

WiMAX Prototyping in Metro Detroit: Current Status & Prospectus

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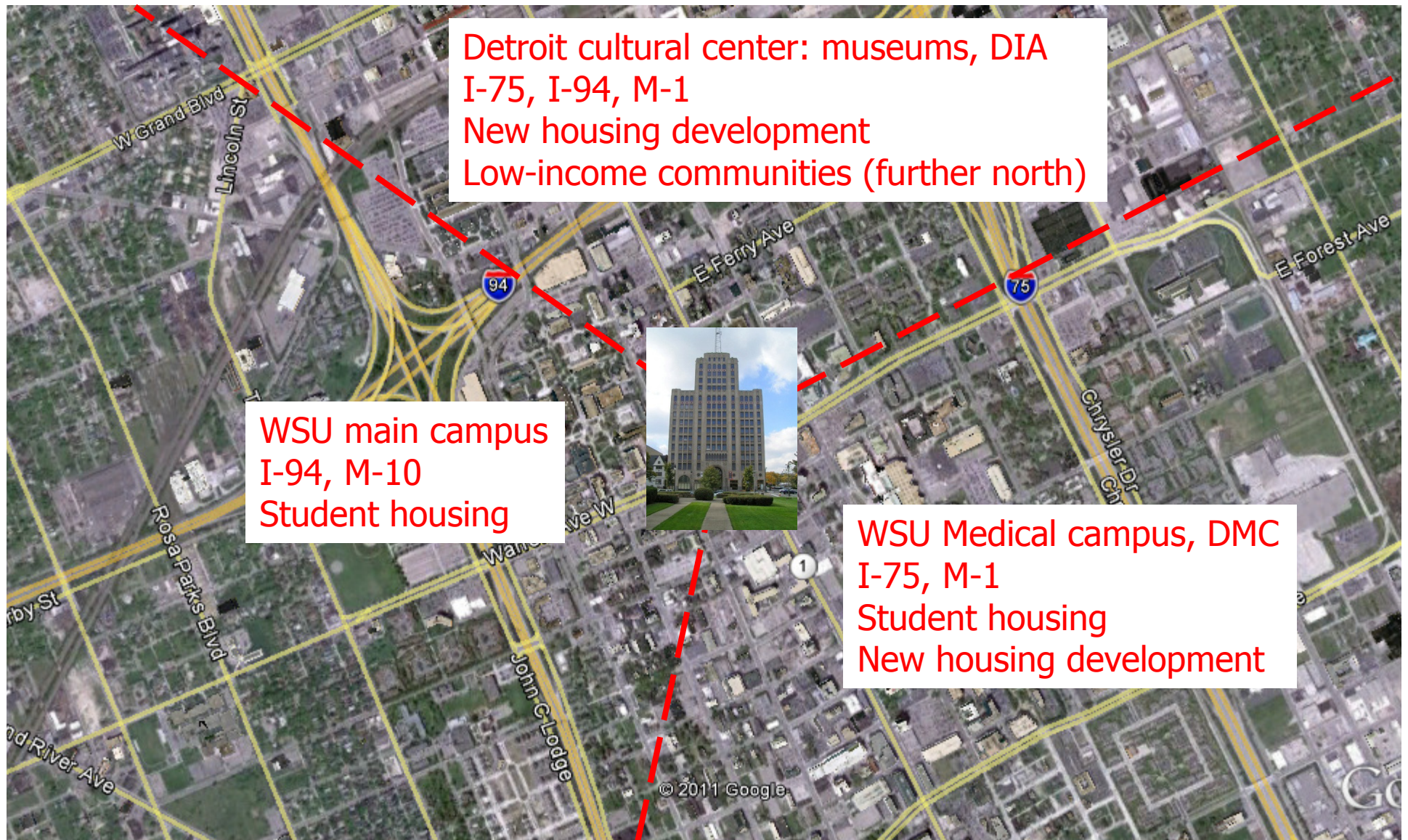
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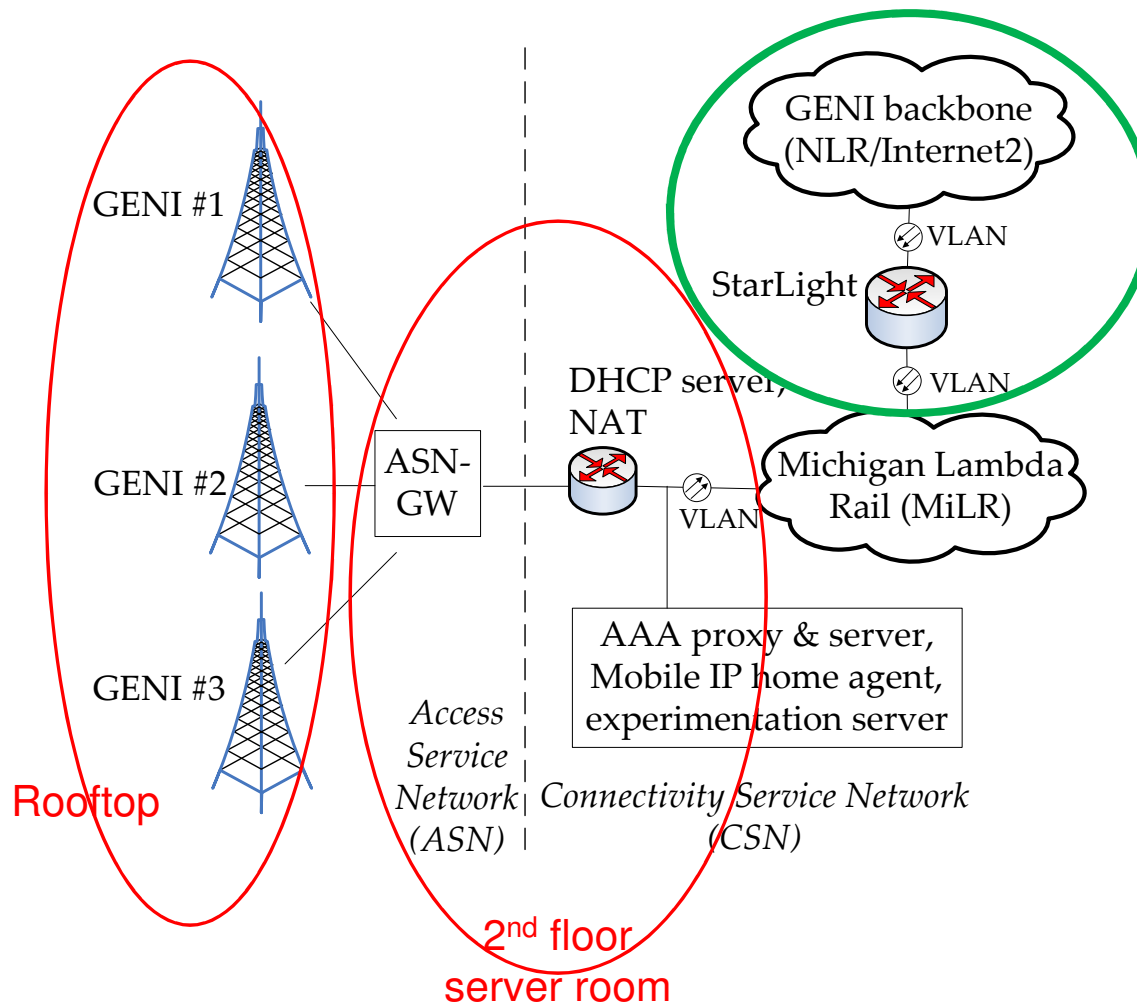


