

The Mobile Phone

**SIM
card**

+

**Handset, or
Mobile Equipment
(ME)**

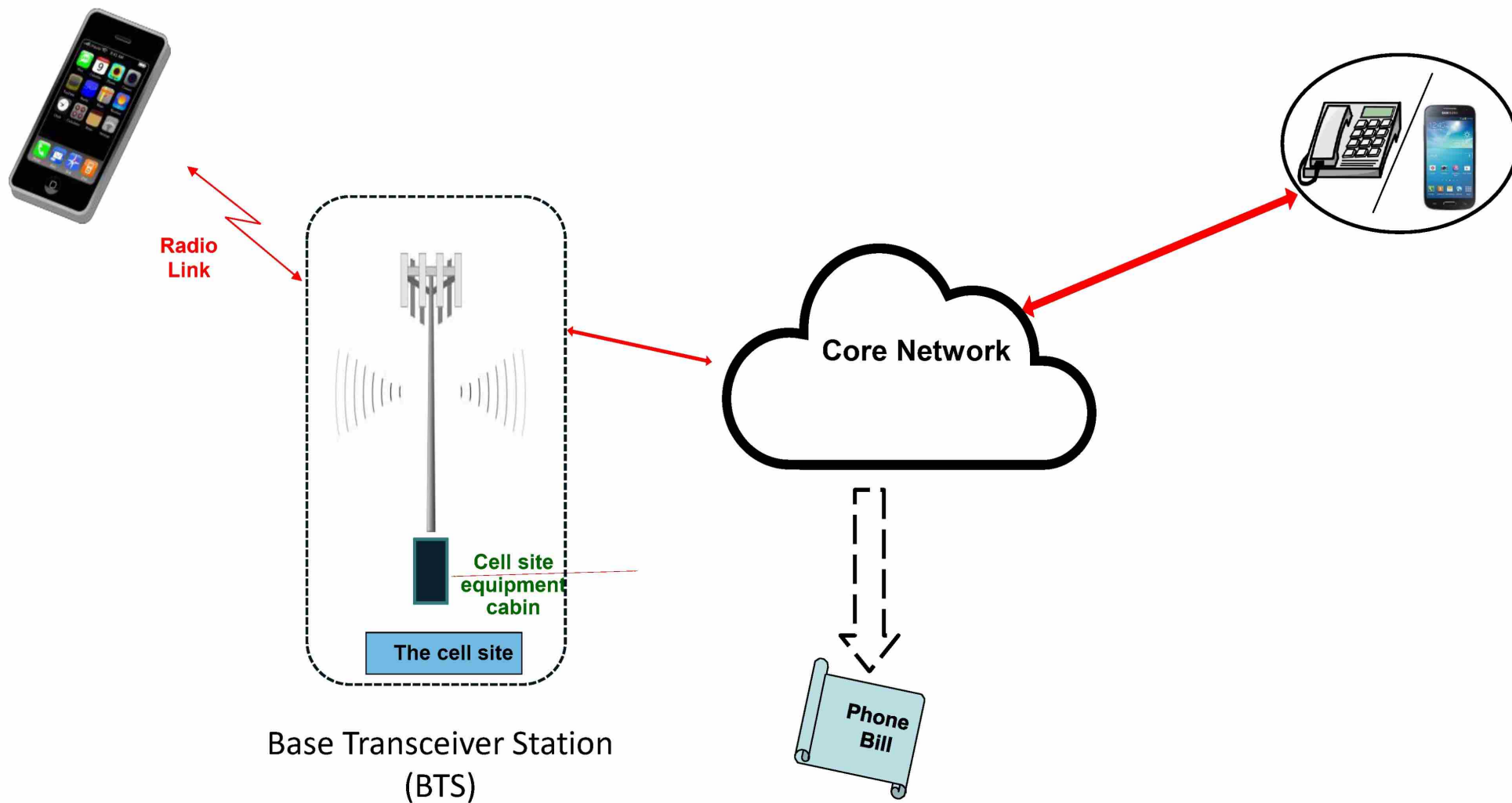
**= Mobile
Phone**



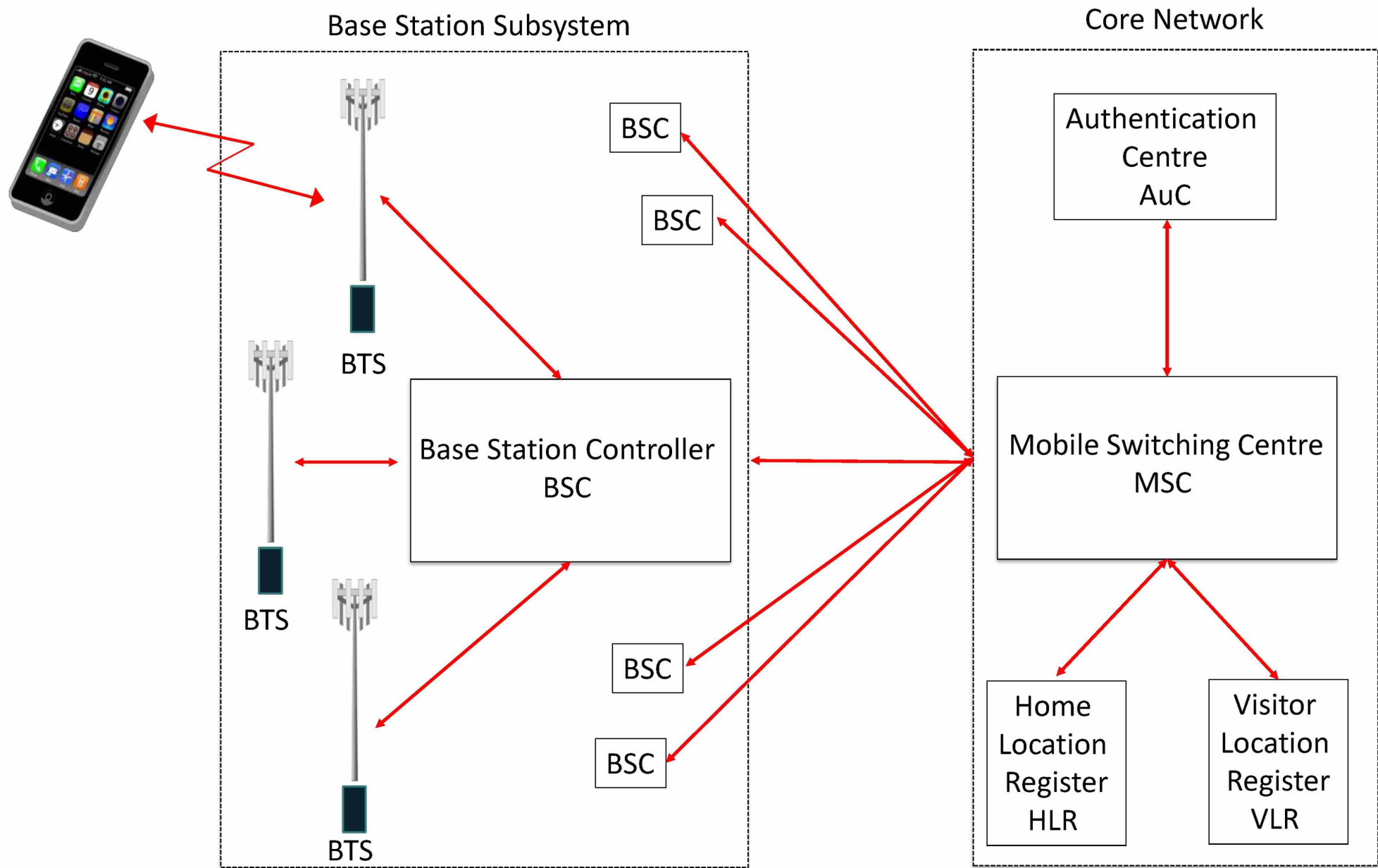
**Contains subscription
information used by
the network to
identify the user and
assign a 'phone
number'**

