GloTech International

Optimizer Presentation - 2010

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Introduction

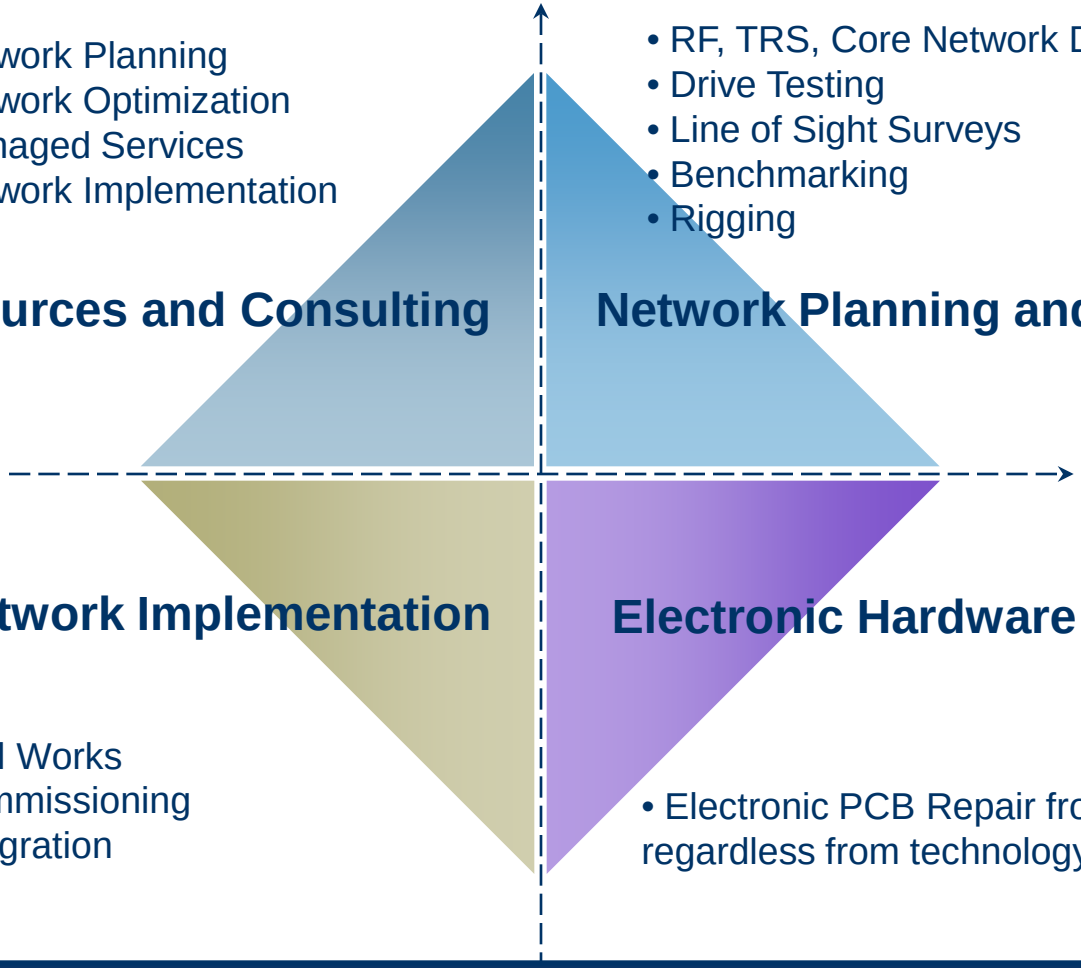
- **GloTech International-**

  a Telecommunications **Consulting**, Technology **Services** and **Outsourcing** company based in Dubai,UAE.

- **Main areas of expertise are:**
  - Network Planning and Optimization
  - Consultancy Services
  - Electronic Hardware Repair
  - Network Integration and Implementation



Business Structure



Our Business Structure is composed of 4 main business units

How can we support?

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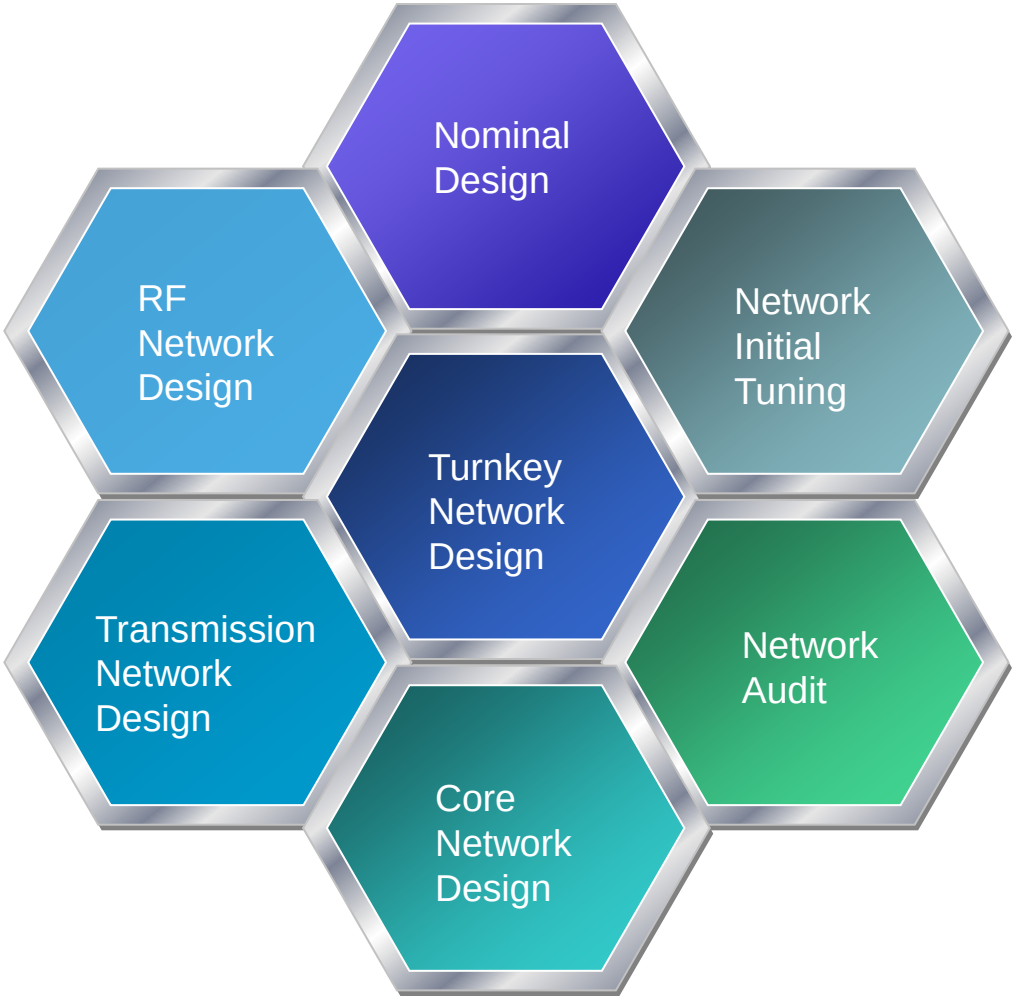
Network Planning Services



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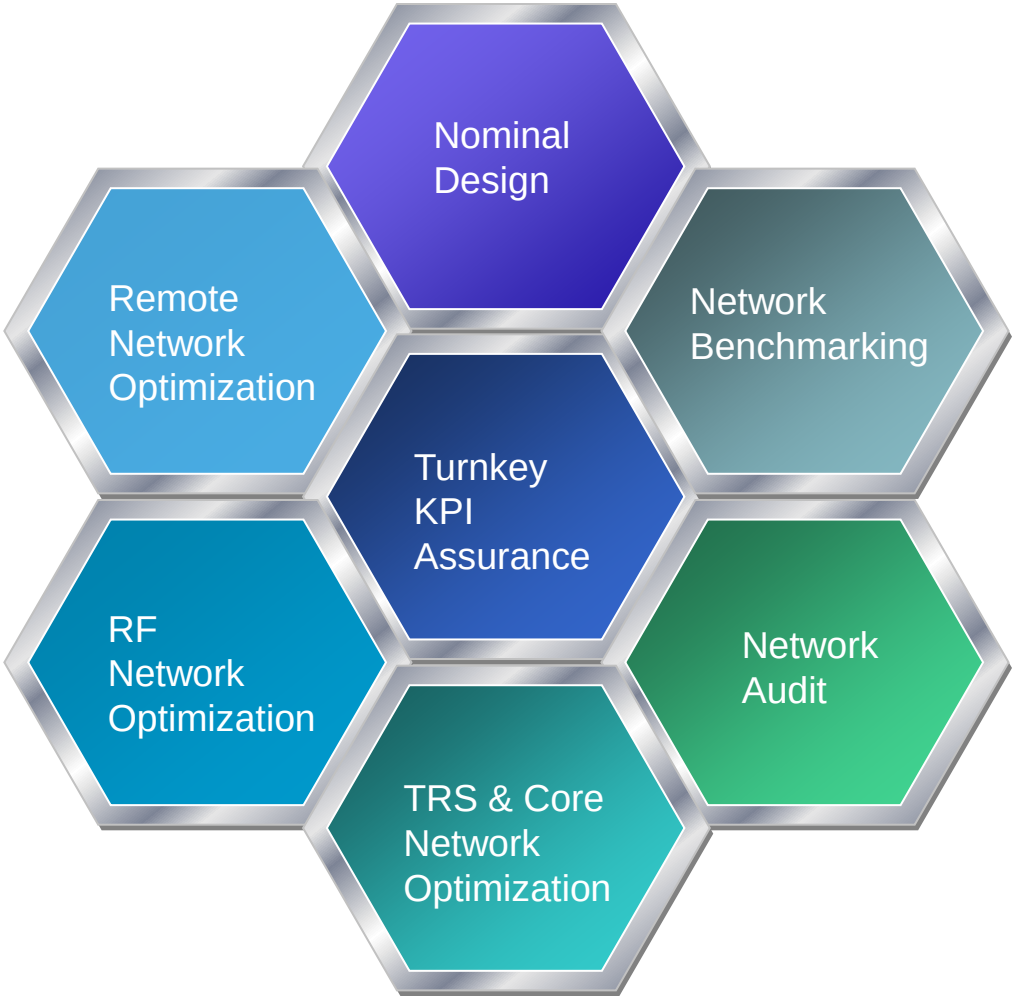
Network Optimization Services



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Our Innovative Methods



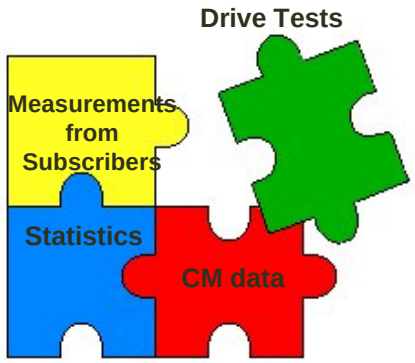
GLOTECH OPTIMIZER

One of the Best Automated Drive Test Logs Post-Processing Tool



Data sources used for Optimization

1. Measurement reports are collected from subscribers
   - Reflects all network (Indoors, hotspots etc.)
   - Reliable Interference matrix for all network can be derived which enables to make
     - Frequency planning
     - Neighbor planning
     - Hardware optimisation
     - ….