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Deployment site: Rooftop of the Maccabees building



System architecture





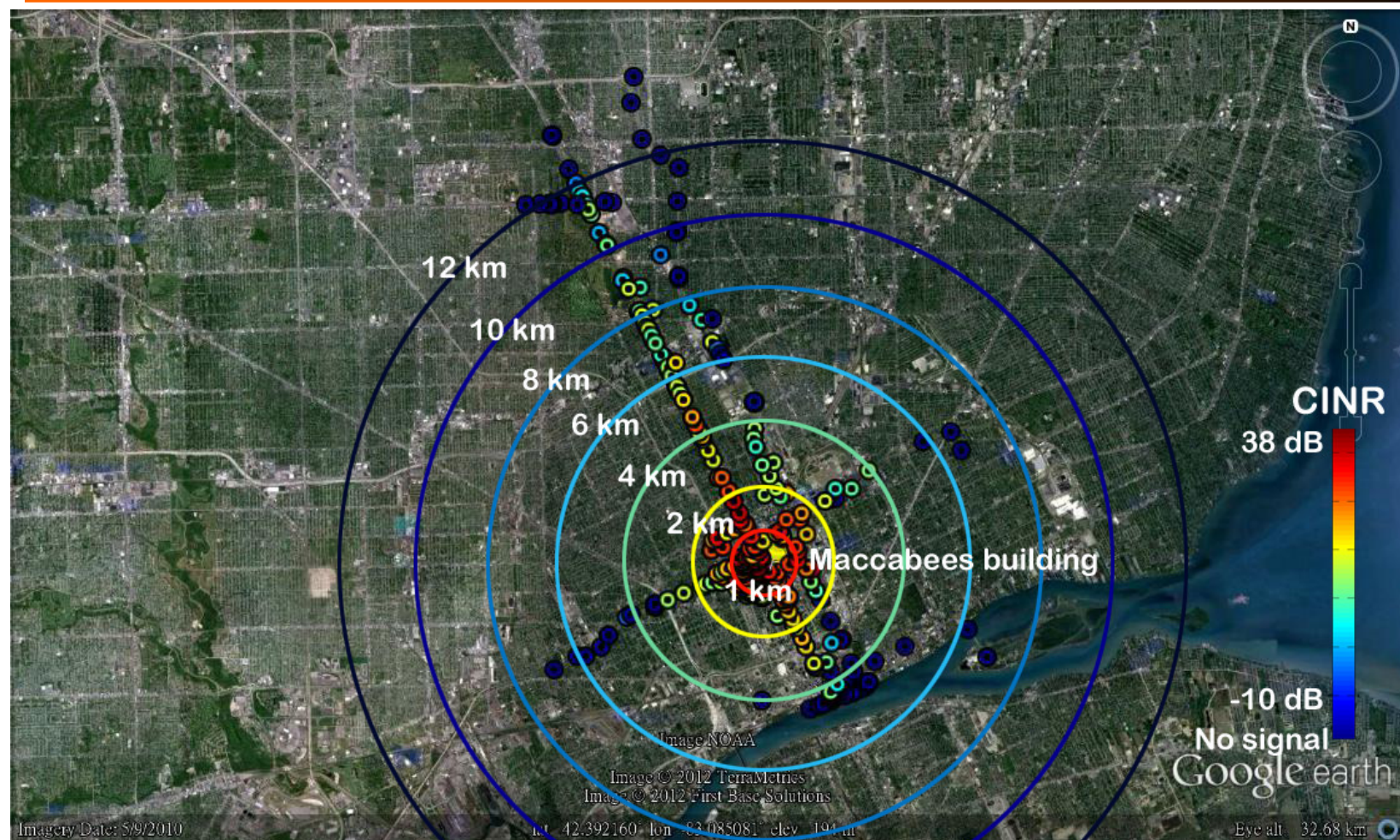
Current status

- Spectrum loan from Clearwire: done
 - ▣ 10MHz band: 2591MHz – 2601MHz (belongs to 2510 Mid band of 2560MHz~2630MHz)
 - ▣ Current loan valid until March 1, 2013; to be renewed annually afterwards
- Two WiMAX base stations up and running;