**Contains IMEI
(International
Mobile Equipment
Identity)**

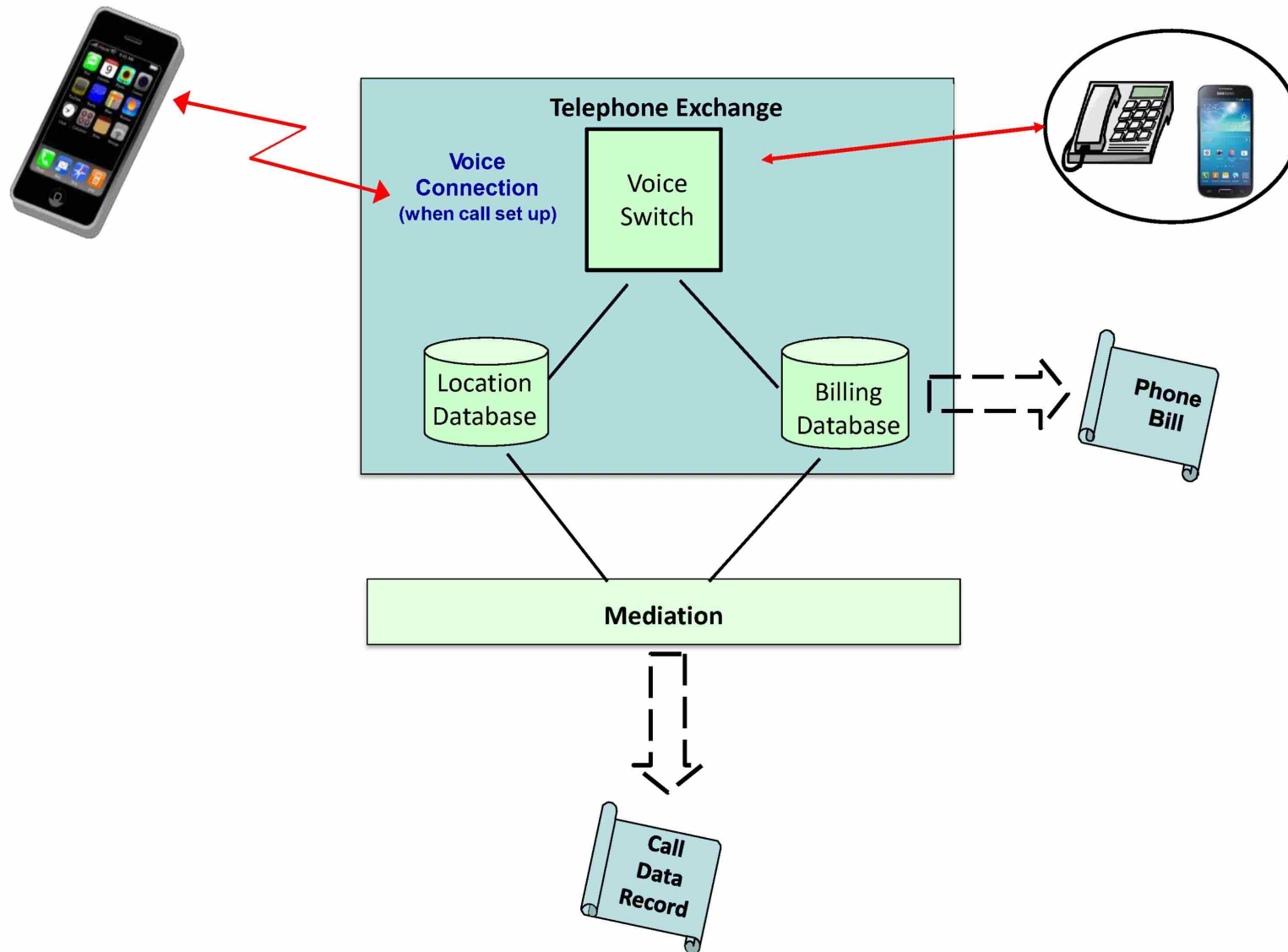
The Network - High Level



The Network - The role of the MSC



Billing



Example of current call data content (normalised)

Call data for Phone 073 PD 1139

Date	Time	Duration	Calling Number	Receiving Number	Call Event Type	Start Cell ID	Start Site Name	Start Postcode	Azimuth	End Cell ID	End Site Name	End Postcode	Target Phone IMEI
31/07/2021	18:06:51	00:00:24	075 1130	073 PD 1139	Incoming Voice	3012872	UNSWORTH CRICKET CLUB	BL9 8QL	30	06506	PRESTWICH HEYS AFC	M45 8EZ	4222
31/07/2021	18:21:44	00:00:00	077 5520	073 PD 1139	Incoming Text	3012872	UNSWORTH CRICKET CLUB	BL9 8QL	30				6366
31/07/2021	18:27:53	00:04:26	073 PD 1139	PD	GPRS Data	3012873	UNSWORTH CRICKET CLUB	BL9 8QL	180				6366