Optimisation is being done to get best overall performance which may cause some problems on important roads.

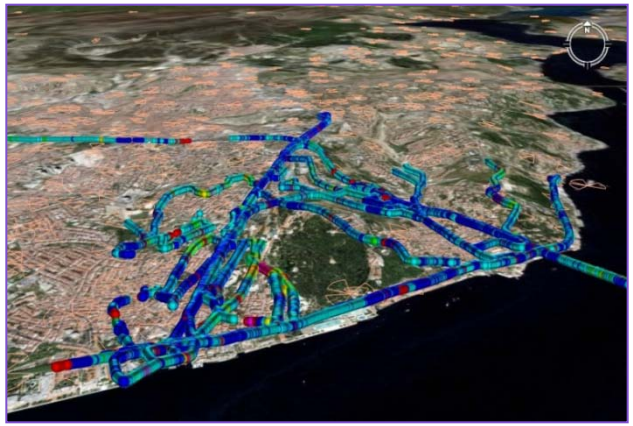
2. Drive Test Data
   - Special optimisation for important roads
   - Performance on important roads has big effect on subscriber perception
   - Benchmarking
   - Periodic Monitoring
   - …

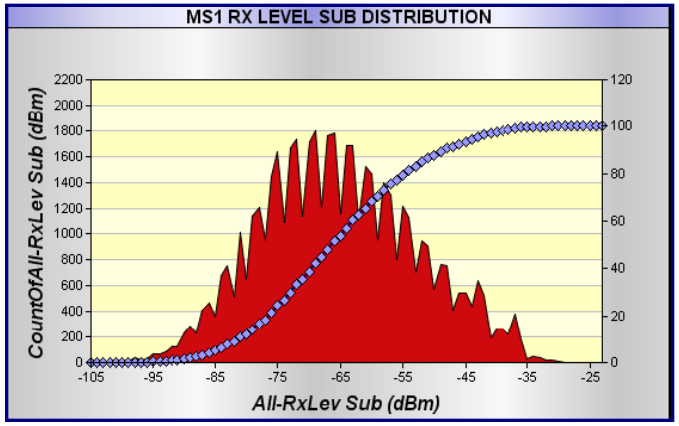
Drive test method has some disadvantages that are explained in next slides but it is a indispensable part of optimization.



Traditional Methods for Drive Testing

- **Drive Testing, Analysing and Reporting**
  - Time consuming
  - Expensive
  - Unsatisfactory results frequently
- **Why?**
  - Investigation is being done for only problematic areas
  - Need to be repeated to catch different scenarios
    - Interference problems can be hidden if mobile uses a clean channel
    - Call drops may occur in different call scenarios
  - Accuracy of actions depends on competence







What is the solution ?

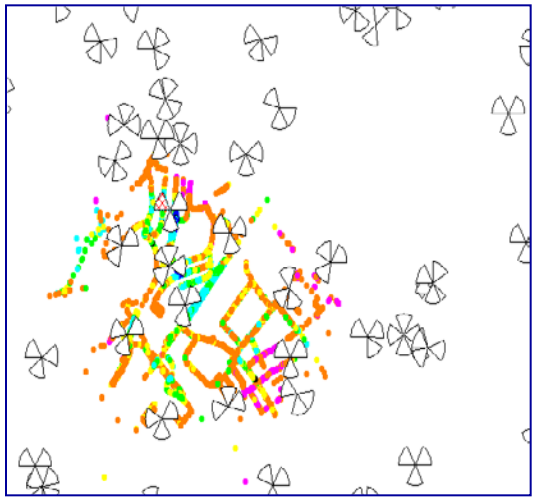
Functions & Advantages of Glotech Optimizer

- **Inteligent Post Processing**
  - Automatic Drive test analysis
  - Detection of problems (missing neighbors, overshootings, interferer cells)
  - Analysis of 3G&2G together, very useful to catch IRAT missing neighbors.
  - Analysis of dedicated and scan mode measurements simultaneously
  - Worst interferers, all missing neighbors and overshoots are determined by processing that interference matrix, hardware and CM data.

- **Cell coverage layers**
  - Real cell coverage areas on street level
  - Hardware optimisation
    - Azimuth or tilt changes can be decided easily
  - Identify interferers
  - Automatic cross feeder check
  - Automatic RX-TX cross feeder check

In automatic analysis an interference matrix created for all the route, and used like in tools which process SACCH reports.

All possible problems (Interferers, interfered frequencies, overshoots) can be analyzed, although they did not cause any problem during drive tests



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Key Benefits

- Inteligent Post Processing
- Fast and Accurate Drive Test Log Analysis
- Minimum competence & Time requirements
- Maximum benefit out of drive test investments
- Less number of optimization engineering
- Reduced drive test requirements due to accurate and complete analysis
- Seemless features which make analysis a unique experience (cross connections, consistency checks)

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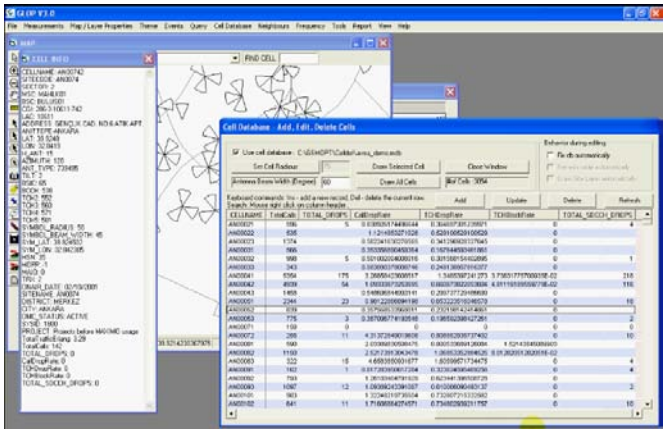
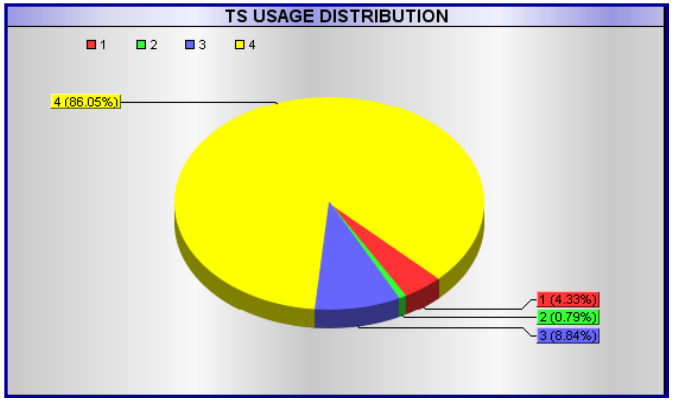
Glotech Optimizer

- Flexible database format
  - Easy for updating
  - Add of new columns (for statistics, parameters...)
  - Thematic maps
  - Consistency Checks
    - One way neighbors
    - Same or adjacent frequencies in neighbors
    - Same BSIC-BCCH pair in neighbors
    - Same HSN in neighbors
  - Compare two Databases
- Automatic report generator
  - Flexible report design interface
  - Automatic report generation
    - Multiple templates
    - Custom Report Template Creation
- Most of the functions are programmable to minimize required man power







Glotech Optimizer

- Automatic parameter planning
  - Frequency planning
  - HSN planning
  - BSIC planning
  - SC planning
- Other Strong Tools
  - One click to add/delete Neighbors
  - Thematic maps
  - Neighbor distances
  - Closest cells having same value for a certain parameter
    - Closest BCCH , Closest SC etc.
  - Show Channels
  - Show neighbors
  - Querying of measurements, sites
  - Fast addition of needed modules by development team



Complete Analysis

Sample Results ;

- **Summary of actions for 700 MB drive test logs**
- **3 MWD**
- **Drive test includes only 11 drops**

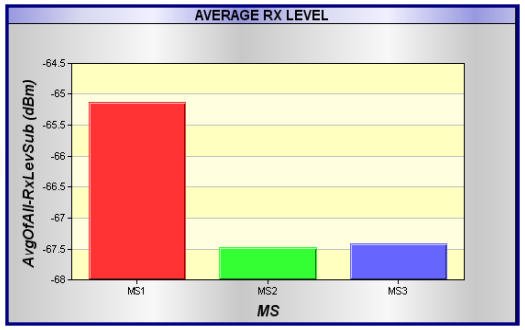
Type of Change requests	Qty
DOWNTILT	50
AZIMUTH CHANGE	2
MISSIN NEIGHBORS	337
1WAY DEFINED NEIGHBORS	157
CO-SITE MISSING NEIGHBORS	150
CROSS CONNECTION	0
RX-TX CROSS CONNECTION	1
REMOVABLE TRX	514
TRX ADD	239
REHOME OF BTS	1

