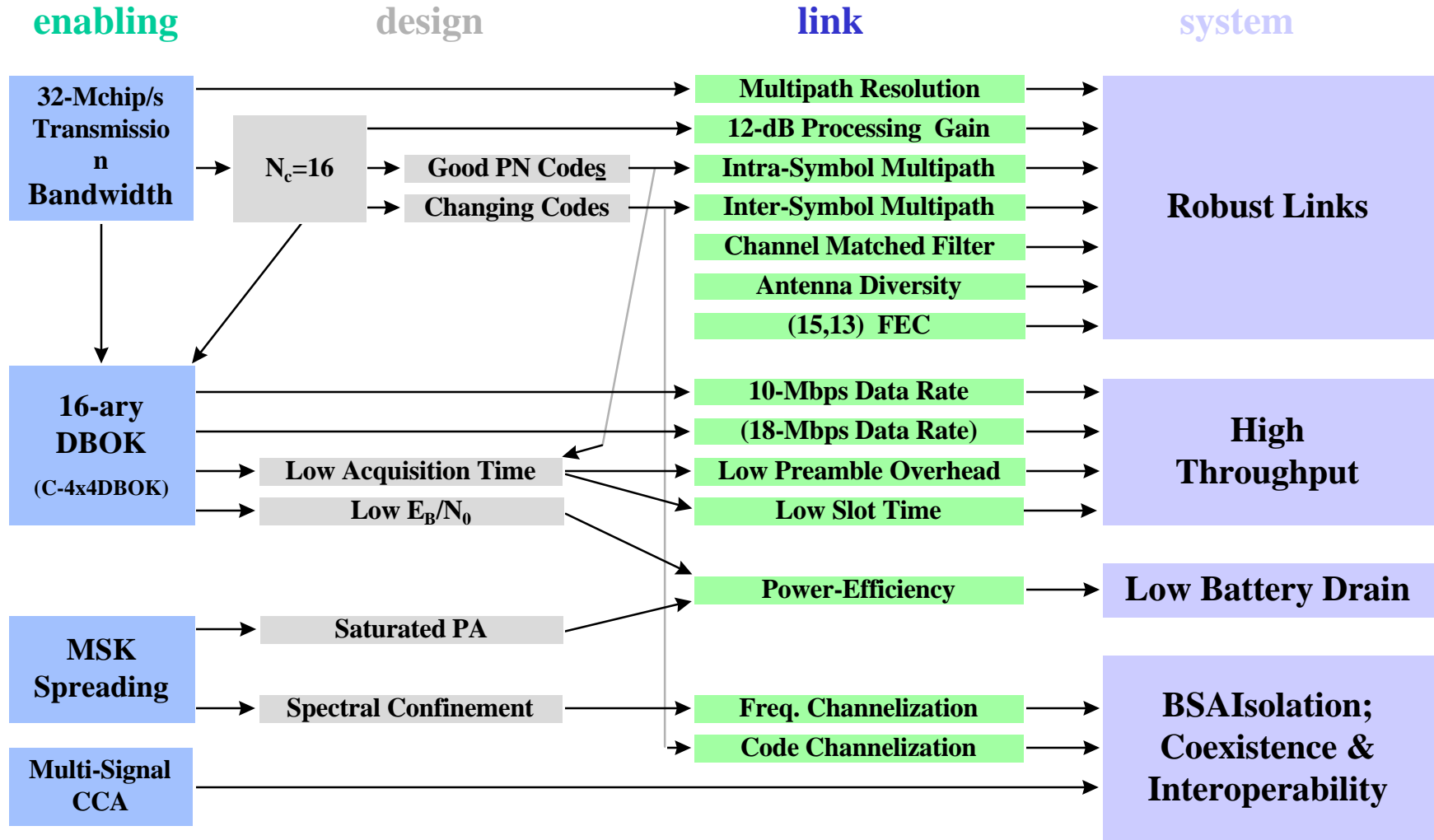


# Proposal for 2.4-GHz PHY

## May 1998 Update

John H. Cafarella  
MICRILOR, Inc.