Ready for the deployment of the third base stations

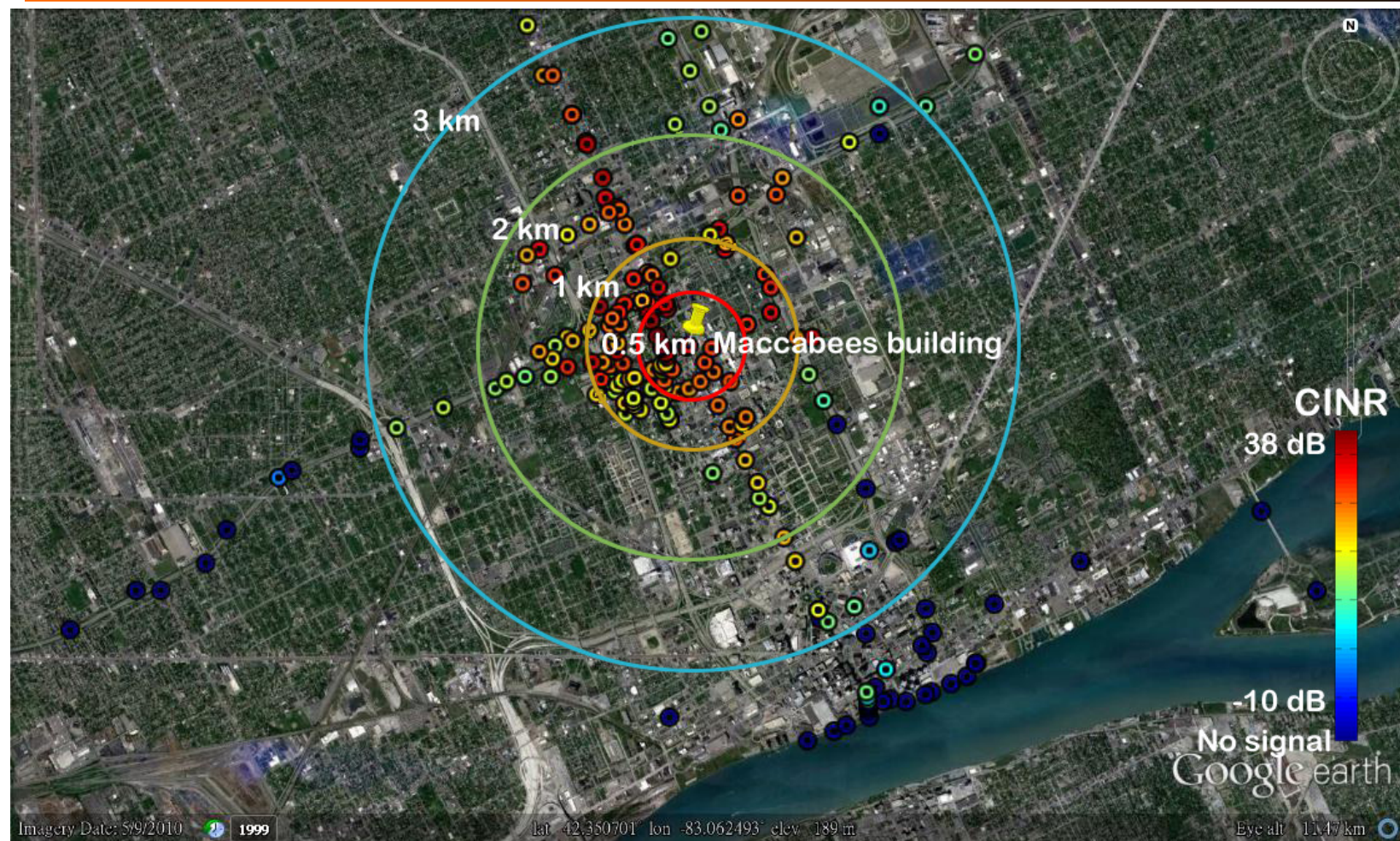


CINR (1)



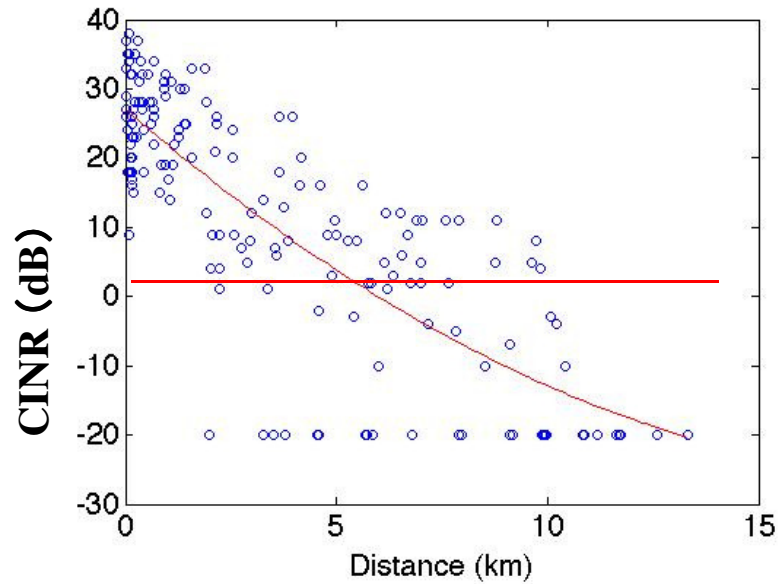
USB Dongle in car; Expect extended range with external antennae.