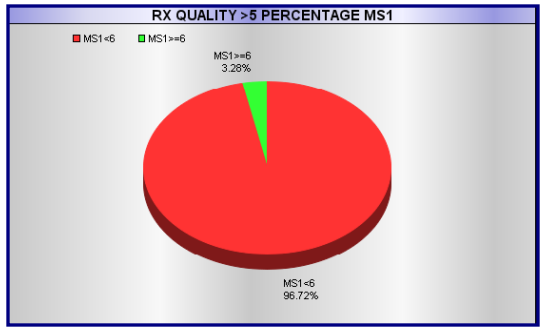


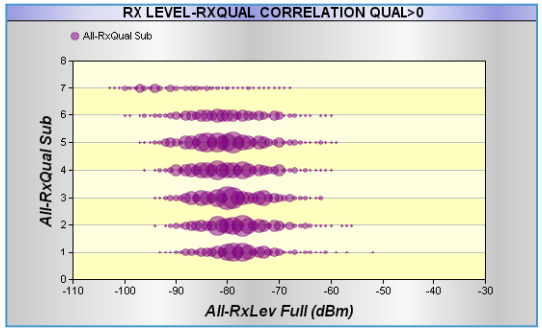
Samples of Glotech Optimizer Deliveries

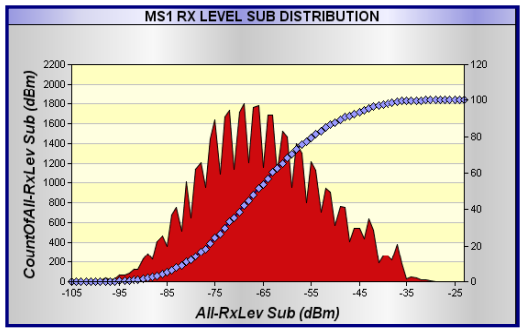


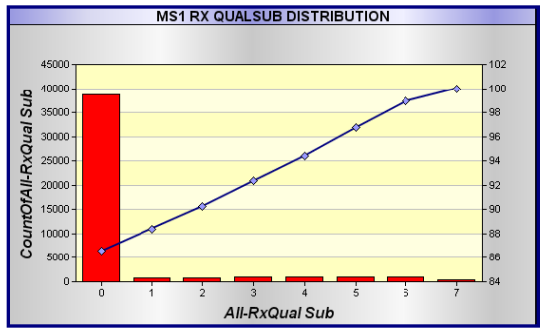
RxLevel & Rx Quality & Correlation

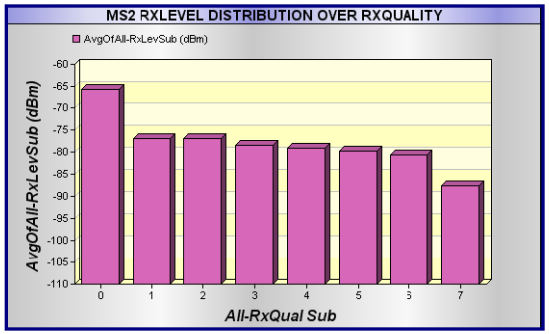


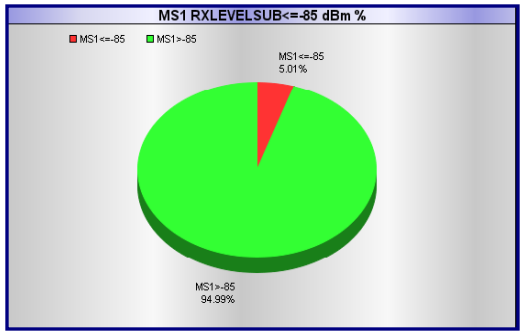


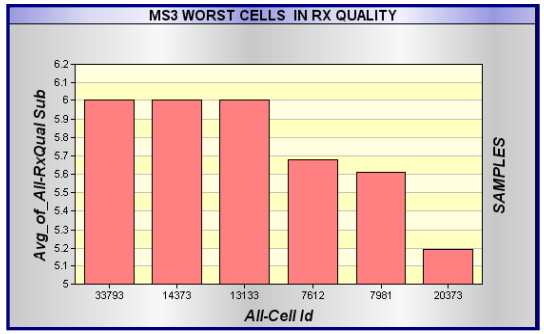






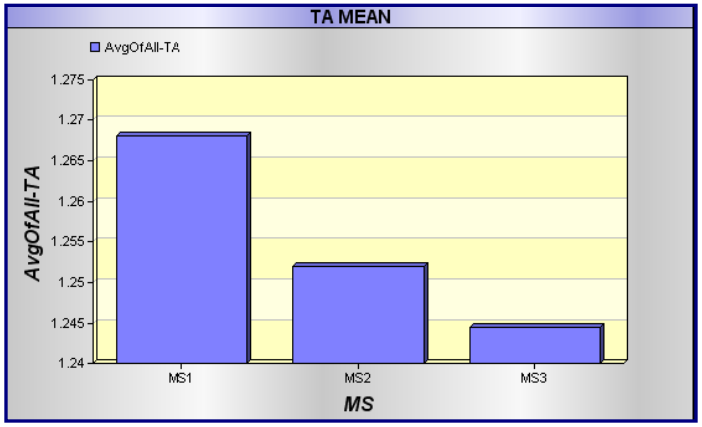


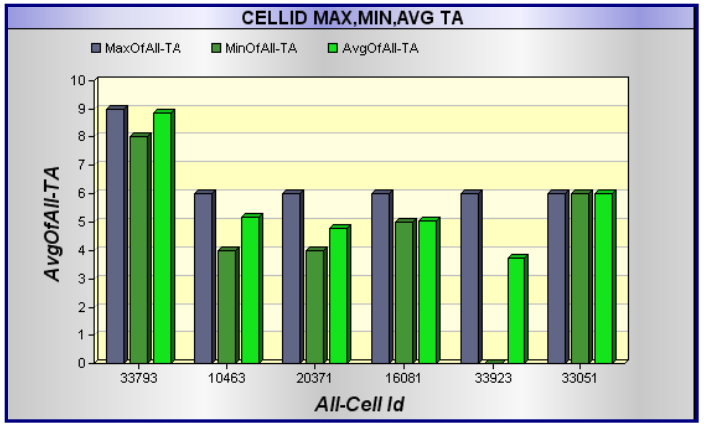


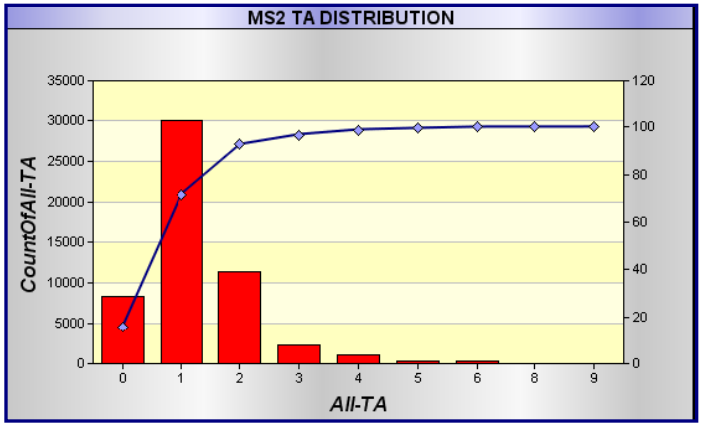


