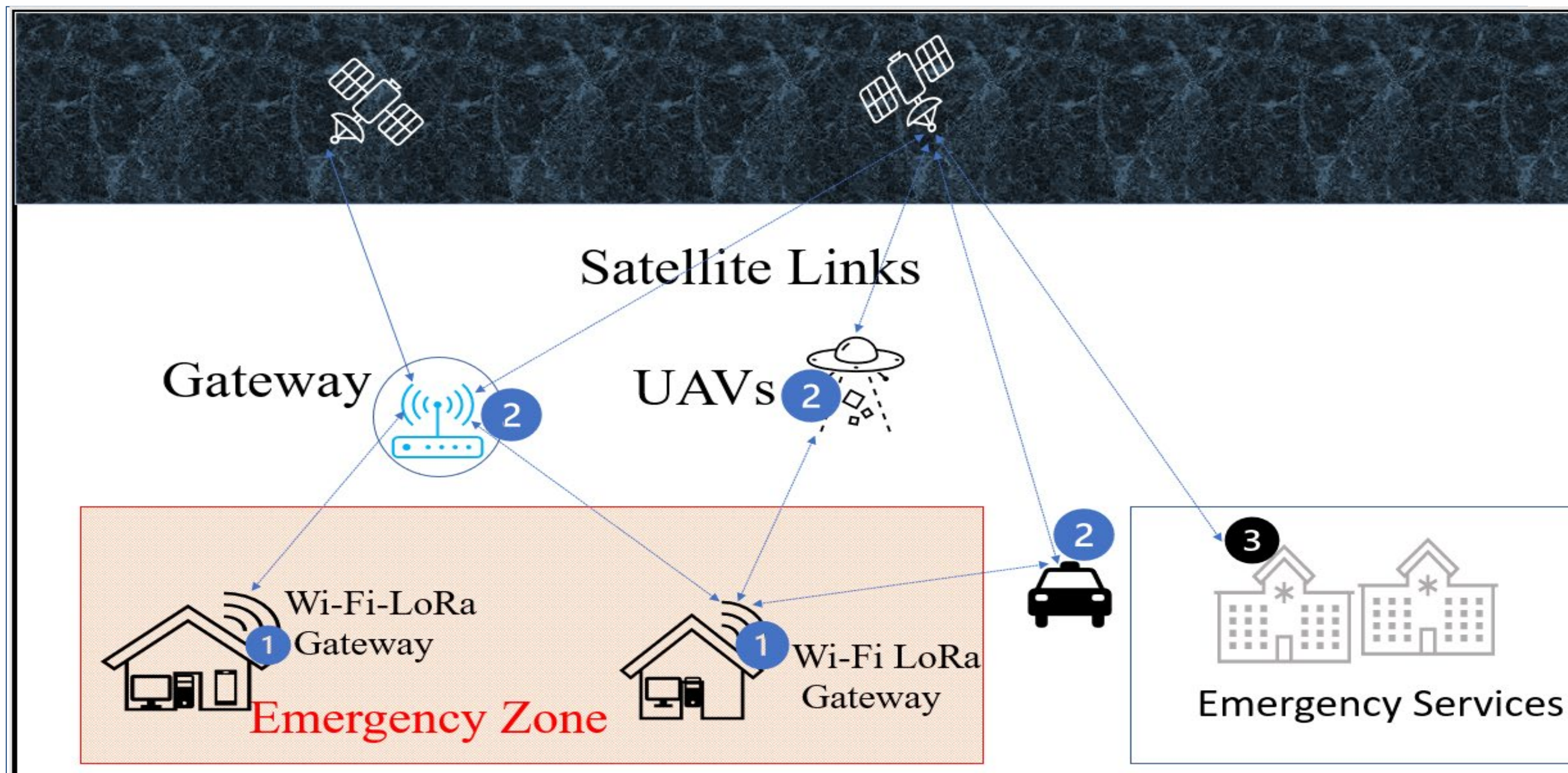


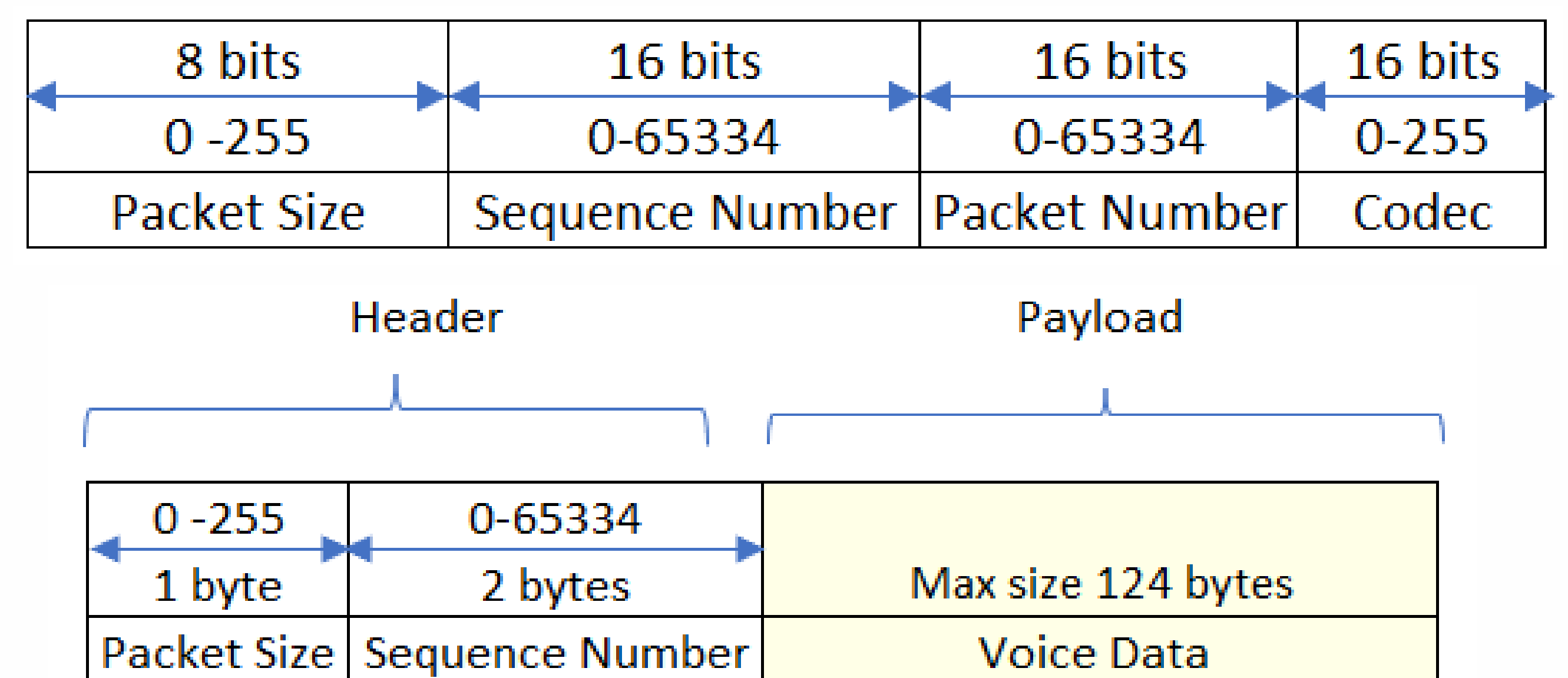
Emergency Buddy System

Francis Kagai
(fkagai@swin.edu.au)

Supervisors: Associate Professor Philip Branch, Associate Professor Jason But, Dr Rebecca Allen, Dr Mark Rice



Low bitrate Voice Communication Protocol (700b/s)