CINR (2)

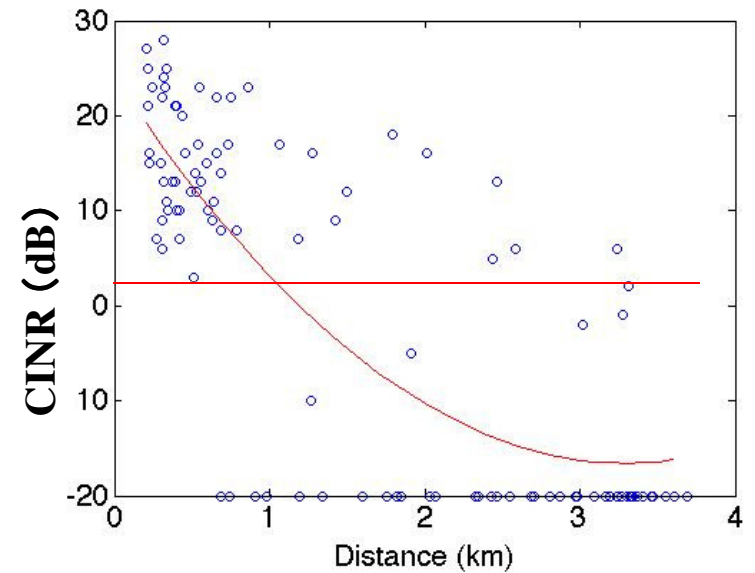


Curve fitting

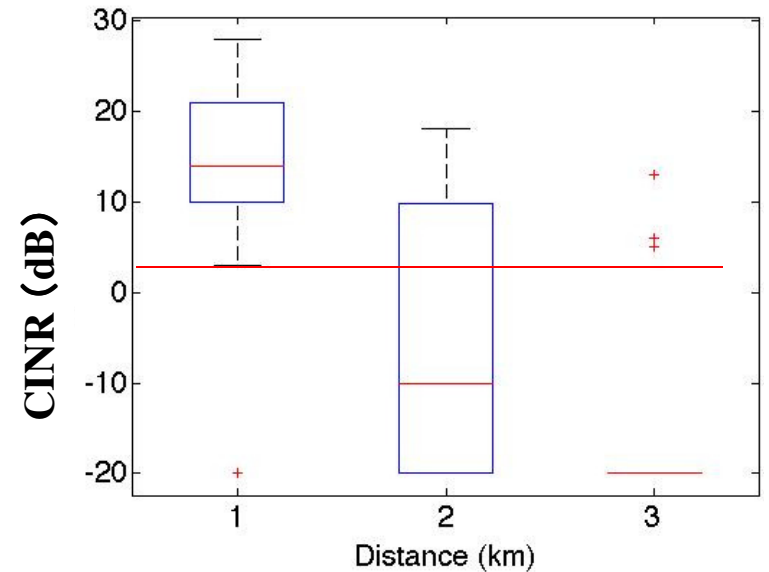
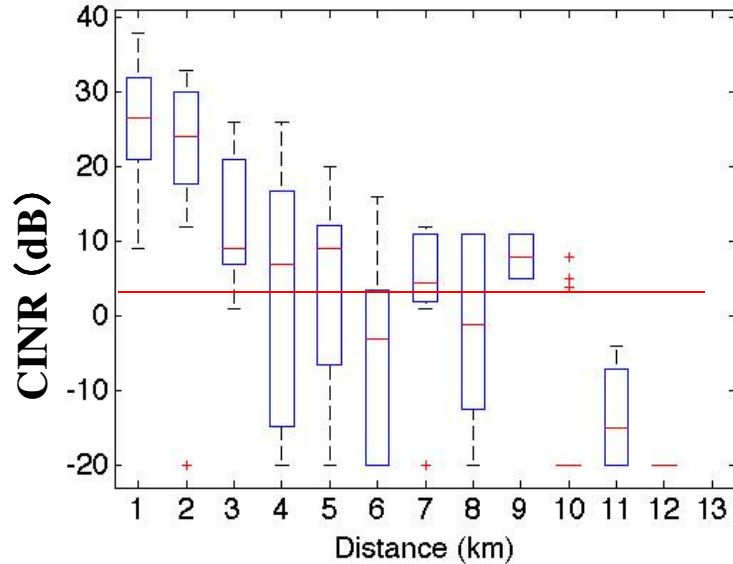
Signal CINR on north side



