

# Dropped Calls: Measurement, Perception, and Policies

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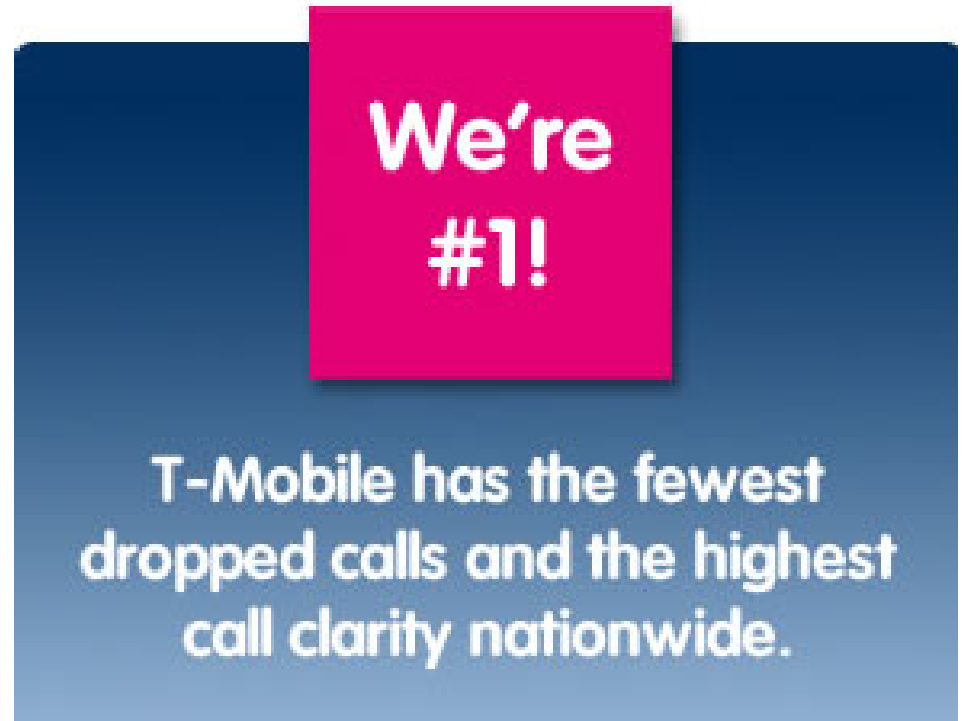
# Consumers care about quality

THERE ARE DIFFERENT WAYS TO MEASURE QUALITY  
AT A GIVEN PRICE

- Frequency of dropped calls
- Disruptiveness of call problems (i.e. in an emergency)
- Call clarity
- Connection speed

# Dropped calls are a common quality measure

QUALITY IS FREQUENTLY ADVERTISED IN TERMS OF DROPPED CALLS



...yet the way in which they are measured is unclear

## WHERE DO THE DROPPED CALL DATA COME FROM?

- Surveys
- Actual call data
- Complaints
- Geographic coverage?
- Time period?
- Selection of consumers?

# The most widely quoted measure is from J.D. Power

## WIRELESS CALL QUALITY PERFORMANCE STUDY

- Semi-annual survey
- Sample: 25,000 wireless users
- Number of customer-reported problems experienced per 100 calls with:
  1. Dropped/disconnected calls
  2. Static/Interference
  3. Failed connection on first try
  4. Voice distortion
  5. Echoes
  6. No immediate voice mail notification
  7. No immediate text message notification

# Other national measures are from Consumer Reports and from FCC

THESE MEASURES ARE BASED ON SURVEYS OR ARE  
SELF-REPORTED

- Annual Survey of Cell-Phone Service (Consumer Reports)
  - Frequency problem
- Quarterly Inquiries and Complaints Report:
  - Bias problem

# There are also dropped calls measures of smaller geographic coverage

## STUDY BASED ON ACTUAL CALL DATA IN HOUSTON FROM MINDWIRELESS

- Dropped call: call from a cellular device to another wireless device or landline placed within two minutes of a prior call to the same destination, with no call between. Voicemail & Nextel push-to-talk calls were excluded.
- Data from 80 million calls placed in the Houston area between January 1, 2006 and June 30, 2006.

# There debate about the right way to measure dropped calls has reached the courts

## CINGULAR LAW SUIT

- Kaltwasser: Cingular misrepresented the findings made by Telephia, a data provider for the telecommunications industry
- Cingular conducted a widespread ad campaign based on what it claimed was a study by Telephia that rated Cingular as having the fewest dropped calls of any wireless carrier in the country
- Kaltwasser v. Cingular Wireless LLC, No. 07-0411, complaint filed (N.D. Cal. Jan. 22, 2007).

..and there is a proposal in Senate to make this information more transparent

SENATOR AMY KLOBUCHAR INTRODUCED  
LEGISLATION REQUIRING

- Prorated cell-phone service termination fees
- Public disclosure of the incidence of dropped calls and coverage gaps by location.

# How much do dropped calls really matter to consumer?

## ANALYZING THE INFLUENCE OF QUALITY ON DEMAND:

- How do dropped calls influence adoption (first choice)?
- How do dropped calls influence switching between providers?
- How does the attribution of cause of dropped calls matter? For example, New Year's Eve, top of mountain, versus failure of network, handset?
- Randomness of dropped call?
- Industry statistics of dropped calls versus consumers' perception of dropped calls?
- Quality and competition?

# WE FACE DATA AND MEASUREMENT CHALLENGES

## THE MAIN EMPIRICAL PROBLEMS ARE ABOUT CONSUMER BEHAVIOR

- How do people form beliefs about quality? Word of mouth versus official ratings?
- How to measure demand? Number of subscribers? Usage? Number of users versus number of calls made? How to measure demand?

# POTENTIAL ESTIMATION TECHNIQUES

## SURVIVAL ANALYSIS AND PROBIT ANALYSIS

- Ideally: How much would you be willing to pay for one less dropped call?
- Probability of switching given the number of dropped calls that encountered?
- Probability of dissatisfaction (reporting problems) given demographic characteristics and objective measures that should influence dropped calls



- FCC data As part of its ongoing efforts to promote air safety, the Federal Communications Commission requires owners to register certain antenna structures (generally those more than 60.96 meters (200 feet) in height or located near an airport) with the Commission.

# Structure Registration

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## Search Results

ADVANCED SEARCH

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PA =

CALIFORNIA

Owner	Status	File Number	Owner Name	Latitude/Longitude	Structure City/State	Overall Height Above G
	Constructed	A0534325	URBAN RADIO, L.L.C.	37-50-58.0N 122-17-48.0W	BERKELEY, CA	138.1
	Constructed	A0565409	American Towers, Inc.	37-51-31.0N 122-15-38.0W	BERKELEY, CA	26.0
	Constructed	A0532454	Nextel of California, Inc	37-51-20.0N 122-15-35.0W	BERKELEY, CA	16.9

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# How to estimate the influence of dropped calls on consumers' behavior?

## EMPIRICAL IMPLEMENTATION DEPENDS ON DATA AVAILABILITY ON CALL QUALITY AND CONSUMER BEHAVIOR

- JD Power quality ratings: Estimate how demand depends on those ratings? Actual call data and subscriber behavior
- Base station information, topography, and weather data: construct quality indicators by geographic area and compare with responses by people that were surveyed.
- Number portability? May 24, 2004
- Use complaints to FCC data?