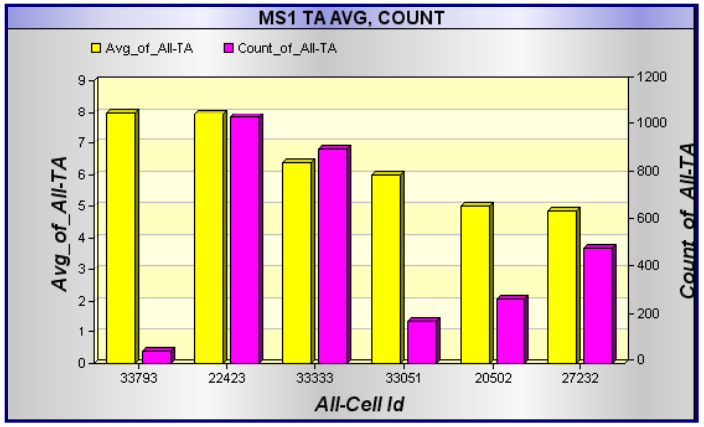


Timing Advance



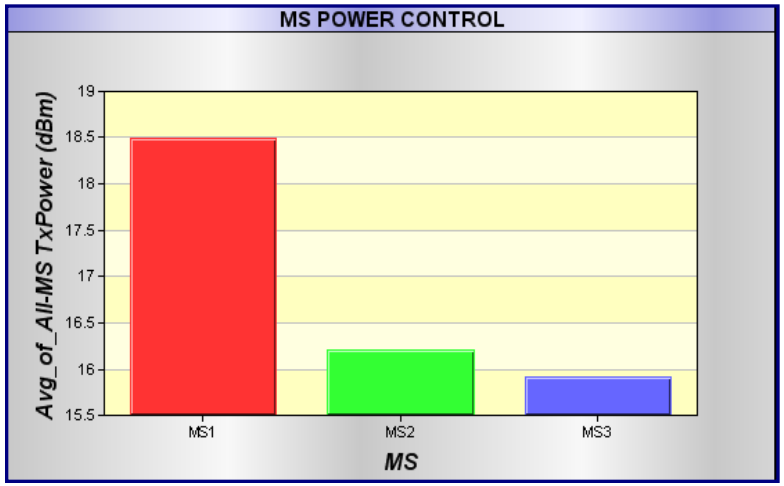


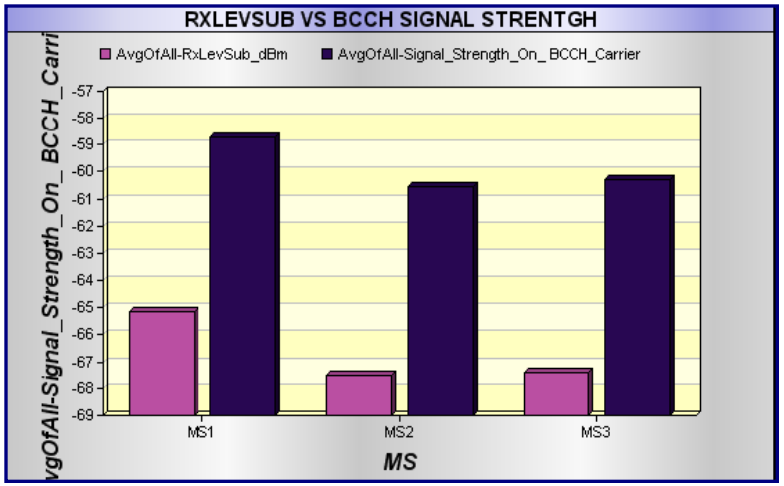


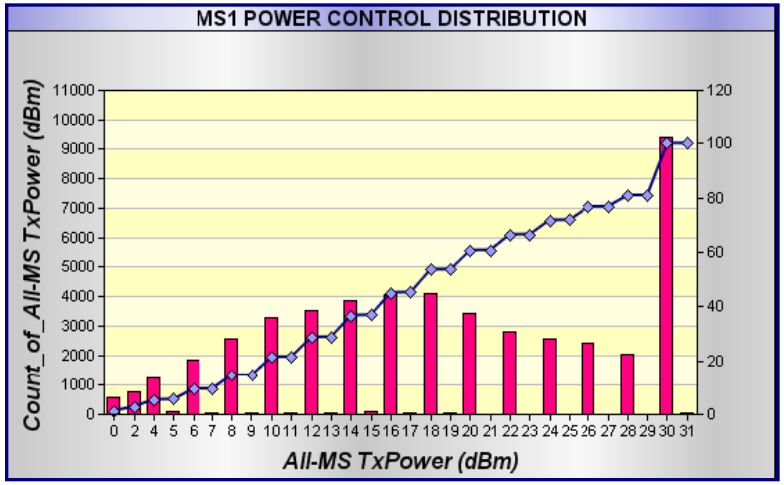


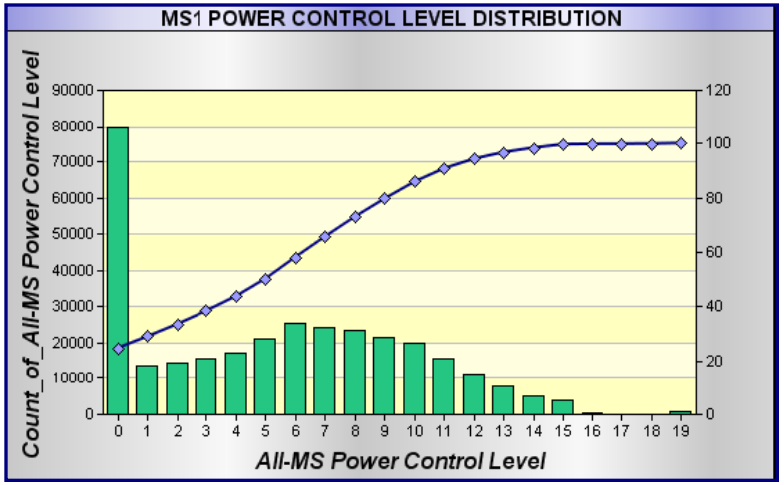


Power Control









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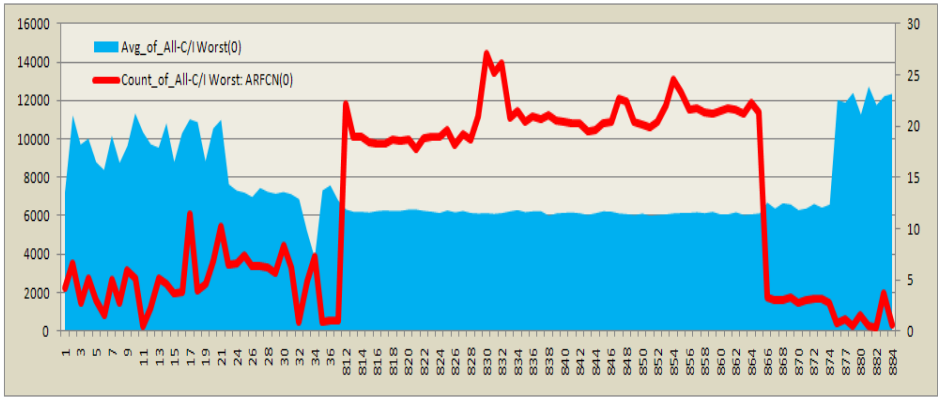
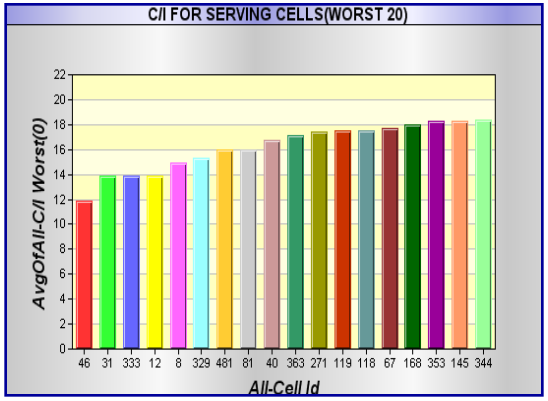
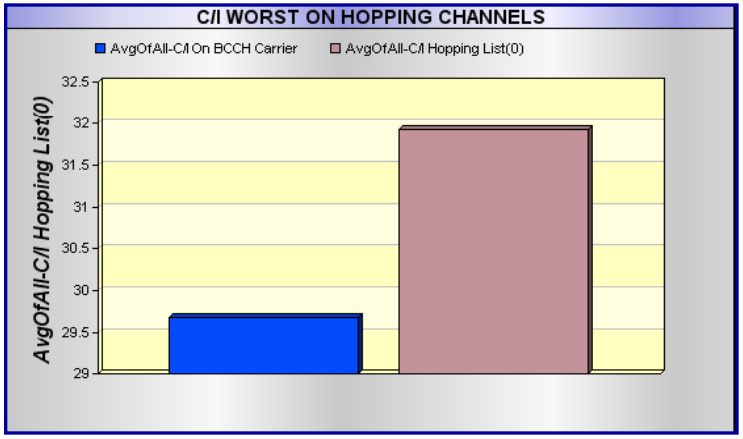
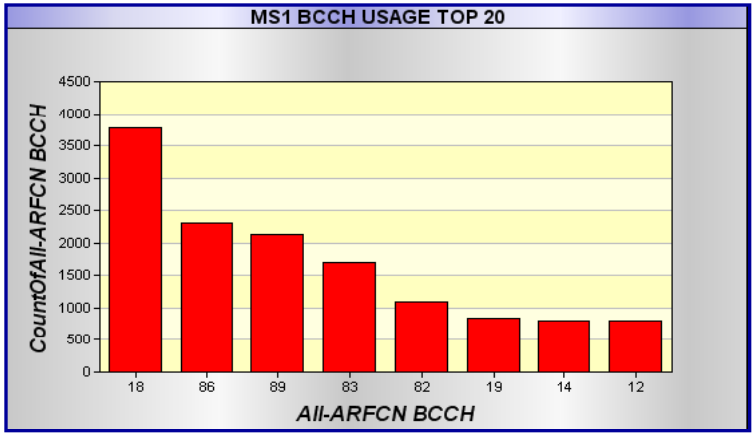
C/I over the band & BCCH Usage

