

Broadband Summit 2014

Rural Public Safety LTE

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Let's first define some LTE capabilities

- Capacity

	2RX 1 TX (SIMO)	2RX 2TX (MIMO)
1 Sector	25 / 35 Mbps	25 / 70 Mbps
3 Sector	25 / 105 Mbps	25 / 210 Mbps

- Range

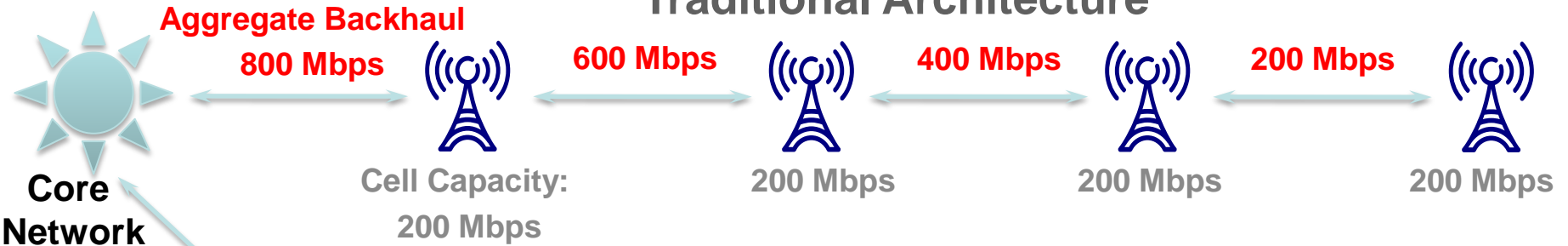
* Approximate values for reference

	Mini (2-5 watt TX)	Macro (40 watt TX)
Urban	1/8 to 1/4 mile	1-5 miles
Suburban	1/8 to 1/4 mile	5-8 miles
Rural	1/4 to 1/2 mile	8-20 miles
Highway	1/4 to 1/2 mile	As great as possible

How do we deliver this peak data rate across rural America?

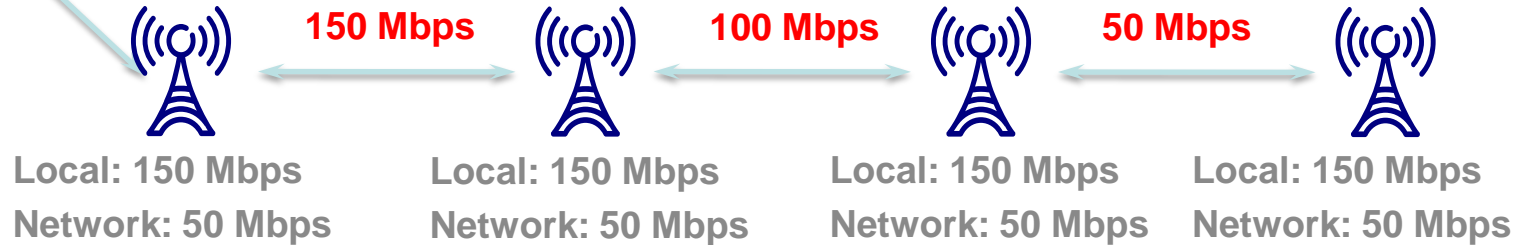
Backhaul will limit peak throughput

Traditional Architecture



Aggregate Backhaul
200 Mbps

Architecture using Localized Core Network Components



- Backhaul without fiber will be expensive for rural deployments
- CAPEX for local EPC can be less than OPEX of backhaul services
- Reliability and Availability increases with localized network elements

Traditional Mobile Broadband Architecture

In urban areas, with robust fiber backhaul availability, a traditional Mobile Broadband architecture makes sense.

- Easily covers traffic load
- Fiber backhaul is affordable
- All traffic passes over the backhaul to a centralized EPC
- Applications are hosted in regional centers
- User Authentication (HSS) is in a regional center

This makes sense for urban ... but what about rural?

