

GE
SMART
ASIA 2017



ASSET AUDITING

Geo Location Telecommunication
The Learning Experiences



"The campfire's down and I can't send any messages. Call IT."

Overview

- A Mission TO VALIDATE AND VERIFY DATA OF RADIO COMMUNICATION INFRA (RCI)
-
- Divided into 5 phases :
 - Phase 1 - WP Kuala Lumpur, WP Putrajaya and Perak
 - Phase 2 - Perlis, Kedah, Kelantan, Terengganu and Pahang
 - Phase 3 - Pulau Pinang, Melaka, Johor and Negeri Sembilan
 - Phase 4 - Sarawak
 - Phase 5 - Sabah
- Completed within 5 month (Average) time frame every phase

Project Area of Interest (Phase 2 and Phase 4)



Radio Communication Infra (RCI) in the state of Perlis, Kedah, Kelantan, Terengganu , Pahang and Sarawak



Total Towers

Sarawak : 1156

Peninsular Malaysia : 3257



Project Time Frame : Phase 2 (Within 5 months, Year 2014) and Phase 4 (Within 5 months, Year 2016)

Objectives

- To validate and verify RCI data submitted by Telco's.
- To verify accuracy of RCI data within CIMS.
- To update the observation data into CIMS.



PROJECT WORKFLOWS



Basic Standard Procedures



Logistic / Accommodation
/ Personnel

Contact Person / Phones / Vehicle / Working Permit / Schedule

Hardware Check list

Battery Life / External Disk / Disk Space / GPS / Vehicle / Whether forecast



Site Preparation Check list

Job Tracking / TOR/ Daily Target / Photos

Instrument
Calibration

GPS related parts



Planning Route

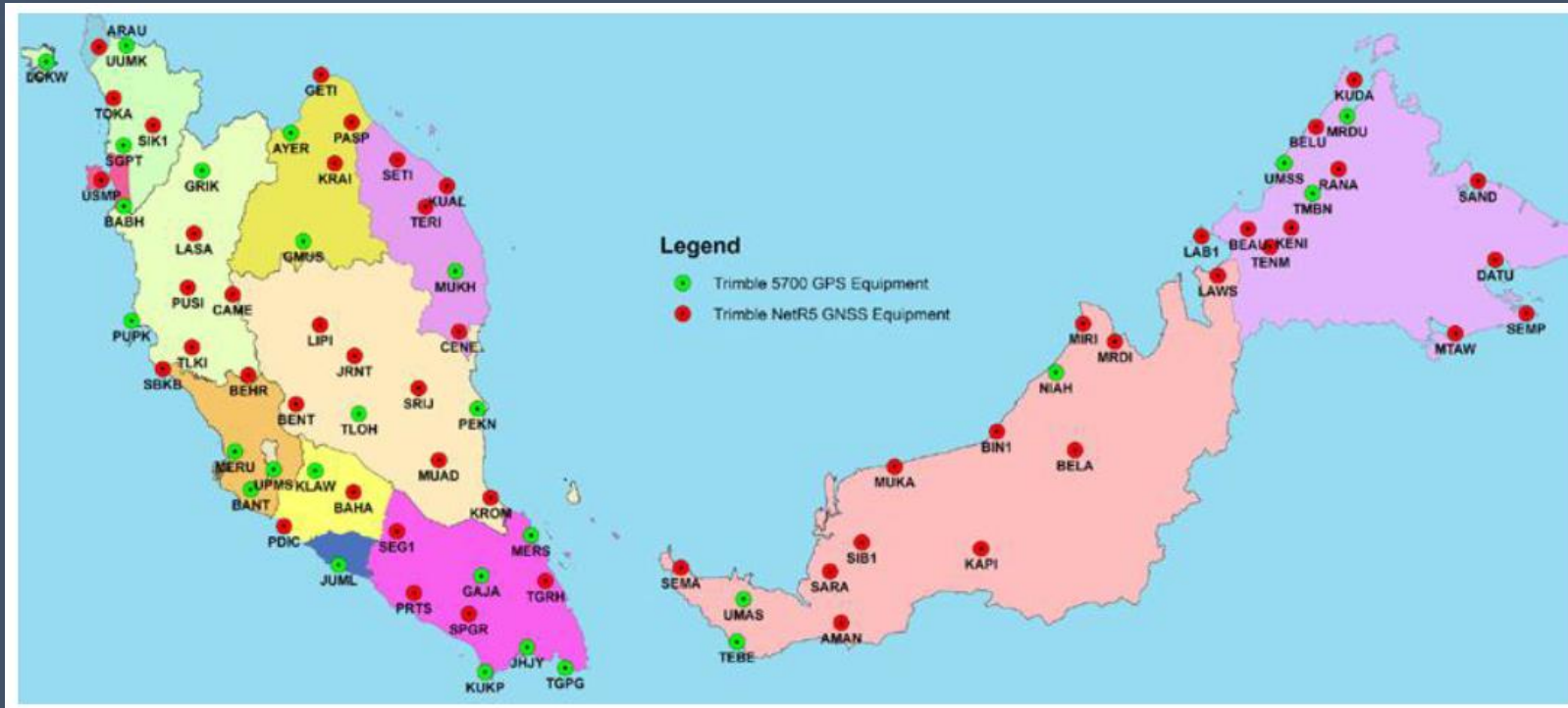
Site Layout / Time Restriction / Mapping Style / Naming Convention Dataset /
Daily Backup / Cross Check Daily Work / Next Day Planning

- GPS RTK Technology (Single Base Correction)
- Pekeliling KPUP Bil. 9/2005 – Garis Panduan Mengenai Penggunaan Perkhidmatan Malaysia RTK GPS network (MyRTKnet)
- Pekeliling KPUP Bil. 1/2008 – Garis Panduan Mengenai Ujian Alat Sistem Penentududukan Sejagat (GNSS) Yang Menggunakan Malaysia RTK GNSS Network (MyRTKnet)
- Pekeliling KPUP Bil 3/2016 – Perkhidmatan MyRTKnet di bawah platform Spidernet
- 50 GNSS reference stations are located in Peninsular Malaysia whilst 28 stations in Sabah and Sarawak, spacing between 30km to 120km

Method & Equipment



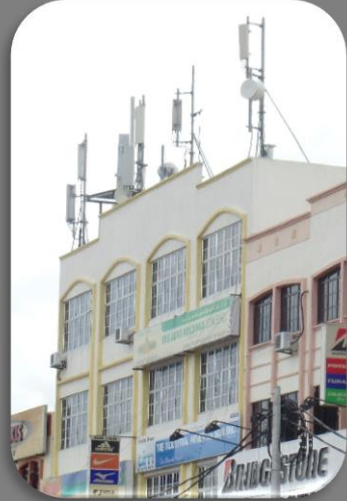
RTK BASE STATION



RCI sites (CIMS database categories)



Tower



Rooftop



Dual-Function



In-Building



Temporary BTS.

RCI Structure Type



Monopole



4 Legged



3 Legged



Guyed Mast

RCI Structure Type



Mini Structure



Ramo



Rapole



Water tank



Monopole Tree



Minaret

Data Dictionary

Attributes Structure	Information	Data Type
TOWER_ID	T13-000989	
AUDIT_REFID	LITSB-T13-000989	
STRUCTURE_OWNER_AUD	MAXIS	Maxis/ Sacofa / Celcom / Edotco / DiGi
STRUCTURE_CATEGORY_AUD	TOWER	Tower / Roof top / Temporary BTS / Dual Function/ In Building
STRUCTURE_TYPE_AUD	3LEGGED	Monopole / 4 Legged / 3 Legged / Guyed / Mini Structure / Ramo / Rapole / Watertank / Monopole Tree / Minimast
STRUCTURE_HEIGHT_M_AUD	60.24	
DISTANCE_TO_NEAREST_BLDG_M	0	
TYPE_OF_NEAREST_BLDG	NONE	Commercial / Industrial / None
SUB_TYPE_OF_NEAREST_BLDG	0	
AVIATION_LIGHT	YES	Yes / No
GROUND_STATUS	EXIST	Exist / None
SITE_CONDITION	WELL_MAINTAIN	Well Maintain / Average / Poor
FENCING	AVERAGE	Well Maintain / Average / Poor
BLDG_HEIGHT_M_AUD	0	
X	110.4449239	
Y	1.624309988	

Infographic : Statistics Peninsular Malaysia 2014 : Surveyed Date

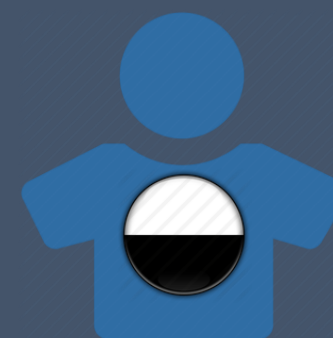


State	Start Date	End Date
Perlis	1/7/2014	8/7/2014
Kedah	9/7/2014	25/8/2014
Kelantan	17/9/2014	1/10/2014
Terengganu	29/10/2014	9/11/2014
Pahang	10/11/2014	30/11/2014

