Consideration of MMR Basic Networking Topology Constraints (update)

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Purpose:
To further clarify the MMR configuration modes

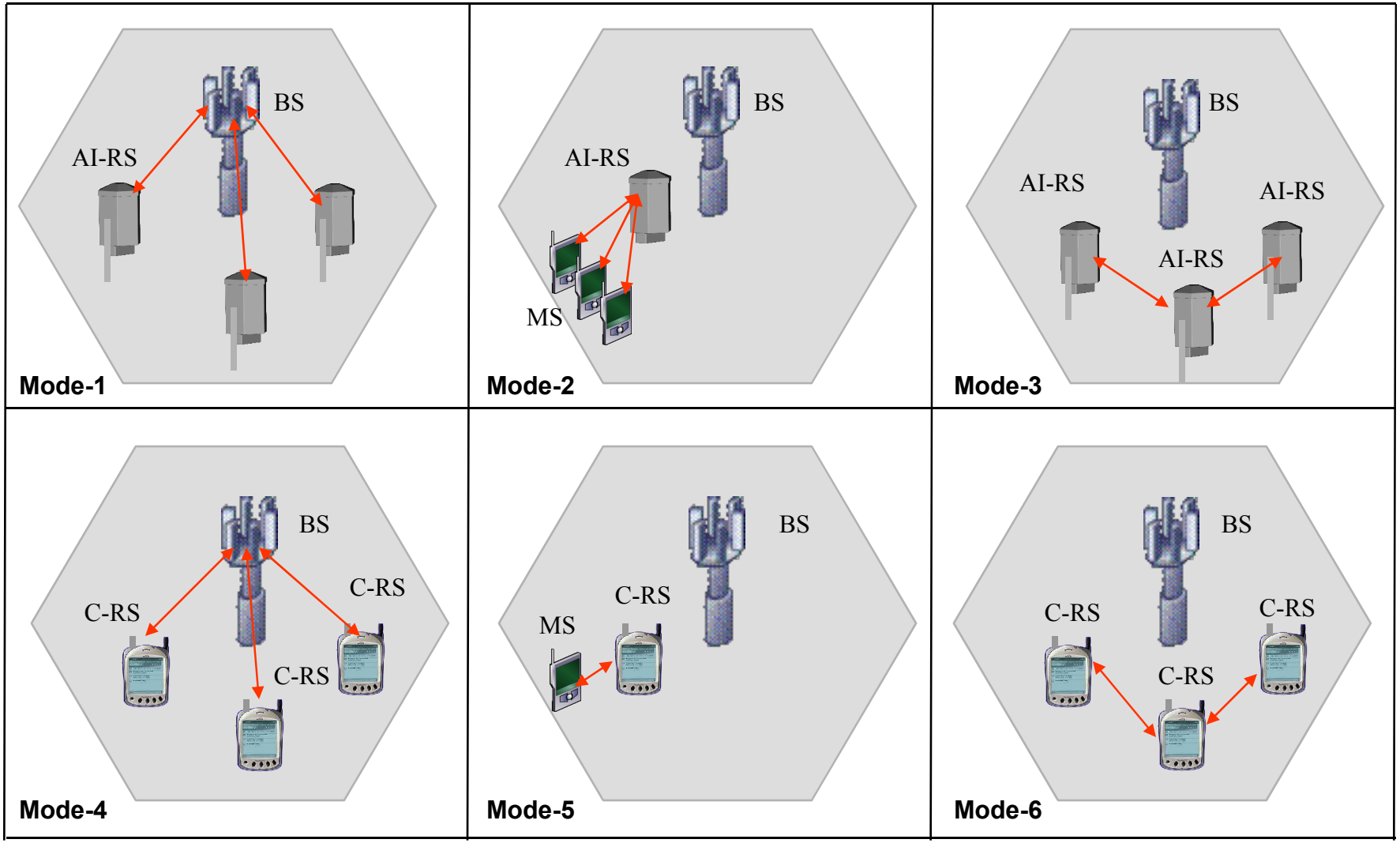
Introduction

- The scope of Multi-hop Mobile Relay (MMR) contains the following nodes which are already existing in the 802.16 TGe PMP mode
  - Base Station (BS)
  - Mobile Station (MS)
- The scope of MMR creates the following new nodes which are not existing in the 802.16 TGe
  - Ancillary Infrastructure Relay Station (AI-RS)
    - Service provider deployed and optimized with networking capability
  - Client Relay Station (C-RS)
    - User device with relay capability
- In this contribution, we discuss the constraints and limitations of the network topology of the MMR with backward compatibility of 802.16 TGe PMP mode
- The practical consideration of extension MMR with minimized complexity in networking and implementation complexity for the new nodes, especially
  - The mobile device complexity
  - The handover complexity required to support mobility
  - The radio performance benefit by enable the MMR
  - To minimize the overall latency of the MMR