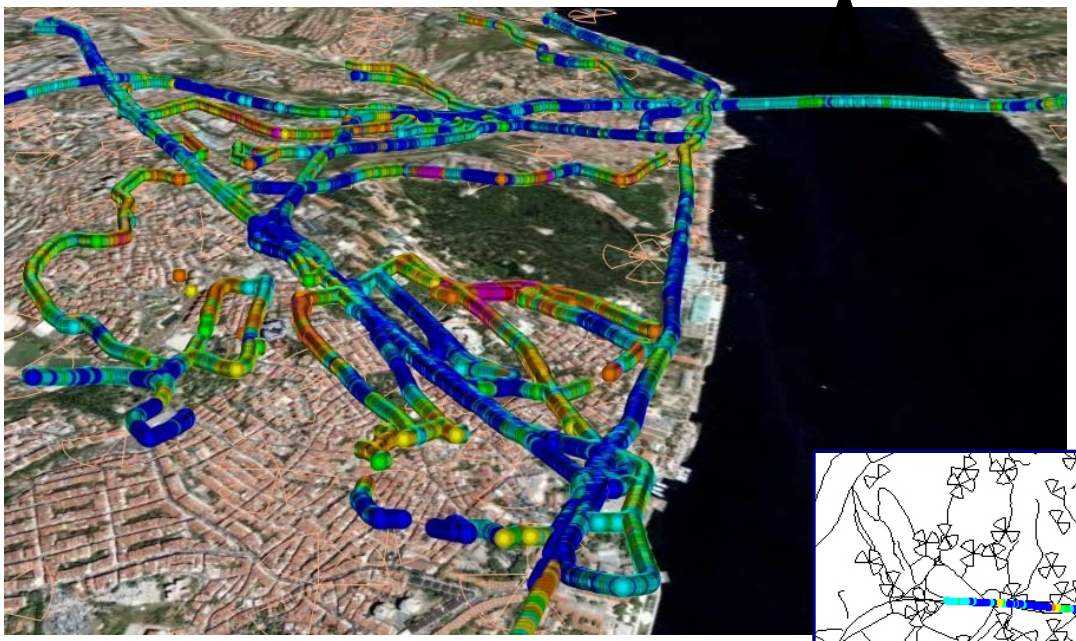


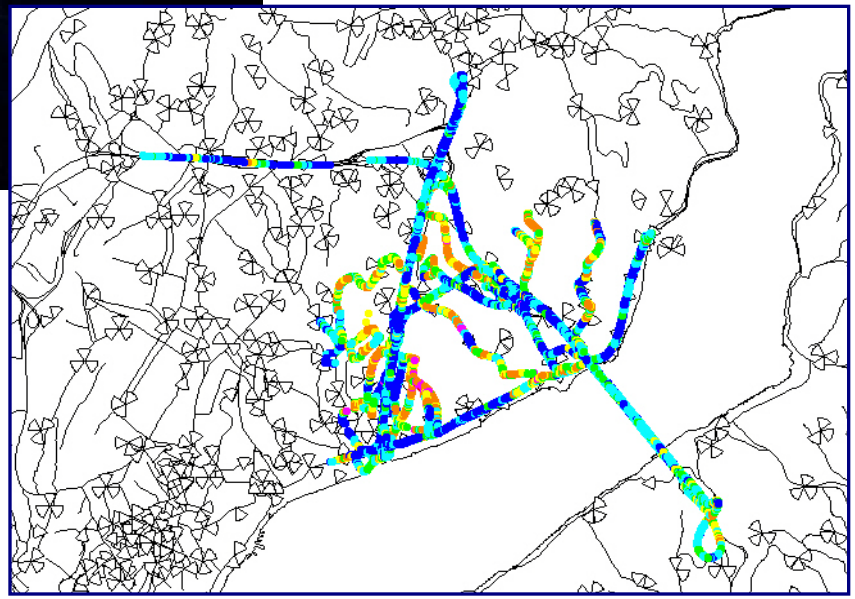






RxLevel Sub





MS1_ALLVOICE
by All_RxLev_Sub_dBm

-60 to	-20	(13880)
-70 to	-60	(13316)
-75 to	-70	(6082)
-80 to	-75	(4490)
-90 to	-80	(4297)
-100 to	-90	(455)
-110 to	-100	(13)

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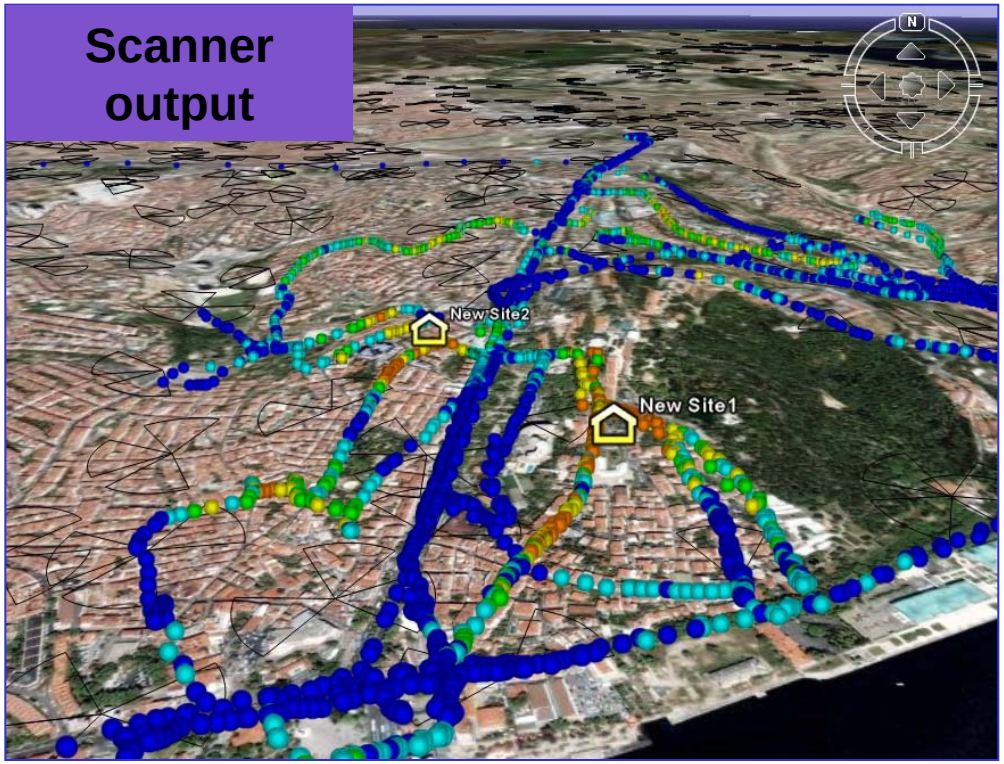
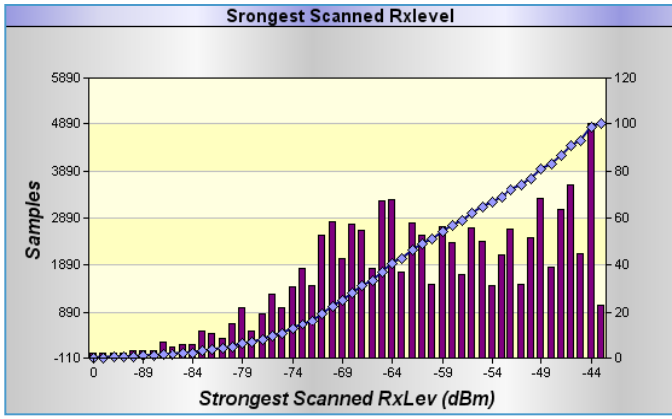
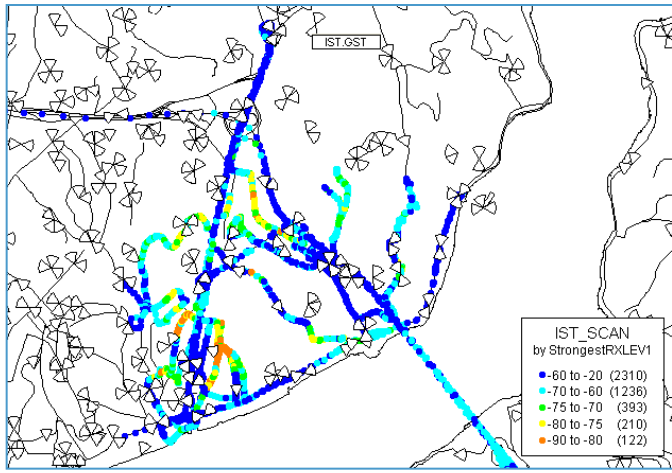
Strongest Scanned Rxlevel

Scanner output





Average Scanned RxLevel	-62.50 dBm



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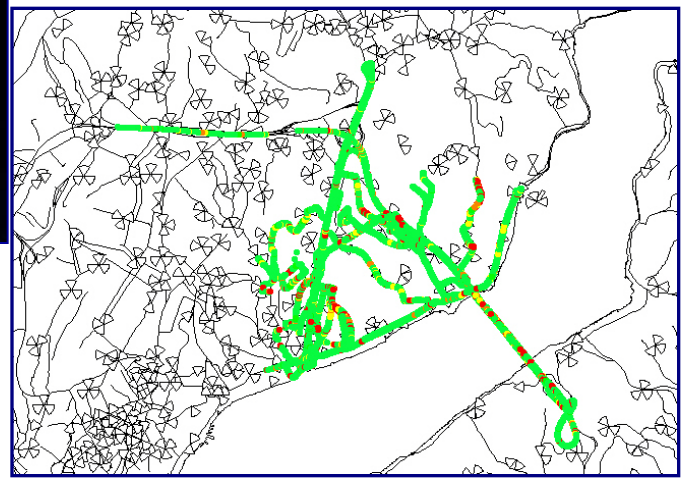
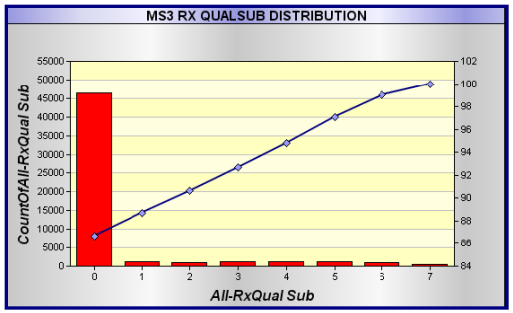
Rx Quality

