



The POWDER mobile and wireless living laboratory

***[powderwireless.net](http://powderwireless.net)***

***Kobus Van der Merwe***

***University of Utah***



**Platforms for Advanced  
Wireless Research**





# Plan...

- What is POWDER?
- What POWDER is not.
- What is the FCC *Innovation Zone* designation?
- Why does it matter?

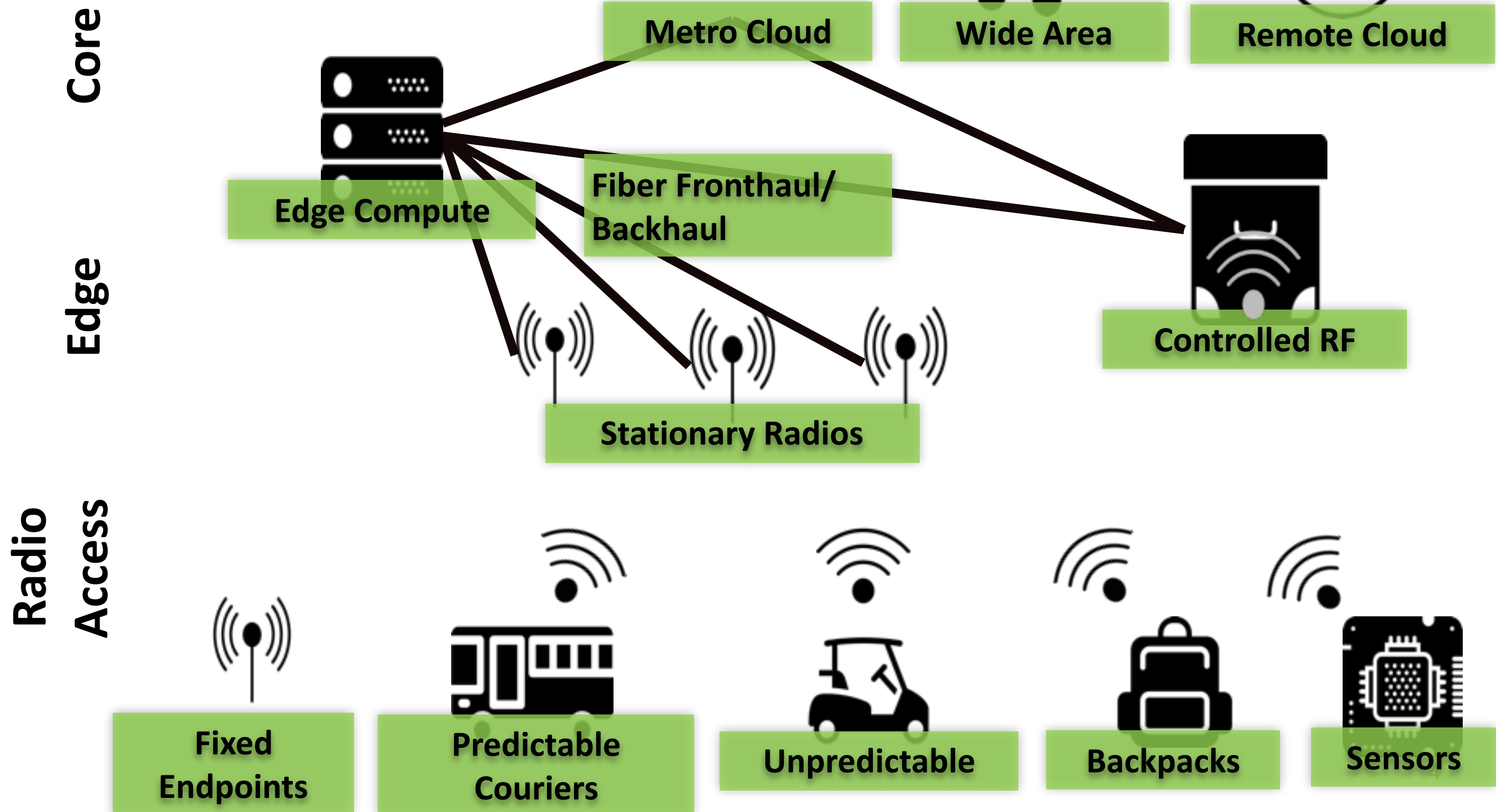


# What is POWDER?

- **Platform for Open Wireless Data-driven Experimental Research**
- A testbed in SLC to enable mobile and wireless research in a city-scale “living lab” environment
  - Uses off-the-shelf equipment and equipment from partners at Rice University
  - Expect to enable broad range of academic/industrial research
- Part of National Science Foundation (NSF) initiative to enhance research in mobile and wireless
  - PAWR: Platforms for Advanced Wireless Research
  - Public/private partnership: \$100M
  - Three platforms: POWDER (UofU with Rice), COSMOS (NYU, Rutgers, Columbia), AERPAW (NCSU, RENCi, MSU)



