

Importance of longer eMBMS CP for large ISDs

Telstra, Ericsson, Qualcomm, BBC,
IRT, Fraunhofer, Dish, Nokia

RP-160825

Planned R14 CP extension is critical to eMBMS' commercial success

We are committed to building the eMBMS ecosystem

- Telstra is actively deploying eMBMS in our LTE network today
- We have made a number of successful eMBMS demonstrations

The commercial success of eMBMS depends on full national coverage

- eMBMS cannot be an 'occasional' technology

All networks have larger ISDs outside city centres

- ISDs are larger for low frequency carriers, which are favoured for eMBMS
- National rollouts of eMBMS will not be possible without large ISD support

The longer CP originally proposed in the R14 eMBMS WID [RP-160675] is critical to eMBMS' commercial success

Telstra's eMBMS deployment is typical of many operators

eMBMS deployments must maximise coverage

- Deploy into lowest frequency carrier
- Use large MBSFNs
- Mix with unicast traffic, which also requires low frequency carrier for coverage

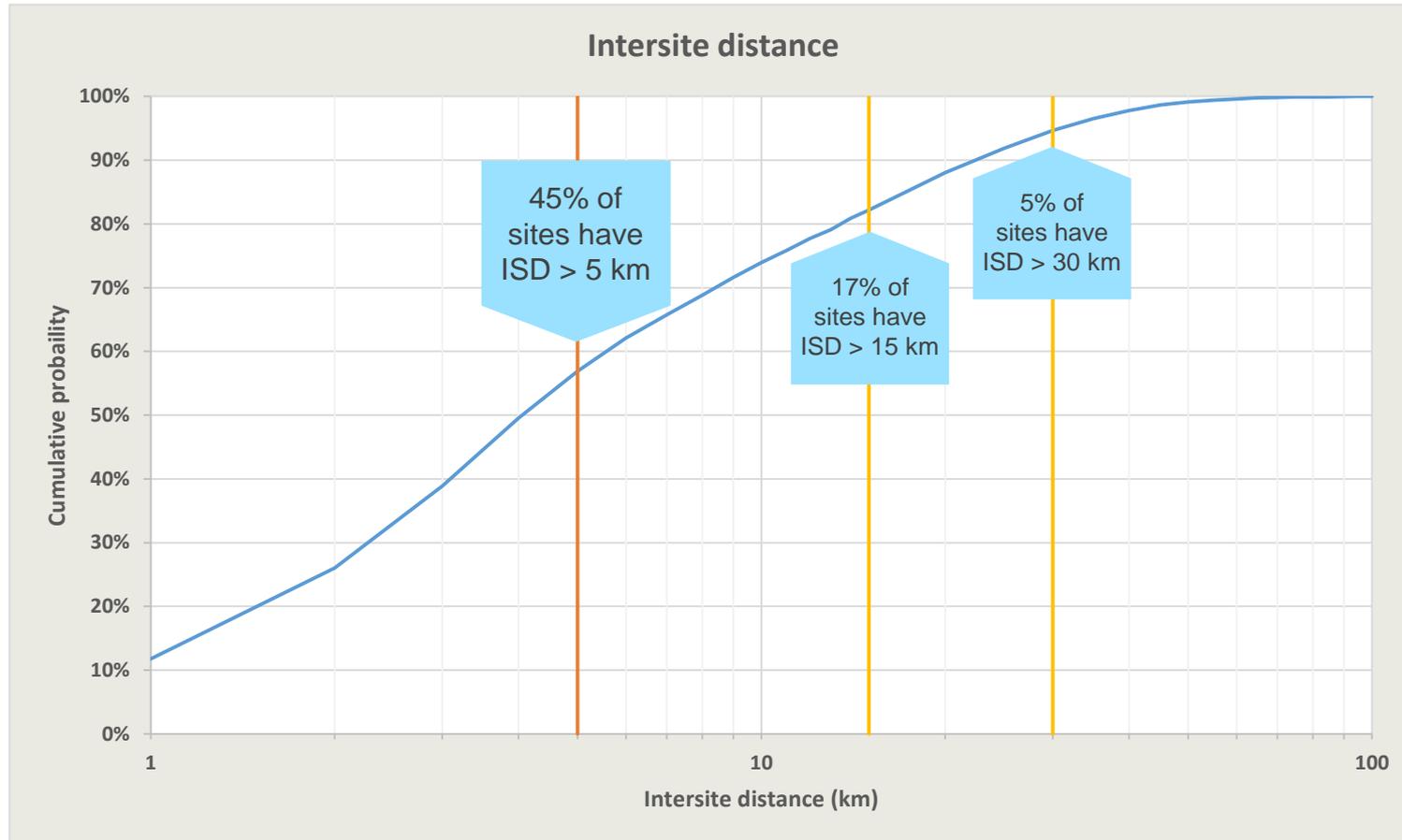
eMBMS deployments must maximise capacity

