

# The Tower, the Bird and the Truth

Navigating the Location Technologies for Pings and Profit

June 22, 2010



**David Allen**

Chief Technology Officer  
LOC-AID Technologies, Inc.

[Dallen@loc-aid.com](mailto:Dallen@loc-aid.com)



**John Kavulich**

Director Location Products  
Qualcomm

[Kavulich@qualcomm.com](mailto:Kavulich@qualcomm.com)

- The Shift
- Relevance & Methods
- Three Points

## Global Mobile Apps Download

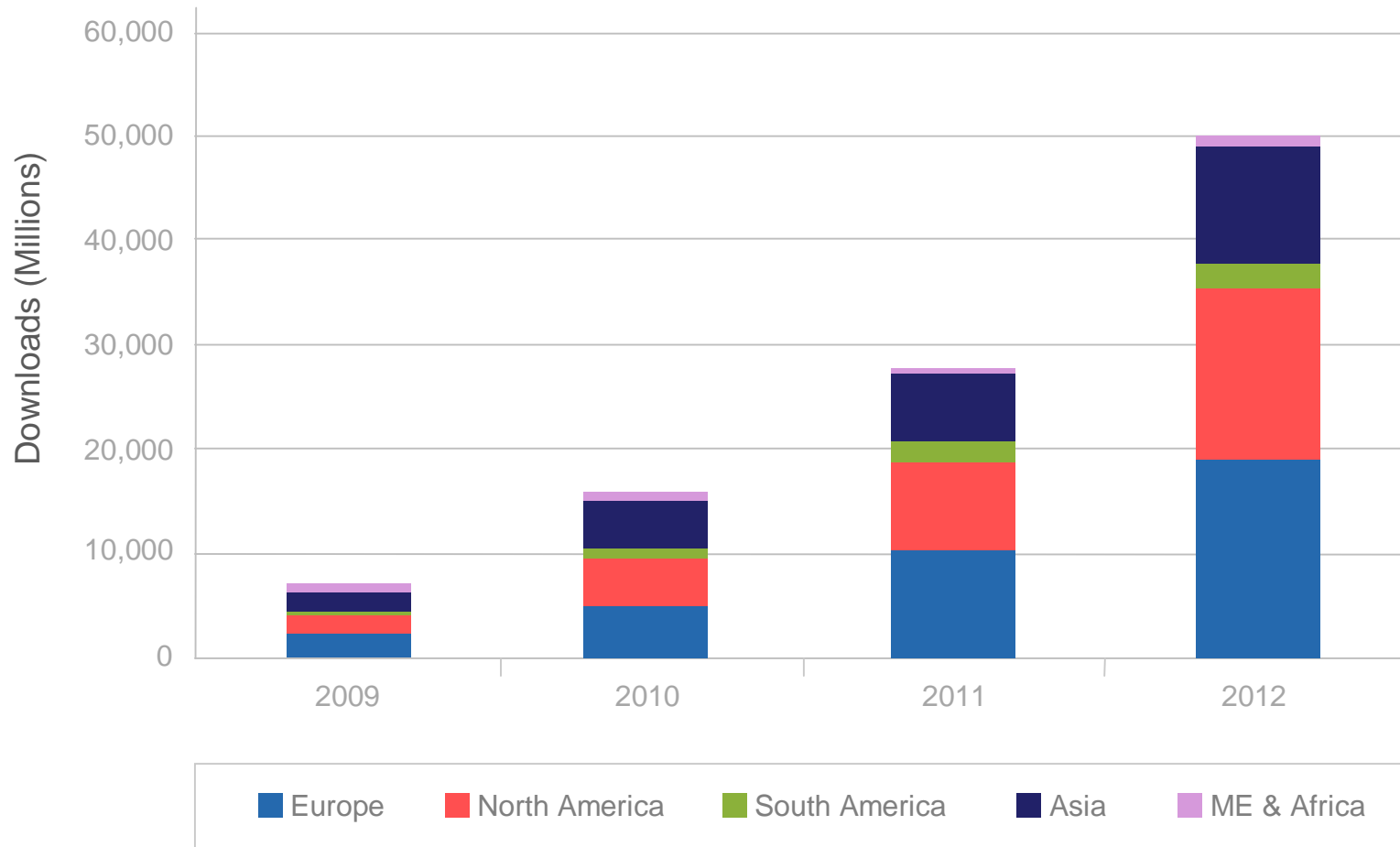
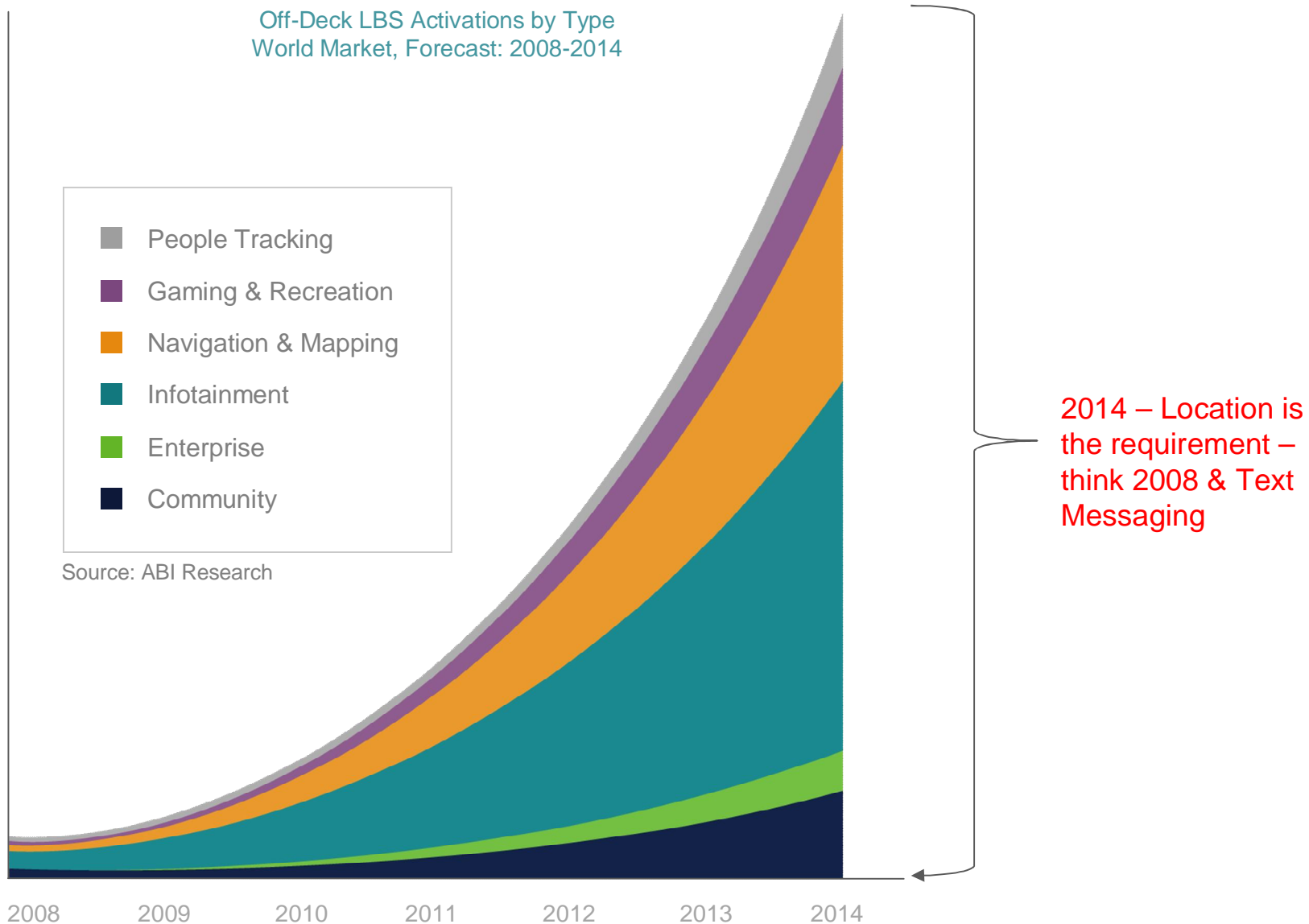