31/07/2021	20:23:55	00:01:05	073 PD 1139	075 1130	Outgoing Voice	25425	PRESTWICH HEYS AFC	M45 8EZ	300	25425	PRESTWICH HEYS AFC	M45 8EZ	6366
31/07/2021	20:55:23	00:00:00	073 PD 1139	075 1130	Outgoing Text	25425	PRESTWICH HEYS AFC	M45 8EZ	300				6366

Subject
Phone Number
(SIM)



Other
Party's
Phone
Number



Cell Site Mast
Information
(Subject
Phone)

Cell Point
Direction
(azimuth)



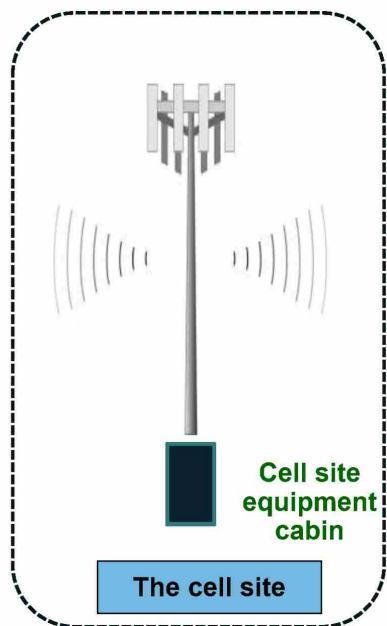
Subject
Handset
(IMEI)



Different
Handset
(IMEI)
Used with
Suspect's
SIM

PD

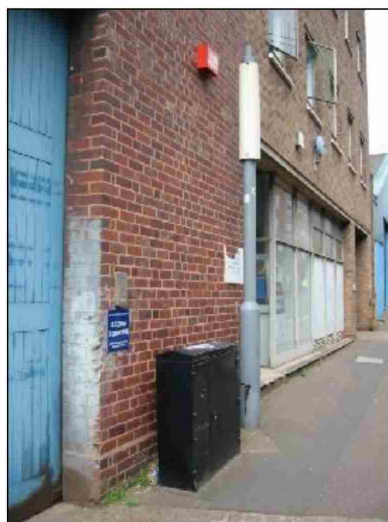
Cell Sites



Dedicated Radio Mast



Rooftop Antennas

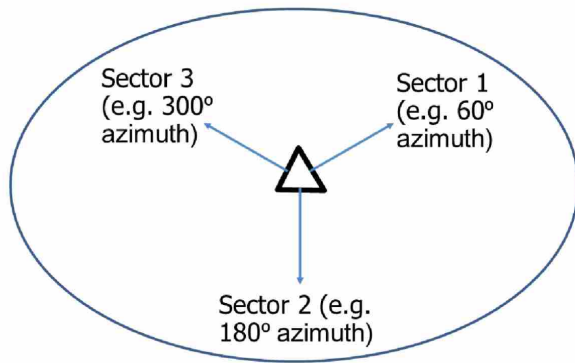


Street Works



2 micro cells on side of building

Sectorisation



Sector 3

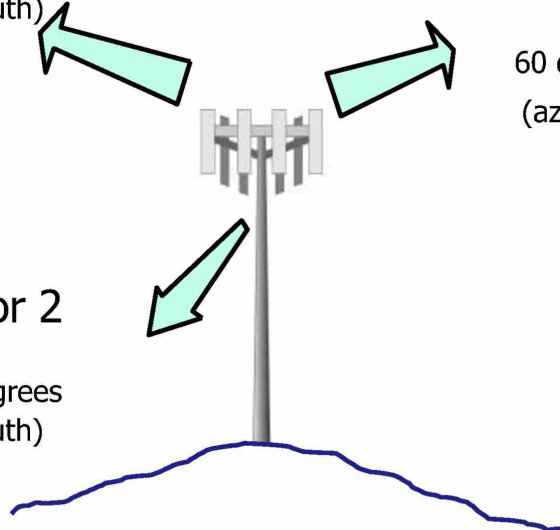
e.g.
300 degrees
(azimuth)