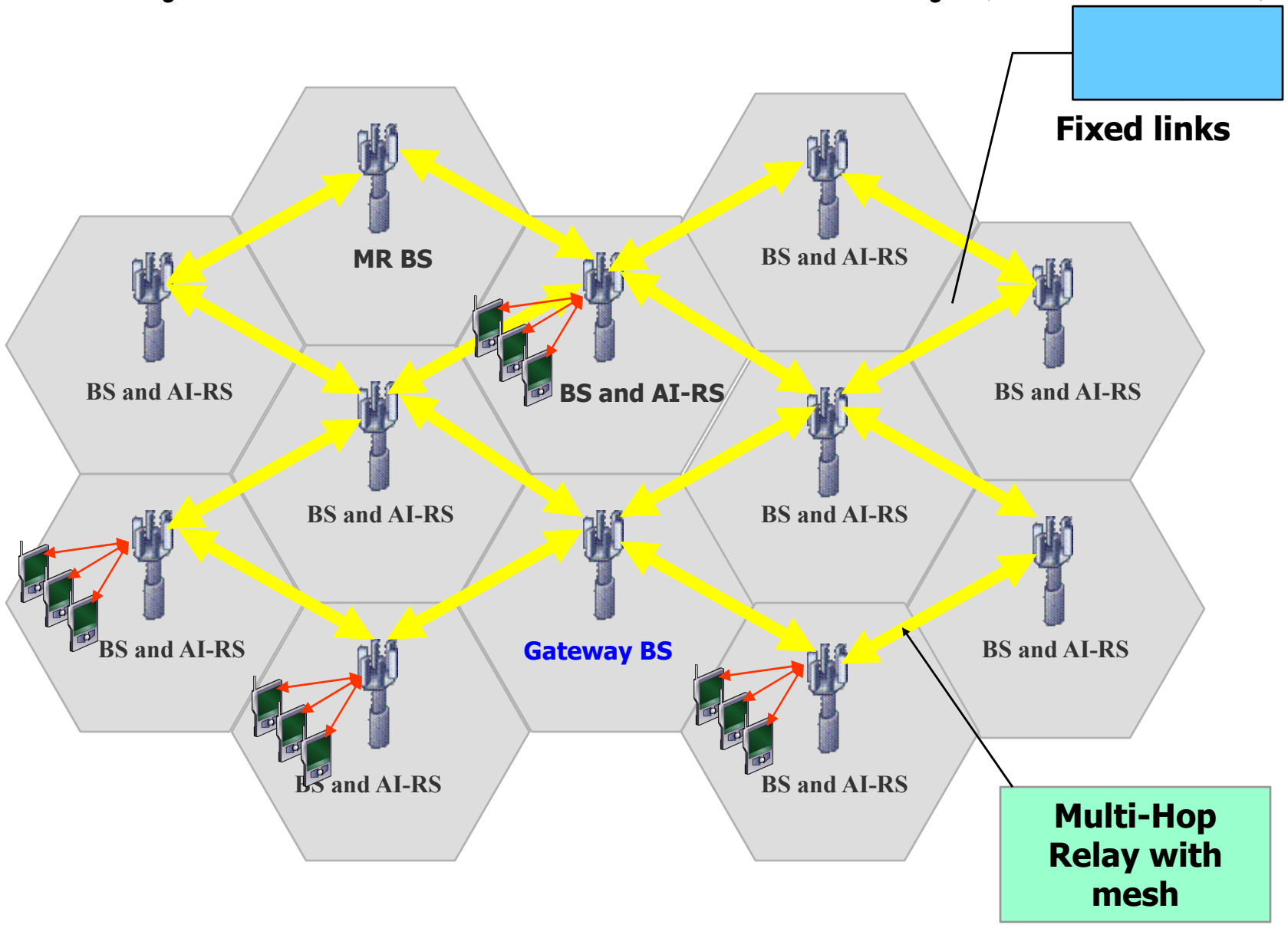
The Six MMR Link Configurations (1)