Figure 5. Global Mobile Apps Download Forecast

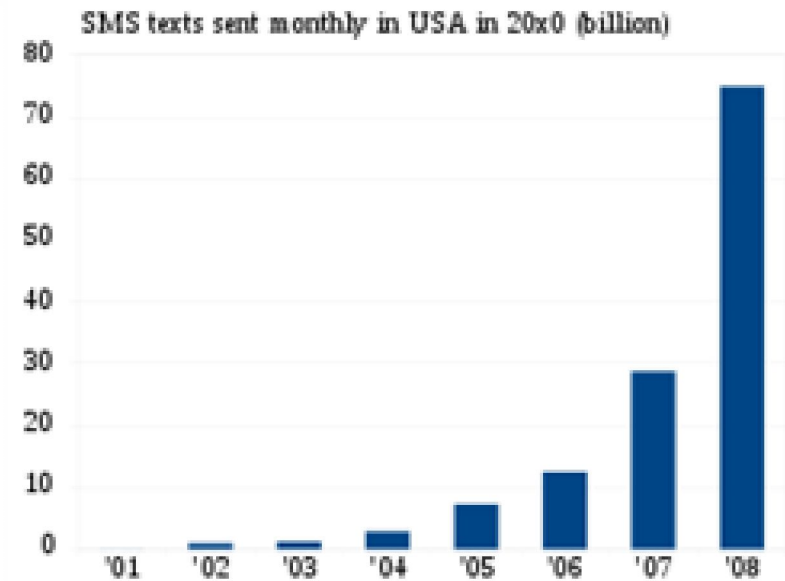


# The Paradigm Shift



2008 – Location is the novelty– think 2000 & Text Messaging

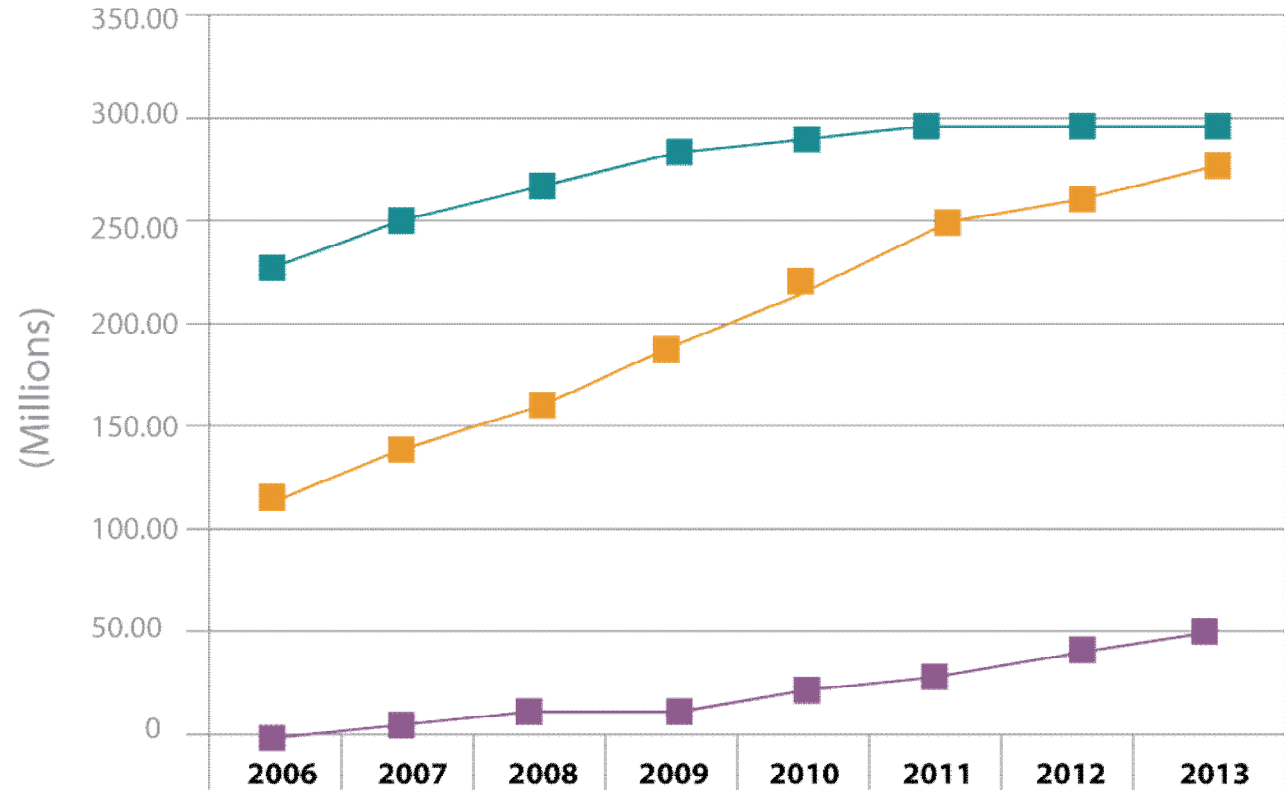
- In 2009, over 1.6 trillion SMS messages were delivered in the US
  - 78% growth in 2009, after doubling previous three years
- SMS market growth accelerated after entrance of SMS aggregators
  - Allowed enterprises easy access to multiple carriers
  - Easy development, on-boarding of apps using SMS
- LBS aggregators provide same advantages to developers wanting to access location