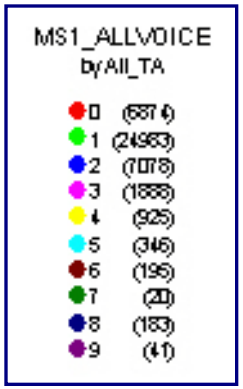


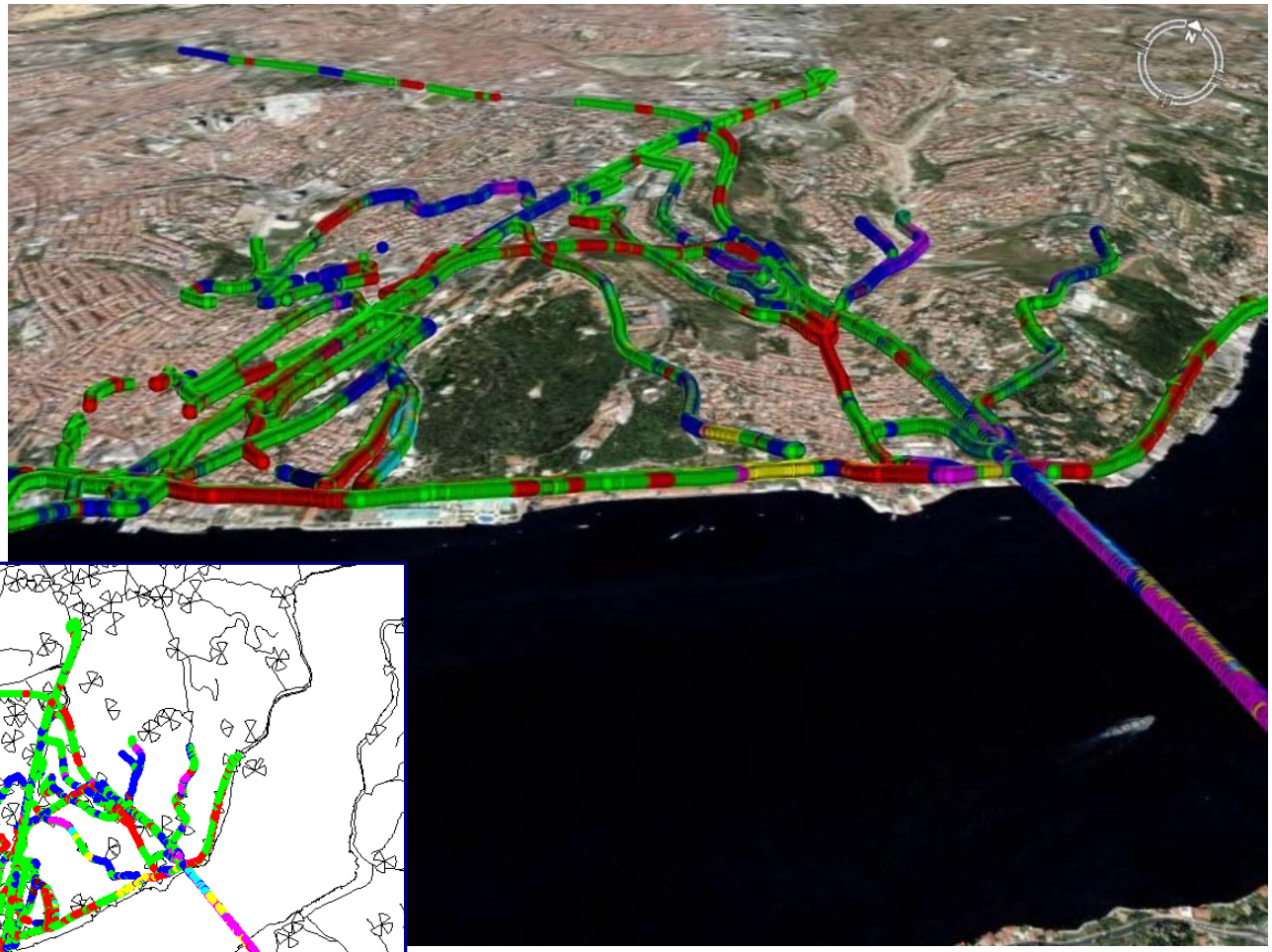


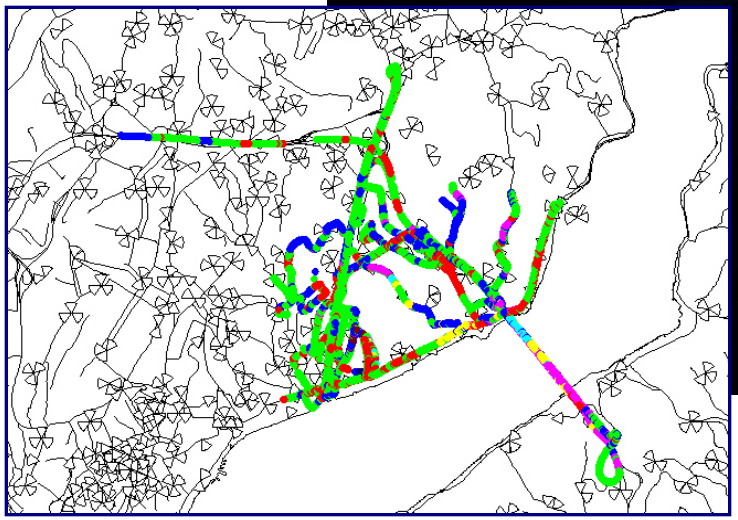
MS1_ALLVOICE
by All_RxQual_Sub

7 to 8	(458)
6 to 7	(924)
5 to 6	(936)
4 to 5	(823)
3 to 4	(827)
2 to 3	(761)
1 to 2	(753)
0 to 1	(37051)

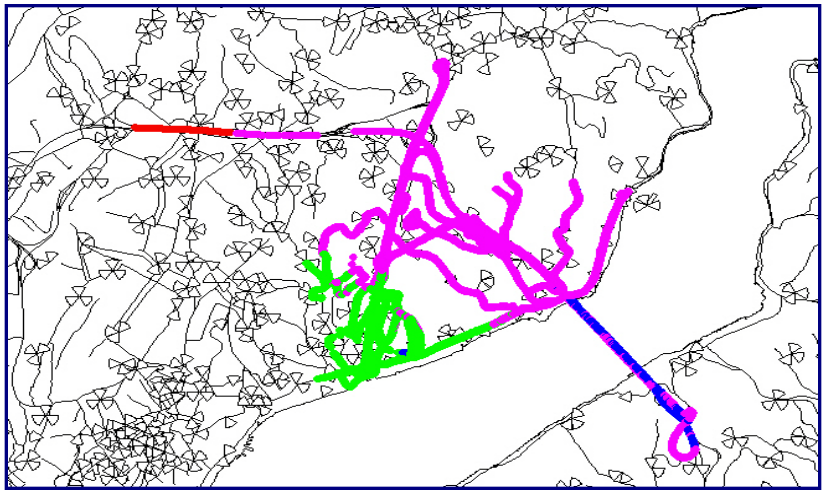
Timing Advance







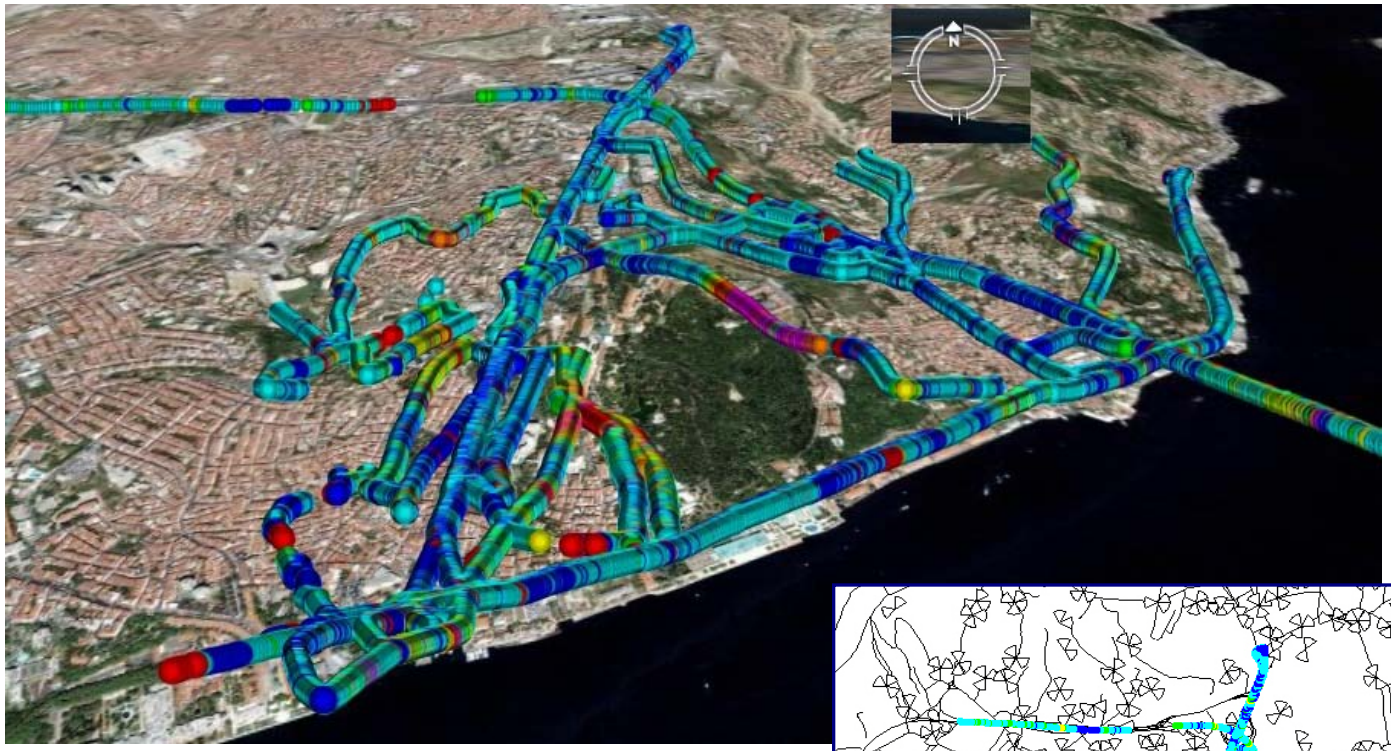
LAC



MS1_ALLVOICE
by LAC

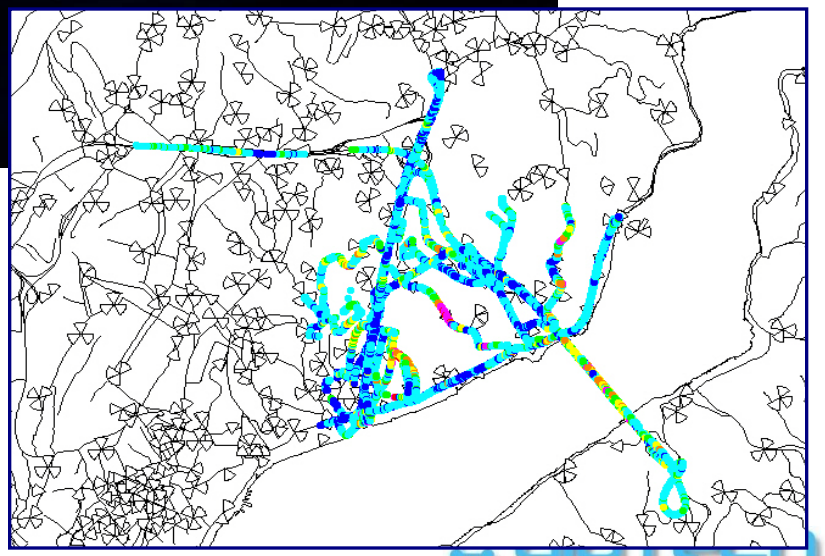
- 13,401 (69)
- 13,411 (17529)
- 13,434 (1683)
- 13,435 (22652)