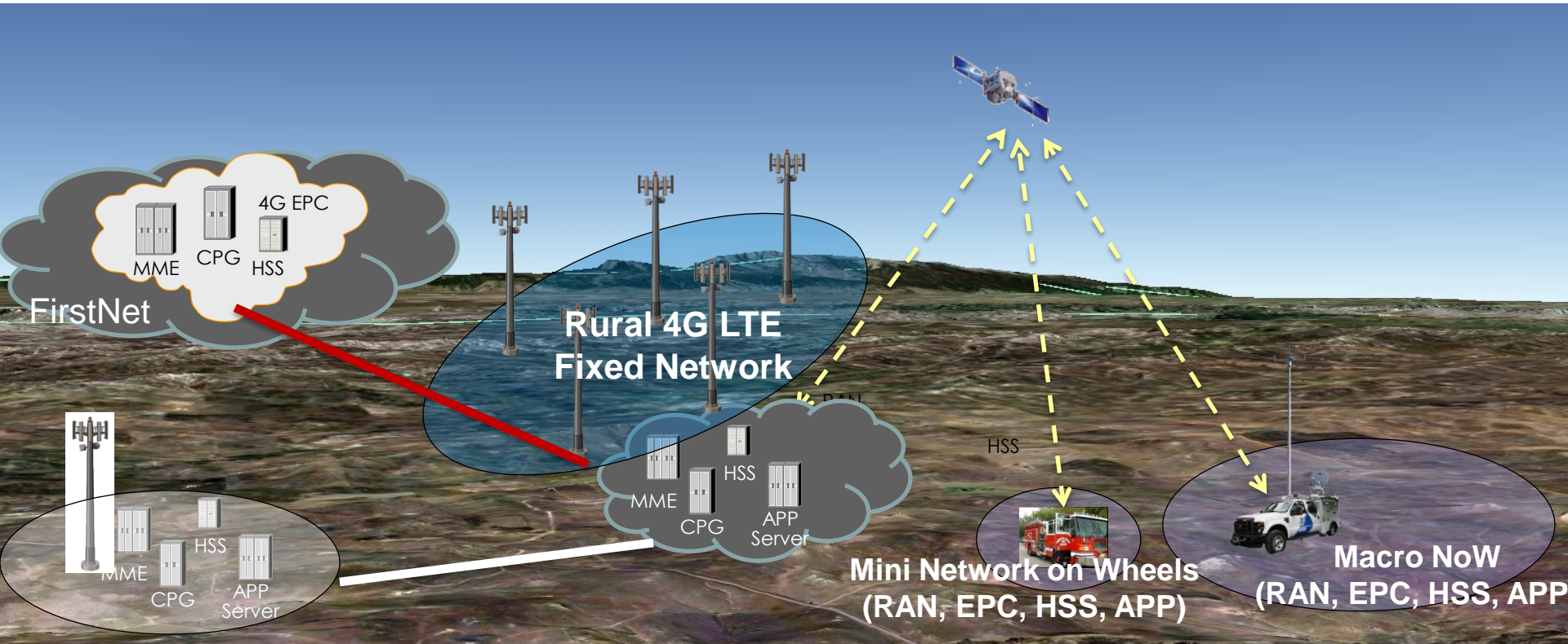
Consider a Hybrid Architecture

For rural areas, a hybrid architecture should be considered

- Backhaul is microwave, rural carriers or satellite
- Utilize local EPC elements to keep data traffic within the cell. Only backhaul what is necessary.
- Some applications are hosted locally
- User Authentication (HSS) is in a regional center, with local (cached) backup
- Supports local control and visibility

Placing EPC elements locally increases throughput, improves availability, reduces OPEX and maintains interoperability.

What does a Hybrid Architecture look like?



- Resilient - Local EPC provides LTE call processing at the edge.
- Local Application Servers for video, voice and data without backhaul.
- Reduced backhaul requirements. Local data stays local. Lower OPEX.

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