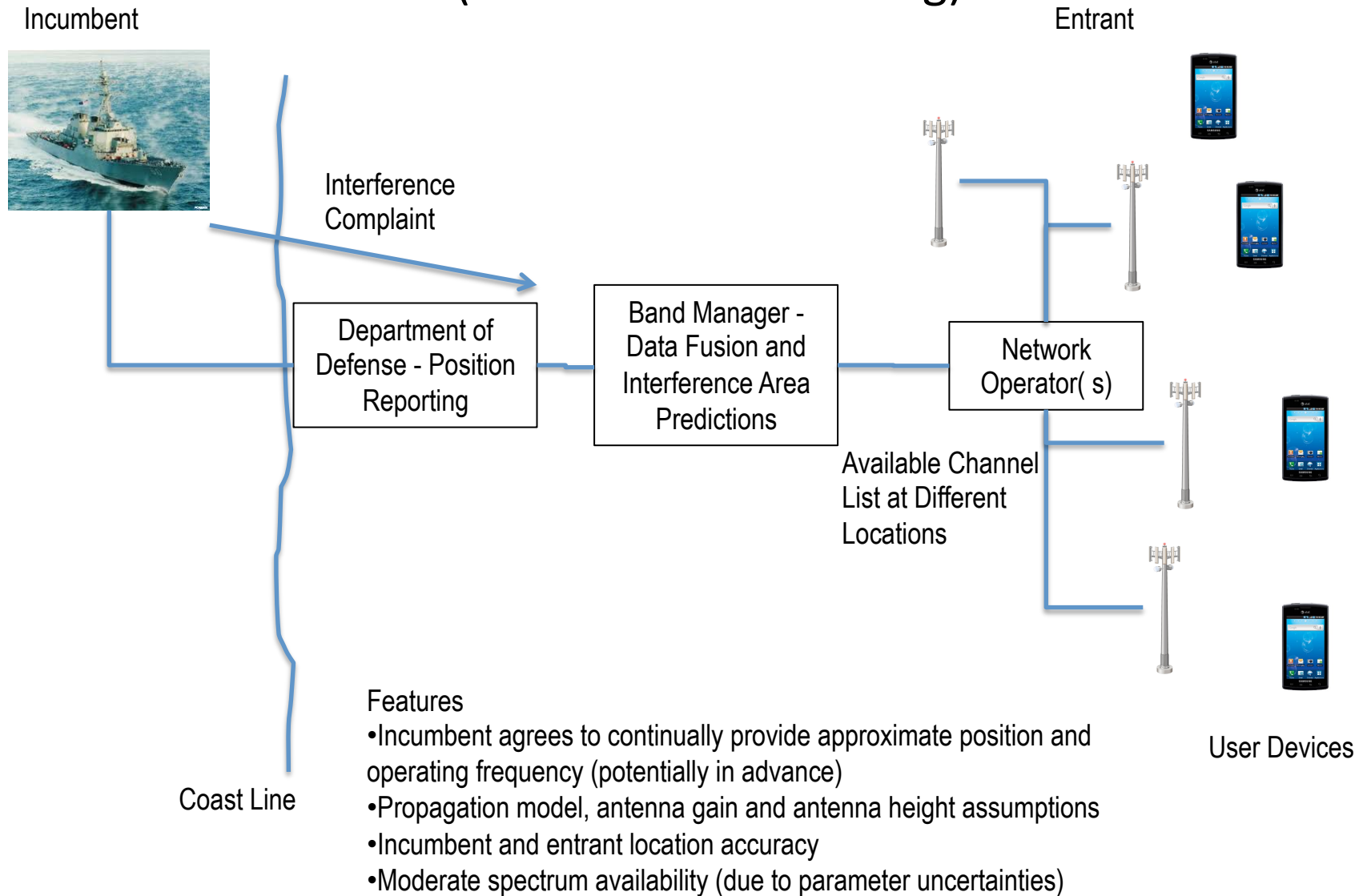
# Alternate Spectrum Sharing Approaches

- Geo-Location method used to determine the transceiver parameters/capabilities (e.g., transmits frequency and power level, bandwidth, receiver capabilities).
  - Exact position vs. approximate position
  - User entered position versus GPS position versus trusted source for position
- Sensing-based method used to determine the transceiver parameters/capabilities.
  - Sensing on all entrant radios
  - Sensing on some entrant radios
  - Sensing at certain locations
  - External sensing network
  - Collaborative entrant sensing
- Combined sensing and geo-location methods used to determine the transmitted transceiver parameters/capabilities.
- Physical layer
  - Receiver ignores interference
  - Transmit modulation (UWB)
- Timesharing
  - Entrant and Incumbent share information to share spectrum in time
  - Entrant senses channel and stops transmitting rapidly when the Incumbent begins transmitting, so as not to interfere with Incumbent communication

