



**TruePosition**

*Opportunistic RF Localization for  
Next Generation Wireless Devices*  
**June 17, 2008**

Global Wireless Location Solutions. Technology. Applications. End-to-End LBS.

## Agenda



- **Introduction**
  - A brief summary of TruePosition
- **The Challenge**
  - A description of current location technology capabilities/limitations
- **A Unified Approach**
  - A discussion of future location technology plans



## TruePosition Company Overview

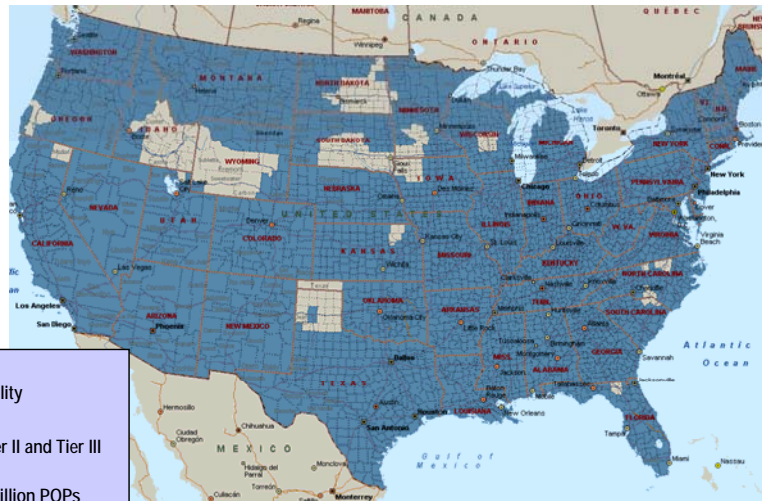


- TruePosition is one of the largest companies solely dedicated to Location-based technology solutions and services
  - 480+ employees, 200+ field staff and 100 international patents
- TruePosition is a wholly-owned subsidiary of Liberty Media
- TruePosition Customers
  - AT&T Mobility (formerly Cingular)
  - T-Mobile
  - Several Tier II and Tier III carriers
- TruePosition Uplink Time Difference of Arrival (U-TDOA) Coverage:
  - Over 75,000 Base Stations deployed
  - More than 270 million POPs covered in the US

Confidential and Proprietary

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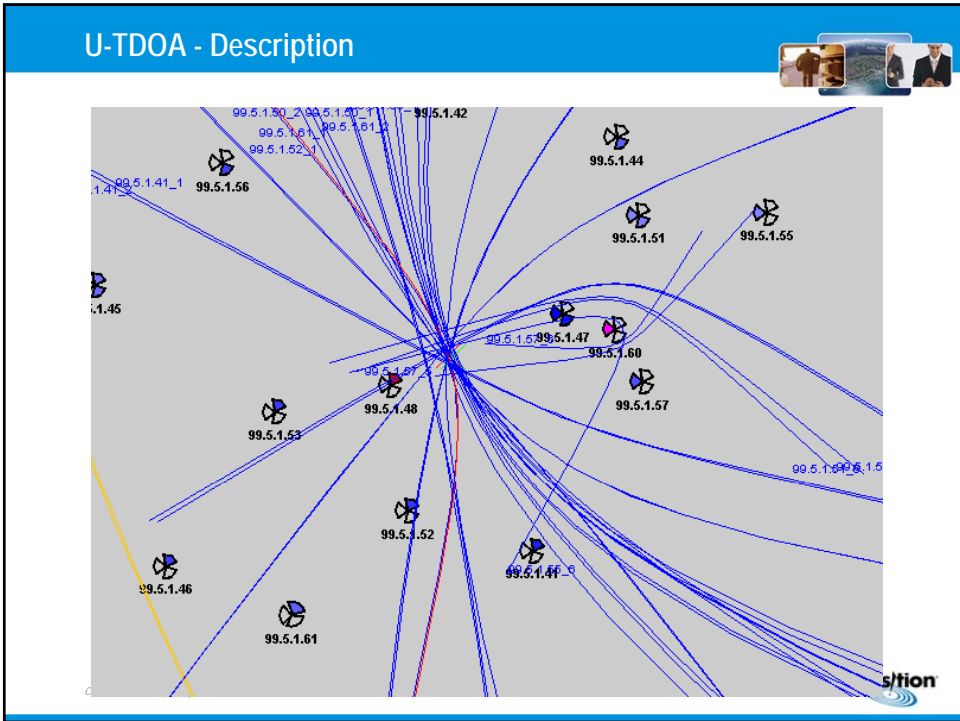
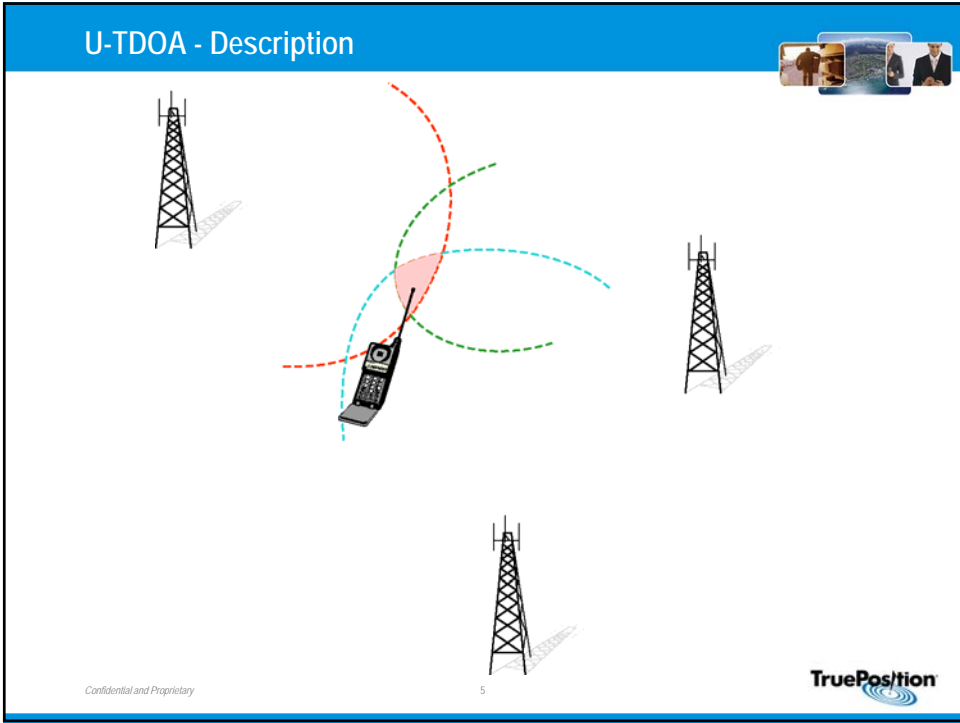
## TruePosition – U-TDOA Coverage