Sector 1

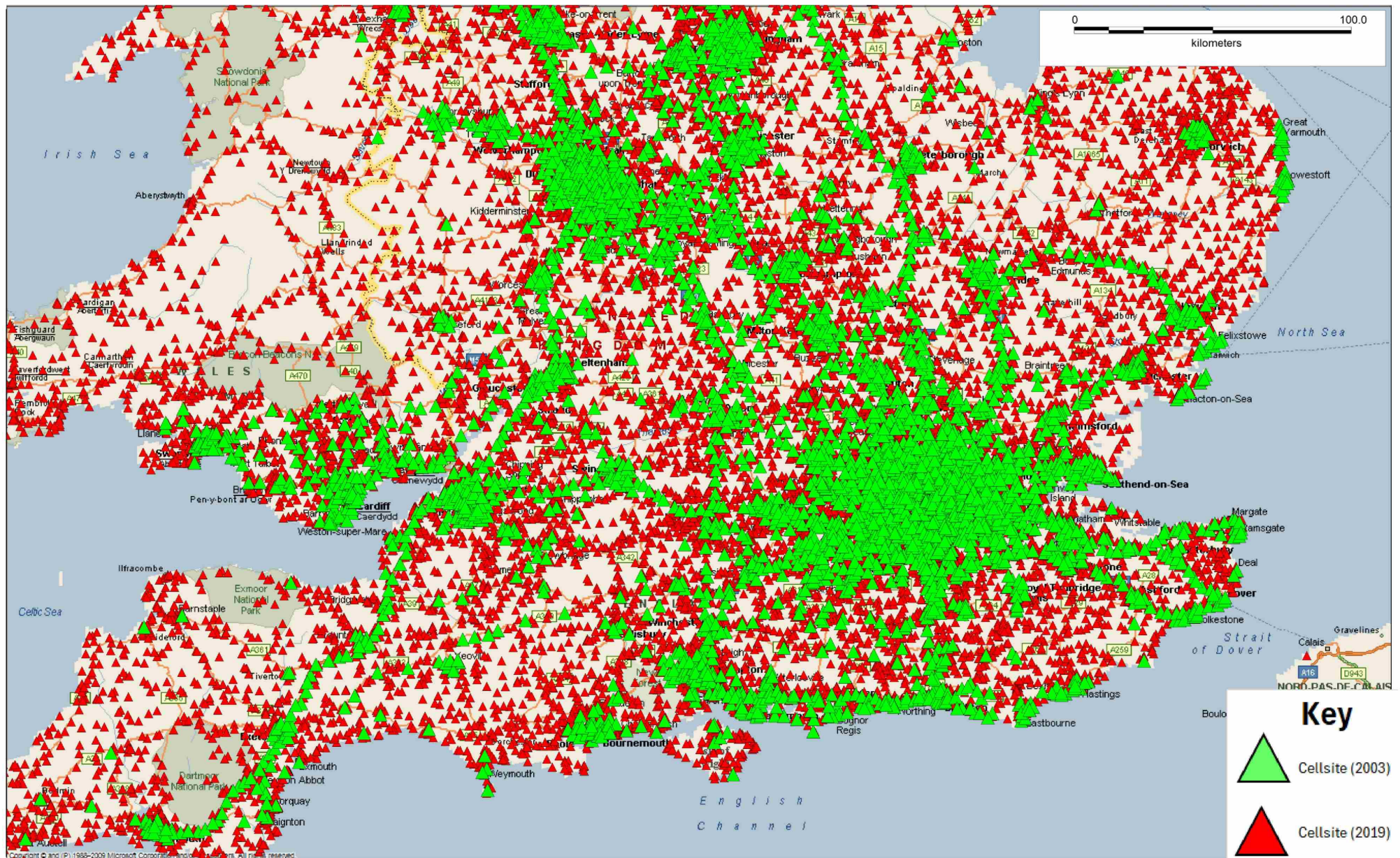
e.g.
60 degrees
(azimuth)

Sector 2

e.g.
180 degrees
(azimuth)



