Universal Service, Mobile Broadband and Reverse Auctions (or, Universal Service in a 5G world) (or, or, what can we learn from MF-II challenge process)

Agenda: Universal Service: What Needs to be Measured

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USF in U.S.: $9B/year, $4.5B CAF, $0.5B MF-II

Mobility Fund – Phase II (MF-II): reverse auction for allocating USF funding
- **Reverse auction**: like an RFP with competitive bidding. Providers bid to meet service requirements.
- **Mobile**: probability to deliver X Mbps Y% at network loading Z% at edge of 1 km grid zone? (CAF: Fixed is to locations in area.)
- **Step 1: Identify Eligible Areas?**
  - (1) 477 Data: operator reported coverage by zones
  - (2) Challenge: submit measurements to ID white space

Proposal: Analyze MF-II Challenge Process and Data
- (1) Reverse auctions are economists’ preferred mechanism. How to improve process?
- (2) Markets/Light-handed reg needs healthy measurement ecosystem which requires capability for third parties (incl. independent analysts) to access basic broadband performance/service data (speed, latency, provider, etc.) for arbitrary locations/time/providers that combines mobile & fixed

Rosenworcel: “FCC says 24million, while recent NYT article says 162million without adequate BB”
Universal Service in a 5G World

• **5G: converged broadband – mobile/fixed, tech-neutral regulation**
  - Lots of heterogeneity: tech, uses (bursty traffic), value, costs
  - Digital Divides *always... markets evolve, tech changes*

• **Universal service – ensure access to BB**
  - Available, Affordable, Accessible, (Adopted, Equitable, Choice)
  - Why not available? Not economically viable for private investors.
  - Solutions: **Subsidize**, Lower cost (other barriers), Raise demand

• **Challenges/research questions/measurement need?**
  - Identify **target BB goal**: speed, services (latency), affordability, usage
  - Identify eligible subsidy areas (**coverage** goal)
  - Measure actual performance (better targeting, **impact** assessment, enforcement)
Universal Service in 5G world

- **(Q1) Goal:** technology neutral reverse auction design (i.e., does not differentiate between fixed and mobile proposals)
  - Avoid distorting investment (arch, fixed/mobile), duplicative investment, tech-neutral regulation

- **(Q2) Data: USF needs**
  - Identify territories eligible for subsidies (reverse auction) & challenge measurements (to target funds, measure effectiveness)
  - QoS impacts (how much speed matters? Balancing mobile v. fixed service differences in performance, demand/supply)

- **(Q3) Approach: look at MF-II process (and relation to CAF)**
  - Evaluate challenge process, Implications of MF-II for investment
  - Does MF-II crowd-out/promote broadband investment in aggregate?

- **(Q4) Management: public data on performance measurement**
  - Need integrated way to measure performance for BB (by location, time, tech, (use))
  - What should be our Broadband USF goal: When (how) are Mobile and Fixed substitutes or complements?
Some further questions

• Can we ever consolidate fixed and mobile measurements?
  • Fixed: by location, but no national dbase of locations geocoded and requires more
detailed infrastructure and subscriber location data that raises security, cost, and
strategic confidentiality issues.
  • Mobile: probabilistic by location, speed. Where are users in cell? What are they doing?
    • *Are these really so different problems?*

• What level of precision needed?
  • Do we really need to serve 100%? At what cost to address last 1%?
  • What level of divergence between min and average is acceptable?
    • *How many 9’s accuracy is reasonable? Where is inflection point?*

• How to aggregate data from different sources?
  • States/locals have more granular data, but not interoperable.
  • Voluntary data usually only provided with NDAs so hard to share.
  • Data layers: availability, usage, socio-economic demographics, pricing, costs
    • *No economic impact assessment unless layering/aggregation feasible*

• Accuracy, sustainability challenges?
  • Measurement error? Misrepresentations?
  • Algebra of Measurement: how to composite measurements from different sources?
  • Incentives to measure, report truthfully, and share?
Mobile Fund II support to advance LTE service in underserved areas

Challenge Process Timeline:
- **Jan. 4, 2018**: providers submitted one-time collection of 4G LTE coverage data
- **Feb. 27, 2018**: initial map of eligible areas released publicly
- **Mar. 29, 2018 – Aug. 27, 2018**: window to file challenges ("challenge window")
- **Sep. 2018**: opportunity for challenged parties to view challenge data
- **Oct. 2018 – Nov. 2018**: window to file responses ("response window")

Green: "1 unsubsidized provider" - challengable; Blue: no challenge, eligible for funding
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