# Key Features



# Simplified Matrix

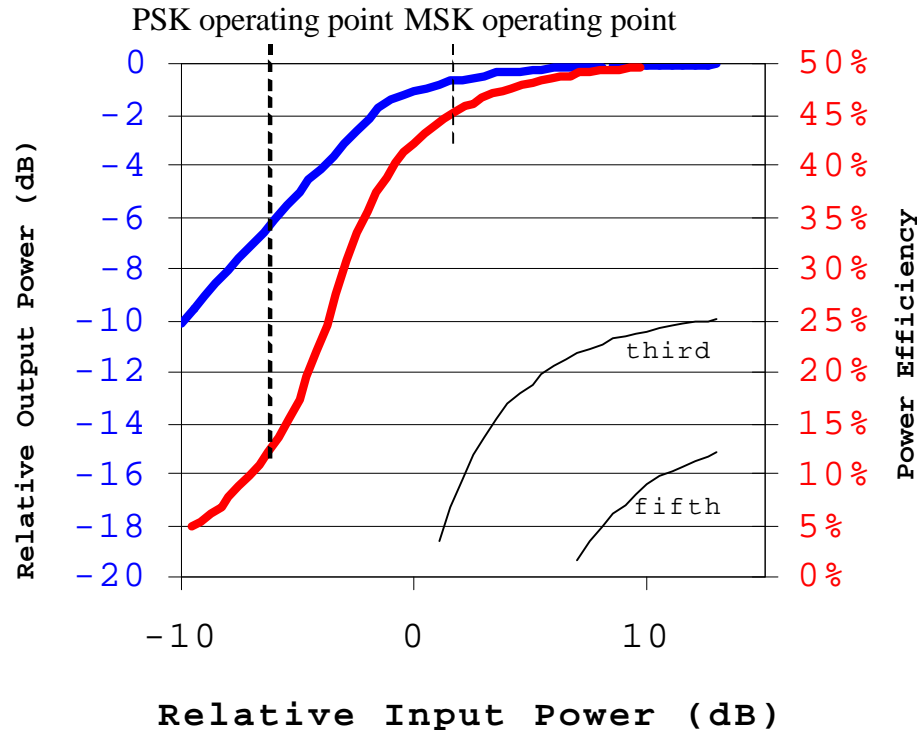
	Lucent	Harris	Micrilor
Interference Tolerance	Less Weak	Weak	Strong
Multipath Tolerance	Good	Weak	Good
Basic Data Rate	8 Mbps	11 Mbps	10 Mbps
Chip Complexity	60K gates	70K gates	40K gates
Amplifier Backoff	Yes	Yes	No
Freq/Code Channels	3/1	3/1	2/48
Higher Rate (good channel)	10 Mbps	None	18 Mbps
Interoperate Legacy DSSS?	Optional*	Optional*	Yes

Raytheon same as Harris except no Amplifier Backoff

\* must choose between high throughput or backward interoperability

# Power Amplifier Efficiency

(seems mundane, but does not improve with time)