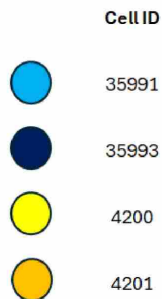
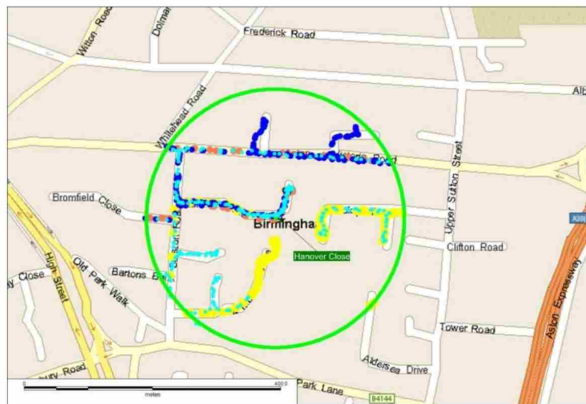
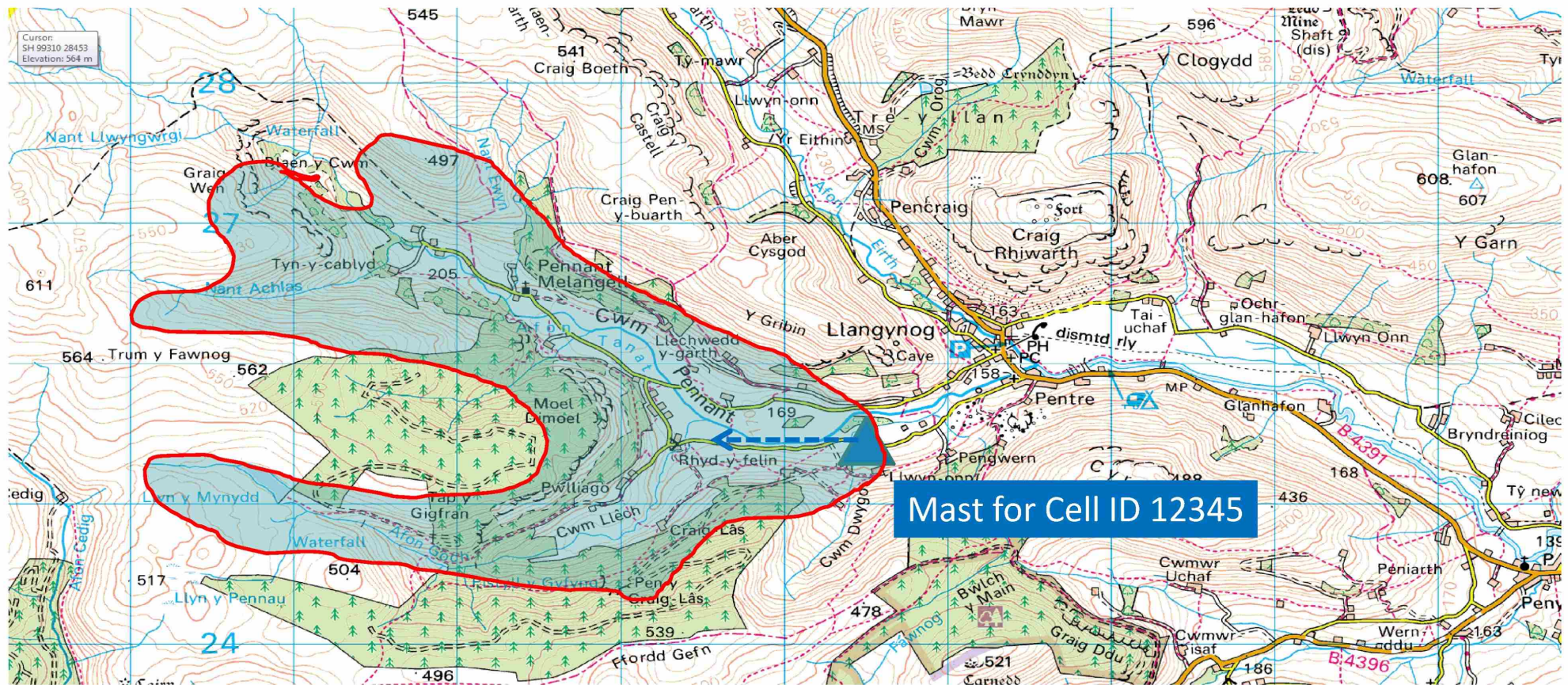
Factors affecting service - Cell Site Density (which can change with time)