- Mix with unicast traffic
- Employ dynamic techniques to activate eMBMS transmission only when required

eMBMS is a key enabler for many use cases

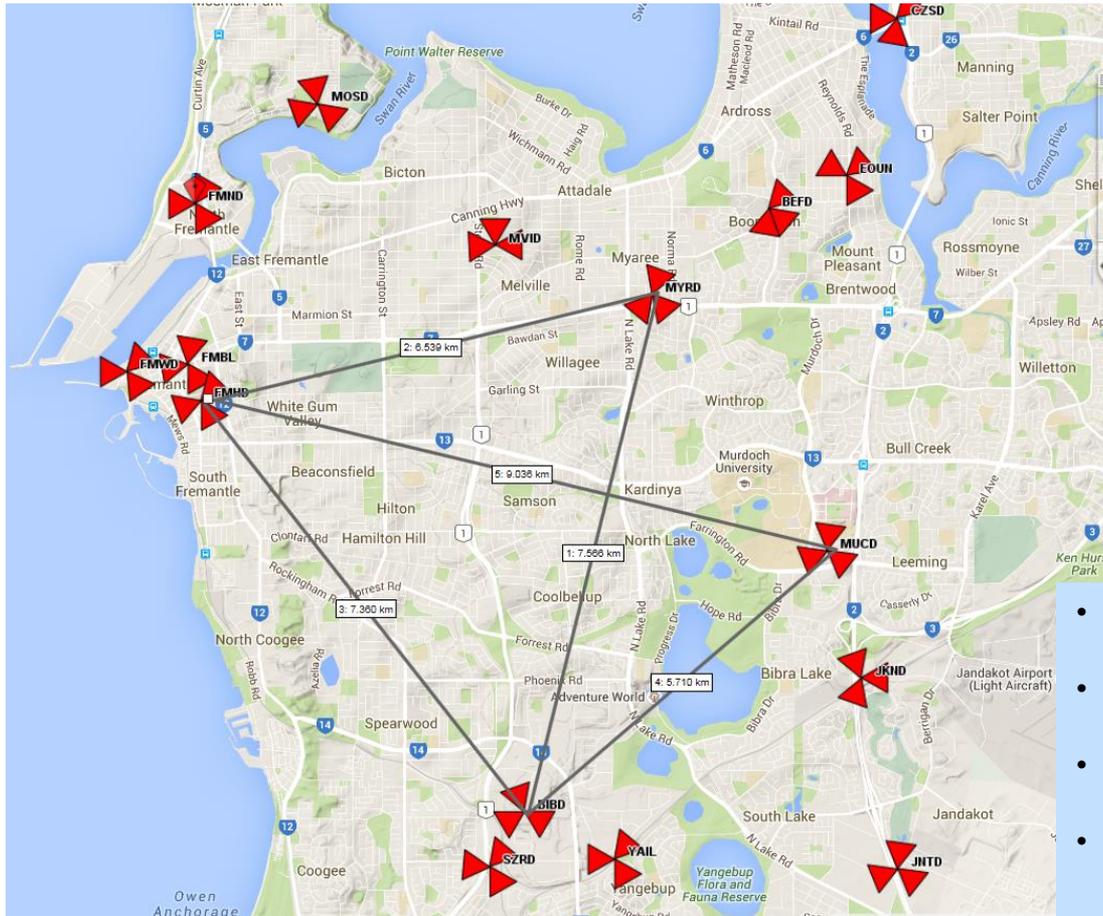
- Broadcast video with high quality and low capacity impact
- Software delivery
- Mission-critical push-to-talk (MC-PTT)
- Emerging V2x technologies