# US Market

## LBS Addressable Market (US)



Total Module Subs (US)	229.00	250.00	268.00	281.40	289.84	295.64	298.60	301.58
Total Addressable Market (AOPS Handsets)	115.42	139.40	157.96	180.86	216.80	245.97	260.97	276.25
LBS Penetration (Subs)	0.98	2.79	7.11	12.52	19.30	29.52	42.80	51.93

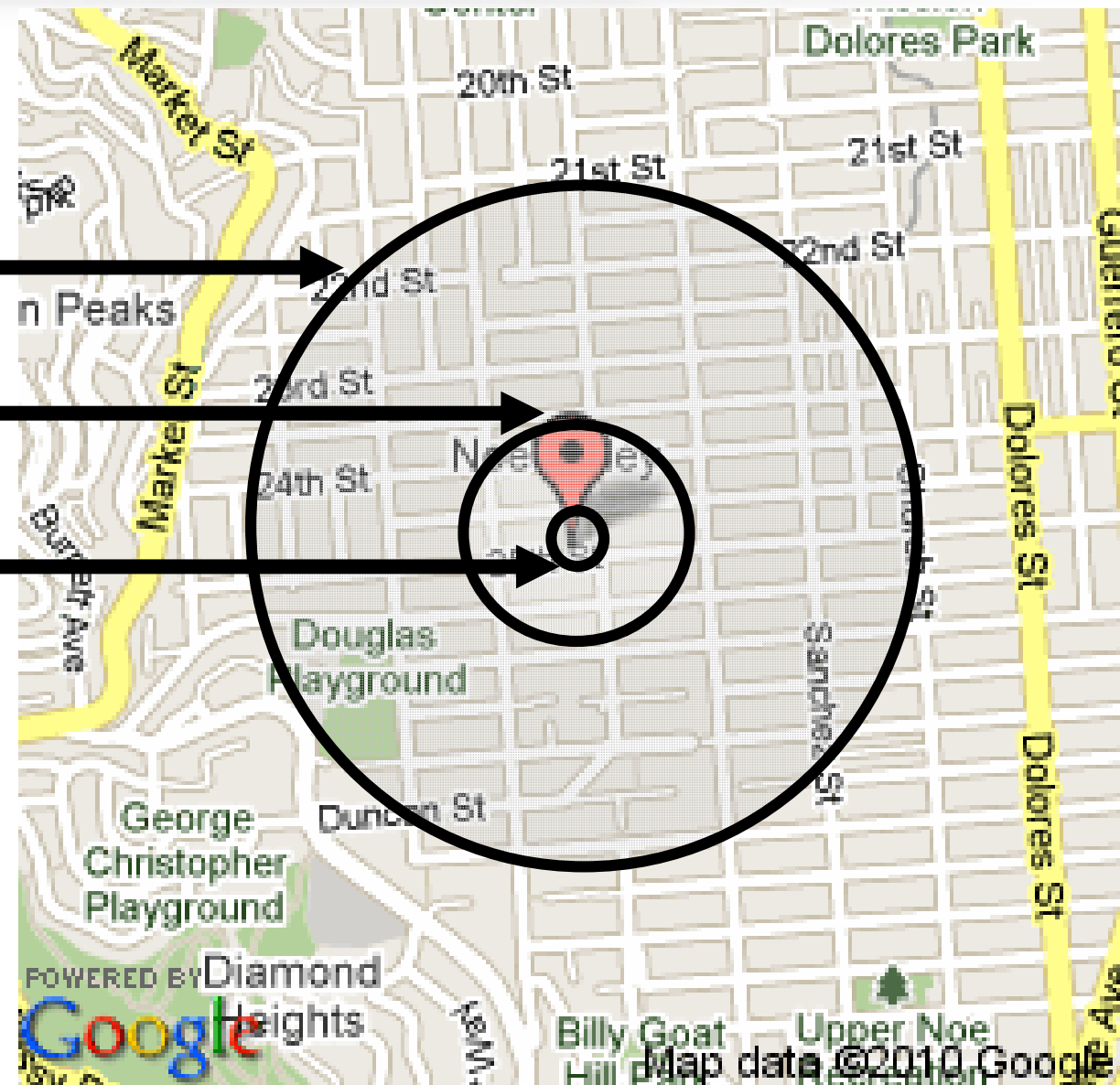
Source: Frost & Sullivan

- The Shift
- Relevance & Methods
- Three Points

Cell/Cell Sector  $\approx$  500m- $\geq$ 5km  
 "What neighborhood?"

Network Solutions  $\approx$  100m-500m  
 "What block?"

A-GPS  $\approx$  5-50m  
 "What address?"



## Tradeoffs in Location Methods

- CELL ID: Lower Accuracy, Lower Cost, Faster Response Time (1-3 seconds), All Devices