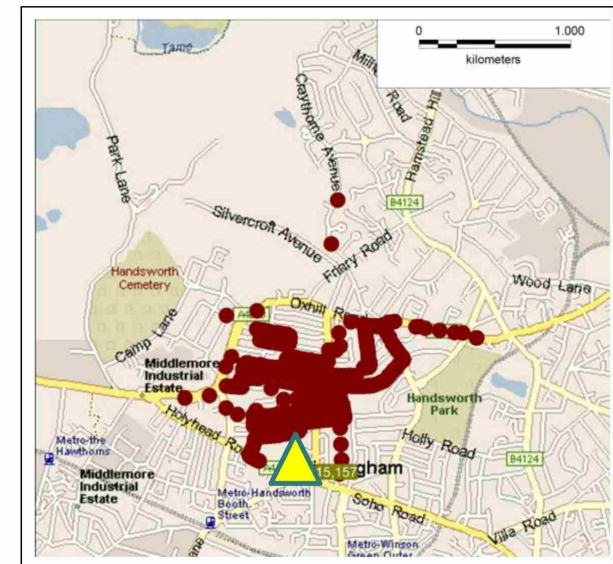
2003 vs. 2019



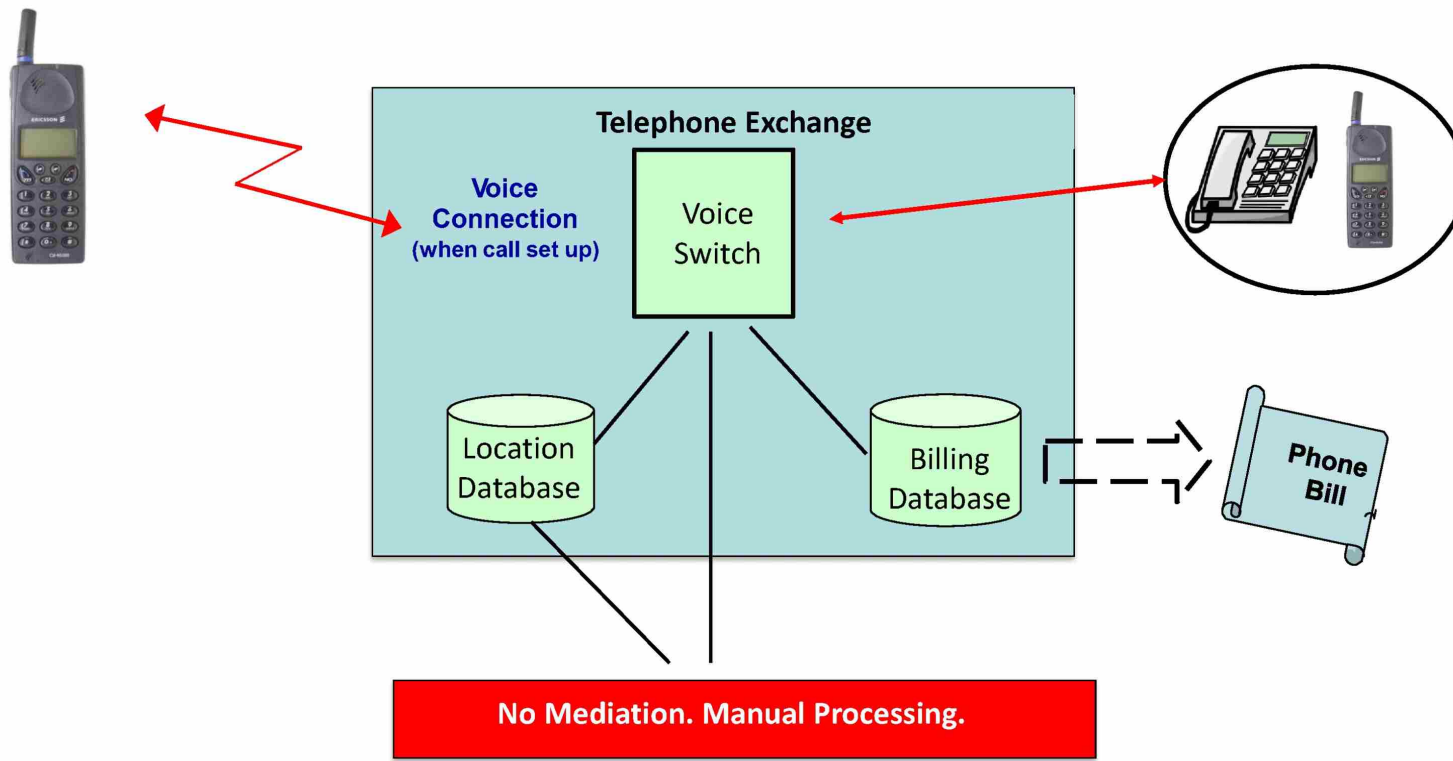
Factors affecting service - Azimuth & Mast Height vs. Terrain



It is normal for cells to overlap; Example survey data



Toll Tickets



Toll Ticket Format & Cellsite Information in the data from 1998

Toll Ticket from INQ000433

Mobile Number: 353 86 PD 5430

INCOMING CALLS RECEIVED FROM THE VF NETWORK

DATE	TIME	CALLER	DURATION	BASE SITE	LOCATION OF CALLER
15/08/98	14:30:33	SMS RECEIVED	00:00:00	NA	TEXT MESSAGE RECEIVED
15/08/98	14:10:56	00353 87 5585	00:00:17	61451	N.IRELAND ELECTRIC, PIGEON TOP, MOUNT POLLNAUGHT, CO. TYRONE.
15/08/98	14:38:53	00353 87 5585	00:00:10	4620	N.I.E.B. SITE, CRANLOME, NORTHERN IRELAND.
15/08/98	14:24:26	00353 86 2477	00:00:07	45760	BRITISH RAIL STATION, STAFF CAR PARK, HOLYHEAD, GWYNEDD.
15/08/98	14:25:14	00353 86 2477	00:00:05	45760	BRITISH RAIL STATION, STAFF CAR PARK, HOLYHEAD, GWYNEDD.

Cell Site Information from INQ034428-INQ034433

SITE	CELL	Cell Name	X	Y	STATUS	TYPE
462	0	4620	77778	525197	In-Service	G
463	0	4630	52528	545673	In-Service	G
4107	1	41071	64172	543338	In-Service	G
4685	1	46851	57694	535796	In-Service	G

Data we would now get that wasn't included in the 1998 material

If this were the type of data used for our earlier slide on call data for Phone 073 PD 1139

Date	Time	Duration	Calling Number	Receiving Number	Call Event Type	Start Cell ID	Start Site Name	Start Postcode	Azimuth	End Cell ID	End Site Name	End Postcode	Target Phone IMEI
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Subject Phone Number (SIM)