- Mode-0: The BS can associate with several MSs
  - Basic PMP one hop
  - Direct link when the radio condition is good
- Mode-1: The BS can associate with *at least one* AI-RS
  - Basic two-hop relay from BS to AI-RS
- Mode-2: The AI-RS can associate with several MSs
  - Basic two-hop relay from AI-RS to MSS
- Mode-3: The AI-RS can associate *at least one* AI-RS *(optional)*
  - Enable multi-hop for the AI-RS
- Mode-4: The BS can associate with several C-RS
  - Enable two-hop from BS to C-RS
- Mode-5: The C-RS can associate with *at most one* MS
  - Enable multi-hop from C-RS to MS
- Mode-6: The C-RS can associate with *at most one* C-RS *(optional)*
  - Enable multi-hop from C-RS to C-RS

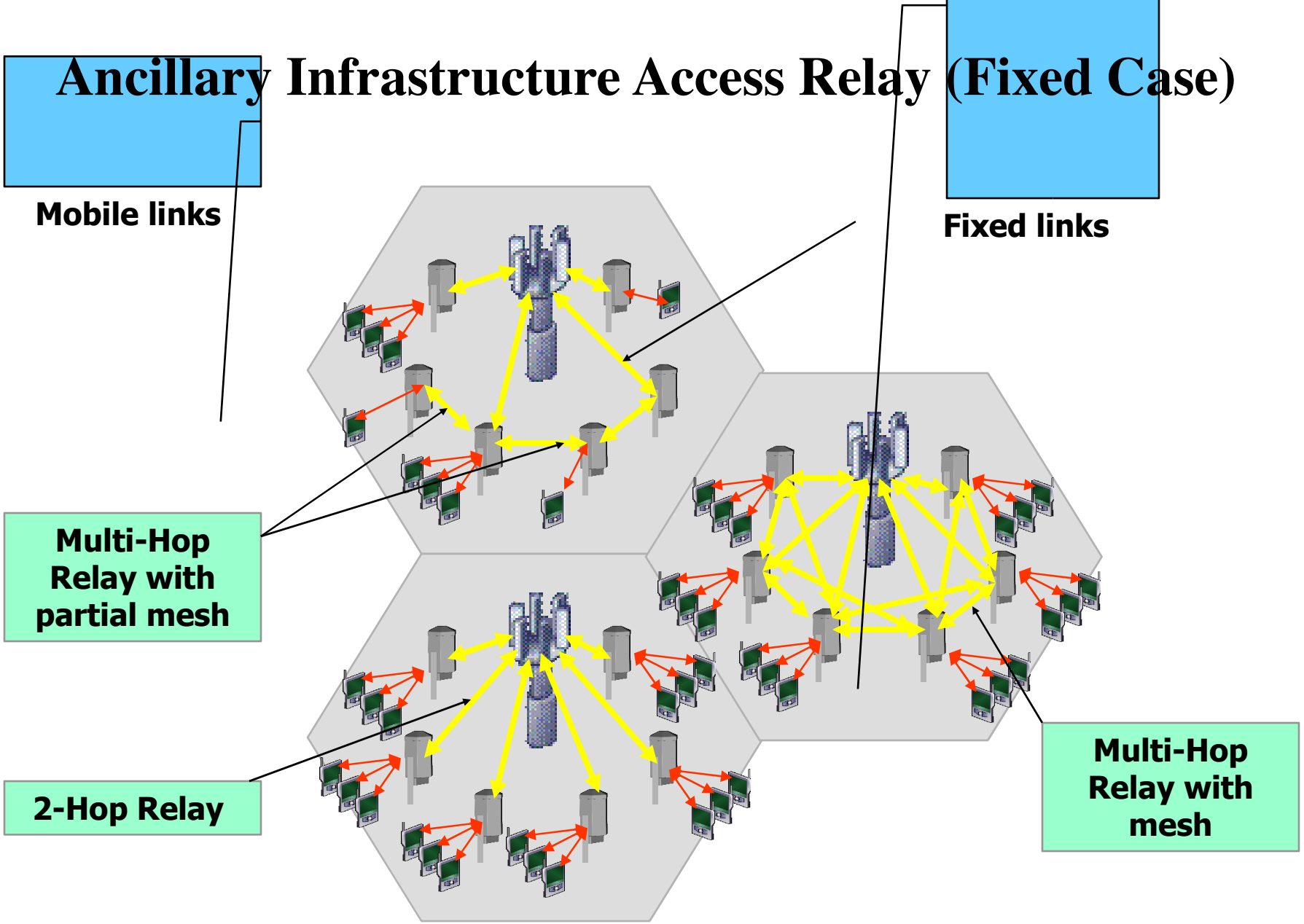
The Six MMR Link Configurations (2)