- A-GPS: Higher Accuracy, Higher Cost, Slower Response Time (5-20 seconds), Fewer Devices



# Network-based location can address 285 million US mobiles

US Install Base	Feature Phone	Smart Phone
GPS Chip	146M (51%)	
No GPS Chip	79M (28%)	11M (4%)

- Network-based location addresses 100% of the installed base (285 million devices)
  - Feature phones & Smart Phones
  - GPS-enabled & non-GPS
- App-based location capabilities can only address a small subset



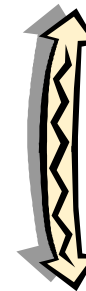
# Widespread Technology Adoption



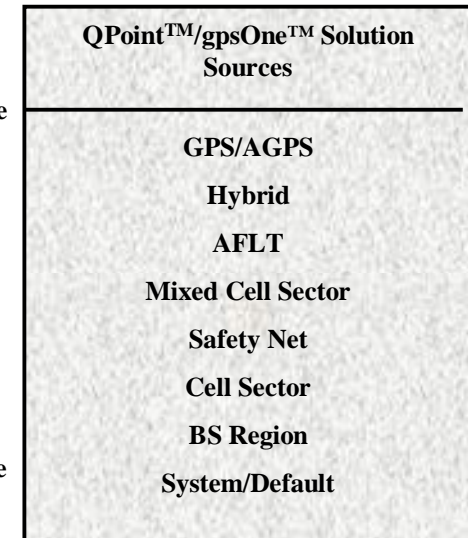
## Depth

- Dynamic, Multi-mode Solution Estimates
  - UE-Based/UE-Assist
- Wireless Standards
- Multiple O/S Support