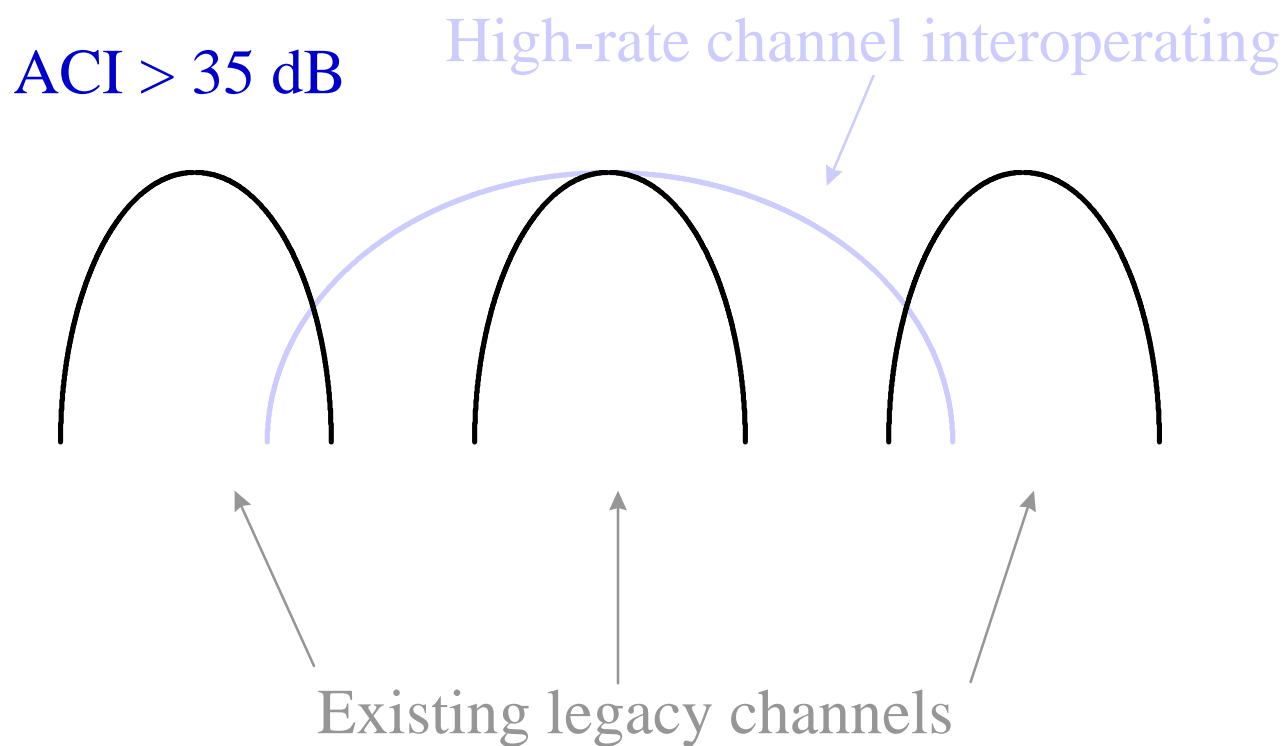


- MSK allows operation to power-amp 1-dB compression
- PA efficiency greatly improves
- **D11-97/118** describes low-cost MSK implementation

# Interoperability

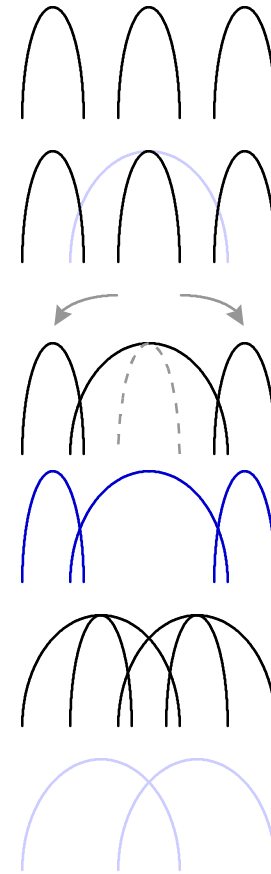
- Dual-Mode transceiver (re-using circuitry)
  - High-rate and Legacy DSSS PHY
  - Independent Operation with common CCA
  - Coordinate via RTS/CTS exchanges
- Single PHY Solution
  - No need for alternate PHY Headers
  - Does not sacrifice high-rate potential

# Three-Channel Operation



# Migration Possibilities

- Begin with 3 Legacy Channels
  - Introduce High-Rate Channel; Interoperate with Mid. Legacy Channel
  - Move Legacy Units from High-Rate Channel
  - Keep Three-Channel Deployment
- or
- Two High-Speed/Legacy Channels
  - Eventually Two High-Speed Channels



# Channelization

- Many PN Code Channels
  - Especially for BSA Isolation
- Two 10-/18-Mbps Frequency Channels
- Three Half-Bandwidth Channels if Desired
-