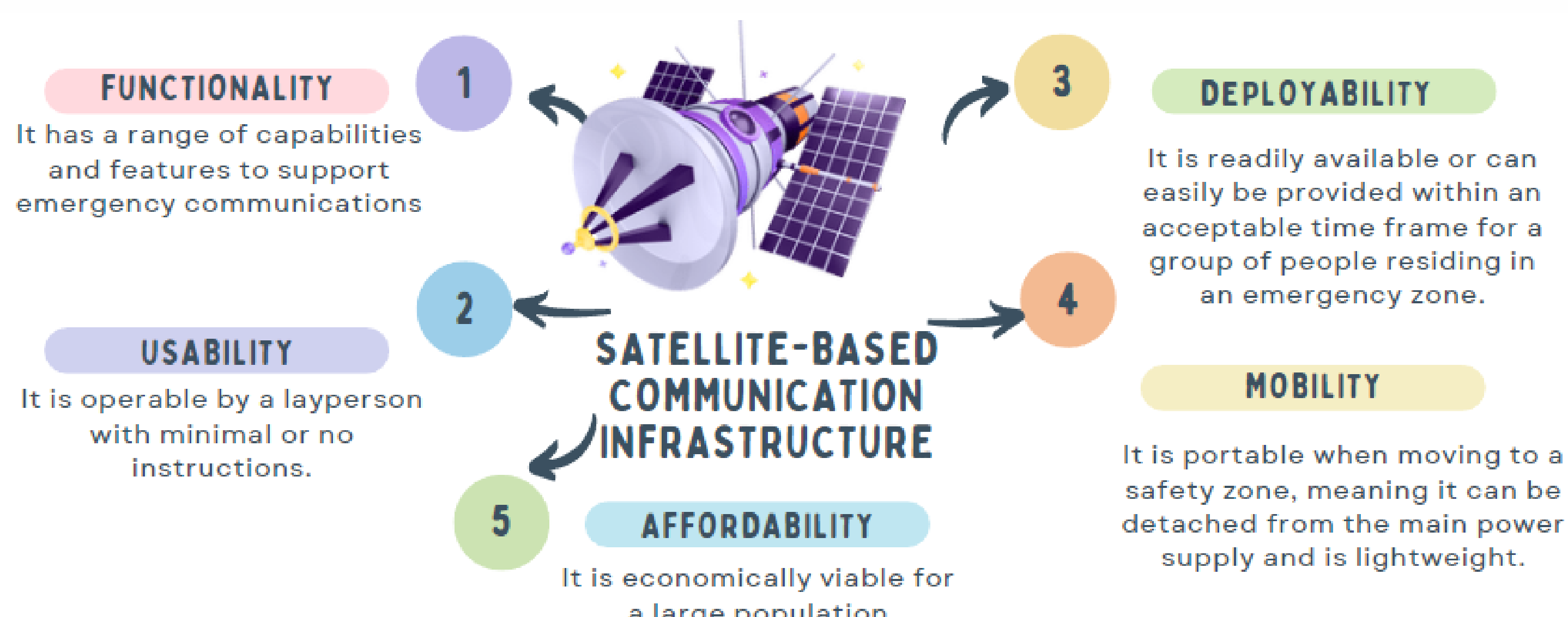
Aims

- Assessing Technical Feasibility:** A baseline survey of Rapidly Deployable Satellite Based Emergency Communications Infrastructure
- Prototype Development:** - Develop prototype of an emergency beacon capable of sending pre-canned messages and, when enabled, text messages via a mobile app tethered to the beacon device.
- Performance Analysis:** Evaluate performance based of number on users operating within a power and bandwidth-limited channel. Transmission of small data packets, such as very low-rate encoded voice

Methods

- Literature review and Surveys** that involves examining real-world case studies of projects or deployments that have attempted to integrate satellite, LPWAN, and mobile technologies.
- Prototyping Emergency Network** using low power low-cost microprocessors for low bitrate satellite communications
- Experimental testing** to assess performance of emergency communication channels.

