COMMERCIAL, SENSITIVE

Office of the Minister for Land Information

Chair, Cabinet Economic Development Committee

SouthPAN Cabinet report back — May 2023

Proposal

1. This paper updates Cabinet on the progress of SouthPAN since my most recent update in November 2022 [CAB-22-MIN-0511 refers], including benefits realisation, procurement of infrastructure, finances and risks.

Executive Summary

2. The Southern Positioning Augmentation Network (SouthPAN) is an initiative to deliver a satellite-based augmentation system to Australasia, in partnership with Geoscience Australia (GA). SouthPAN will improve the accuracy of global positioning signals (such as GPS) from 5-10 metres down to as little as 10cm on land and sea, without the need for mobile or internet coverage.

3. New Zealand will contribute 25 per cent of the shared costs for SouthPAN. Australia is contributing the remaining 75 per cent of costs. New Zealand's total funding across the 19-year programme period is $NZD781 million.

4. SouthPAN is a key building block for a modern economy and is essential for New Zealand's economic future. SouthPAN is expected to improve productivity in many sectors. For example, it will enable precision agricultural technology and the automation of vehicles. It will support emissions reduction through improved and reliable navigation for all forms of transport and protect the health and safety of workers in sectors such as construction and forestry, and it will enable aircraft to safely operate in challenging weather conditions.

5. Similar systems are available in North and Central America, Europe, Russia, China, Japan, and India.

6. SouthPAN services (Early Open Services) commenced in September 2022 and can be used by commercially available Global Navigation Satellite Systems (GNSS) receivers to provide more accurate positioning. The accuracy and availability of SouthPAN services will be improved in the coming years as satellite capability and ground-based infrastructure come online. Full services are on track for delivery in 2028.

7. In March 2023 work began on an uplink centre in Awarua, Southland which will be operational by June 2024. In addition to the uplink centre SouthPAN requires five ground stations across New Zealand and one at Scott Base. These are critical components of the SouthPAN network, and in addition they bring skilled employment opportunities to regional New Zealand. Work on similar infrastructure is underway in Australia.

8. To ensure that SouthPAN is used by new services and innovation is supported, specialists have been engaged. This resource will actively engage with industry to ensure benefits are realised. The development of a Benefits Realisation Management Plan will ensure benefits are tracked and reported over time.

9. In mid-April 2023 SouthPAN Early Open Services were temporarily impacted due to a power outage on the existing satellite that broadcasts the SouthPAN Early Open Services signals. SouthPAN was one of a number of customers that were impacted by the outage. The satellite operator is reviewing their systems and investigating the cause of the incident.

10. Officials from LINZ and GA have used this experience to ensure that contracts for two future SouthPAN satellite services are robust and provide appropriate mitigations for potential impacts to services. While not every possible issue can be predicted, officials will ensure that contractors have robust practices in place.

11. The contract for the first SouthPAN satellite payload was awarded on 1 May 2023. Contract negotiations took longer than expected. While this represents some slippage from the original schedule, the delay does not impact on the overall launch date of the first satellite payload (late 2027) and future critical SouthPAN milestones remain on track.

12. The award of the contract is a significant milestone. A robust procurement process was followed, and the contract cost is within LINZ's budget. The 'Request for Tender' for the second SouthPAN satellite payload is expected to be released shortly.

13. While overall SouthPAN delivery is on track, there have been delays to certain key scheduled activities since November 2022. These activities were a Preliminary Design Review of the project and the finalisation of the contract for the first satellite payload. These activities have now been completed and have not impacted on future critical SouthPAN milestones. The Preliminary Design Review was completed in February 2023 and, as reported above, the contract for the first satellite was awarded on 1 May 2023.

14. The key risks to the delivery of SouthPAN are cost uncertainty and ensuring strong trans-Tasman relationships. Risks continue to be actively monitored and maintained. In the long-term there is a risk of reduced user uptake impacting on full benefit realisation. The implementation of a robust Benefit Realisation Management Plan, along with specialist resource to undertake engagement with industry and drive user uptake is expected to mitigate this risk.