Most Accurate

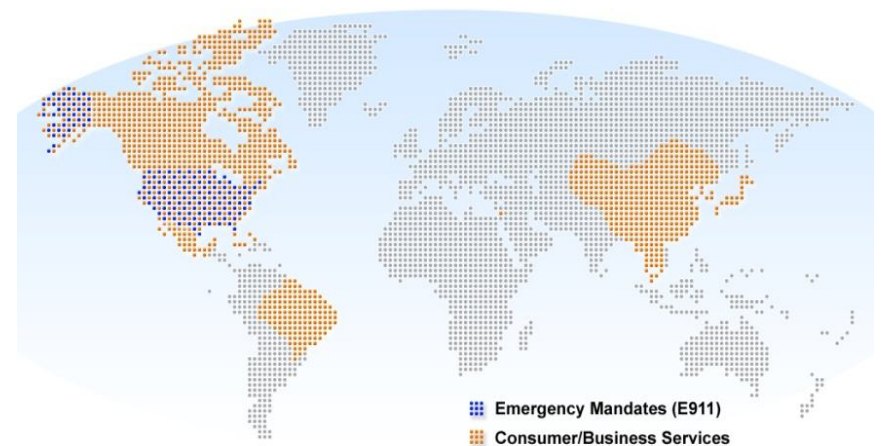


Less Accurate



## Breadth

- Over 50 QPoint wireless operators globally
- Over ½ Billion cumulative gpsOne Devices



**GPS-enabled handsets sales are estimated to reach about 960 million, or 60 % of total handset shipments in 2014 – Berg Insight**

## CID / E-CID

- Low Cost
- Ubiquitous
- Low Network Impact
- Fast Time To Fix (TTF)
- Common Denominator



## A-GPS

- High Value
- Enhanced Service Enablement
- Smart Phone & Handset Penetration
- Accuracy
- Key Differentiator