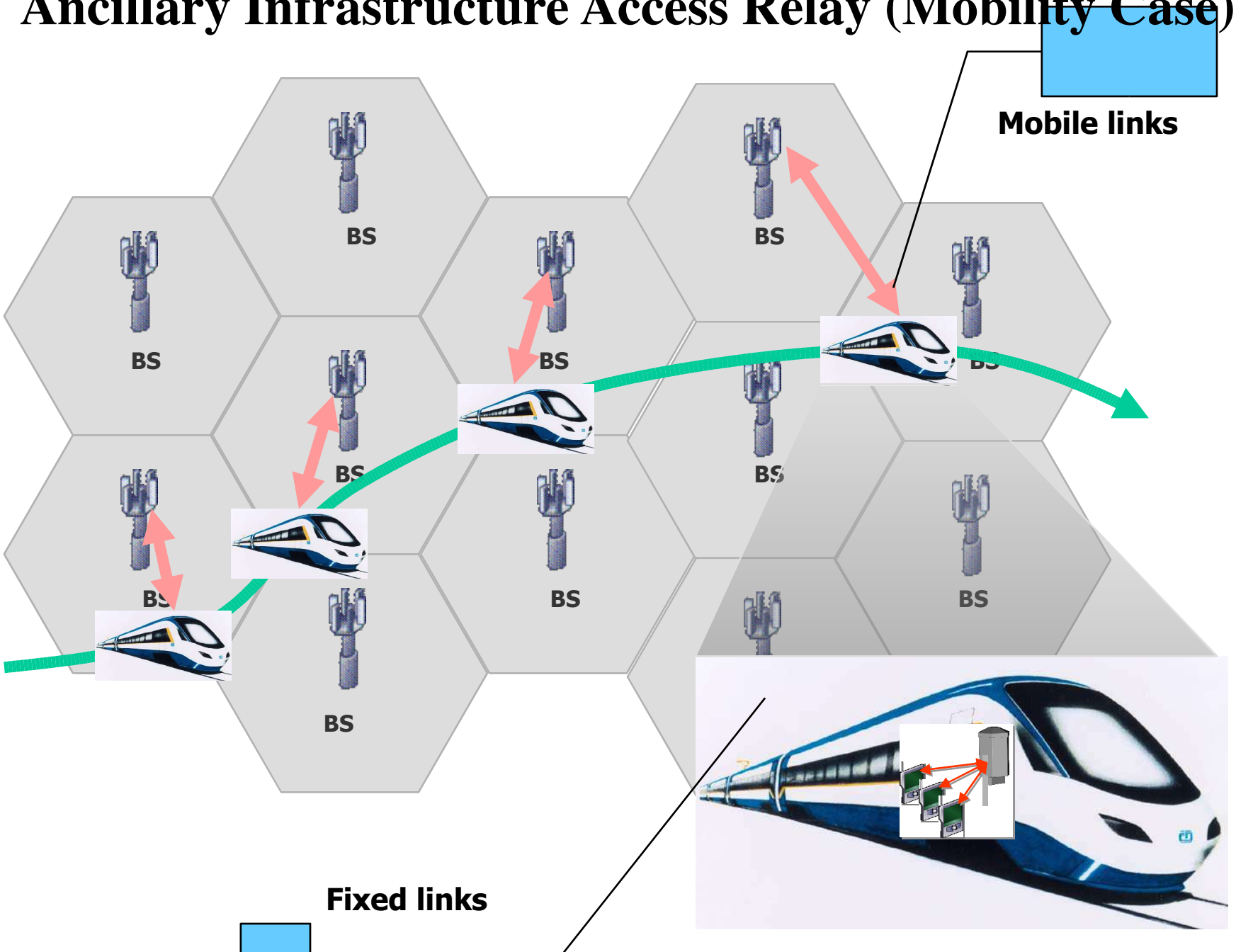
Ancillary Infrastructure Backhaul Relay (Fixed Case)



