



National Science Foundation
WHERE DISCOVERIES BEGIN

NSF Wireless Cities Workshop

Feb 2,3, Washington D.C.

Organizers: Dipankar Raychaudhuri (WINLAB, Rutgers University) and Suman Banerjee (U Wisconsin)

Workshop Objectives

- Focus on broad areas of **future wireless networks and cloud**
- Engage the research community to identify **potentially transformative network architectures**, enabling technologies and applications – **5-10 year time horizon**
- Specific focus on “**future wireless cities**” as the use case which drives disruptive breakthroughs in wireless system design



Workshop Scope (cont.)

- “Wireless cities” architecture, design goals, ..
- Next-gen wireless/mobile systems & services
- Emerging wireless access technologies
- Software defined networks and infrastructure
- Cloud technologies and virtualization
- Mobile edge cloud scenarios
- Smart Cities, IoT and vehicular
- City-scale testbeds and building blocks

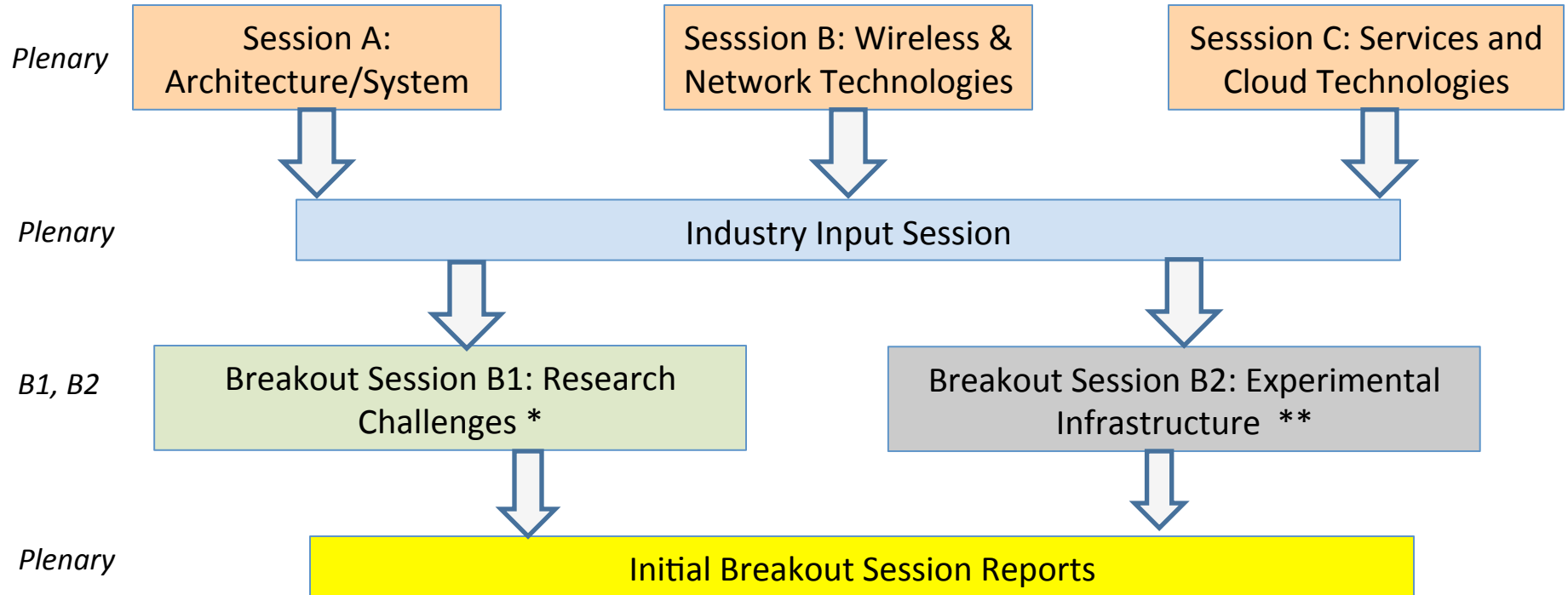


Workshop Objectives

- Serve as a **forum for NSF community** to exchange research ideas
- **Open discussion and brainstorming** on wireless cities ideas, research, testbeds, ..
- Obtain input from industry and city projects
- Develop **research and experimental infrastructure agenda** for NSF CISE
- Written **report** on key findings and recommendations



Workshop Agenda (Day 1)