- The Shift
- Relevance & Methods
- Key Points

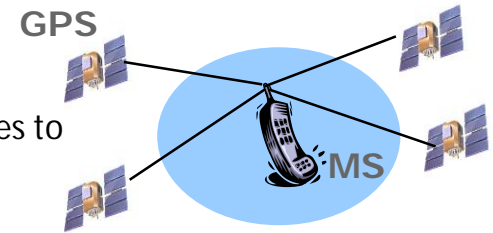
# One Size Does Not Fit All



## Most Precise

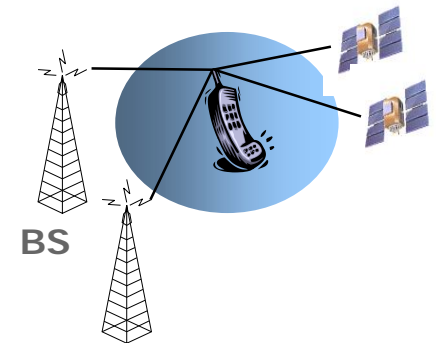
### GPS Fix ... open sky

Uses measurements of 3 or more GPS satellites to precisely determine location



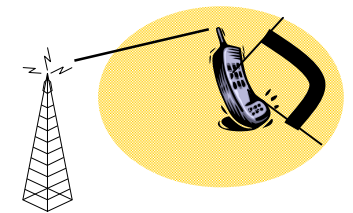
### Hybrid

Combines cellular network data with GPS measurements to determine location



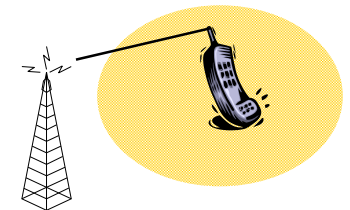
### Enhanced Cell / Sector

Uses advanced network data and serving cell and sector to determine location



### Cell ID

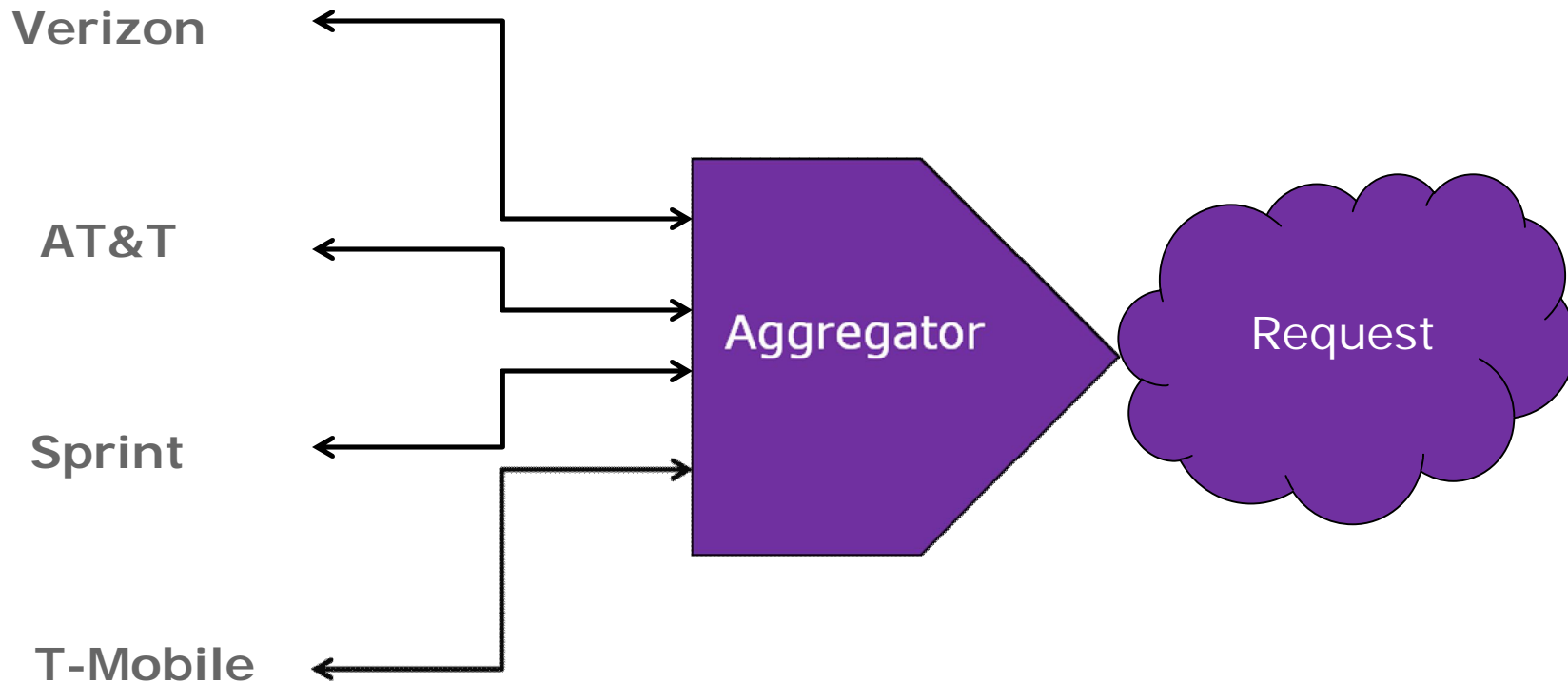
Uses basic network data for serving cell and sector to determine location



## Least Precise



# Delivering Ubiquitous Positioning





# A Rising Tide Raises All Ships



© Original Artist  
Reproduction rights obtainable from  
[www.CartoonStock.com](http://www.CartoonStock.com)



search ID: bron1791

***"It's our last model without GPS functionality, sir. Your wife will never know where you are !"***

# The Tower, the Bird and the Truth

Navigating the Location Technologies for Pings and Profit

June 22, 2010



**David Allen**

Chief Technology Officer  
LOC-AID Technologies, Inc.

[Dallen@loc-aid.com](mailto:Dallen@loc-aid.com)



**John Kavulich**

Director Location Products  
Qualcomm

[Kavulich@qualcomm.com](mailto:Kavulich@qualcomm.com)