C/I on Hopping List



MS1_ALLVOICE
by All_Cpl_Hopping_List0

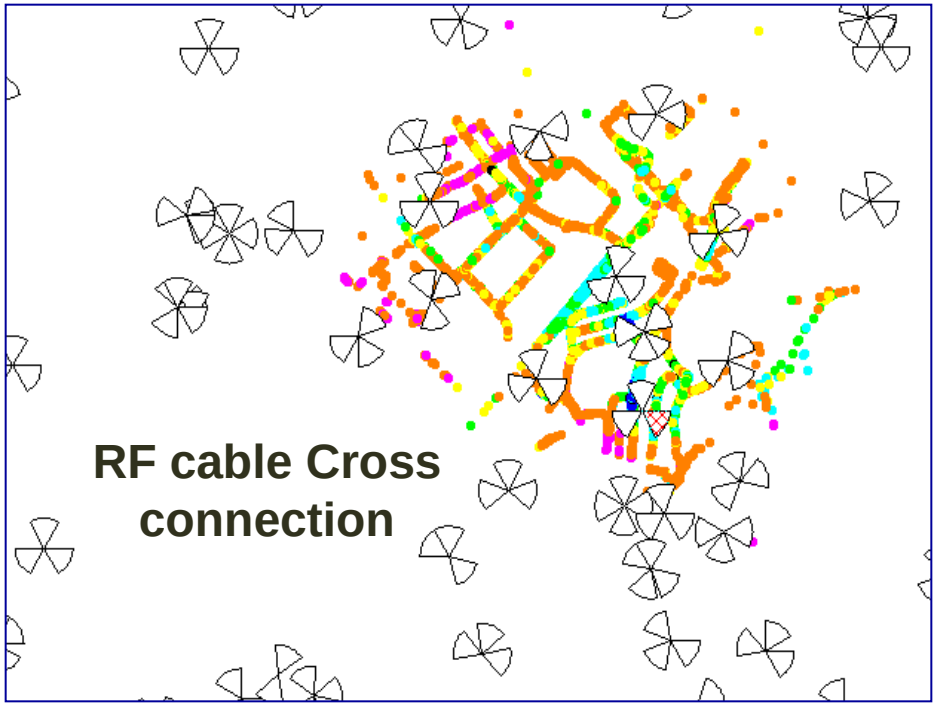
- 22 to 110 (10357)
- 17 to 22 (24018)
- 15 to 17 (2924)
- 12 to 15 (1872)
- 9 to 12 (703)
- 6 to 9 (330)
- 0 to 6 (103)



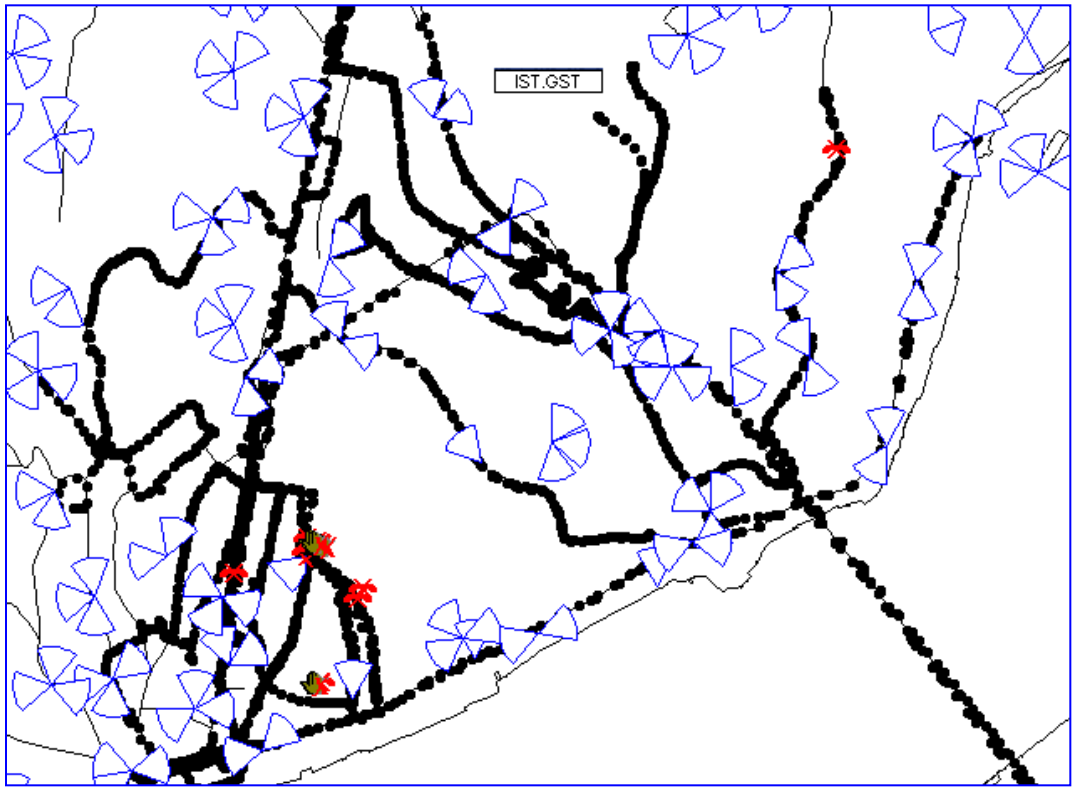
Cell Coverage Layers

ST0001 Cell Coverage

Detection of cross feeder connection is easy with Cell coverage layers



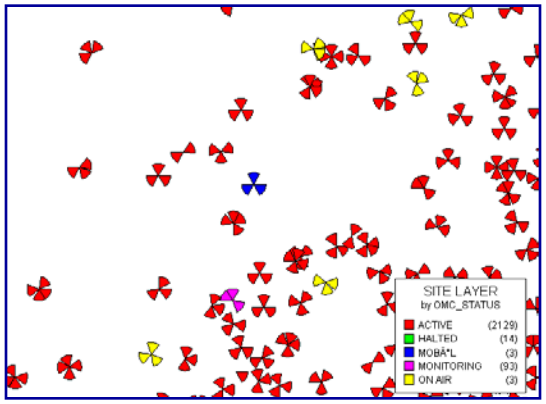
Event Locations

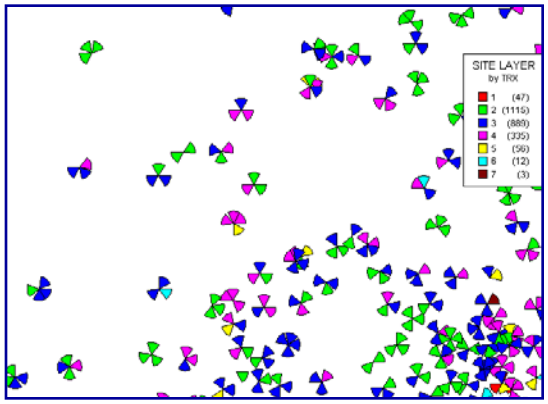


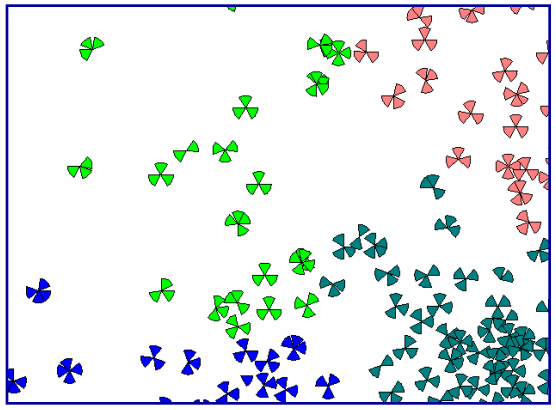
☑	Handover Failure
☑	Handover Intracell Failure
☑	Blocked Call
☑	Call Setup
☑	Dropped Call