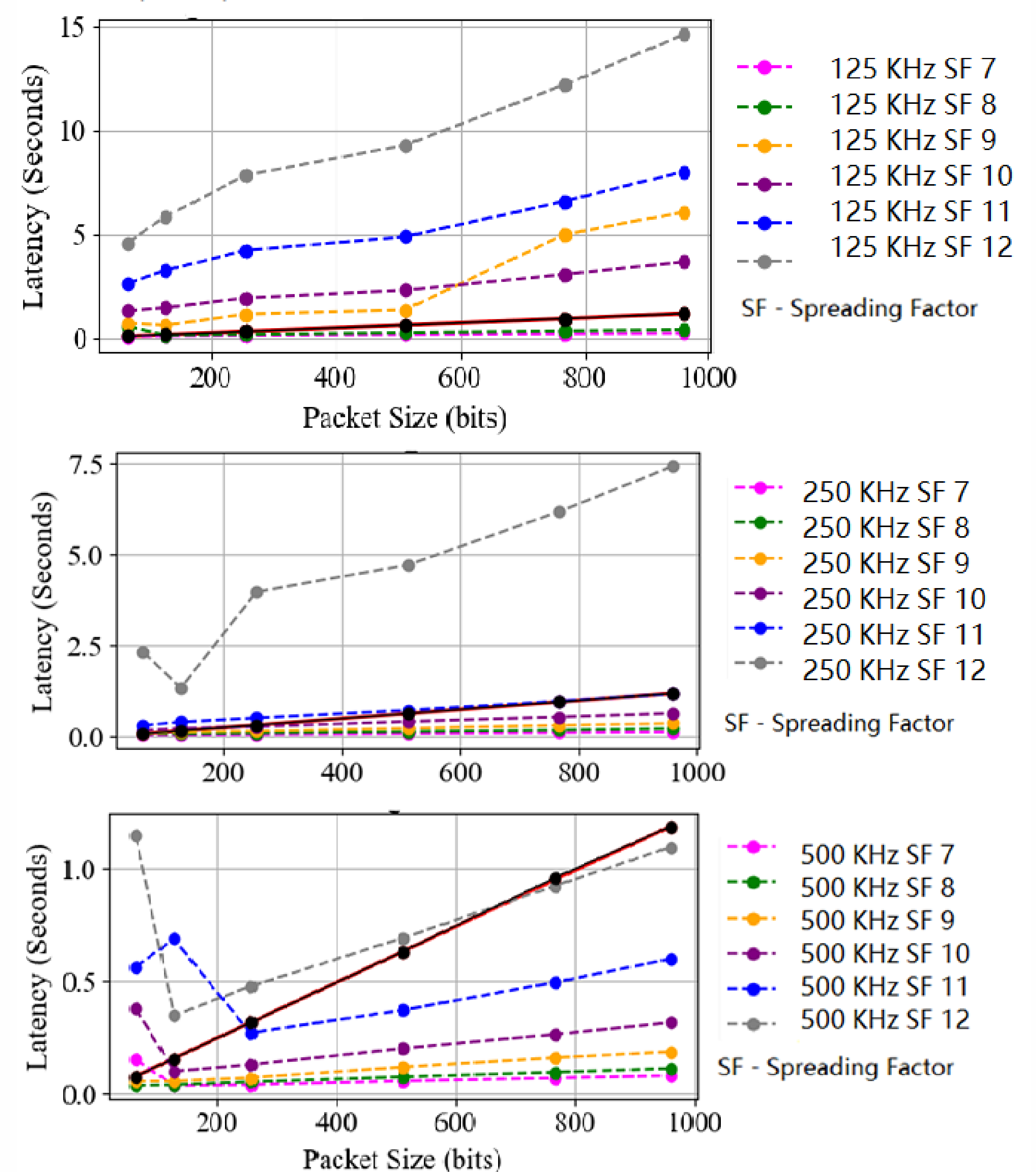
Rapidly Deployable Infrastructure



Future Work

- Adapting the low bitrate protocol for emergency communications over the Beagle Waveform
- Securing satellite-based emergency voice and messaging
- Evaluating performance and scalability

Performance of Low Bitrate Voice Over LoRa Chirp Spread Spectrum Modulation



References

- S. C. Research, "Capability Demonstrator: I-In-The-Sky," SmartSAT, 2023. https://smartsatrc.com/app/uploads/SmartSat_IITS_FINAL_WEB.pdf.
- S. C. Research, "Resilient Emergency and Search and Rescue (SAR) Communications," SmartSAT, 2023. [Online]. Available: https://smartsatrc.com/app/uploads/SmartSat_FactSheet_SAR-project-v2.pdf.
- Swinburne University of Technology. Available: <https://www.swinburne.edu.au/>.
- Safety from Space, Available: <https://www.safetyfromspace.com/>.
- F. Kagai, P. Branch, J. But, and R. Allen, "Voice Over LoRa™," 3292 in 2024 International Conference on Information Networking3293 (ICOIN), (Ho Chi Minh, Vietnam), pp. 526–531, 2024