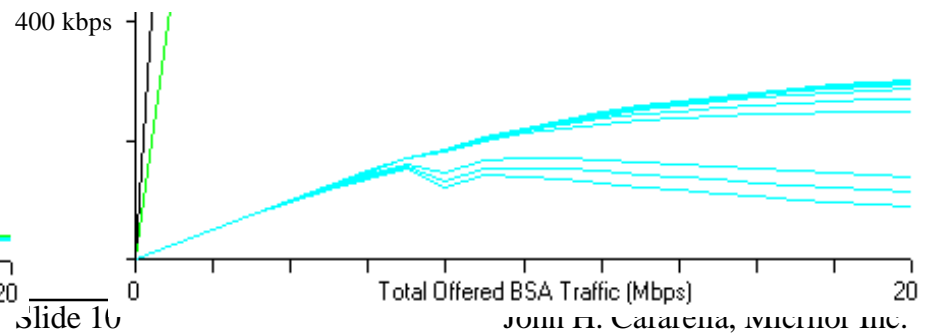
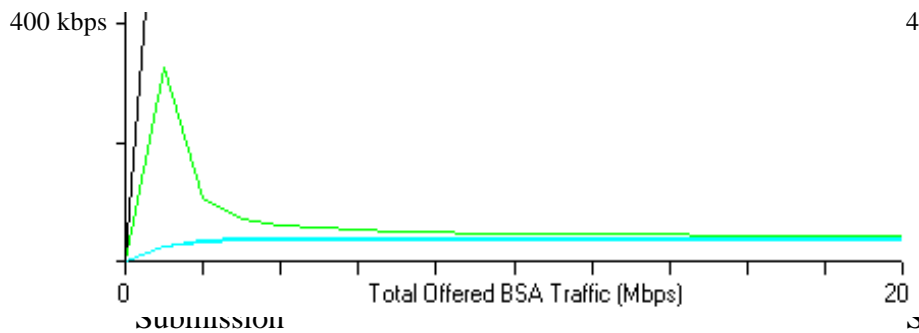
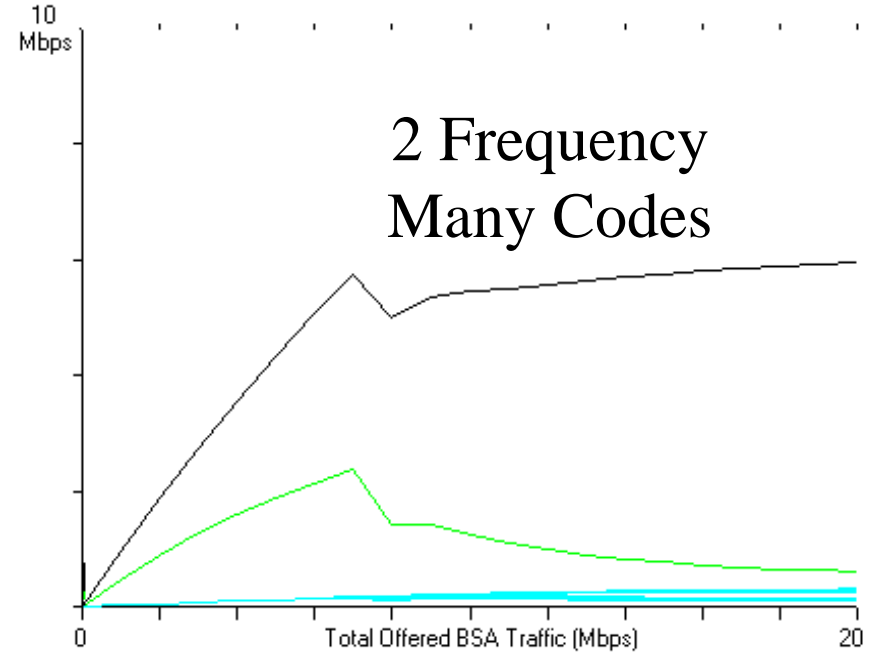
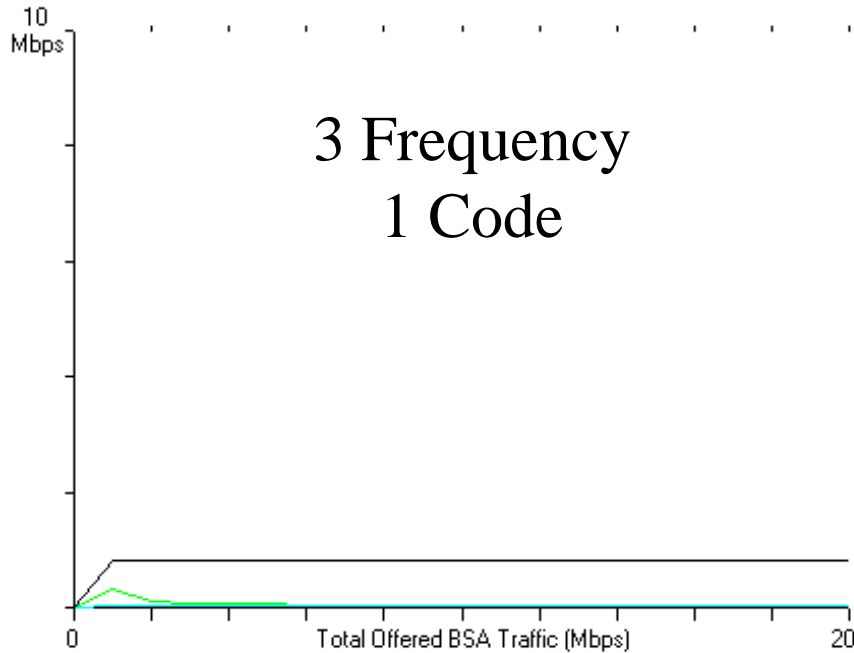