ISD distribution for Telstra's low frequency LTE sites



Examples of large ISD sites

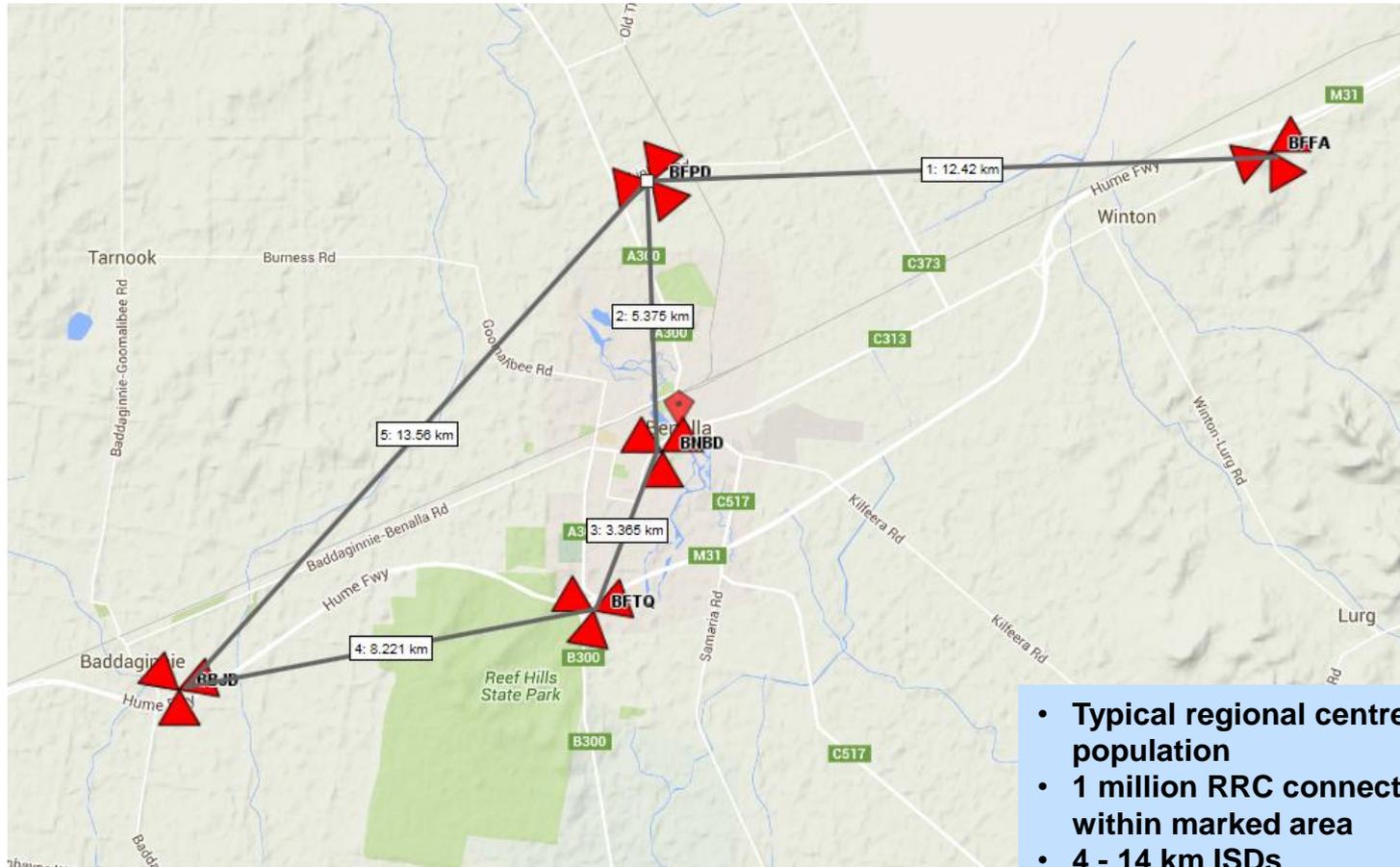
Metropolitan suburbs



- Heavily populated metropolitan suburban area
- 2 million RRC connections per day within marked area
- 7 – 10 km ISDs
- Additional infill sites exist, but these are high band and will not have eMBMS deployed, which is typical