Signal CINR on south side



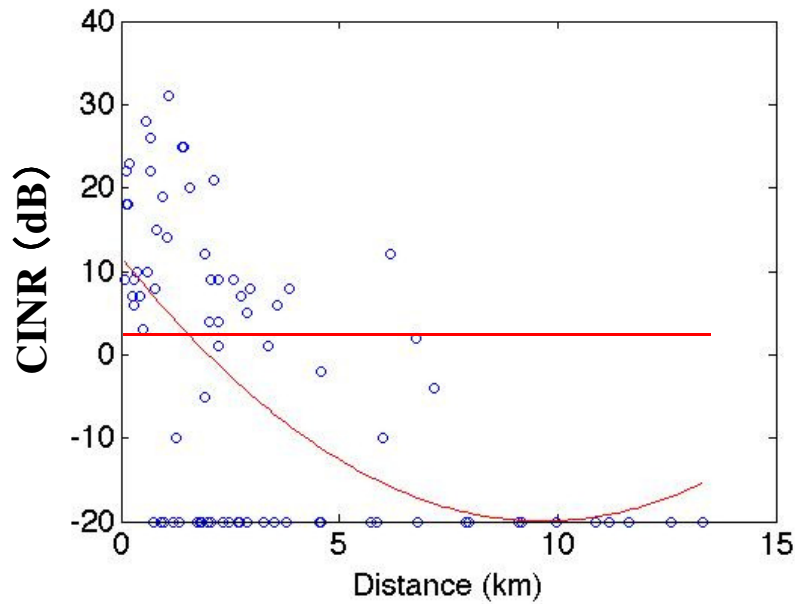
Boxplot



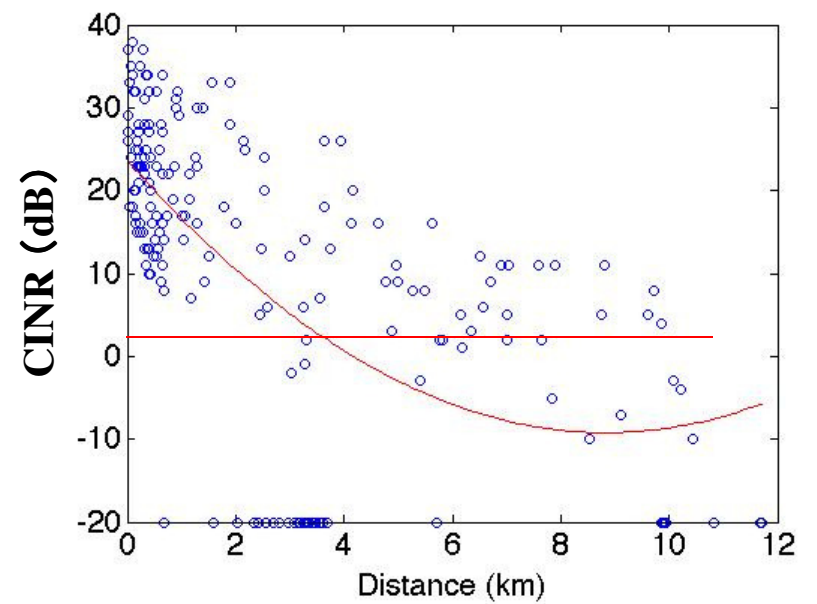
Better signals on the north side: a third base station will solve the problem