Other Party's Phone Number

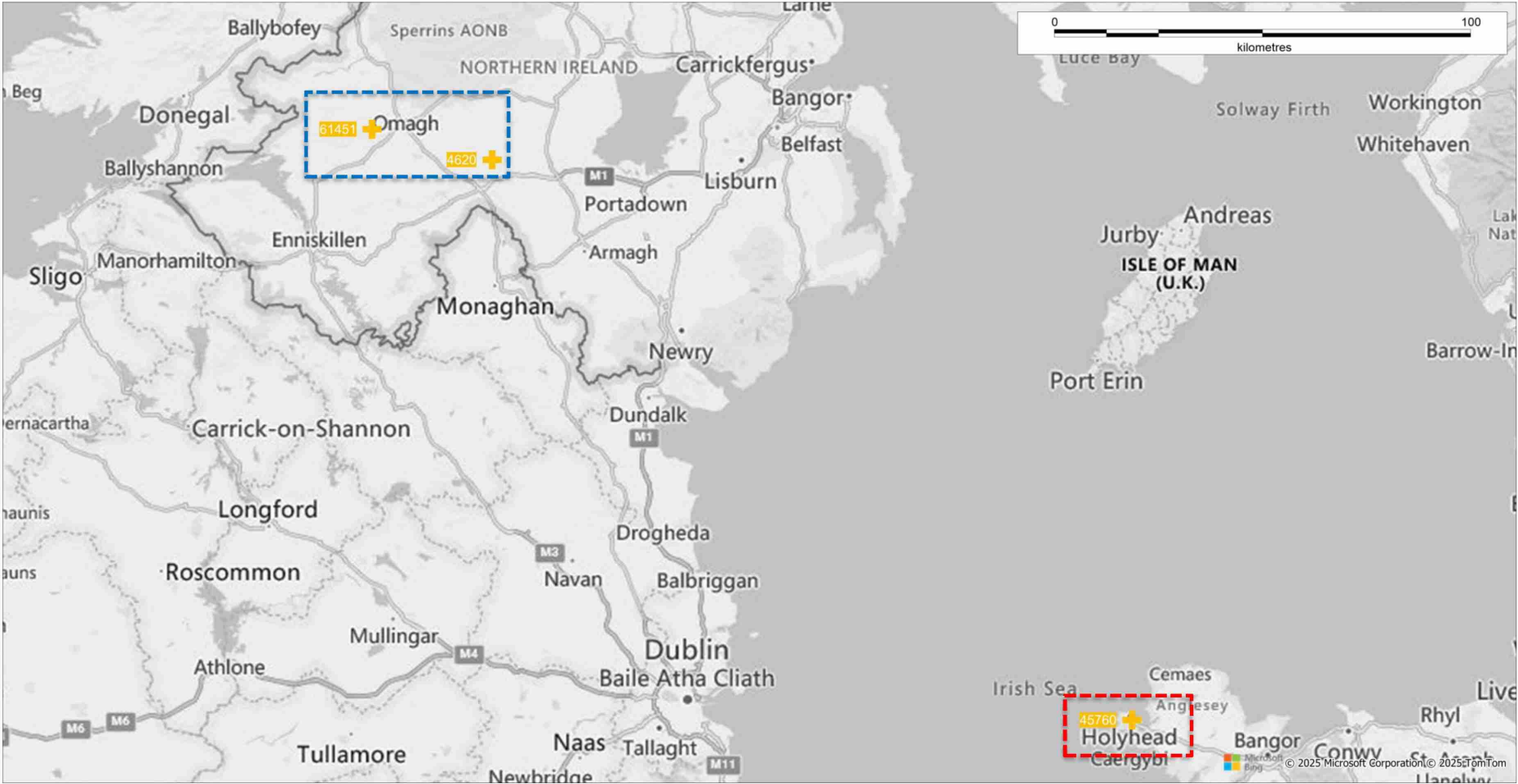


Cell Site Mast Information (Subject Phone)

No Cell Point Direction (azimuth)

No End Cell

Misleading information - example of "Other Party" call data.