# Channelization Issue

- Three-Frequency/One-Code Deployment
  - Re-use of frequencies demands sharing capacity
- Two-Frequency/Many-Code Deployment
  - Re-use of frequencies can be shared or independent
- BSA Isolation Critical for High System Capacity
- 
-

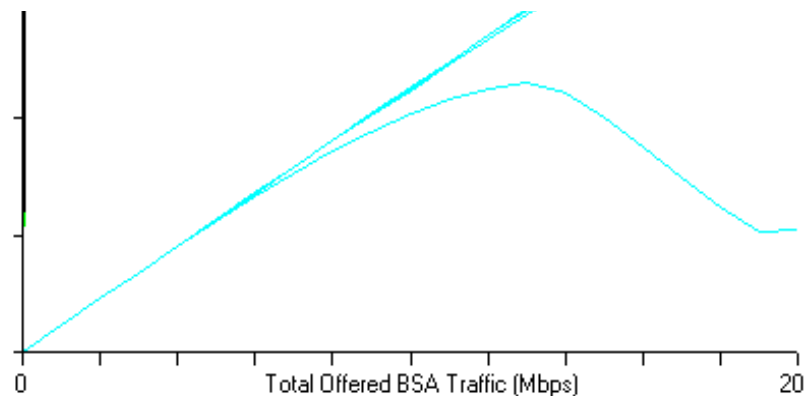
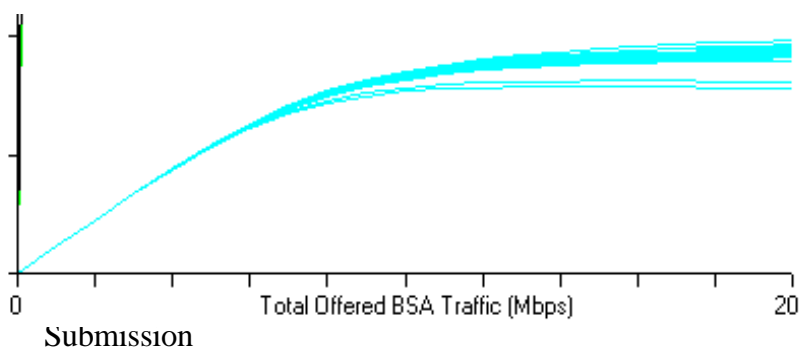
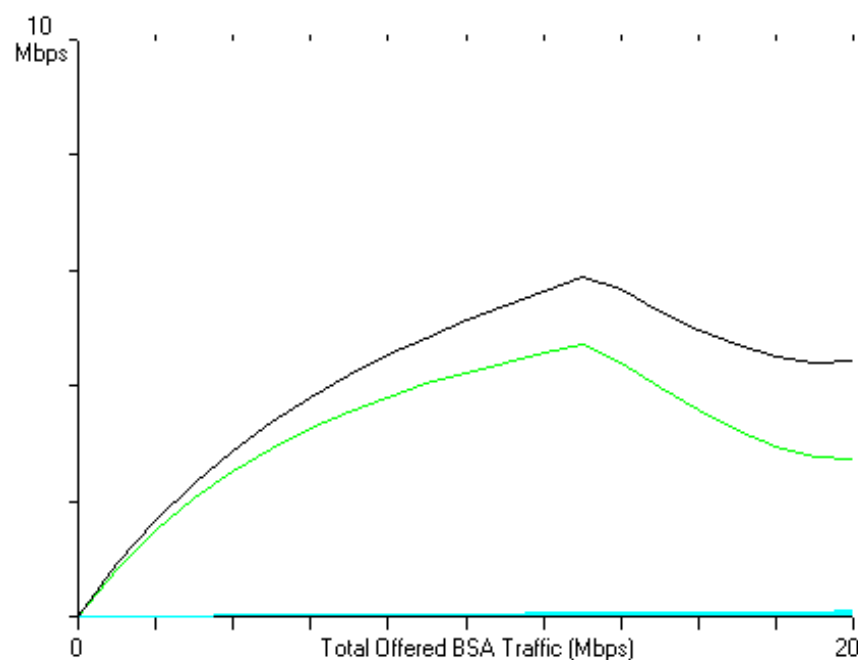