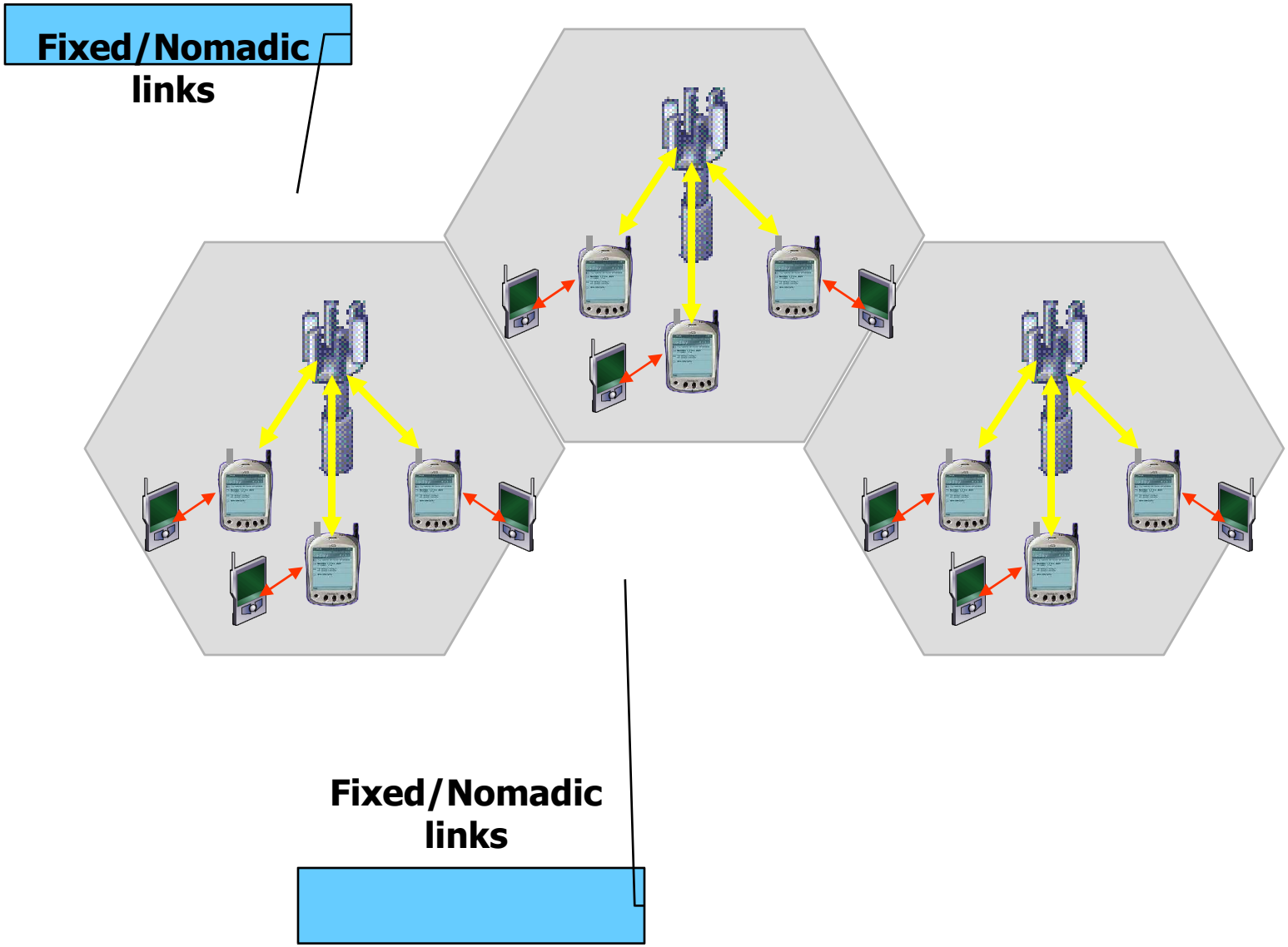
Ancillary Infrastructure Access Relay (Fixed Case)



Ancillary Infrastructure Access Relay (Mobility Case)