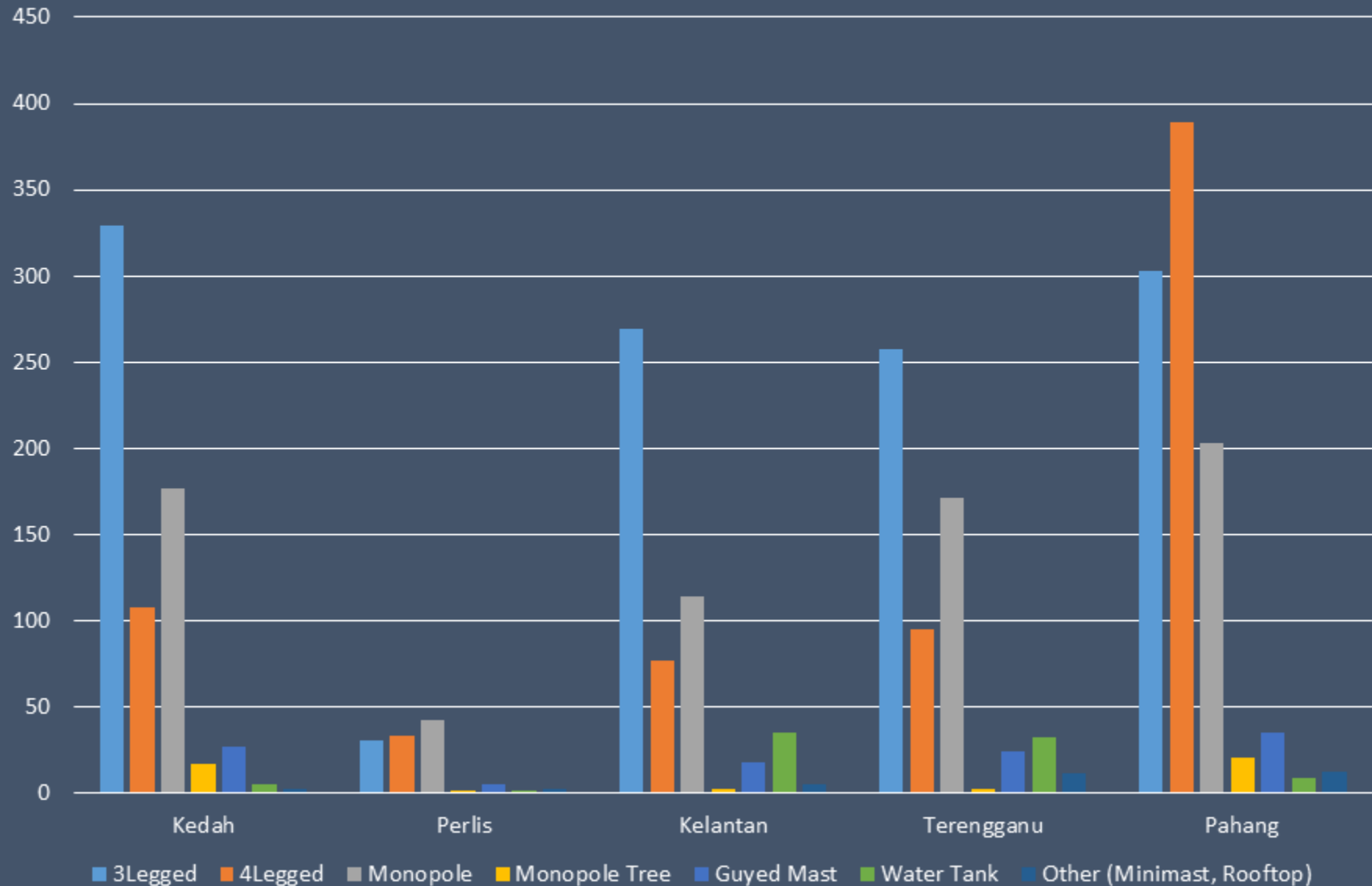


Infographic : Statistics Peninsular Malaysia 2014 : Structure Type

State	3Legged	4Legged	Monopole	Monopole Tree	Guyed Mast	Water Tank	Other (Minimast, Rooftop)
Kedah	329	108	177	17	27	5	2
Perlis	30	33	42	1	5	1	2
Kelantan	269	77	114	2	18	35	5
Terengganu	257	95	171	2	24	32	11
Pahang	303	389	203	20	35	9	12
Total	1188	702	707	42	109	82	32



Infographic : Statistics Peninsular Malaysia 2014 : Structure Type

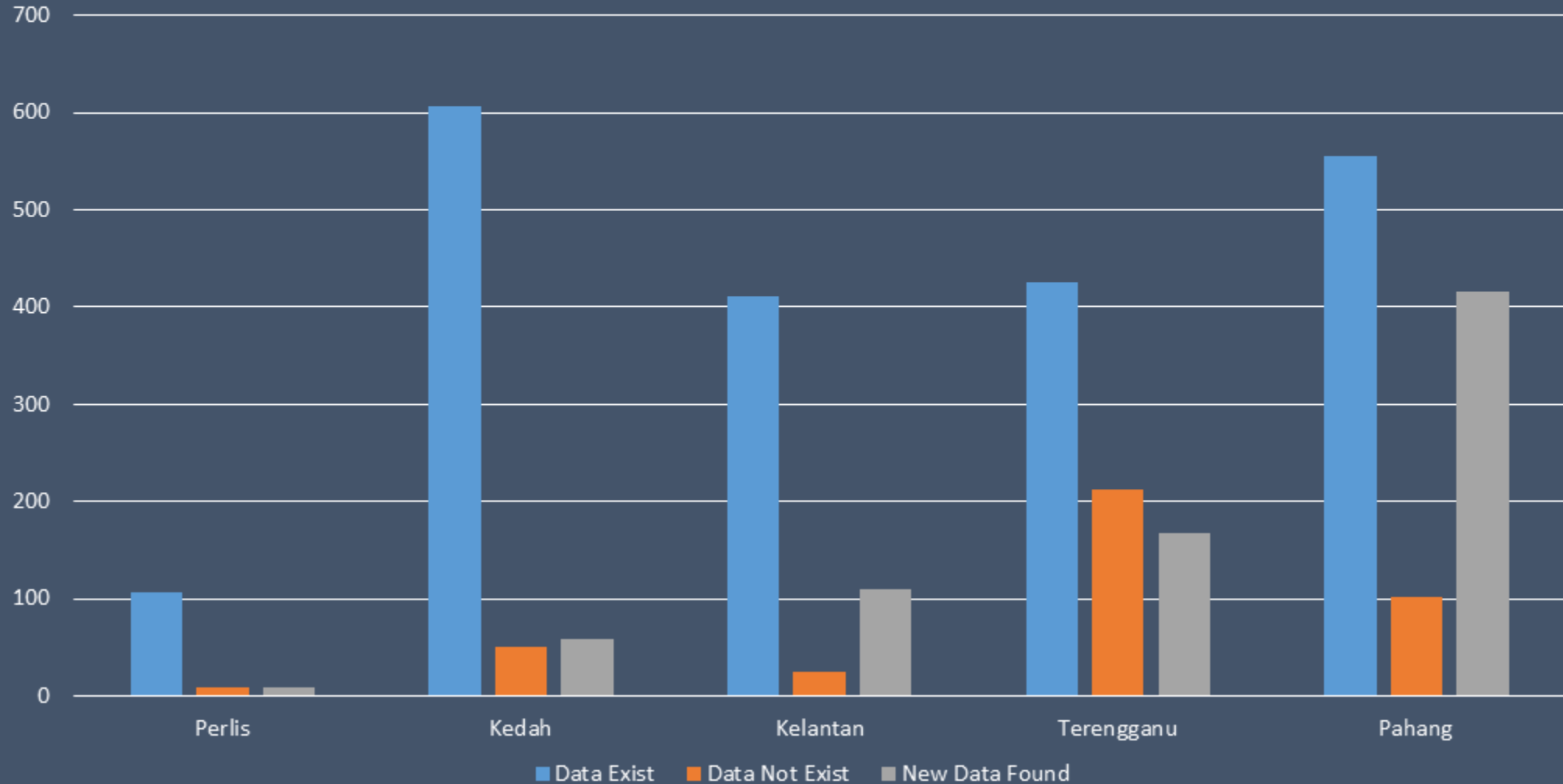


Infographic : Statistics Peninsular Malaysia 2014 : Existing vs. Auditing

State	Provided by SKMM	Total Tower	Data Exist	Data Not Exist	New Data Found	Total Data Audited	DIFFERENT
Perlis	Original data from SKMM	114	106	8	8	122	16
Kedah	Original data from SKMM	656	606	50	59	715	109
Kelantan	Original data from SKMM	435	411	24	109	544	133
Terengganu	Original data from SKMM	639	425	212	167	804	379
Pahang	Original data from SKMM	655	555	101	416	1072	517



Infographic : Statistics Peninsular Malaysia 2014 : Existing vs. Auditing



Infographic Statistics

Sarawak 2016 : Surveyed Date

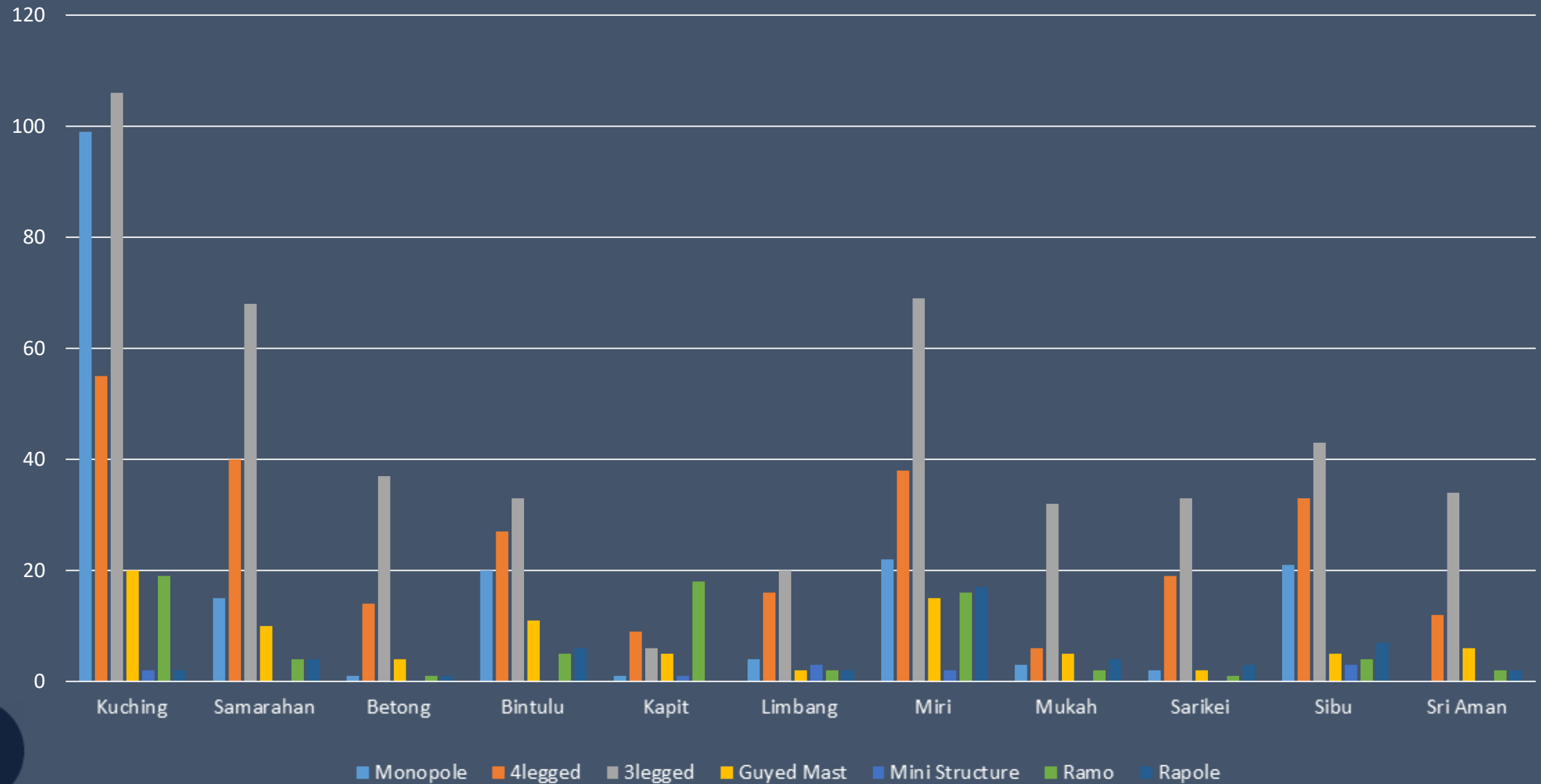


BAHAGIAN	START DATE	END DATE
Kuching	12/11/2015	26/11/2015
Samarahan	17/11/2015	30/11/2015
Asajaya	18/11/2015	18/11/2015
Lundu/Bau	19/11/2015	22/11/2015
Sri Aman	30/11/2015	2/12/2015
Betong	3/12/2015	3/12/2015
Sarikei	4/12/2015	4/12/2015
Sibu	7/12/2015	9/12/2015
Bintulu	10/12/2015	14/12/2015
Miri	15/12/2015	20/12/2015
Limbang	05/01/2016	07/01/2016
Mukah	12/01/2016	16/01/2016
Kapit	18/01/2016	20/01/2016
Newsite (Lundu, Sibu, Saratok)	24/03/2016	28/03/2016