Curve fitting

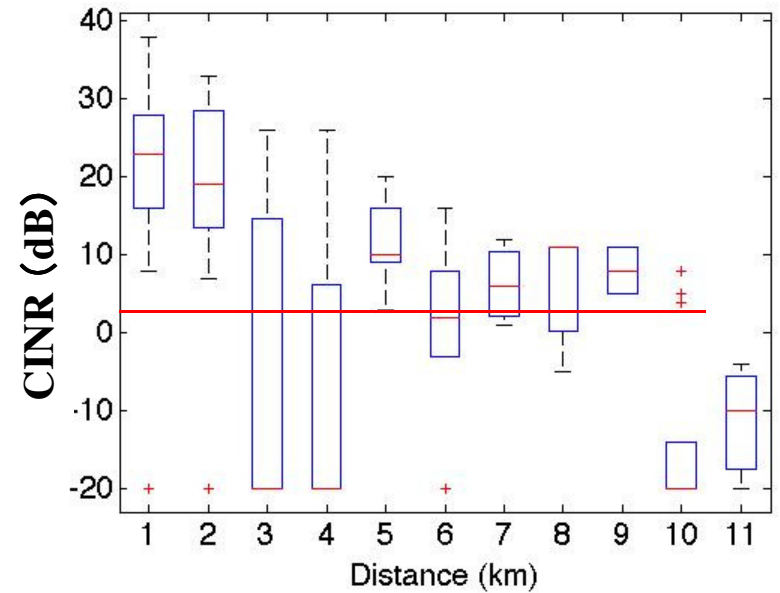
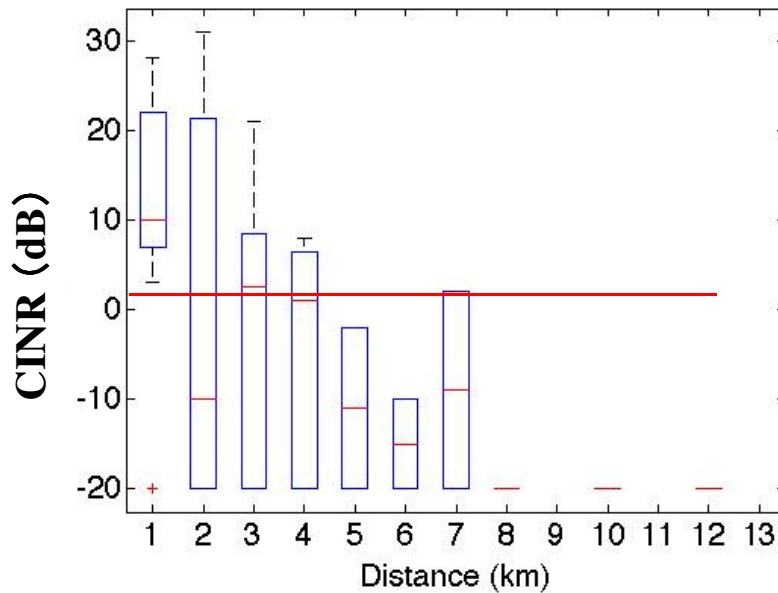
Signal CINR on highway



Signal CINR on city road



Boxplot



Slightly worse signals on highway: external antennae may help

Plan for Spiral 5

- Set up IP connectivity to WiMAX base stations
- Configuring VLAN to GENI backbone
- Deploy yellow nodes & the third base station
- Integrate OMF & enable remote access
- Deploy (and customize) handover/multi-homing services
- Develop measurement services & measurement campaign
 - Mobile-station-based measurement tools: channel status, modulation/coding, signal strength/CINR, integration with GPS etc
 - Spatiotemporal behavior in static & mobile scenarios: smart grid and smart transportation
 - ns-3 integration
- GENI-fy OpenXC vehicular sensing and infotainment platform
 - Refine OpenXC, virtualization, etc
 - Integrate with OMF
 - Integrate with measurement tools
 - Integrate with v2V & V2I platforms (i.e., SDR) as well as vehicle sensing and control apps