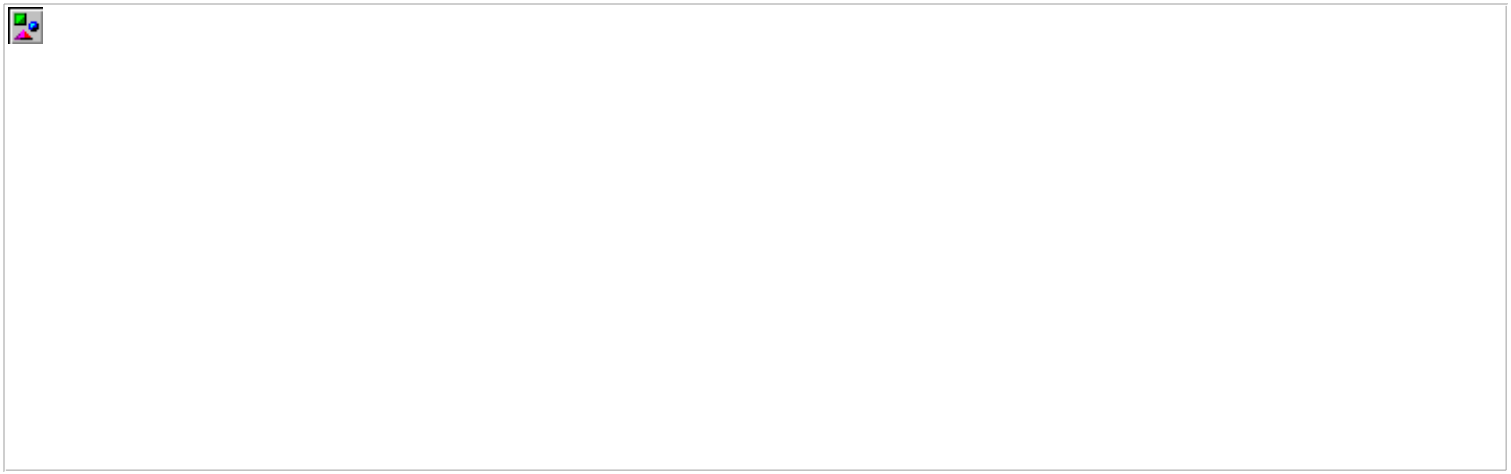


Client Access Relay (Nomadic Case)

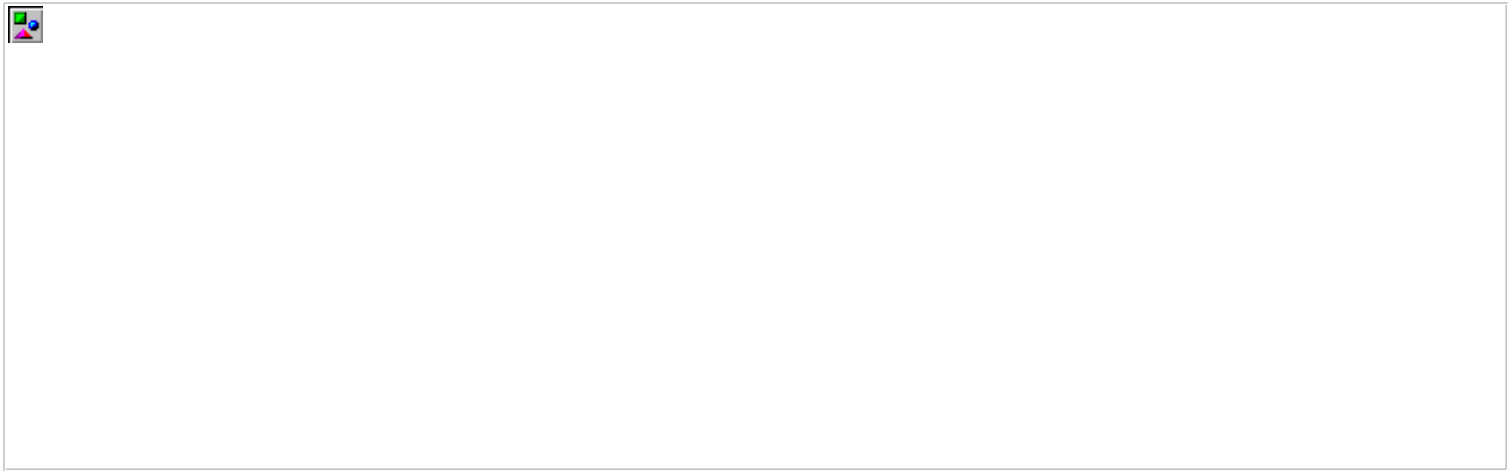


MMR Basic Networking Topology Constraints

Ancillary Infrastructure Relay



Client Relay



Discussion and Summary

- The proposed MMR networking topology is based on
  - Use BS for PMP mode
  - Use AI-RS for sub PMP mode
  - Use C-RS for point-to-point relay mode
    - To simplify the MS and C-RS complexity
    - To simplify the handover
- Enable the multi-hop and mesh networking
  - Mode-2/3/6 enable multi-hops
  - Mode-1/3 enable mesh