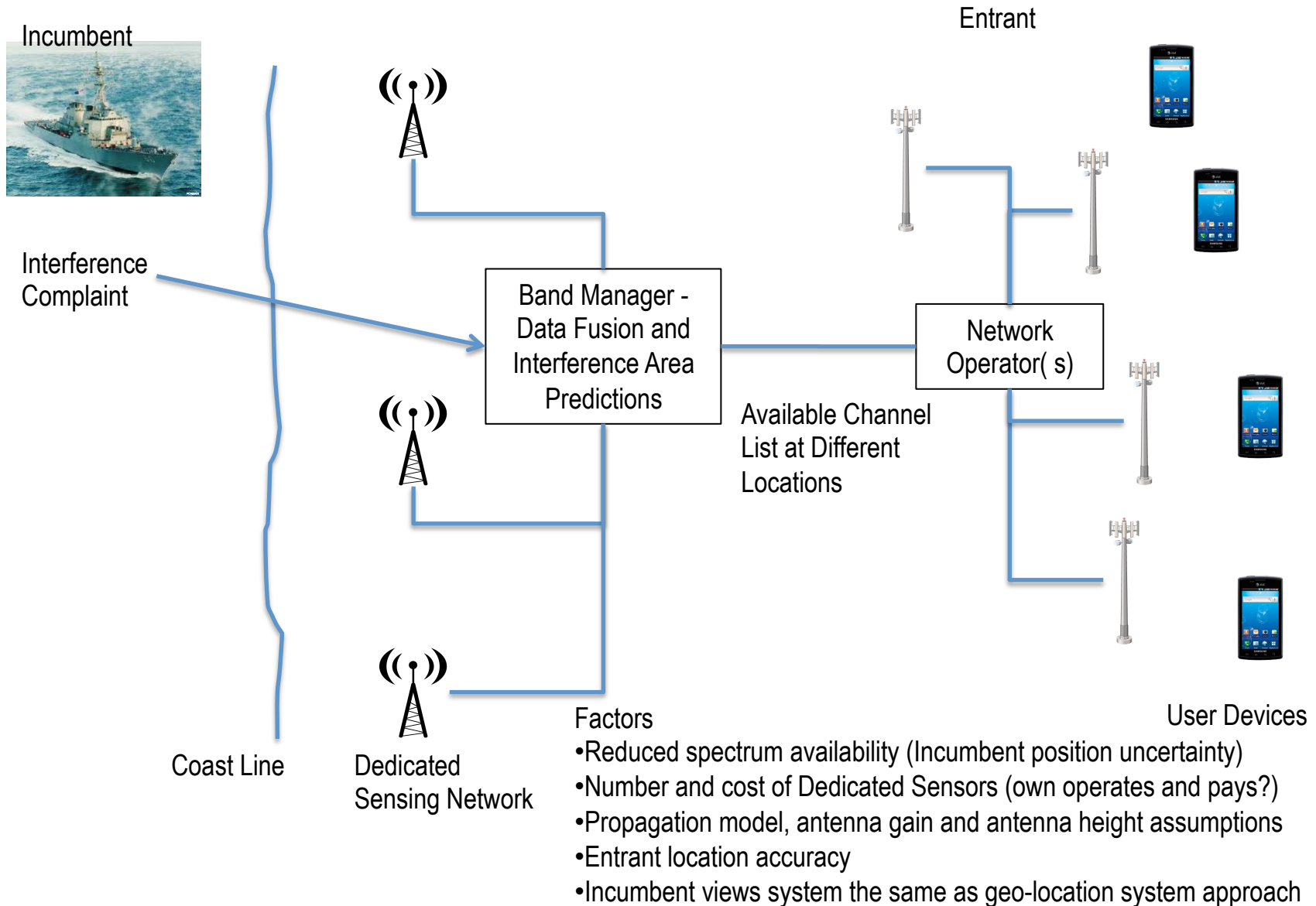
# Spectrum Sharing System Approach

- Estimate propagation loss between entrant and incumbent systems
- Determine entrant operating frequencies for Do No Harm based on the above propagation losses
- Respond to incumbent's interference complaints