Infographic : Statistic Sarawak 2016 : Structure Type

Bahagian	Monopole	4legged	3legged	Guyed Mast	Mini Structure	Ramo	Rapole
Kuching	99	55	106	20	2	19	2
Samarahan	15	40	68	10	0	4	4
Betong	1	14	37	4	0	1	1
Bintulu	20	27	33	11	0	5	6
Kapit	1	9	6	5	1	18	0
Limbang	4	16	20	2	3	2	2
Miri	22	38	69	15	2	16	17
Mukah	3	6	32	5	0	2	4
Sarikei	2	19	33	2	0	1	3
Sibu	21	33	43	5	3	4	7
Sri Aman	0	12	34	6	0	2	2
Total	188	269	481	85	11	74	48

Infographic Statistic Sarawak 2016 : Structure Type



Infographic : Statistics Sarawak 2016 : Existing vs. Auditing

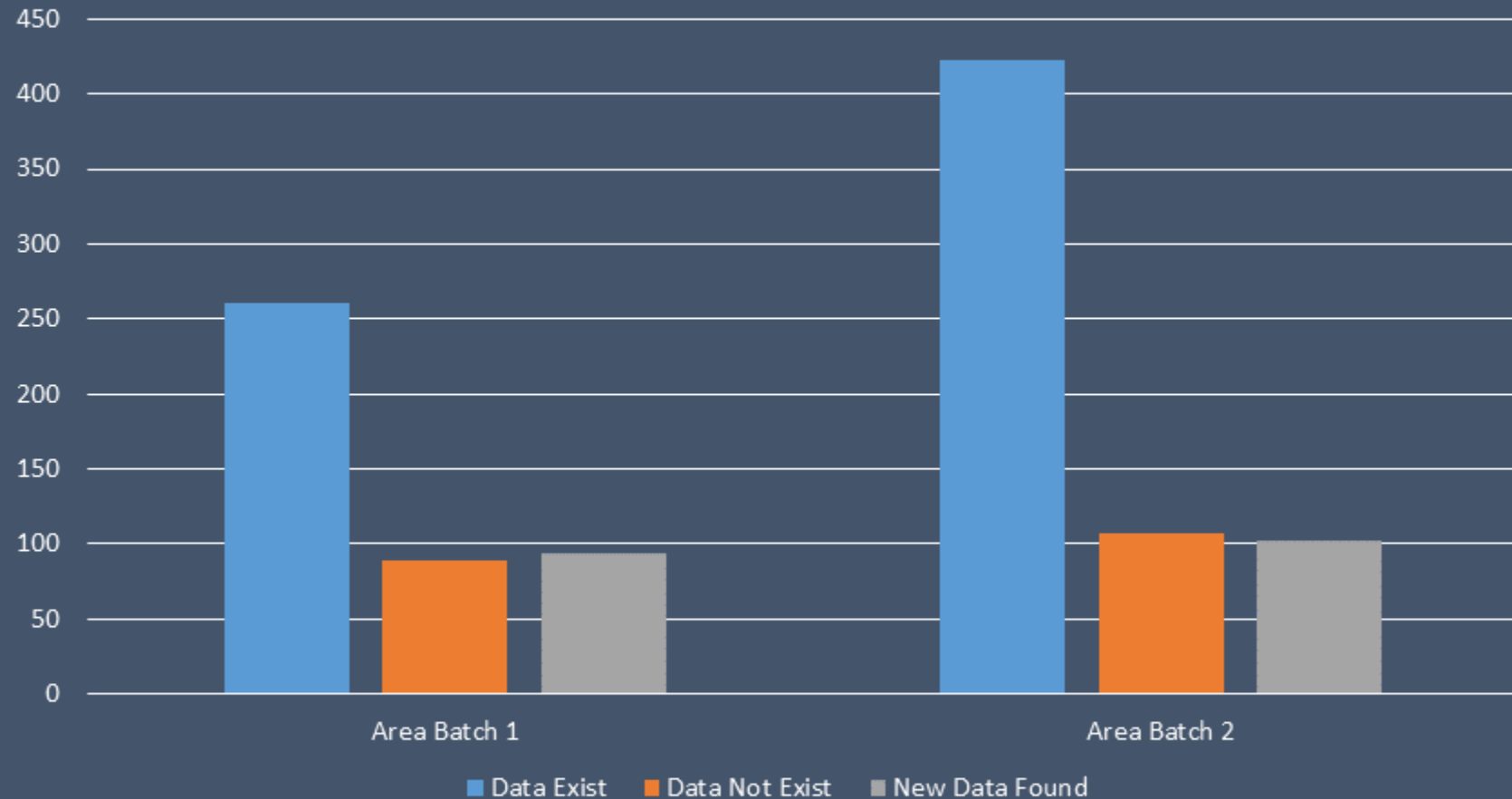
State	Provided by SKMM	Total Tower	Data Exist	Data Not Exist	New Data Found	Total Data Audited	Different
Area Batch 1	Original data from SKMM	350	261	89	94	444	94
Area Batch 2	Original data from SKMM	530	423	107	182	712	182

Area Batch 1 : Kuching, Samarahan

Area Batch 2 : Betung, Bintulu, Kapit, Limbang, Miri, Mukah, Sarekei, Sibuan, Sri Aman

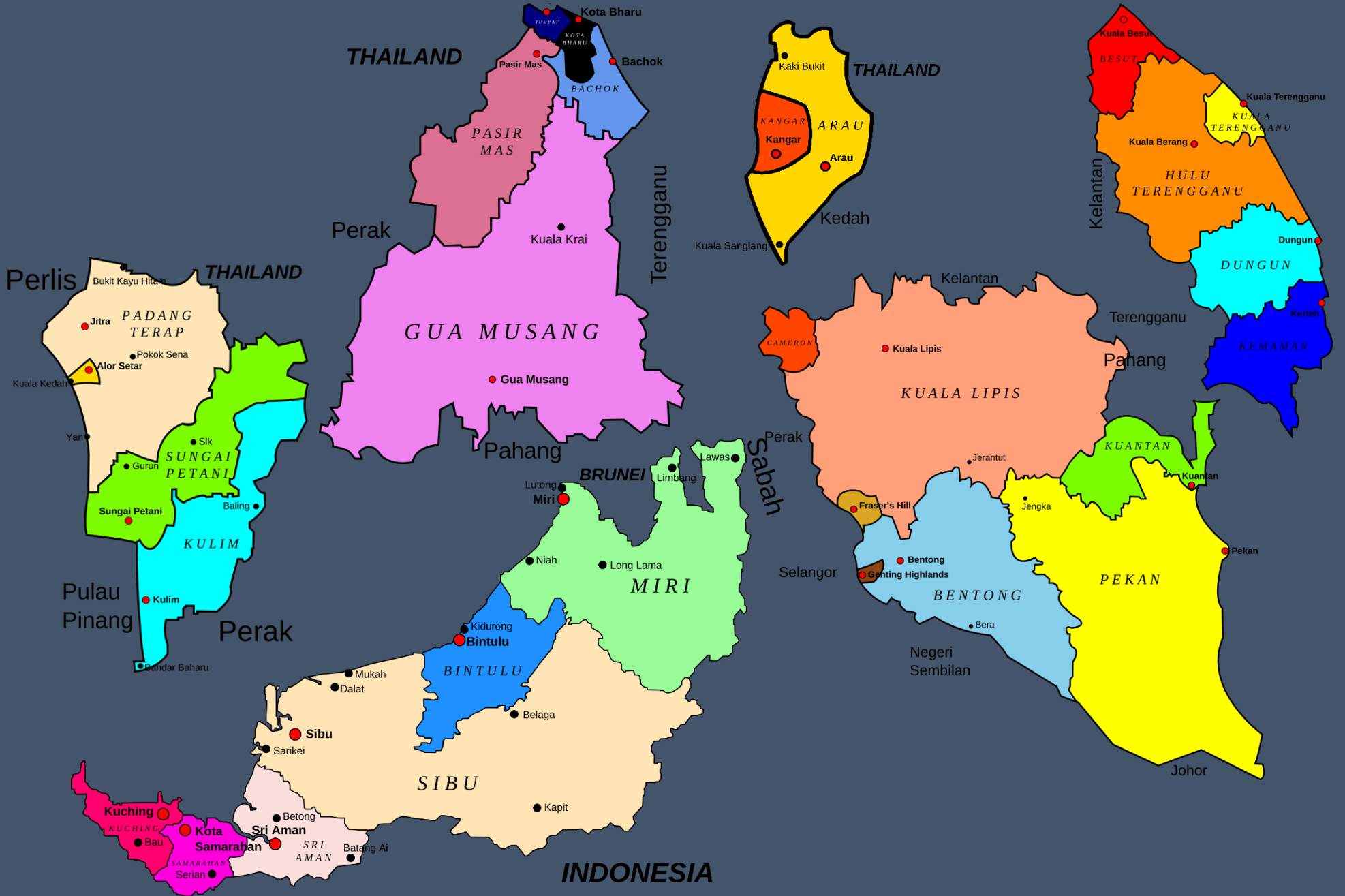
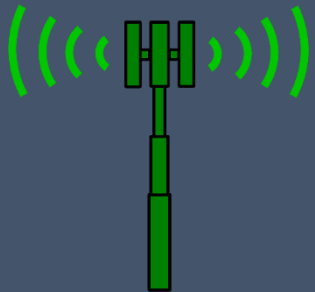