Examples of large ISD sites

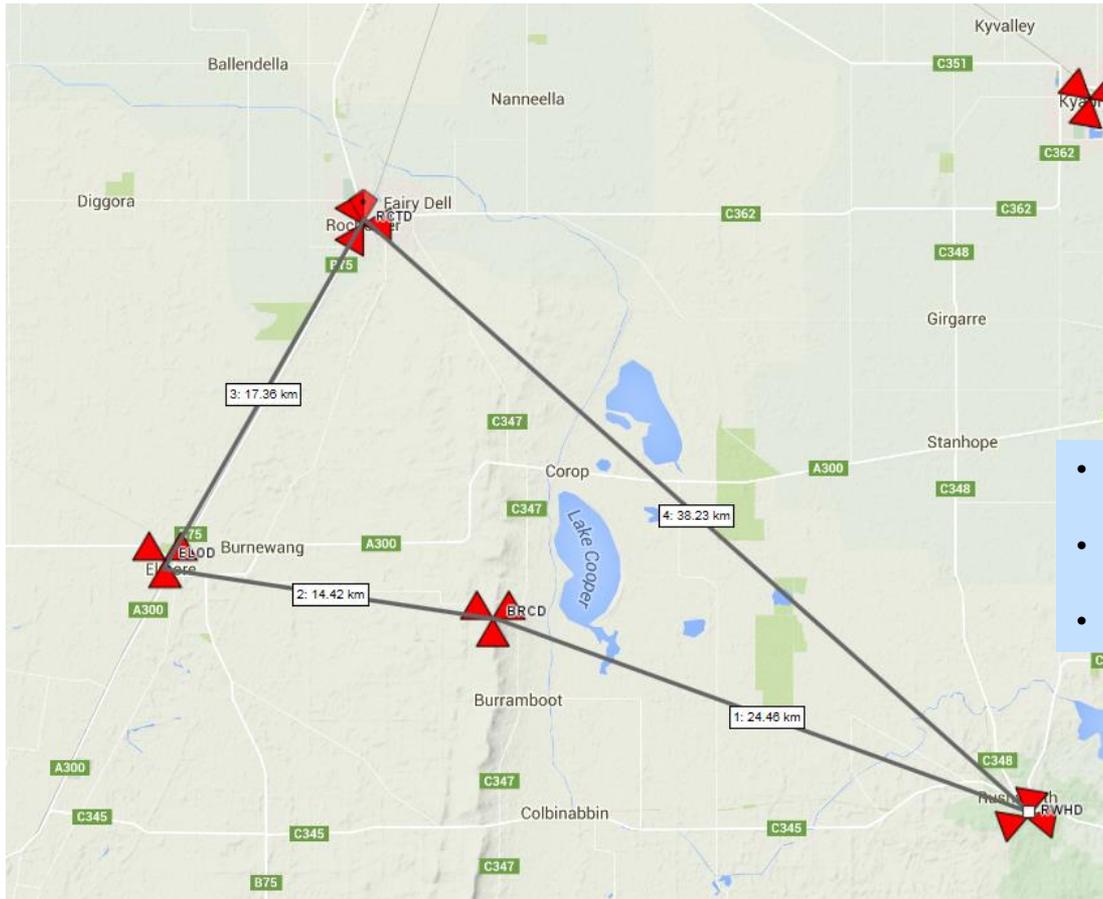
Regional centre



- Typical regional centre with 9,500 population
- 1 million RRC connections per day within marked area
- 4 - 14 km ISDs

Examples of large ISD sites

Rural and remote



- Typical remote area covering multiple small towns
- 400,000 RRC connections per day within marked area
- 14 - 39 km ISDs

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Observation:

- ISDs greater than 5 km are very common outside city centres, particularly for low frequency carriers

Observation:

- National rollouts of eMBMS will not be possible without large ISD support

Proposal:

- The R14 eMBMS enhancement shall provide support for at least 15 km ISDs in a mixed unicast / eMBMS carrier as originally specified in the WID (RP-160675, §4.1, a)

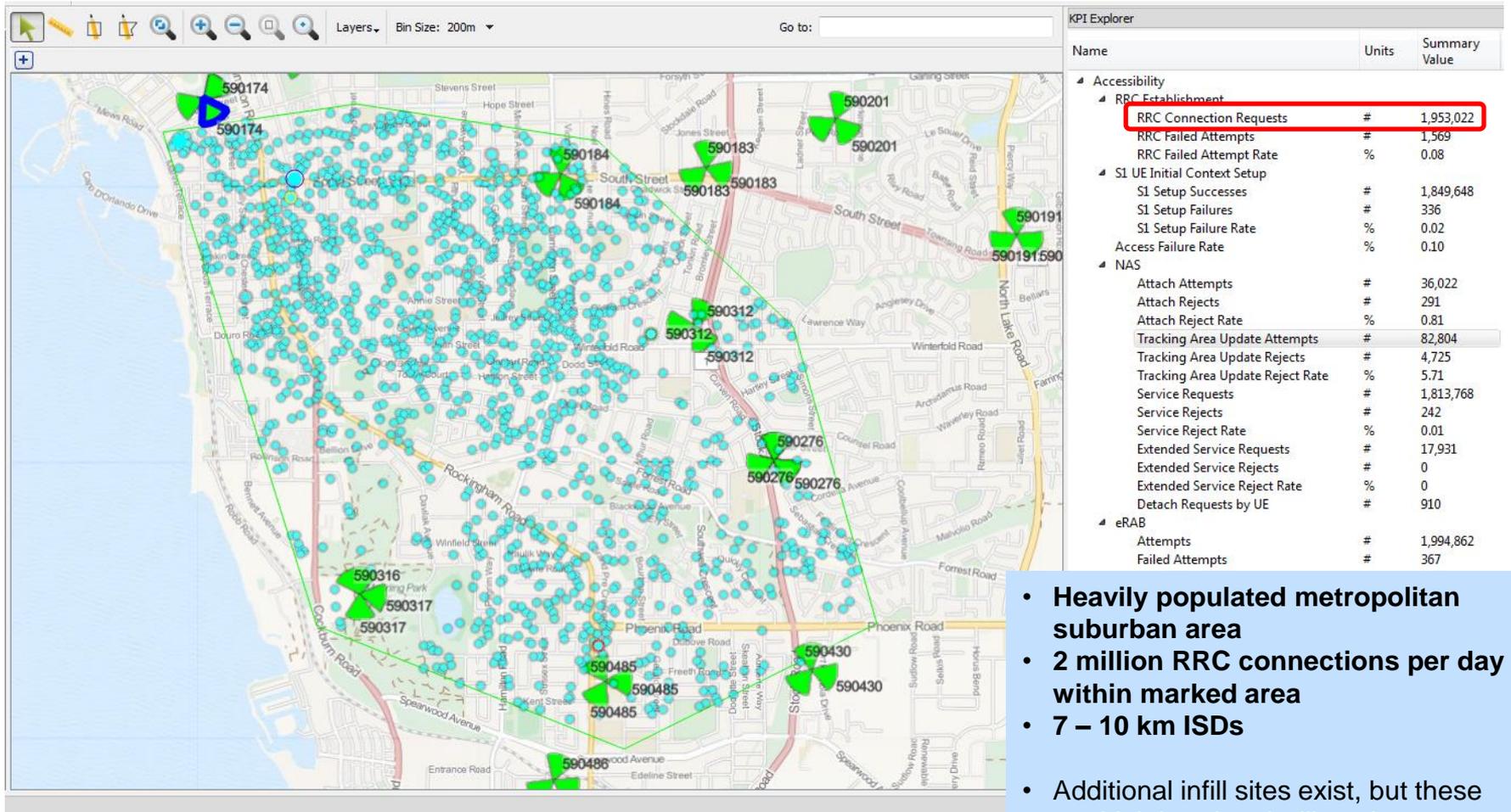
RAN1 should treat this proposal with priority