# System #1 - Geo-location System (Same As Time Sharing)



# System #2 – External Sensing Network System



# System #3 – Sensing on Some Entrant Radios System

Incumbent



Interference Complaint

Sensing Device At Base Station



Sensing-Based Transmit Decision

Entrant

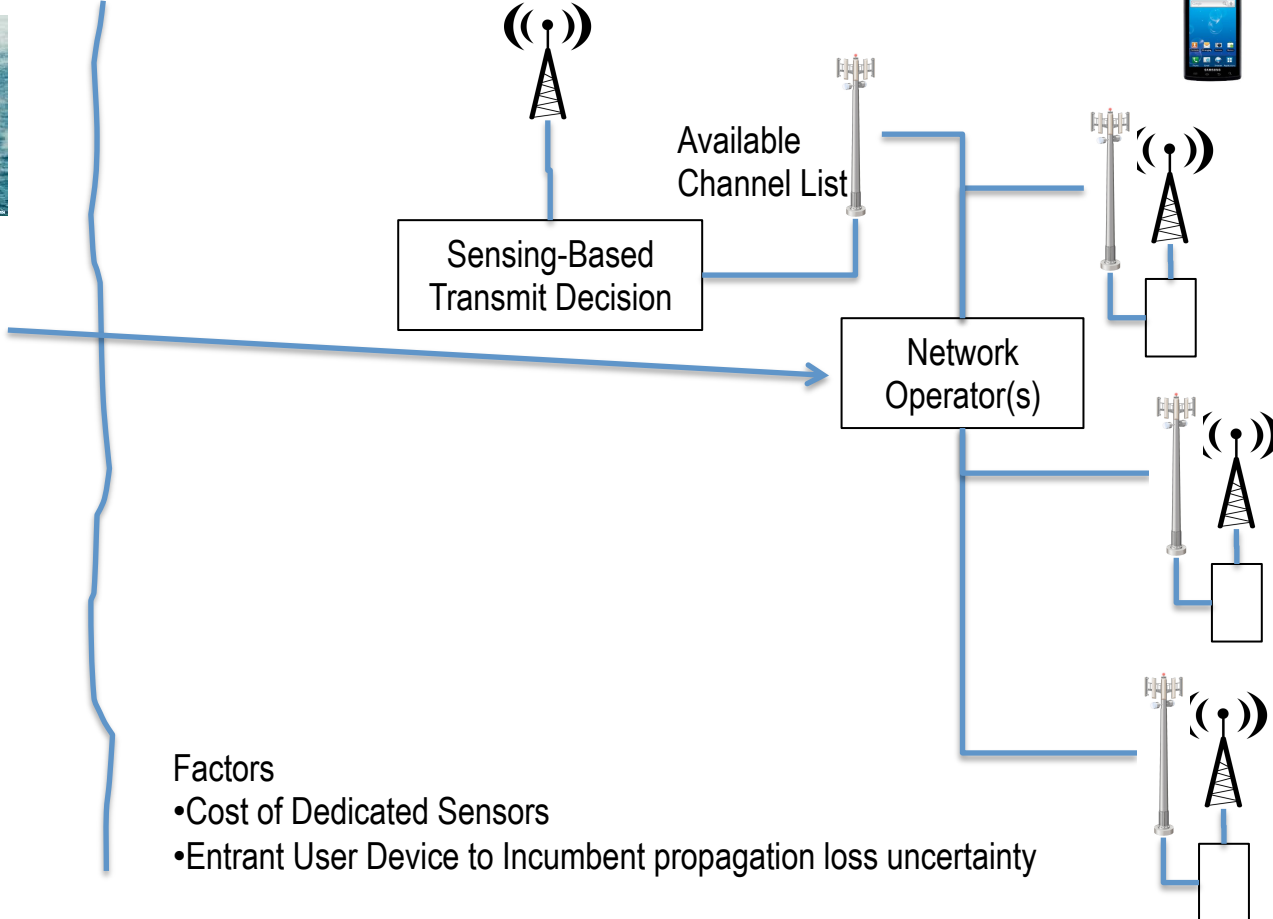
Available Channel List

Network Operator(s)



User Devices

- Factors
- Cost of Dedicated Sensors
  - Entrant User Device to Incumbent propagation loss uncertainty



# System #4 – Sensing on All Entrant Radios System