Infographic : Statistics Sarawak 2016 : Existing vs. Auditing



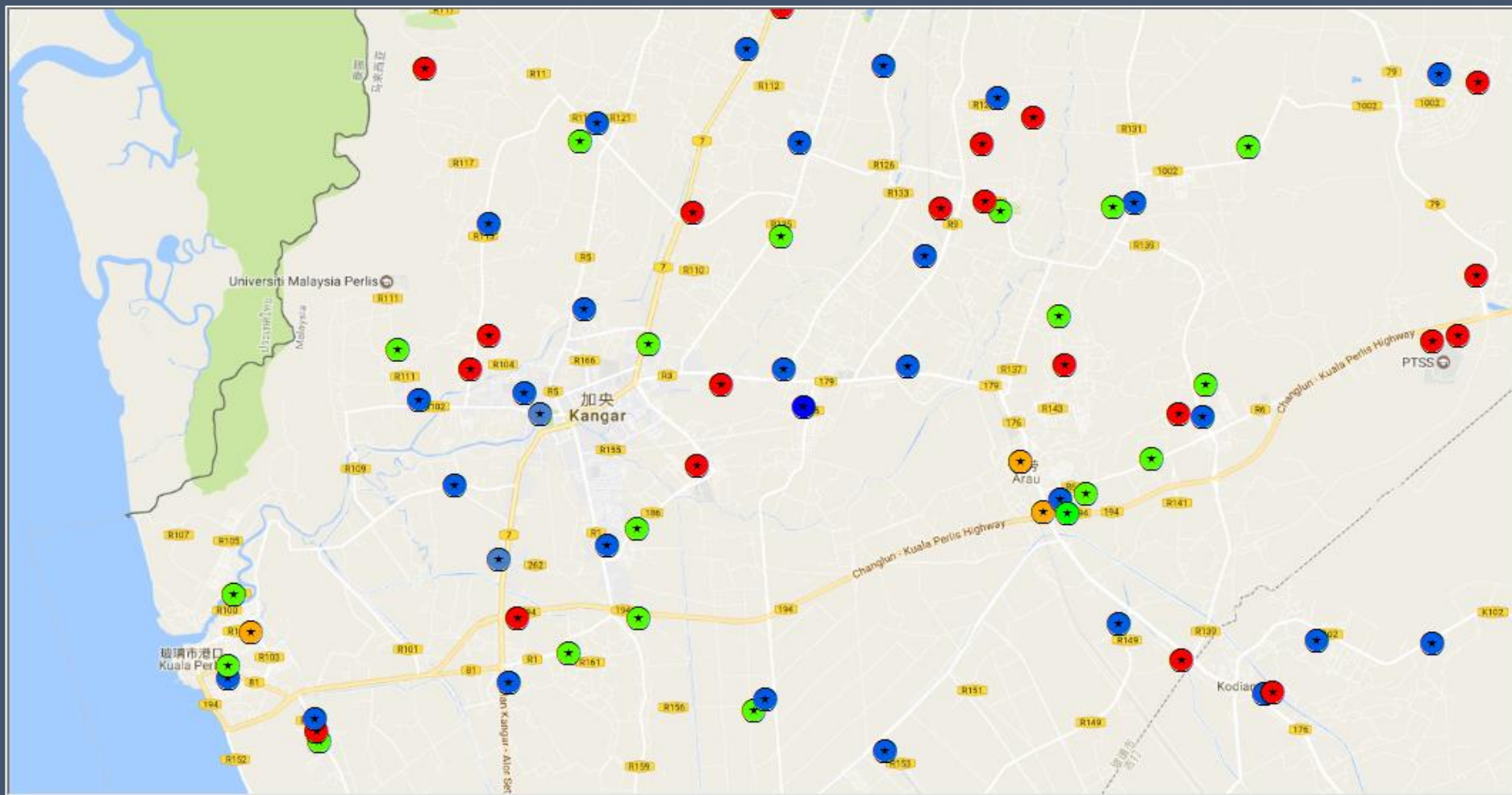
Area Batch 1 : Kuching, Samarahan

Area Batch 2 : Betung, Bintulu, Kapit, Limbang, Miri, Mukah, Sarekei, Sibul, Sri Aman

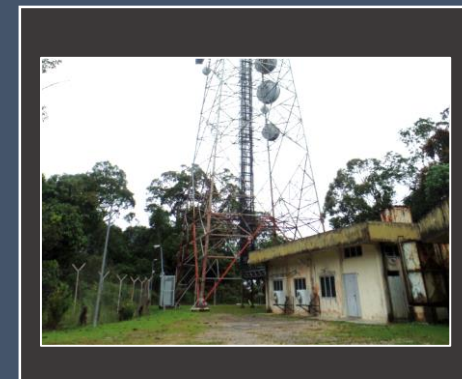




Surrounding Kangar Town

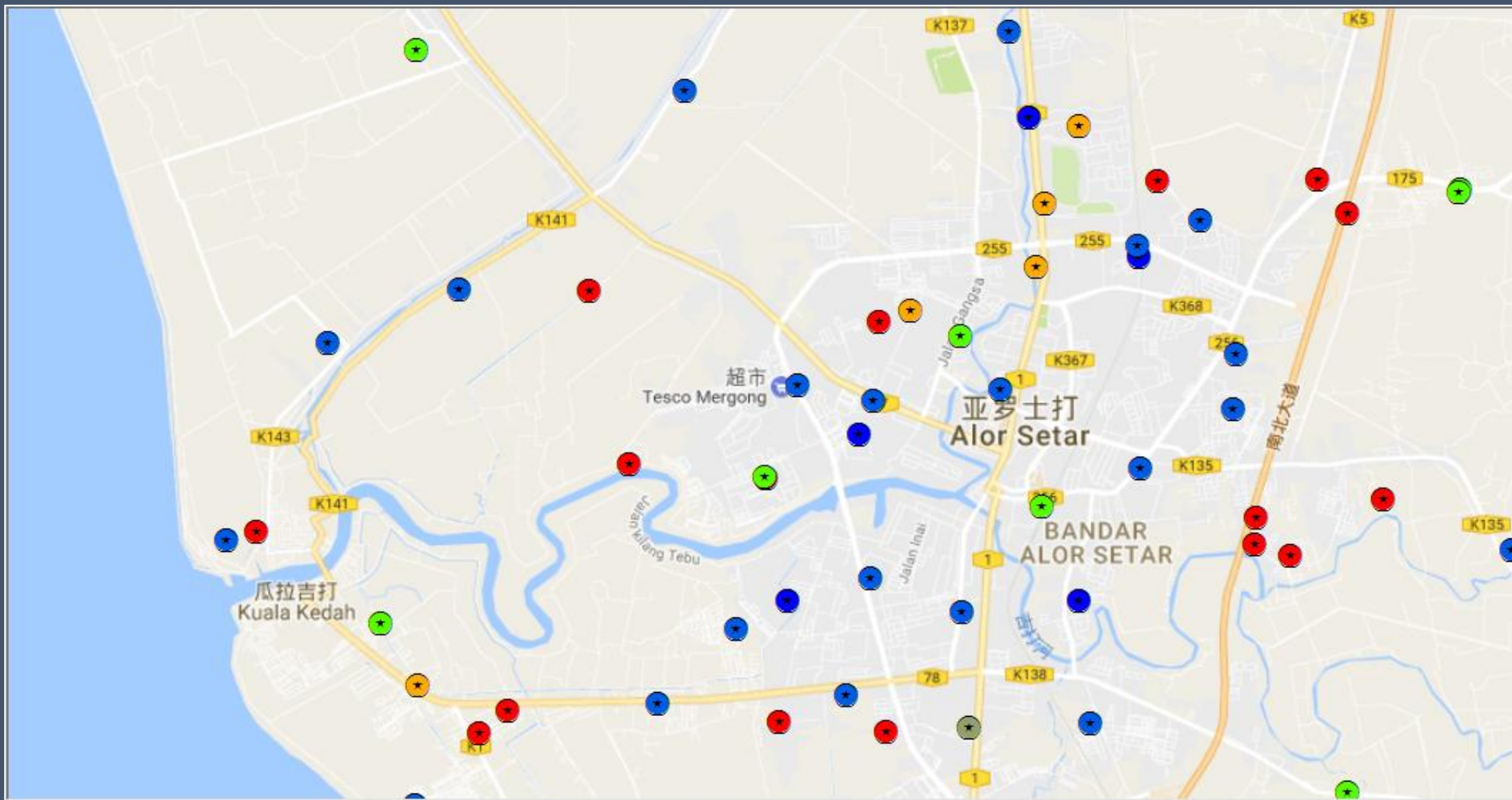


-  3 Legged
-  4 Legged
-  Monopole
-  Guyed Mast
-  Temp BTS

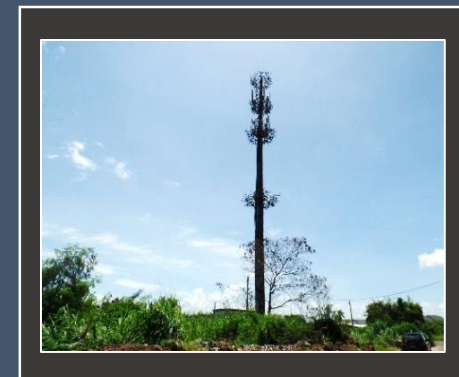




Surrounding Alor Setar Town

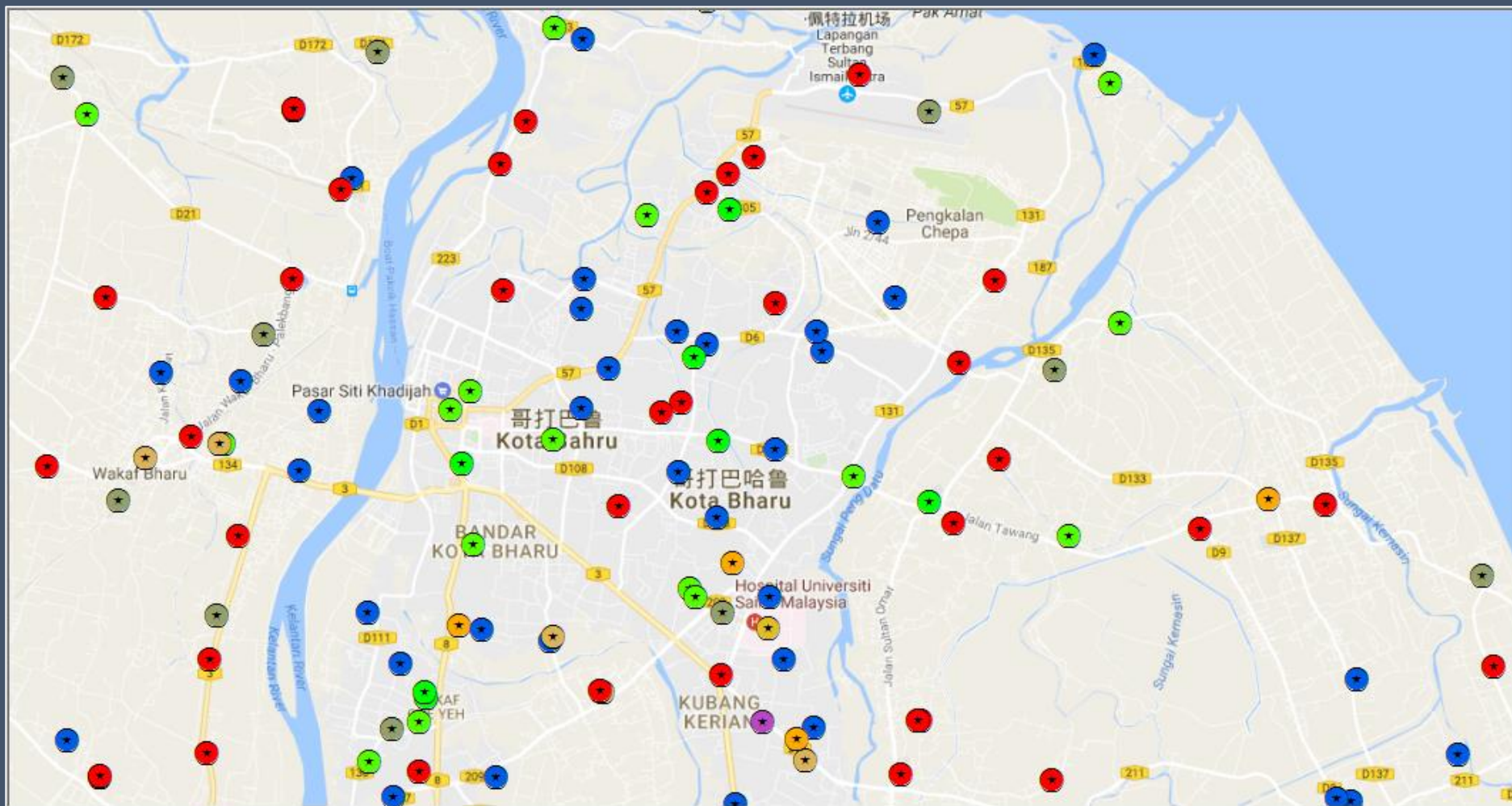


-  3 Legged
-  4 Legged
-  Monopole
-  Guyed Mast
-  Temp BTS

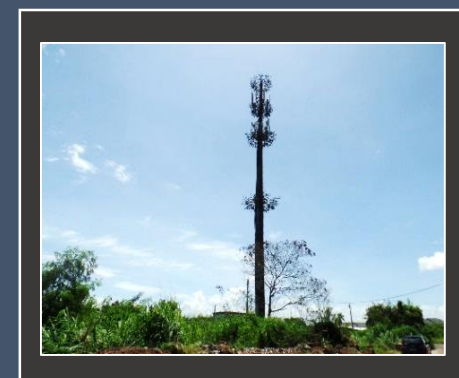
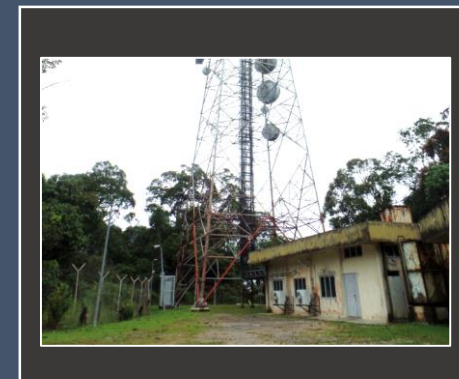