Mobile Number: 353 86 PD 5430

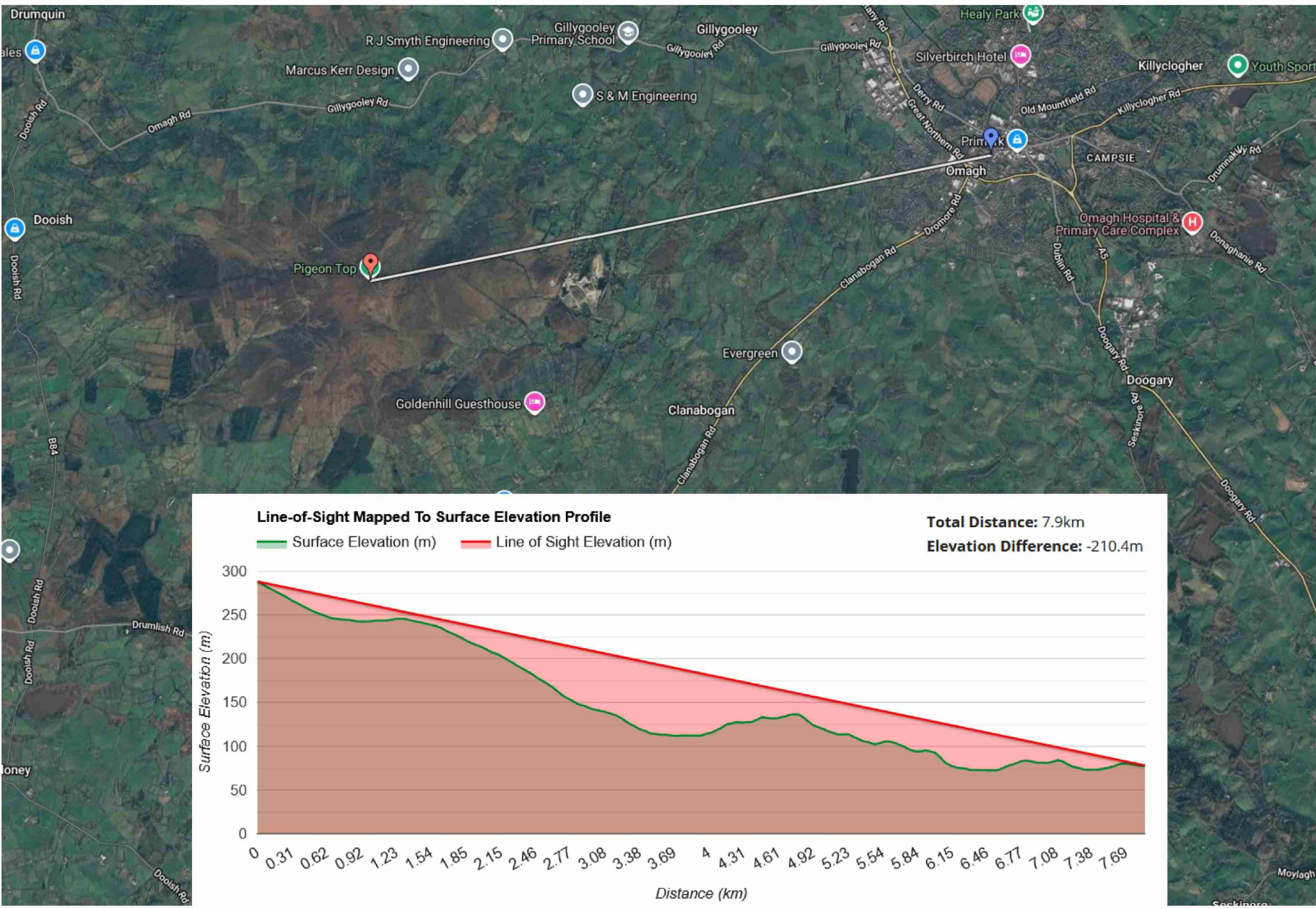
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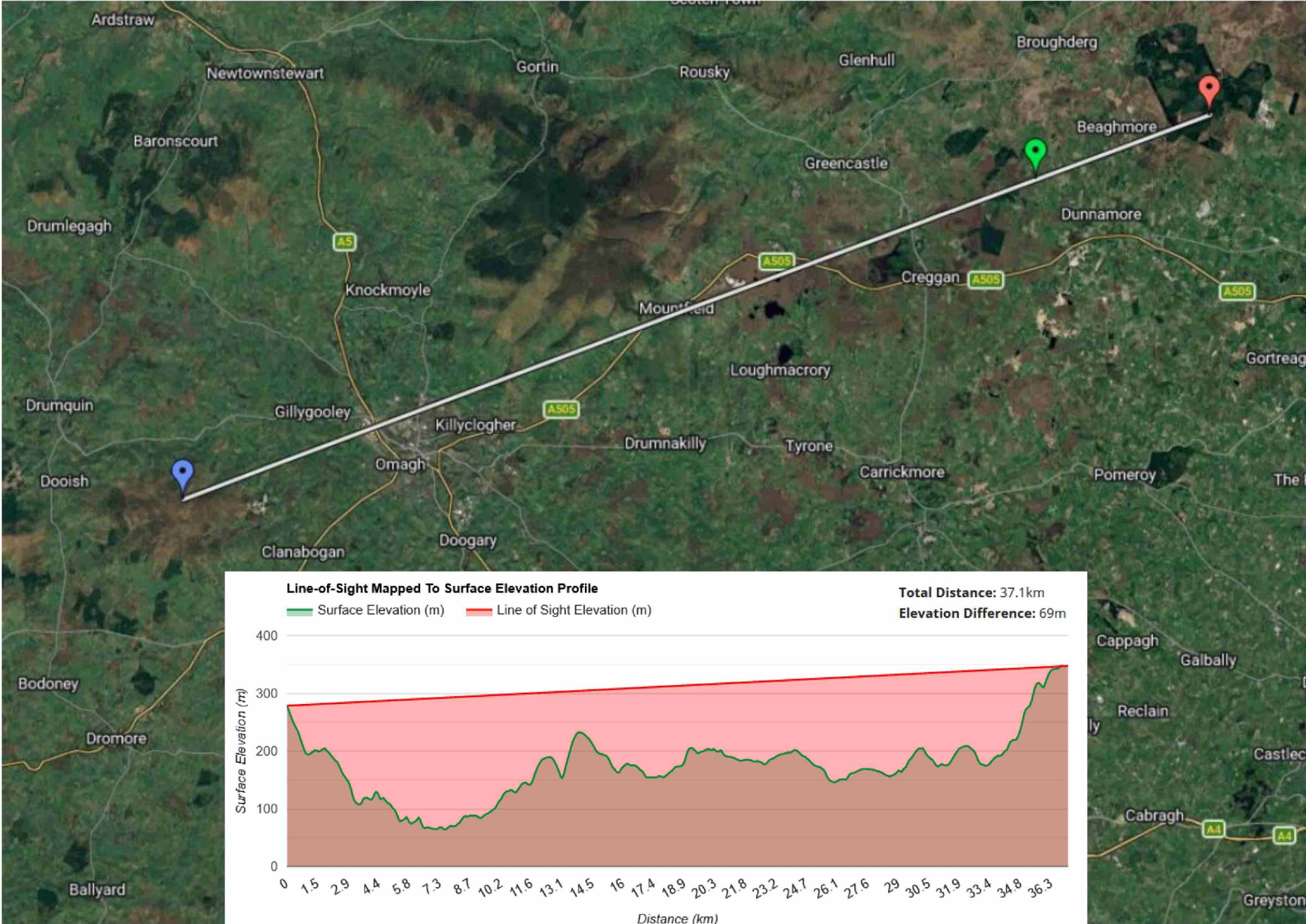
Specific Cell Sites - Pigeon Top



Terrain - Pigeon Top to Omagh



Terrain - Pigeon Top to beyond Omagh



Terrain - Omagh Technical College - Terrain shielding beyond Omagh