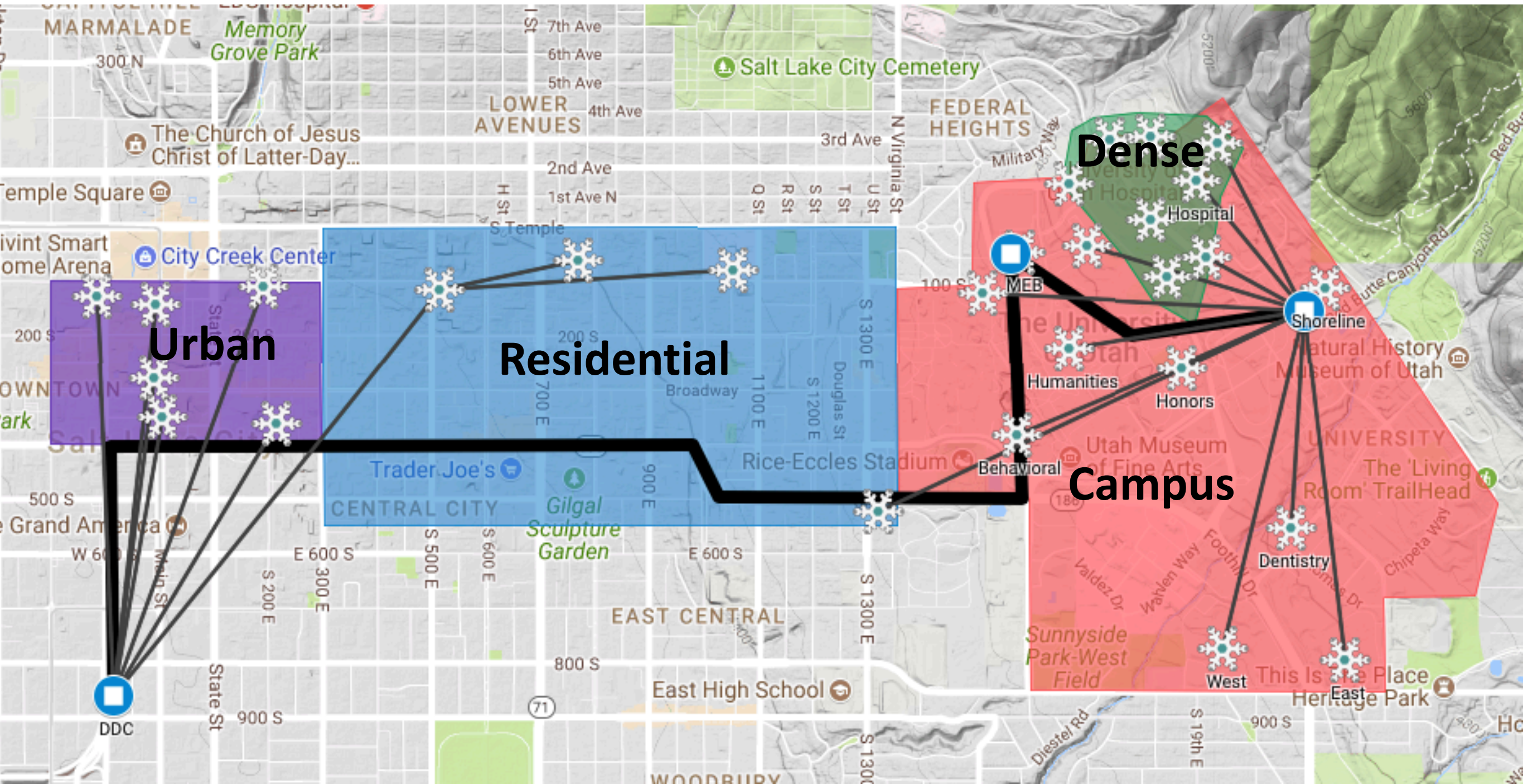
# POWDER Overview





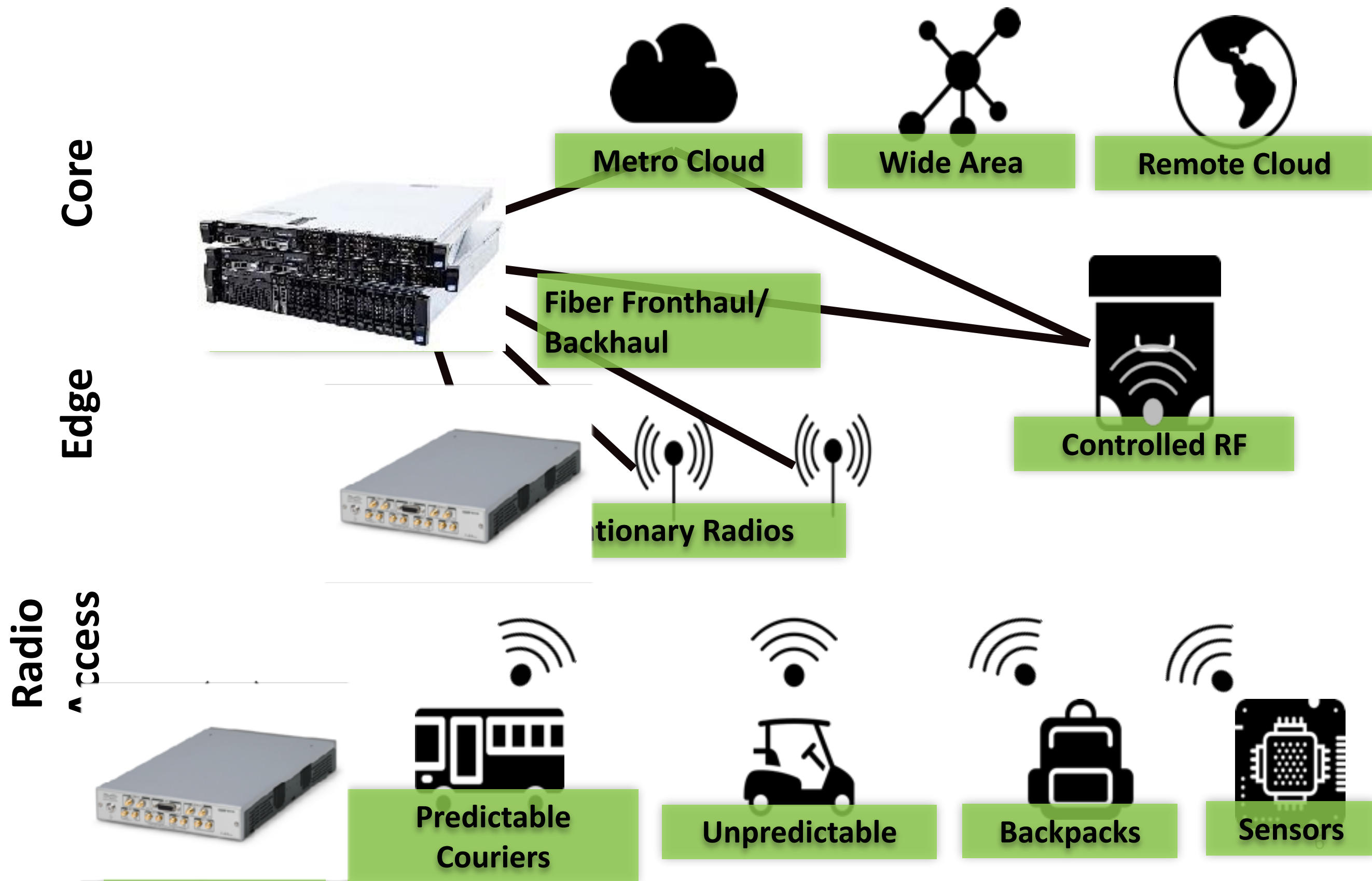


# Planned POWDER Footprint





# Software Defined...







# Software Defined...



General  
purpose  
compute  
hardware

+



(Open source)  
Software

=



Cloud  
Platform



# Software Defined...



Software Defined  
Radio (SDR)

+



(Open source)  
Software

=



4G Base  
Station





# Software Defined...



Software Defined  
Radio (SDR)

+



(Open source)  
Software

=



5G Base  
Station



# Software Defined...



Software Defined  
Radio (SDR)

+



(Open source)  
Software

=



5G Radio  
Access Network (RAN)



+



=





# What POWDER is not.

- It **is not** a 5G testbed *per se*
- It **is** a testbed that can be used for 5G research, *and research related to 4G, or 6G...* (*because it is software-defined*)
- It **will not** provide mobile/wireless services (even experimental services) to the public
- It **is** a living laboratory, i.e., a place for experimentation



# What is the FCC *Innovation Zone* designation?

- Innovation Zone:
  - Part of FCC push to enable innovation in mobile/wireless/spectrum use
  - POWDER/SLC designated as one of two first Innovation Zones
    - More flexibility in how we make use of spectrum
    - Path to interact with FCC
    - Still have to comply with FCC regulations:
      - Follow FCC procedures and regulations
      - “Big red button”
      - Monitor platform in real time





# Why does it matter?

- Why do mobile and wireless research?
  - Expertise and knowhow in mobile and wireless networking of national interest
  - New services and applications
- Why Utah?
  - UofU expertise and tremendous community support (SLC, UETN, UDOT, SL County, UTA, GOED...)
  - Working on proposal on becoming a *Research Lab for Rural Communication Ecosystem*