Surrounding Kota Bharu Town

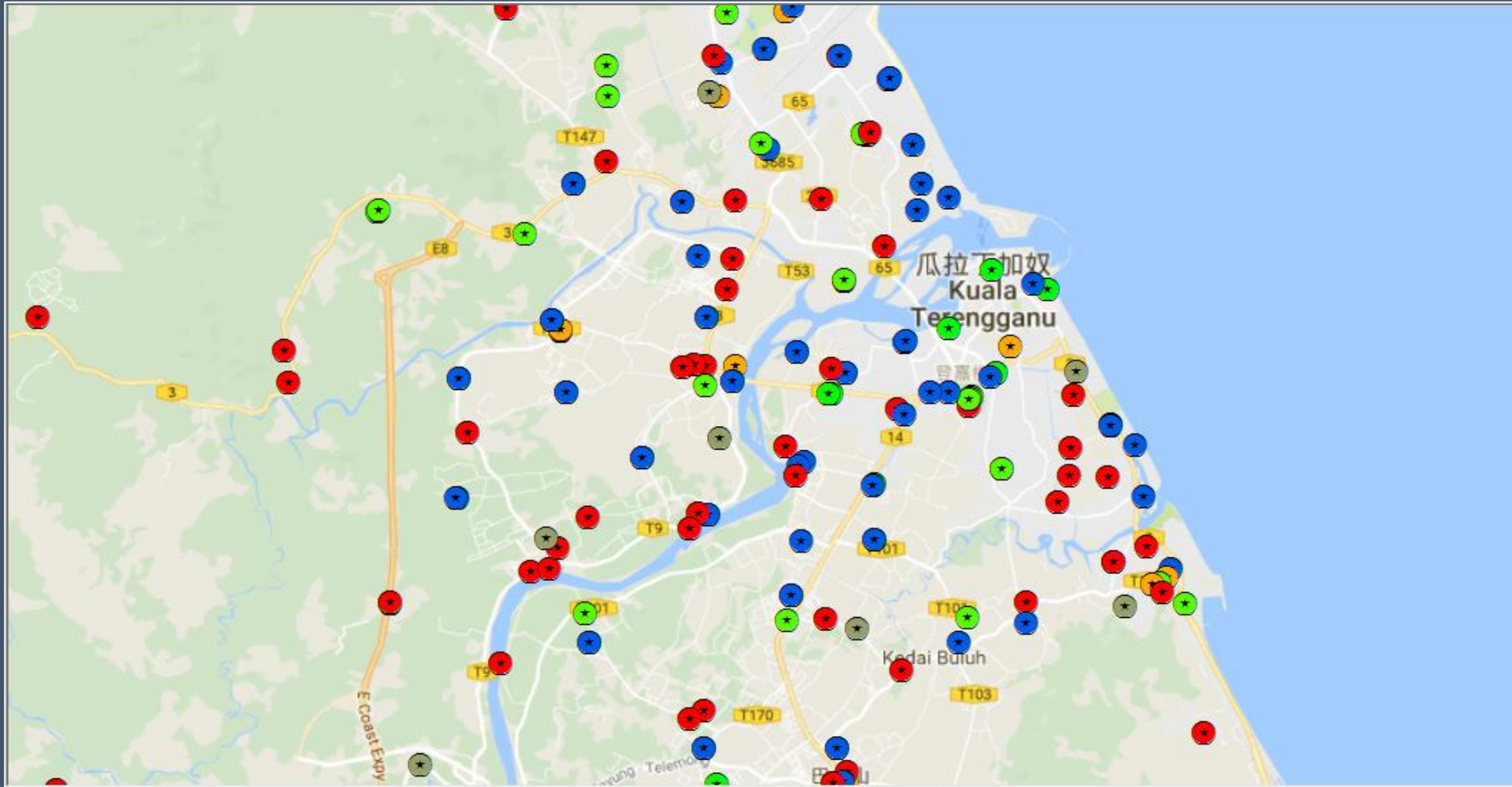


-  3 Legged
-  4 Legged
-  Monopole
-  Guyed Mast
-  Temp BTS





Surrounding K. Terengganu Town

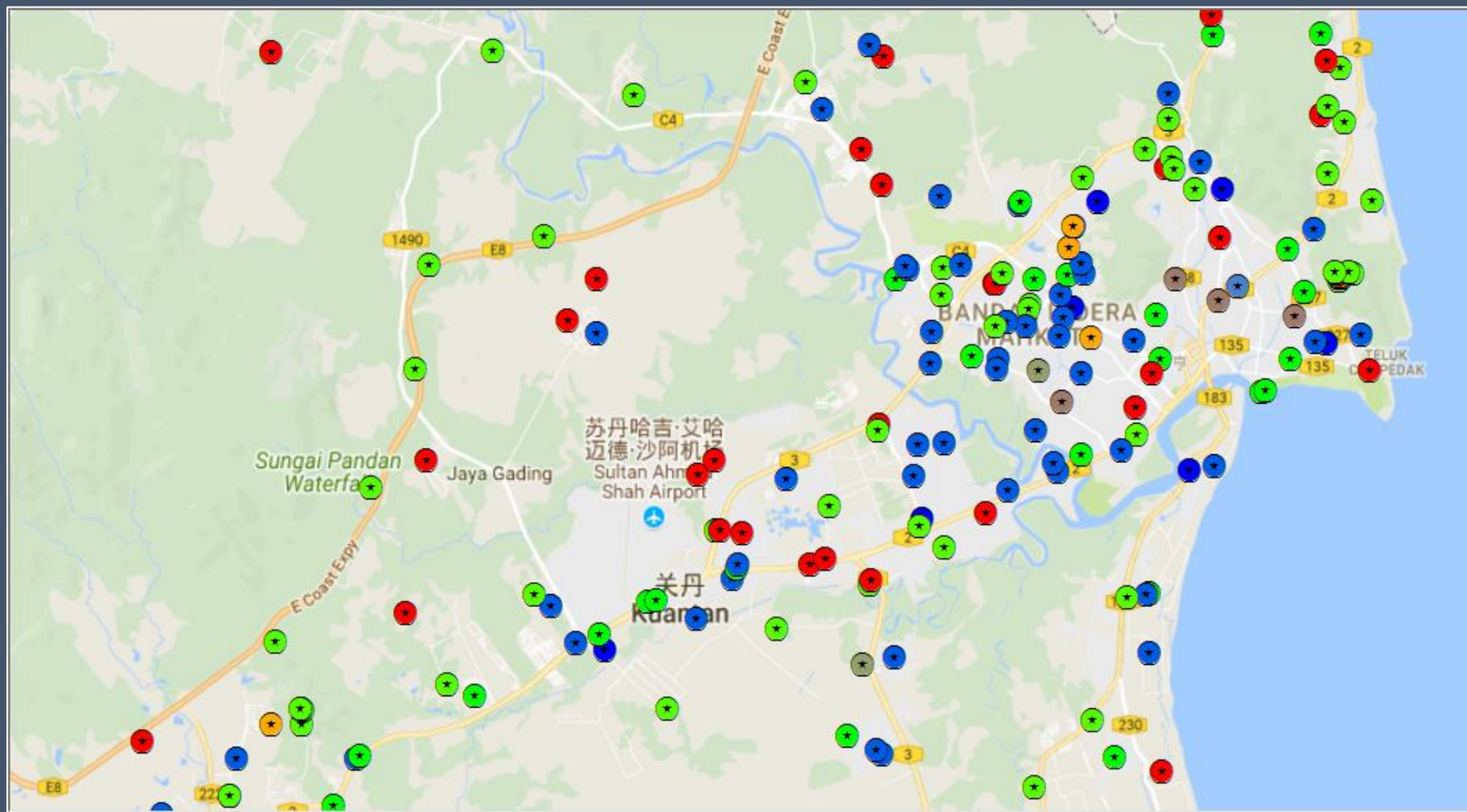


-  3 Legged
-  4 Legged
-  Monopole
-  Guyed Mast
-  Temp BTS

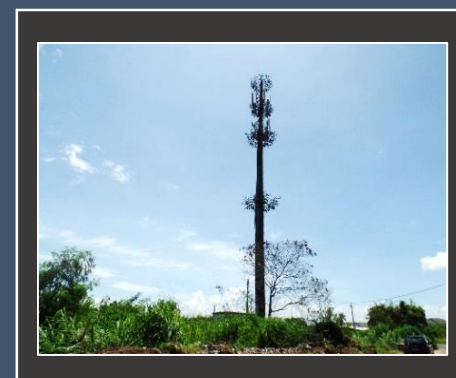
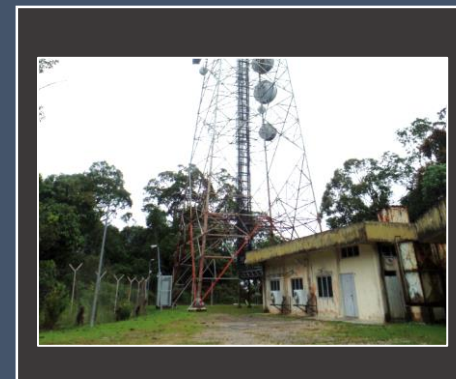