Appendix

Additional details on large ISD examples

Metropolitan suburban example

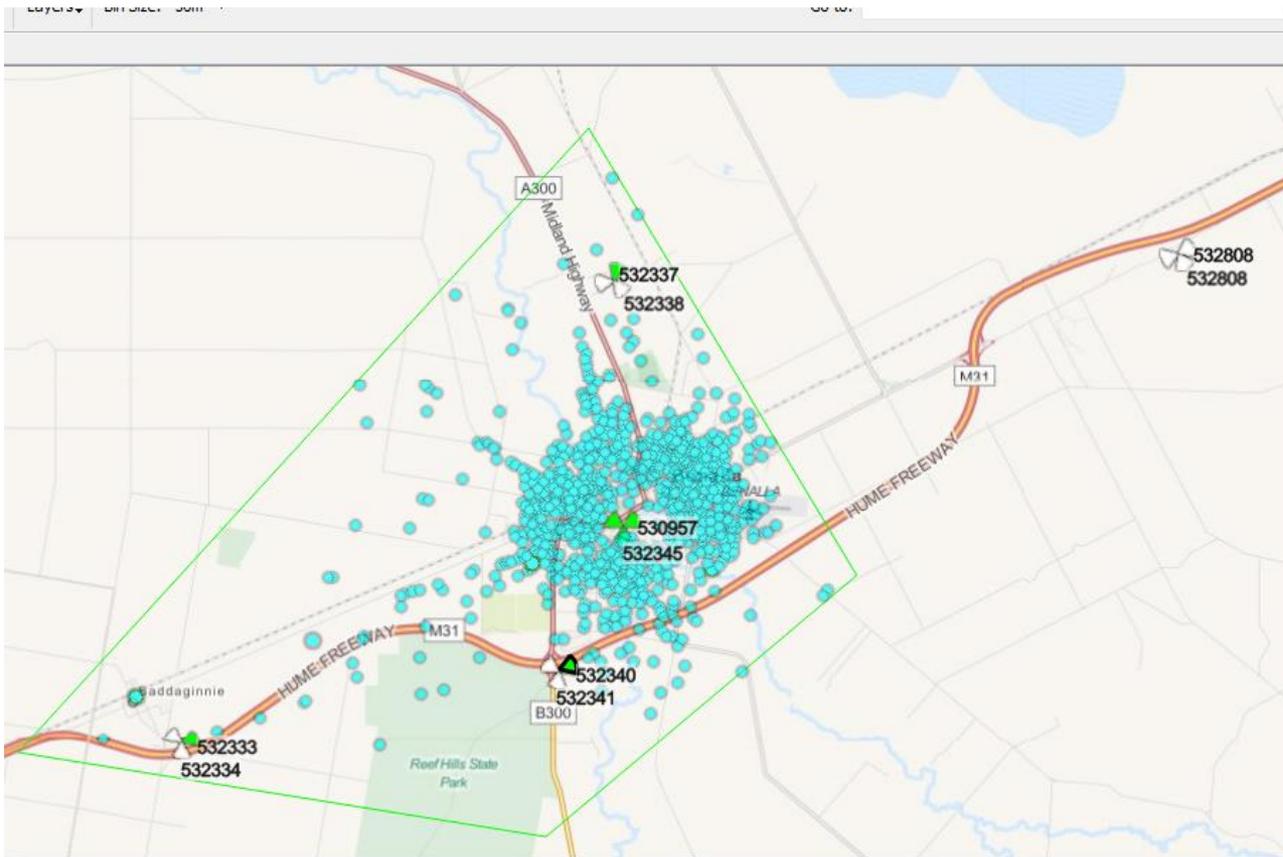
7 – 10



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Regional centre example

Traffic distribution

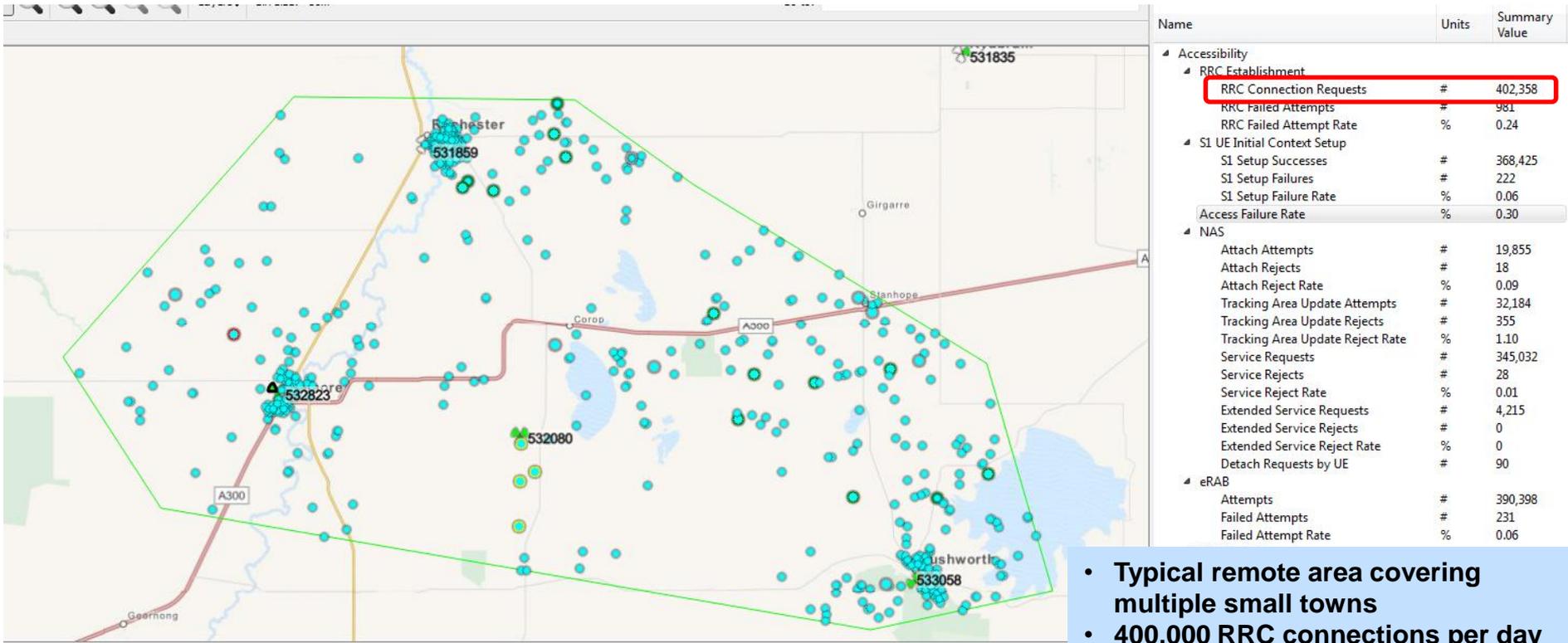


Name	Units	Summary Value
Accessibility		
RRC Establishment		
RRC Connection Requests	#	1,073,205
RRC Failed Attempts	#	698
RRC Failed Attempt Rate	%	0.07
S1 UE Initial Context Setup		
S1 Setup Successes	#	1,011,334
S1 Setup Failures	#	254
S1 Setup Failure Rate	%	0.03
Access Failure Rate	%	0.09
NAS		
Attach Attempts	#	32,464
Attach Rejects	#	43
Attach Reject Rate	%	0.13
Tracking Area Update Attempts	#	51,373
Tracking Area Update Rejects	#	1,845
Tracking Area Update Reject Rate	%	3.59
Service Requests	#	977,815
Service Rejects	#	56
Service Reject Rate	%	0.01
Extended Service Requests	#	10,436
Extended Service Rejects	#	0
Extended Service Reject Rate	%	0
Detach Requests by UE	#	416
eRAB		
Attempts	#	1,086,541
Failed Attempts	#	273
Failed Attempt Rate	%	0.03

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Rural and remote example

Traffic distribution



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