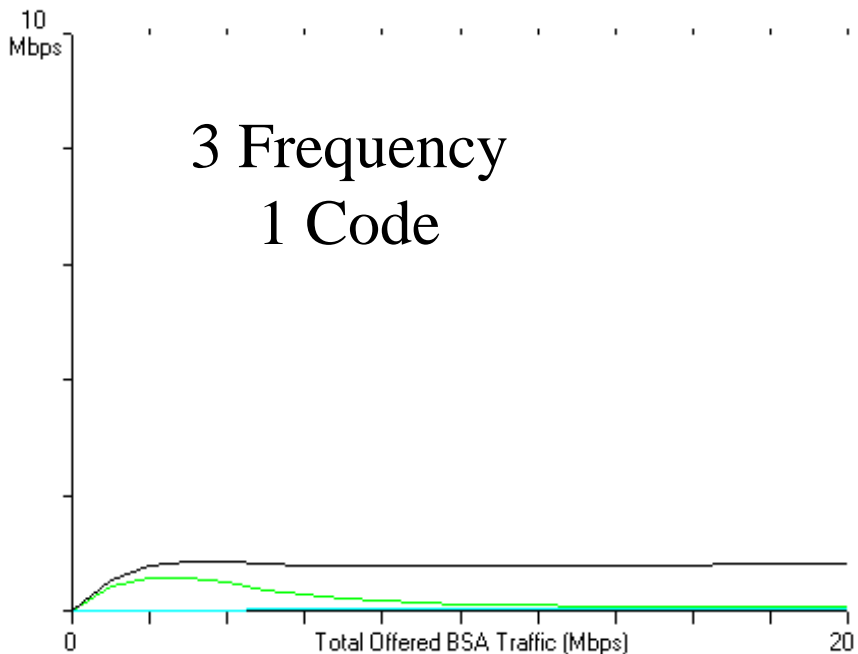
# 12 Same-Frequency BSAs

20 STAs/BSA  $\lambda_{AP} = 20 \lambda_{STA}$



# 12 Same-Frequency BSAs

20 STAs/BSA      $\lambda_{AP} = 200 \lambda_{STA}$



# Conclusion

- ROBUST IN MULTIPATH & INTERFERENCE
- SIMPLE
- HIGH DATA RATES: 10- & 18 Mbps
- INTEROPERABLE
- CHANNELIZATION FOR HIGH SYSTEM CAPACITY
- THROUGHPUT