Surrounding Town Kuantan

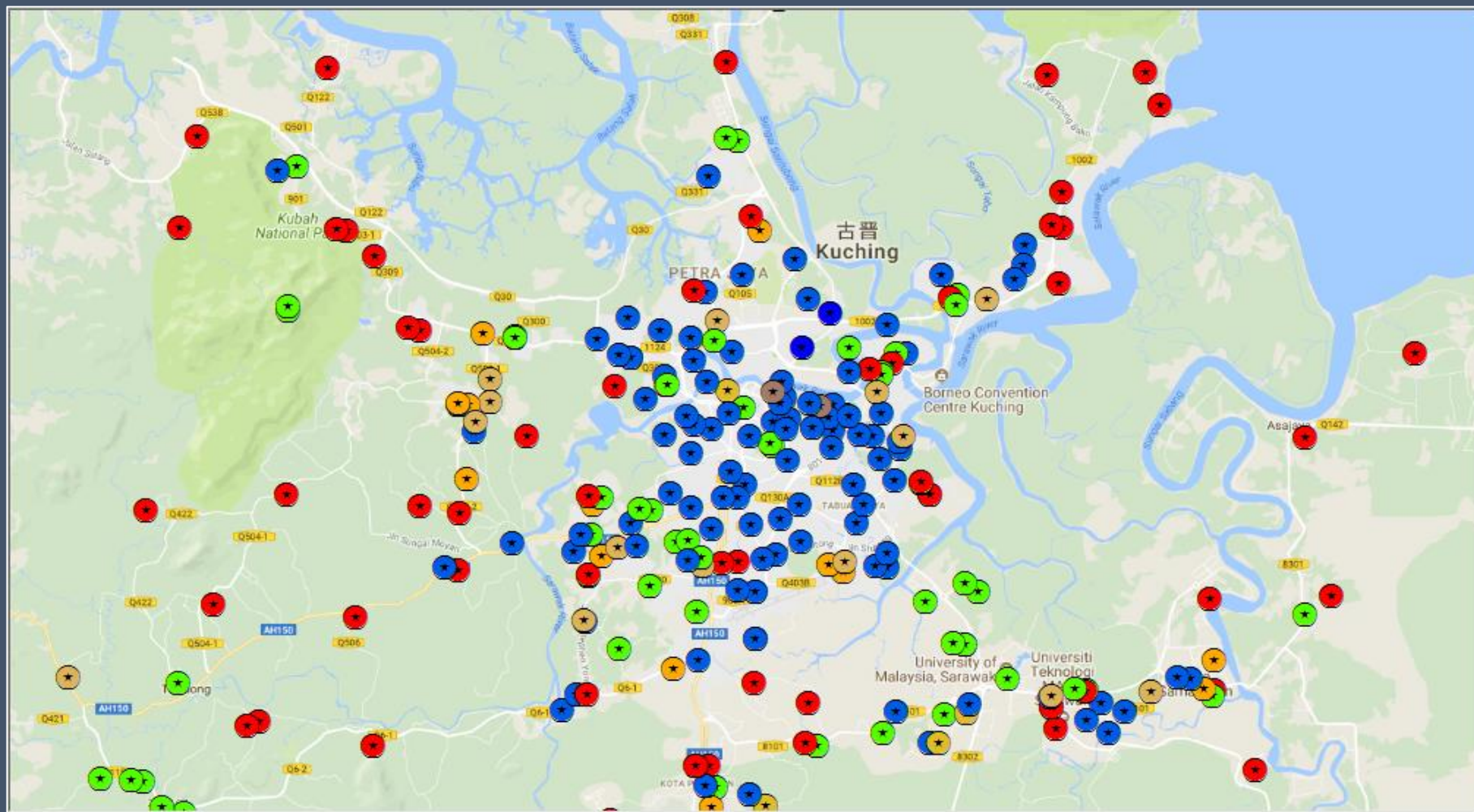


-  3 Legged
-  4 Legged
-  Monopole
-  Guyed Mast
-  Temp BTS

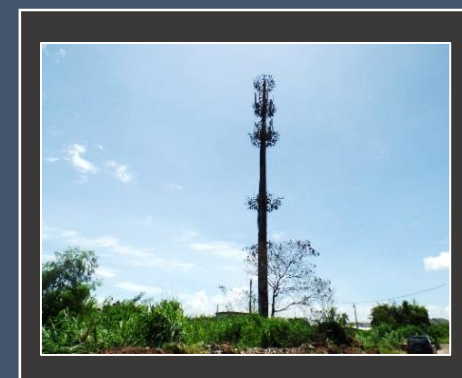
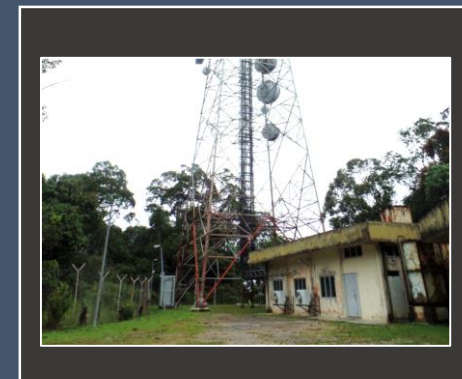




Surrounding Town Kuching

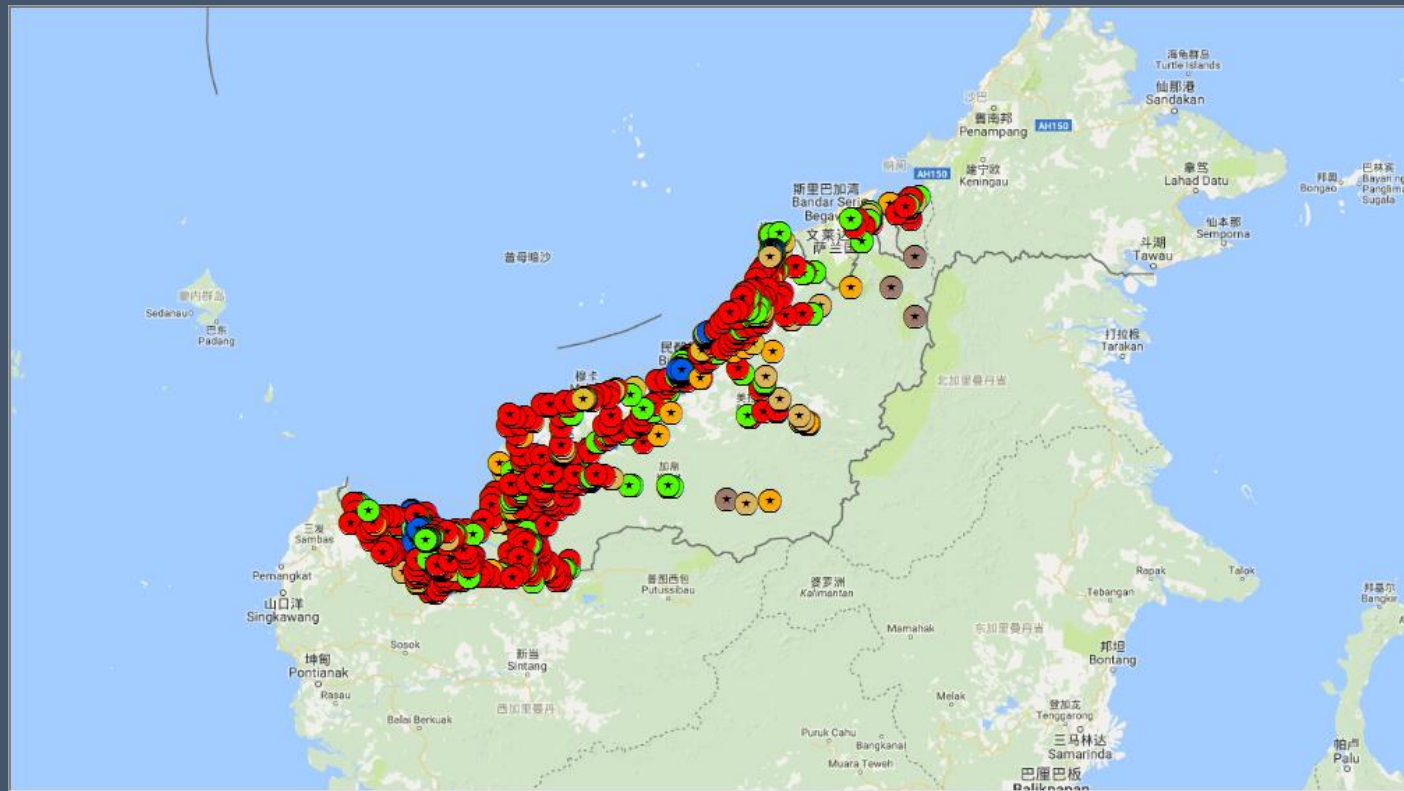
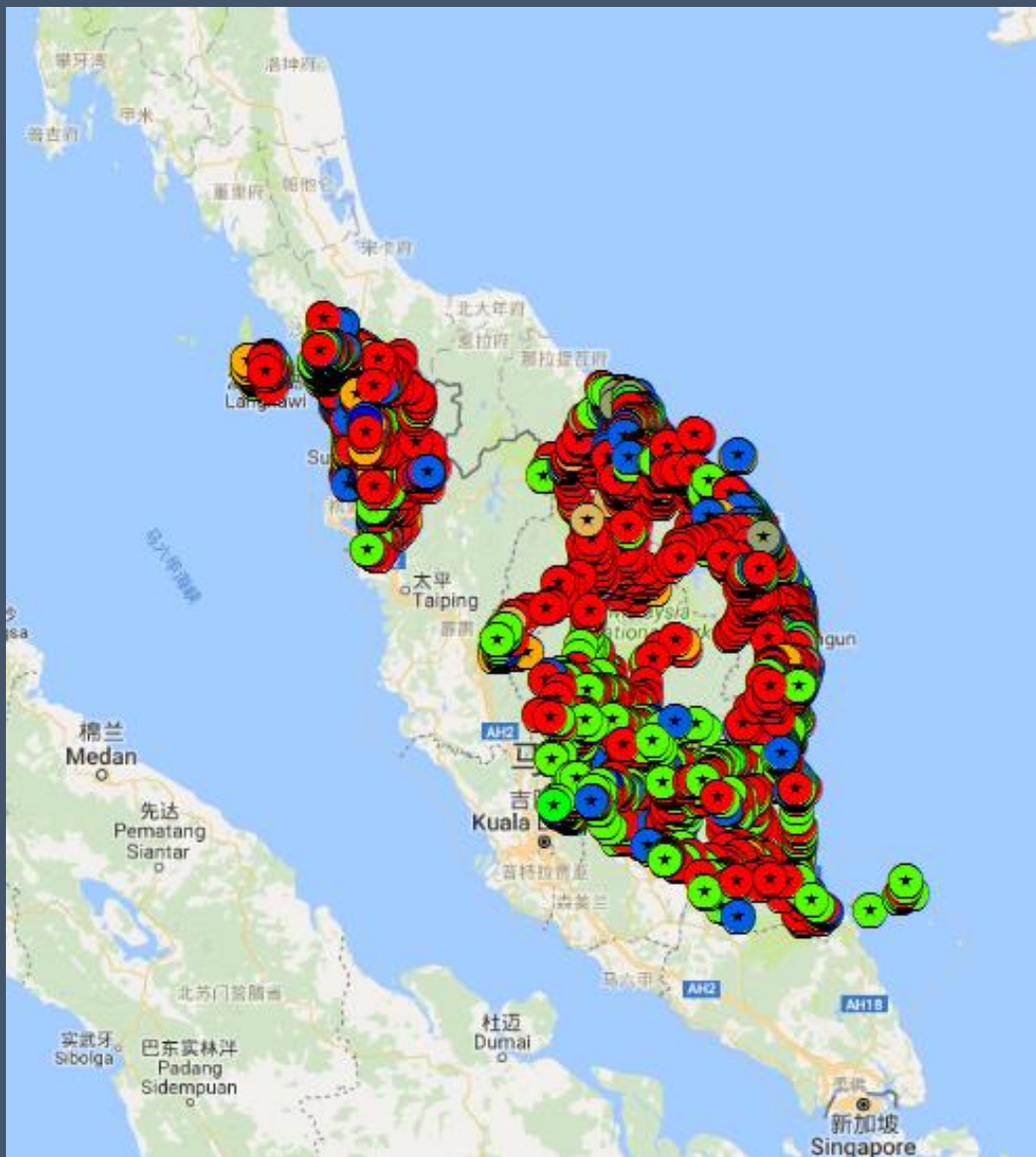