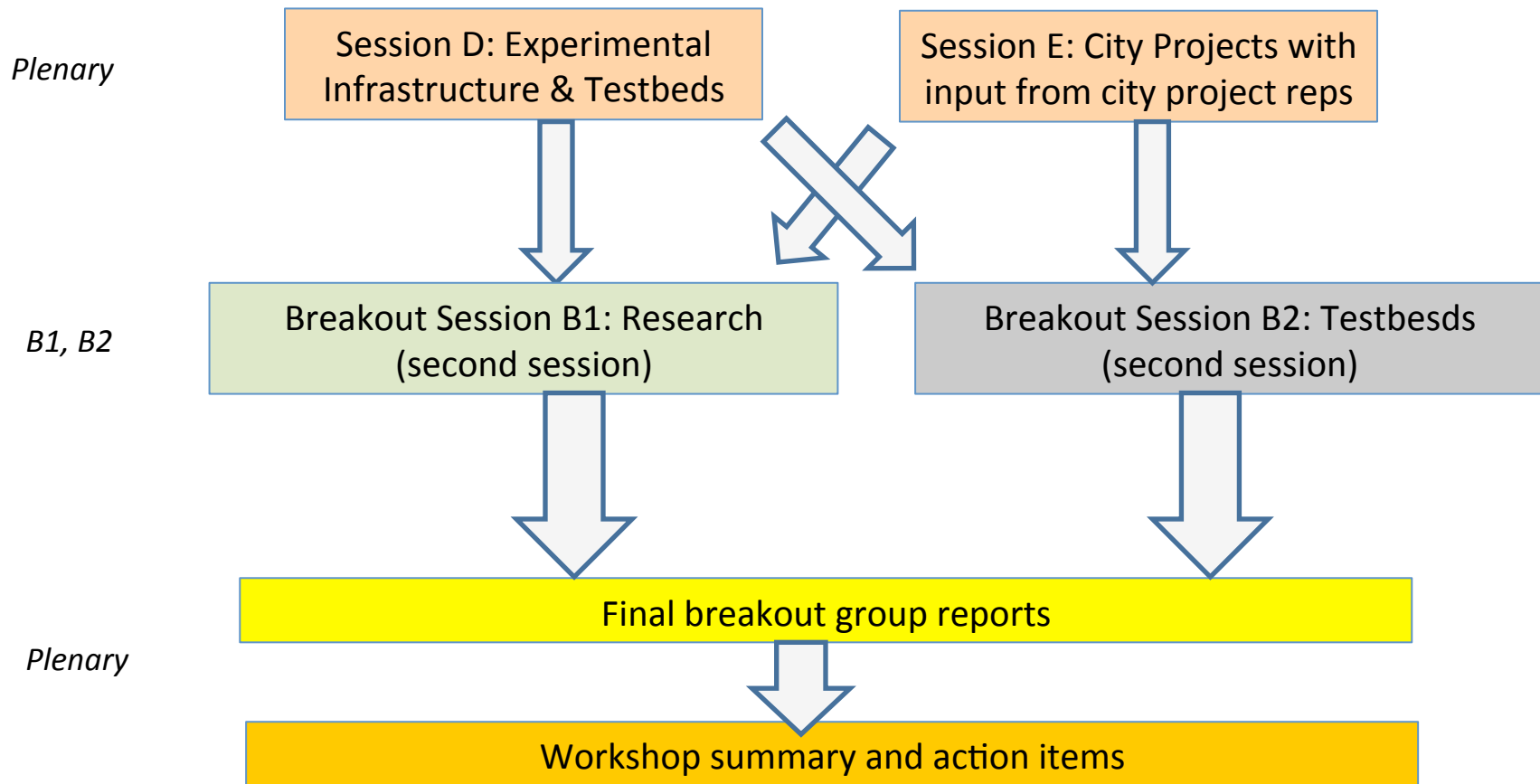


*B1 Chairs: Yanyong Zhang & Peter Steenkiste

**B2 Chairs: Jie Wu and K.C. Wang



Workshop Agenda (Day 2)



*B1 Chairs: Yanyong Zhang & Peter Steenkiste

**B2 Chairs: Jie Wu and K.C. Wang



Guidance for Participants

- Talks should be **brief** – 20 min/10 slides for invited, and 10 min/5 slides for contributed
- Focus on **future research** opportunities rather than reporting on previous work
- **Comments** and 1-2 slide inputs from audience **welcomed** during discussion periods
- Use the meeting to **brainstorm** new ideas with colleagues
- Provide **written notes/slides** to breakout chairs where possible
- **Contribute to draft** breakout session report and overall workshop document



More guidance

- Cities to be broadly construed
 - City (or Community)
- Why should we be doing activities at scale
 - Research on improving a single “link” performance in isolation is important, but not central to our discussions in this workshop

Apps and Services workshop

- Lots of apps
 - Health maintenance
 - Realistic virtual reality, collaborations
 - Secure infrastructure for critical apps
 - Intelligent personal assistants/coaches
 - Smart (dark) factories
 - Planet stewardship
 - Big sciences
 - Educating 7 billion
- Drowning in data, how to visualize, analyze?
 - “Insights-as-a-Service”

Apps and Services workshop

- Infrastructure needs
 - Low latency (edge computing/services)
 - Sliceable networks
 - Federation
- Security and Privacy
 - How to compose privacy policies
 - Social, psychological, and economic issues on privacy
 - How to secure cheap devices?

Questions for breakouts

Research breakout

Day 1

- Identify past successes (briefly).
- What are the grand (application) challenges we should be solving, especially in the context of future wireless cities. (upto three examples).

Day 2

- What wireless systems should we be focusing our research efforts on, starting **2021** (do not tell us about your next project, since that is too near term).
- Why is city-scale experimentation critical to solving some of these problems?
- Useful to guide this agenda based on future wireless cities.
Use Day 1 grand challenges to guide your thoughts, especially on research that would benefit from large-scale testbeds.

Questions for breakouts

Testbeds breakout

Day 1

- What are good examples of successful testbeds.
- What kinds of testbeds do not work well for the community?
- What should a city-wide testbed and infrastructure look like? (very low-level programmability is not likely to be practical at the city scale.)
- Identify potential types of partners and stakeholders to make it successful. How should such partners be incentivized?

Day 2

- Why is scale critical to solving some of these problems? (Try and identify why NSF should be funding city-scale activities as opposed to smaller scale testbeds and infrastructures).
- What else is needed from a logistical standpoint to create such testbeds (e.g., spectrum policy, right of way) ?

Key deliverable

- A report
- Groups leaders to assist us with their report sections (**ideally a draft by end of this week**)
 - Please identify scribes in your groups to assist you with note taking, and report creation
- We (the chairs) will be using your input to create the final report

Slides to be available at:

www.winlab.rutgers.edu/events/wicities/

Speakers – please email talk slides to:

suman@cs.wisc.edu or

seskar@winlab.rutgers.edu