

NSF Platforms for Advanced Wireless Research (PAWR) & the COSMOS Testbed Proposal

RUTGERS

 COLUMBIA UNIVERSITY
IN THE CITY OF NEW YORK

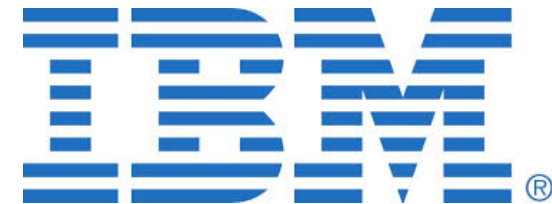


NYCTM

Team

- ▣ **Rutgers/WINLAB:** D. Raychaudhuri (PI), I. Seskar (PD), M. Gruteser, N. Mandayam, T. Nguyen, J. Van Oehsen
- ▣ **Columbia:** G. Zussman, Z. Kostic, H. Krishnaswamy, H. Schulzrinne, A. Crosswell
 - University of Arizona (NSF CIAN ERC): D. Kilper
- ▣ **NYU/Wireless:** S. Rangan, T. Korakis, S. Panwar
- ▣ **NYC Mayor's Office of Tech and Innovation:** J. Breitbart

- ▣ Partner organizations:



PAWR Wireless Testbed: Background



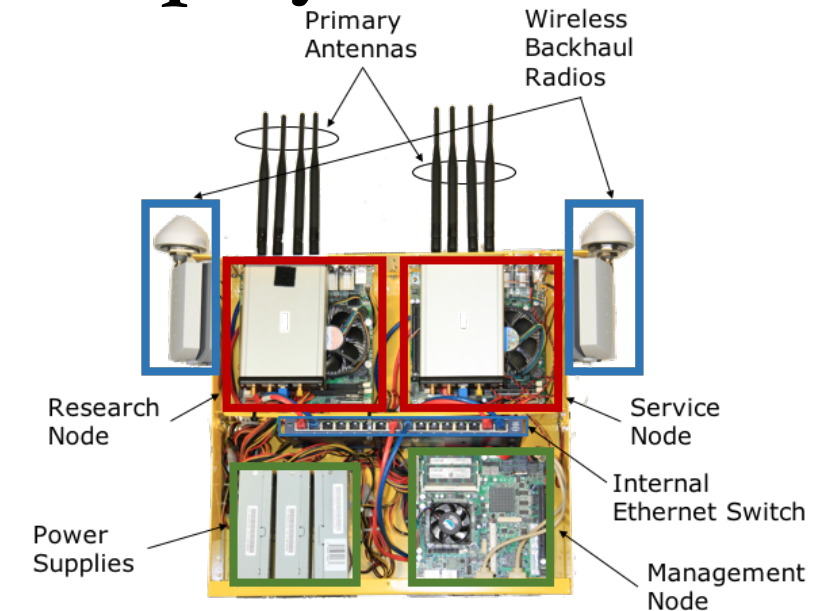
- Over the next 7 years NSF will invest \$400M in wireless research
- At the core - \$100M investment in constructing 4 city scale testbeds (~\$22.5M each)
 - These testbeds will be used to support the research within the “main” program
 - \$50M from ~25 Industry consortium members (for a list see <https://www.advancedwireless.org>)
- A significant part of the remaining \$300M will be invested in research in the testbed
- Timeline
 - Pre-proposal - June 1
 - Full proposal - July 31
 - Site visit – Nov. 13, 14

PAWR Wireless Testbed: Motivation

- Wireless/mobile networks undergoing fundamental transformation:
 - **New application drivers**: mobile cloud services, IoT, ...
 - Emerging core technologies: DSA, SDR, CRAN, SDN, NFV, cloud, ...
 - Architectural change: from cellular 3G/4G to heterogeneous 5G
- US Academic research has a strong track record of basic innovations in wireless/networking
 - However, mostly limited to theory and small-scale experiments
- **Need for a large-scale experimental testbed to evaluate and demonstrate feasibility of radically new ideas**
 - The testbed should be used by the research community and industry

COSMOS Wireless Testbed: High Level Deployment Plan

- ~10 "large" BS sites, ~40 micro/pico BS
- ~200 mobile nodes including both vehicular and hand-held
- Dense urban area: population of ~25K, 1 sq. mile
- Fiber optic backhaul from most sites, option for wireless backhaul in some cases
- Edge computing and Cloud Radio Access Network (CRAN) facilities at colocation site
- Connection to high speed wide area networks including GENI/I2
- Interaction with smart community & innovation initiatives (e.g., 135th St corridor)



Tentative Deployment Plan