-  3 Legged
-  4 Legged
-  Monopole
-  Guyed Mast
-  Temp BTS





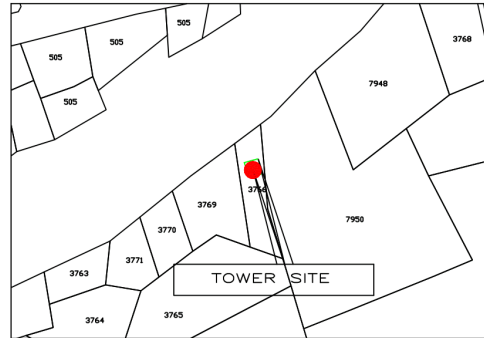
Overview all RCI towers



Report Deliverable



KEY PLAN
NOT TO SCALE



LOCATION PLAN
NOT TO SCALE

NO LOT 3766
NEGERI KEDAH
DISTRICT OF KUALA MUDA
MUKIM OF PEKAN JENIANG

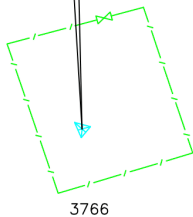
SCALE: 1:250



RADIO COMMUNICATION
INFRASTRUCTURE SITE
STRUCTURE ID : T02-001707

Cassini
N -16893.8487
E -516.9686
WGS 84
Lat 5.7985627
Long 100.6151407

3769

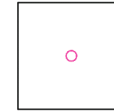


3766

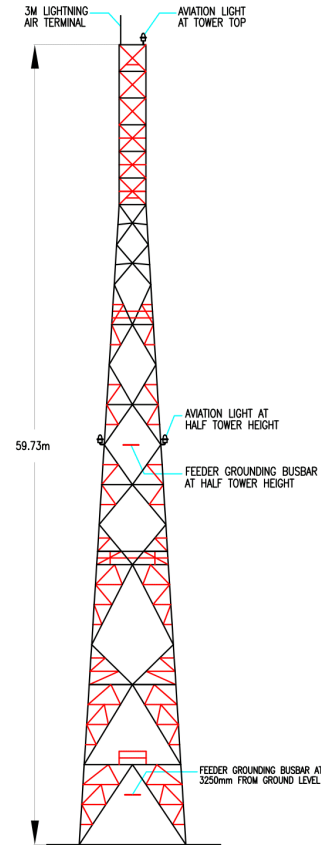
LEGEND:
--- FENCE
▲ TOWER



7950



PLAN ELEVATION



TYPICAL TOWER ELEVATION
(3 LEGGED TYPE)

PREPARED FOR :



MALAYSIAN COMMUNICATIONS AND MULTIMEDIA COMMISSION
OFF PERSIARAN MULTIMEDIA
63000 CYBERJAYA
SELANGOR DARUL EHSAN
T: 03 8688 8000(GL) F: 03 8688 1005

STRUCTURE OWNER :

YBSB

STRUCTURE CATEGORY :

TOWER

STRUCTURE TYPE :

3LEGGED

SURVEYOR :



LAND INFOTECH SDN BHD
SUITE 1-5-29, BLOK C,
JALAN 1/50, DIAMOND SQUARE,
OFF JALAN GOMBAK,
53000 KUALA LUMPUR
TEL:03-61773154 & 019-3588428
Email: landinfotech@gmail.com

PROJECT TITLE :

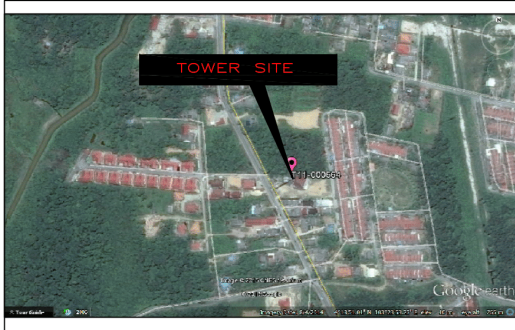
VALIDATION AND VERIFICATION WORKS
OF RADIO COMMUNICATION INFRASTRUCTURE (RCI) DATA
(PHASE 2)

PLAN TITLE :

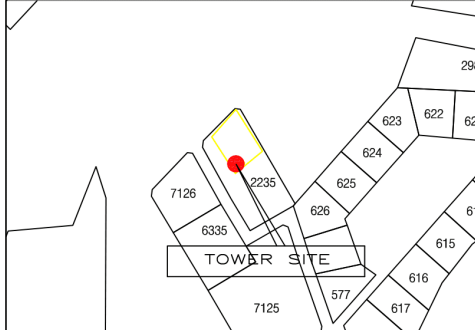
KEY PLAN, LOCATION PLAN
AND SITE PLAN

PLAN NO :	LITSB-T02-001707/2014/SKMM	SCALE :	AS SHOWN
DESIGN BY :	DRAWN BY : IZZAT	CHECKED BY :	SIGNATURE
DATE : OCT 2014	DATE : NOV 2014		DATE

Report Deliverable



KEY PLAN
NOT TO SCALE



LOCATION PLAN
NOT TO SCALE

NO LOT 2235
NEGERI TERENGGANU
DISTRICT OF KEMAMAN
MUKIM OF KERTEH

SCALE: 1:250



RADIO COMMUNICATION
INFRASTRUCTURE SITE
STRUCTURE ID : T11-000664



2235



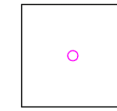
7126

LEGEND:

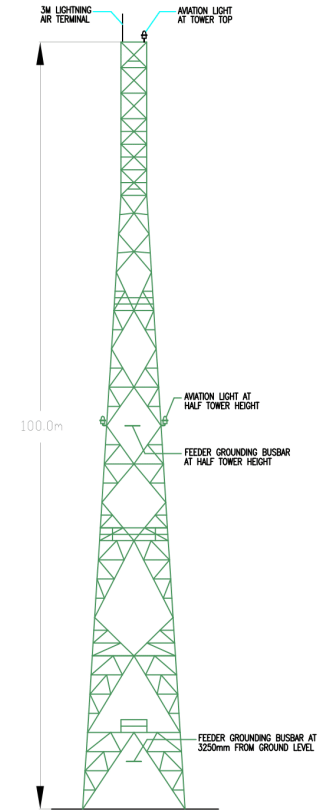


FENCE
TOWER

Cassini
N -47827.644
E 60642.420
WGS 84
Lat 5.321621260
Long 102.786133540



PLAN ELEVATION



TYPICAL TOWER ELEVATION
(4 LEGGED TYPE)

PREPARED FOR :



MALYSIAN COMMUNICATIONS AND MULTIMEDIA COMMISSION
OFF PERSIARAN MULTIMEDIA
63000 CYBERJAYA
SELANGOR DARUL EHSAN
T: 03 8688 8000(GL) F: 03 8688 1005

STRUCTURE OWNER :

TM

STRUCTURE CATEGORY :

TOWER

STRUCTURE TYPE :

4LEGGED

SURVEYOR :



LAND INFOTECH SDN BHD
SUITE 1-5-29, BLOK C,
JALAN 1/50, DIAMOND SQUARE,
OFF JALAN GOMBAK,
53000 KUALA LUMPUR
TEL:03-61773154 & 019-3588428
Email: landinfotech@gmail.com

PROJECT TITLE :

VALIDATION AND VERIFICATION WORKS
OF RADIO COMMUNICATION INFRASTRUCTURE (RCI) DATA
(PHASE 2)

PLAN TITLE :

KEY PLAN, LOCATION PLAN
AND SITE PLAN

PLAN NO :	LITSB-T11-000664/2014/SKMM	SCALE :	AS SHOWN
DESIGN BY :	DRAWN BY : AZMAN	CHECKED BY :	SIGNATURE
DATE :	NOV 2014	DATE :	DEC 2014



Site Condition : Visual Inspection



Google StreetView 2014
Site Condition : Well Maintain



16th August 2017
Site Condition : Poor



The challenge adventures

GPS Signal Satellite Visibility



No land access (road)



Additional "new" tower



Weather



Poor Accessibility



Deficient (metadata) at site



Final Acceptance Test / Verification



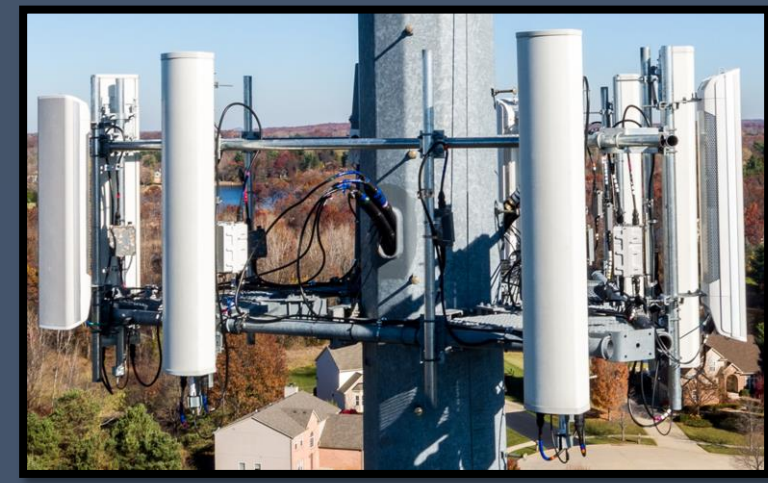
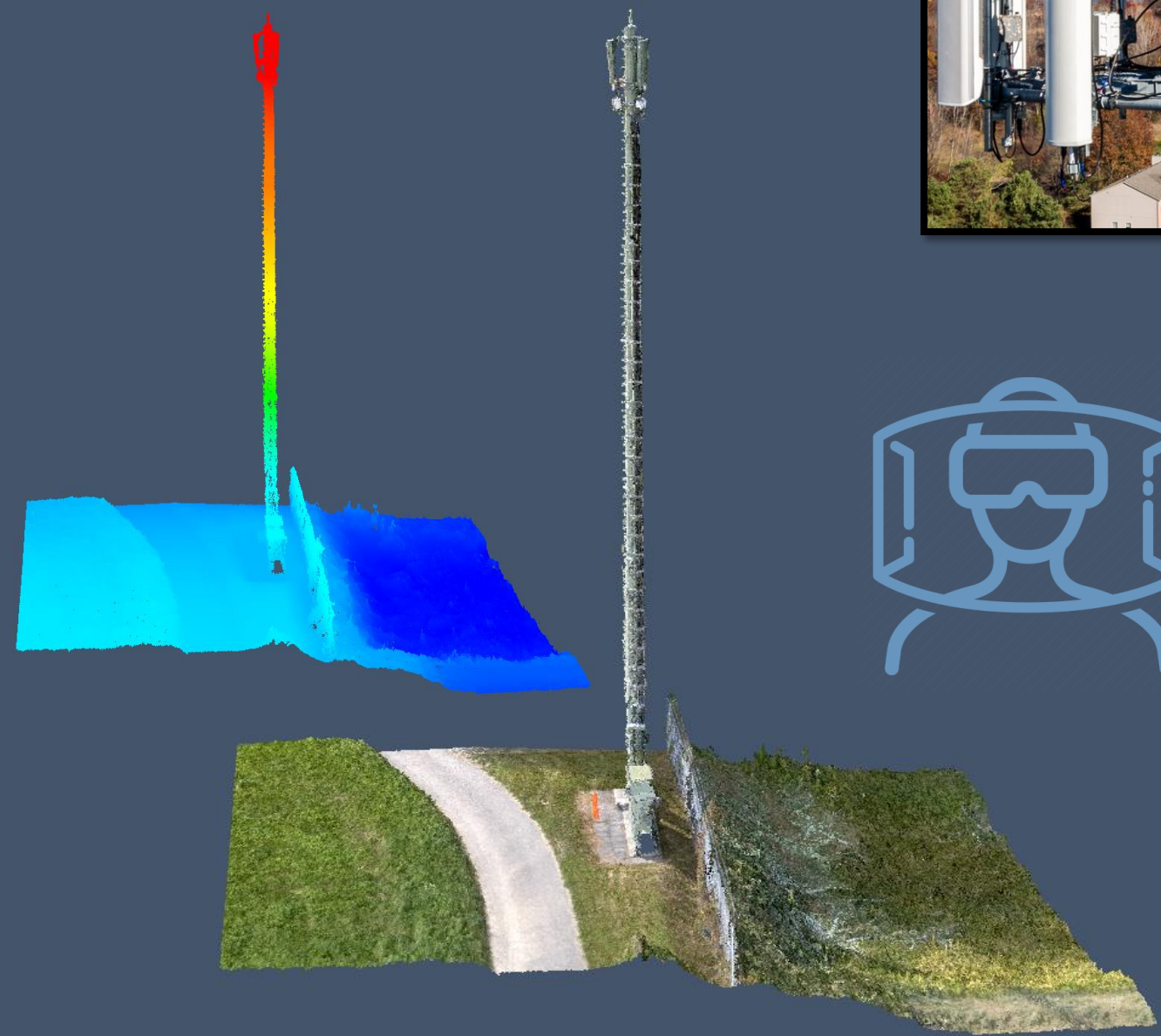
THE NEXT BIG THING