- Includes:
  - AT&T Mobility
  - T-Mobile
  - Several Tier II and Tier III carriers
- More than 270 million POPs covered
- Over 75,000 BTS deployed

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## The Challenge

- Users want a consistent, reliable, and accurate location solution wherever they are at any given time
- They DO NOT want to think about:
  - Who's network am I on?
  - What technology is being used?
  - What is the environment I am in?

*No single existing or anticipated solution meets all these needs*

## Current Solutions

	Time of Flight	Power Loss	Proximity
 <b>Satellite</b>	GPS GLONASS GALLILEO  <i>Weak Signals limit Indoor and Urban Performance</i>	???	N/A
 <b>Terrestrial</b>	U-TDOA E-OTD AFLT TV Signal Dedicated Transmitters  <i>Poor Geometry of Sites Limit Rural Performance</i>	E-CID Calibrated E-CID Pattern Matching Wi-Fi <i>Poor Geometry of Sites Limit Rural Performance</i>  <i>Local Variability Limits Reproducible Results</i>	CID Bluetooth Tags Access Points  <i>Density of sites limits usefulness and/or accuracy</i>



## What do we have today



- GPS covers the Globe



- But leaves lots of holes where people live and work...

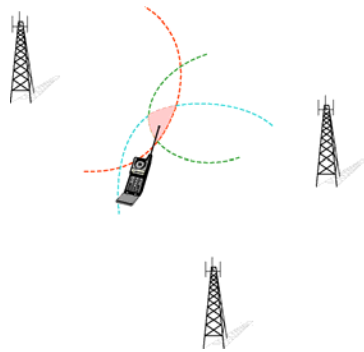


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## What do we have today



- U-TDOA covers the US



- But provides poor accuracy in some (rural) areas



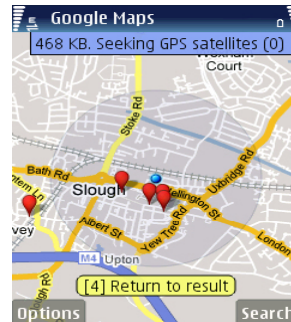
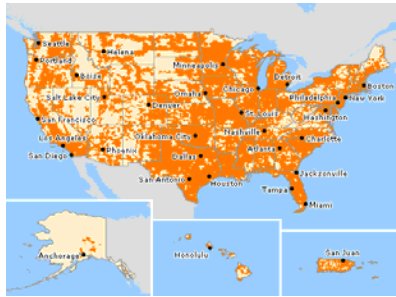
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## What do we have today



- Cell ID is Ubiquitous where carrier have coverage
- But has low and inconsistent accuracy



## Ubiquitous location technology



- OUR GOAL: "Ubiquitous User experience"
- Several factors contribute to user experience
  - High Accuracy
  - High Yield
  - Low Latency
  - Consistency



***A new solution is required that combines the strengths of different approaches***





## Hybrid U-TDOA / AGPS



- Hybrid approach can significantly improve Accuracy and Yield
- Allows high-accuracy location with few or no GPS satellite visibility
- Provides rural accuracy of AGPS with urban and in-building performance of U-TDOA



The A-GPS and U-TDOA technologies operate independently and simultaneously to obtain range estimates, which are then combined in the location system to obtain enhanced accuracy, yield, and performance.



***Combining raw measurements from each approach yields better performance than either technique can achieve by itself.***