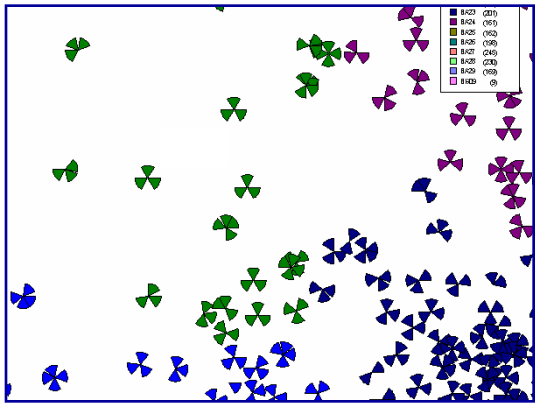


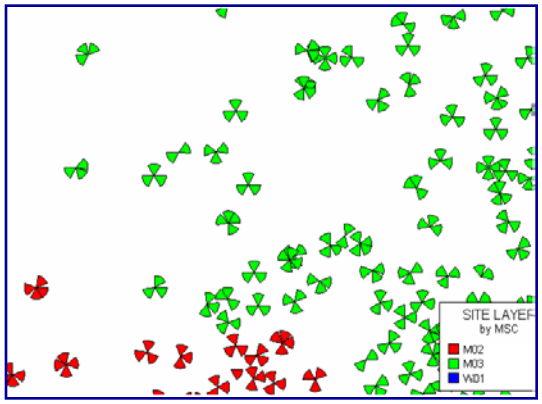
Site Thematic Maps



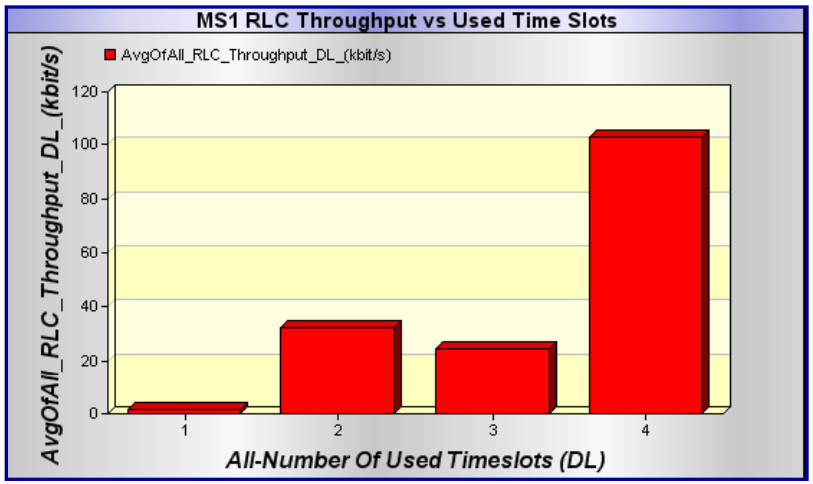


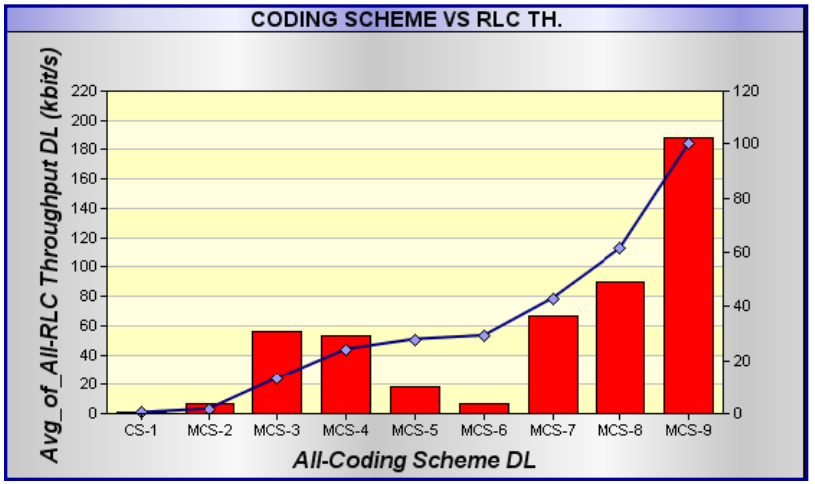


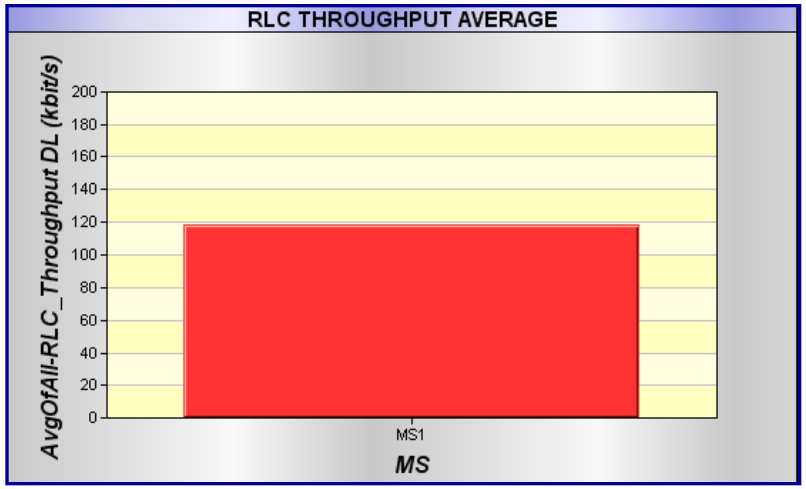




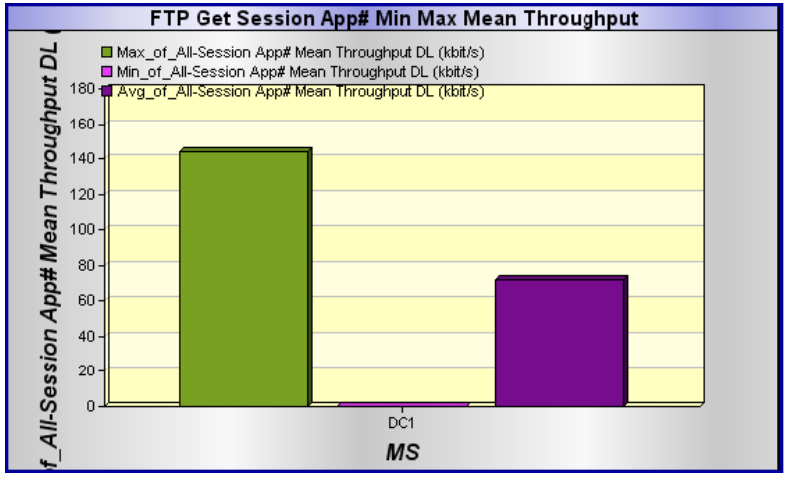
RLC-1

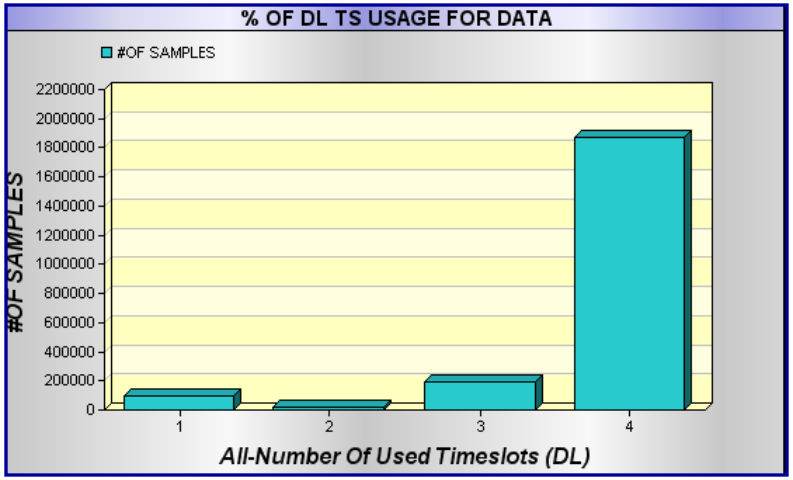

MS1 RLC Throughput vs Used Time Slots
AvgOfAll_RLC_Throughput_DL_(kbit/s)
AvgOfAll_RLC_Throughput_DL_(kbit/s)
120
100
80
60
40
20
0
1
2
3
4
All-Number Of Used Timeslots (DL)

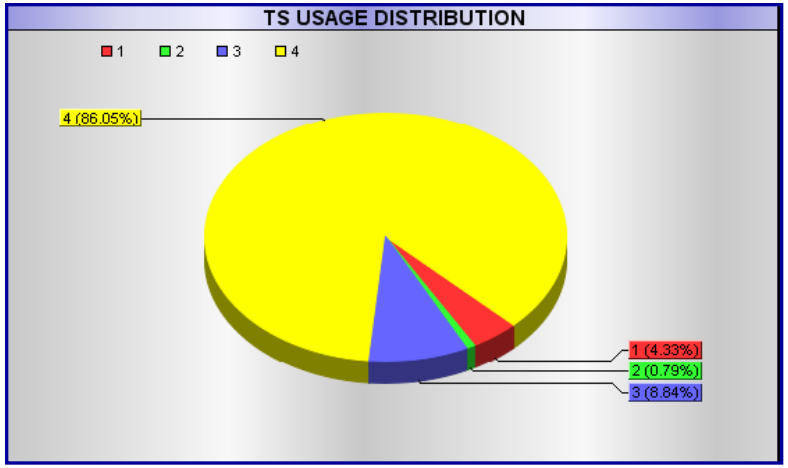

CODING SCHEME VS RLC TH.
Avg_of_All-RLC Throughput DL (kbit/s)
220
200
180
160
140
120
100
80
60
40
20
0
120
100
80
60
40
20
0
CS-1
MCS-2
MCS-3
MCS-4
MCS-5
MCS-6
MCS-7
MCS-8
MCS-9
All-Coding Scheme DL


RLC THROUGHPUT AVERAGE
AvgOfAll-RLC_Throughput DL (kbit/s)
200
180
160
140
120
100
80
60
40
20
0
MS1
MS

FTP Throughput & Time Slot usage









Event Figures

MS	Event	Count_of_Even	%	KPI
MS1	Blocked Call	2	0.57%	Blocked Call Rate
MS1	Call Attempt	353		
MS1	Call Attempt Retry	13		
MS1	Call End	341	97.71%	Call Success Rate
MS1	Call Initialization	352	96.88%	User Success Rate
MS1	Call Setup	349	98.87%	Call Setup Success Rate
MS1	Handover	648		
MS1	Handover Failure	4	99.39%	Handover Success Rate
MS1	Handover Intracell	77		
MS1	Handover Intracell Failure	0		
MS1	Dropped Call	2	0.57%	Drop Rate
MS1	Location Area Update	50		

MS	Event	Count_of_Even	%	KPI
MS3	Blocked Call	1	6.67%	Blocked Call Rate
MS3	Call Attempt	15		
MS3	Call Attempt Retry	2		
MS3	Call End	0	0.00%	Call Success Rate
MS3	Call Initialization	16	0.00%	User Success Rate
MS3	Call Setup	14	93.33%	Call Setup Success Rate
MS3	Handover	788		
MS3	Handover Failure	7	99.12%	Handover Success Rate
MS3	Handover Intracell	87		
MS3	Handover Intracell Failure	0		
MS3	Dropped Call	7	50.00%	Drop Rate
MS3	Location Area Update	4		

Thank You!

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