FUTURE AUDITING 2.0

The Huge Potential of Virtual Reality for Geomatics [ht.ly/GkDV30dLWsu](https://t.me/GkDV30dLWsu)



FUTURE AUDITING



FUTURE AUDITING 2.0

“Hashtag Ideas”

- Ranking - Rate (Risk)
- Tower Elements
- Shelter Elements
- Surrounding Site
- Green Environment / Habitat
- Respond to Emergency / Safety
- Infrastructure Life Cycle (“House keeping”)
- CAD – 3D Model - BIM



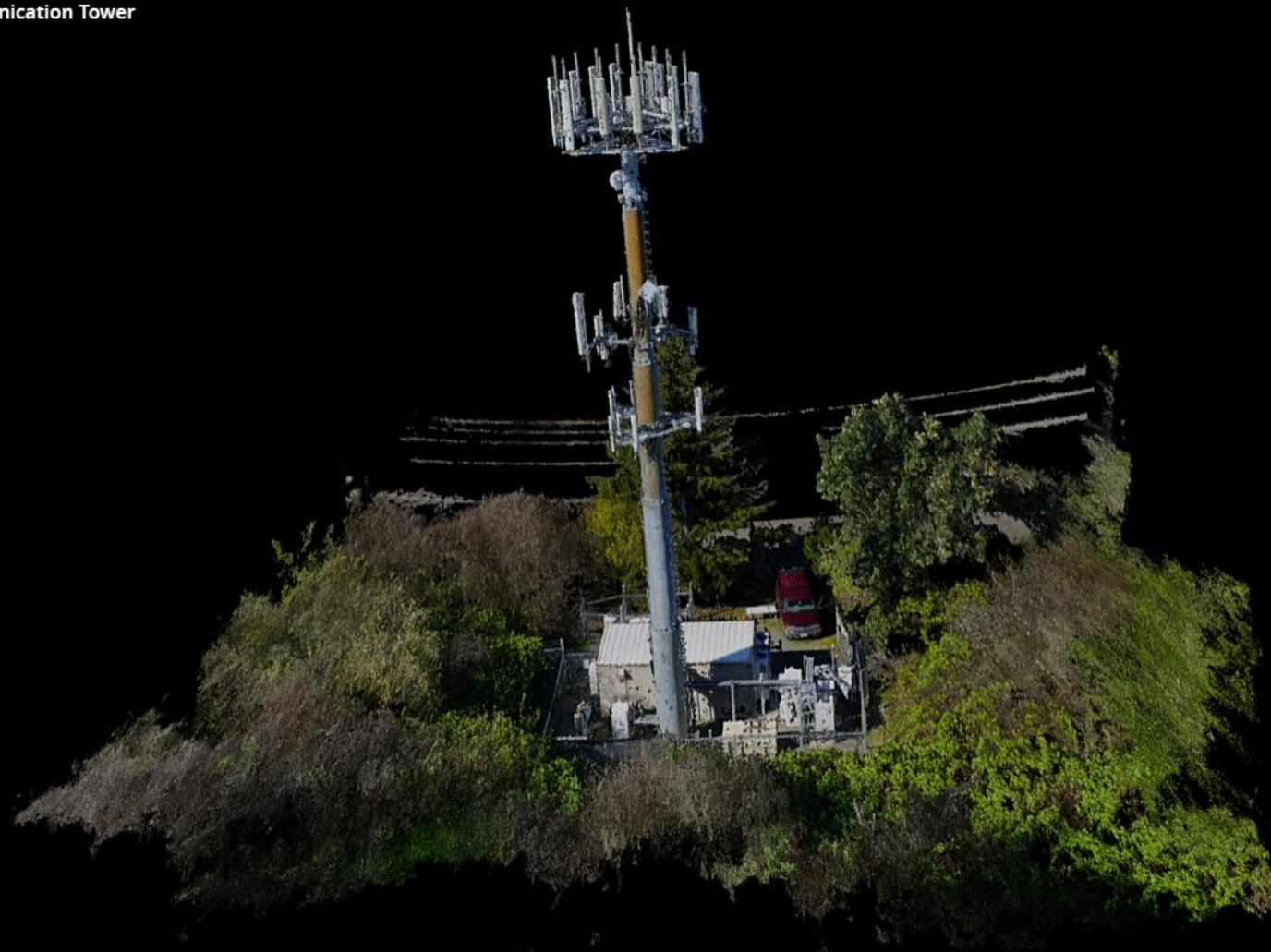
More Data

Spatial layers 2D – 3D

Digital



Drone Inspection of a Telecommunication Tower
by Pix4D SA.



FUTURE AUDITING
Simulated Data



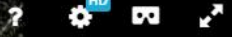
<https://skfb.ly/WVQz>



Drone Inspection of a Telecommunication Tower
by Pix4D SA.

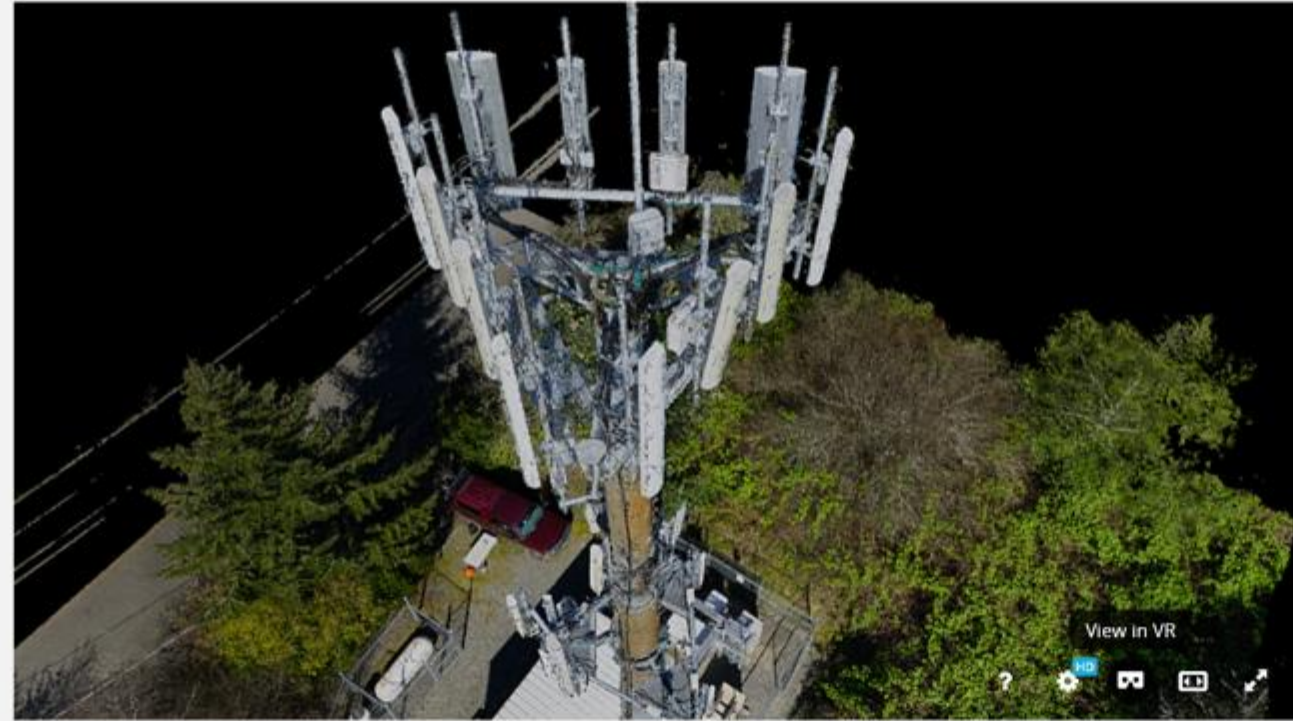


FUTURE AUDITING
Simulated Data



<https://skfb.ly/WVQz>

Drone Inspection of a Telecommunication Tower

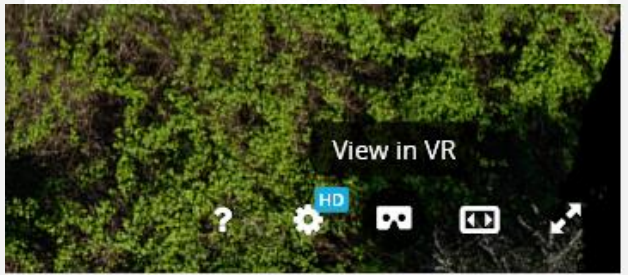


 by Pix4D SA. **PRO**

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ABOUT THIS MODEL

Professional drone service company Ryka UAS inspected an unclimbable telecommunication tower in Washington, to assist in the design of a new antenna mount on the upper rad center...



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“No matter how great the talent or efforts, some things just take time. You can’t produce a baby in one month by making nine women pregnant”
- Warren Buffet



FUTURE AUDITING



Ha ! I see my tower.....



telephone



pull

computer



press

mobile



swipe

VR



feel

