Inclusion of Uplink TDOA Location Method

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Inclusion of Uplink TDOA Location Method

- ## Market Overview

  - Early Days for LCS

  - Market Applications just emerging

  - There are applications that require high location accuracy
    - Examples and required accuracies listed on the next slide

  - More stringent accuracy requirements as the industry matures
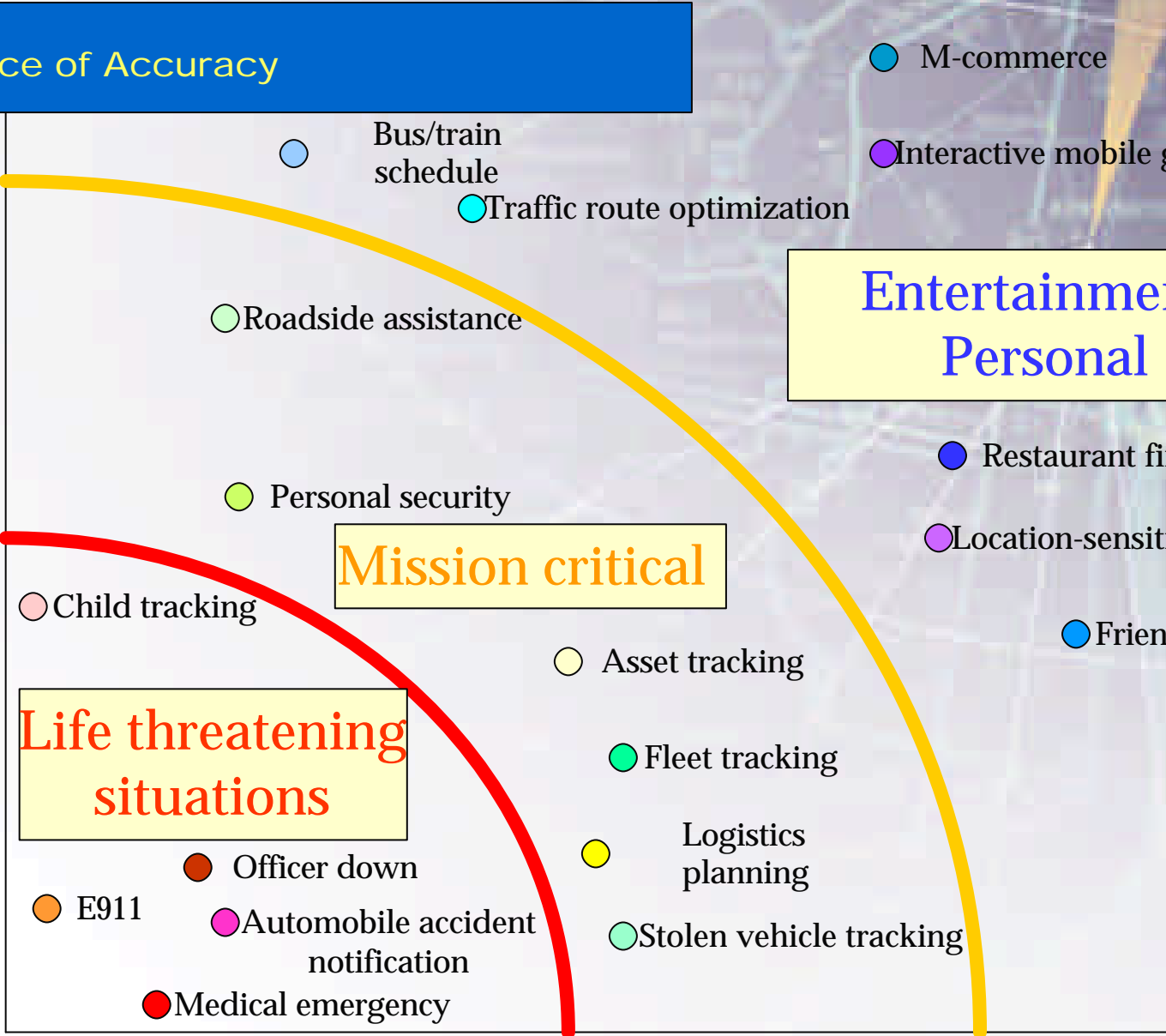
  - Dynamic Scalability is appropriate

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Application	Low	High		Application	Low	High
Enhanced 411 (Operator Assist.)	X			Location of Fraud Perpetrators		X
Personalized Traffic Services		X		Automatic Crash Notification		X
Location Sensitive Billing		X		Officer Down		X
Emergency Roadside Assistance		X		Personal Location		X
Navigation		X		Pet Tracking		X
Friend Finder	X			Dispatch/Fleet Tracking		X
Games	X			Parollee Tracking		X
E911/112		X		Traffic Management		X
Auto Security / Stolen Vehicle Tracking		X		Asset, Inventory and Package Tracking		X
Personal Security		X		RF Optimization		X
Medical Notification		X		Mobile Advertising	X	
Internet – Mobile e-Commerce	X					

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Importance of Accuracy

Accuracy — Increases in importance

Time — Increases in importance

M-commerce

Bus/train schedule

Traffic route optimization

Interactive mobile gaming

Entertainment/ Personal

Roadside assistance

Restaurant finder

Personal security

Mission critical

Location-sensitive content

Child tracking

Asset tracking

Friend finder

Life threatening situations

Fleet tracking

Officer down

Logistics planning

E911

Automobile accident notification

Stolen vehicle tracking

Medical emergency

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Source: The Strategis Group

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- ## Technical Performance of recognized LCS methods

  - ? Accuracy of downlink technologies limited by processing power of MS and limited RF perspective

  - ? Satellite based systems have limited building penetration and satellite acquisition in urban environments

  - ? Uplink TDOA has high location accuracy that is achievable in the highest percentage of circumstances
    - 70 meter accuracy (67%) as demonstrated by test bed
      - *Narrowband IS-95 CDMA*
      - *Wider bandwidth of UMTS will improve accuracy*
    - Good building penetration as verified by field trials in Manhattan (New York, New York, USA)

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- **Advantages of Uplink TDOA**
  - Independent of UE capability
    - Can locate legacy, current and future UE
  - High accuracy
    - LMU based calculation provides 20-30 dB more processing gain than UE based solutions
    - Better multipath mitigation techniques incorporated into LMU
    - Higher performance LMU receiver allows UE location from many, more distant sites
  - Protection from obsolescence
    - Easier to upgrade LMU software than millions of UE

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- ## Advantages of Uplink TDOA (continued)

  - Uses less system resources
    - Location of active UE uses RF energy of current session
  - Data demodulation and reduction in LMU reduces backhaul data volume and cost
  - Lower overall System complexity
  - Dynamic Scalability of location accuracy
    - Location accuracy is proportional to the amount of RF energy captured
  - Compatible with Roaming UE
  - Implementation of IP-DL not required

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Inclusion of Uplink TDOA Location Method

- We propose a Work Item to include Uplink TDOA for UMTS in the Specifications

  - ✍Effort with Working Groups to define which specifications must be modified

  - ✍Generate and submit CRs for those modifications

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