Background

15. In April 2019, Cabinet agreed to initial funding for Toitū Te Whenua Land Information New Zealand (LINZ) to procure and operate a satellite-based system to increase the accuracy of GNSS signals in partnership with Geoscience Australia [CAB-19-MIN-0174.24 refers]. On 22 March 2022 the Prime Minister, the Minister of Finance, and the Minister for Land Information (joint Ministers) agreed to New Zealand's continued participation, with Australia, and additional funding was agreed through Budget 2022 [BRF 22-298 refers].

16. GNSS enables users to determine a geographic position anywhere on the land, sea or air. GNSS data is now fundamental to a range of applications and businesses worldwide. New Zealand and Australia currently have good access to GNSS but there is no free to air augmentation service.

17. Augmentation services, such as SouthPAN, provide a service for improving the accuracy of GNSS positioning through a network of satellite technology and ground-based reference stations. SouthPAN will improve the accuracy of GNSS signals from 5-10 metres down to as little as 10cm on land and sea, without the need for mobile or internet coverage.

18. The quantified benefits of SouthPAN to New Zealand are estimated at $864m over 20 years. Combined with other technologies, SouthPAN will enable precision agricultural technology and the automation of vehicles. It will support emissions reduction through improved and

reliable navigation for all forms of transport and protect the health and safety of workers in sectors such as construction and forestry, and it will enable aircraft to safely operate in challenging weather conditions.

19. SouthPAN is a long-term investment in critical positioning infrastructure and will continue to support increased productivity over and above 20 years. Benefits will increase as new applications and innovations that use SouthPAN are developed.

20. In September 2022, Early Open Services commenced using existing infrastructure. Early Open Services provide three signals that can be received on some commercial GNSS receivers. However, a purpose-built system is needed for SouthPAN to reach full operating capability. This will be developed over the next five years through the establishment of ground stations and new satellite capability coming online.

21. In November 2022, I reported to Cabinet on the progress of SouthPAN at the invitation of joint Ministers.[1] I reported that funding contingencies had been agreed and funding secured, and that SouthPAN was progressing as intended.

22. In March 2023, I visited Awarua, Southland, where construction has begun on an uplink centre for SouthPAN. The uplink centre, alongside five other ground stations, will support SouthPAN and bring skilled employment opportunities to regional New Zealand. The five ground stations will be operational in mid-2025. There will also be a ground station at Scott Base, Antarctica which will be operational in early 2026.

23. Work will continue until full operational capability is achieved in 2028:

Upcoming milestones	
May 2023	First satellite payload (SGP-01) procured and contract entered into.
December 2023	Construction works at the Awarua uplink centre are completed.
Early 2024	Second satellite payload (SGP-02) procured and contract entered into.
June 2024	Initial uplink centre operations commence at the Awarua site.
April – July 2025	Ground Reference Station sites brought online and contributing to the service.
March 2026	Uplink centre in Awarua is fully contributing to the service.
Late 2027	Satellite payload-01 comes online.
Mid 2028	Safety-of-Life operations start (with less continuity, which will be addressed when satellite payload-02 comes online)
Late 2028	Satellite payload-02 comes online, full operational capability is achieved.

[1] On 21 March 2022, Cabinet authorised the Prime Minister, the Minister of Finance, and the Minister for Land Information (joint Ministers), to have Power to Act to take certain decisions regarding New Zealand's participation in SouthPAN [CAB-22-MIN-0083 refers].

24. [redacted]

The contract for the first satellite payload has been awarded

25. Two satellite payload services are required to broadcast positioning signals for SouthPAN. GA is leading the procurement activity in relation to these services, which is being undertaken through two separate procurement processes. On 1 May 2023, GA entered into the contract for the first satellite payload (with LINZ's endorsement). The successful company is Inmarsat Australia Pty Ltd.

26. A robust procurement process was followed, including the approach to market, evaluation to tender offers, selection of the Preferred Tenderer and subsequent contract negotiations over the last five months. This activity has been undertaken in line with Commonwealth Procurement Rules.

27. LINZ's 25 percent share of the contract cost is within LINZ's budget for the first satellite payload, noting this is subject to changes in forecast inflation and foreign exchange rates. Foreign exchange risks will be managed through forward contracts which provide certainty around costs.

28. The contract is a service contract and largely 'firm fixed price' which provides a high degree of budget certainty. The majority of the contract cost relates to service payments when the satellite is in operation from 2027. The award of this satellite contract is a significant milestone and mitigates some of the cost uncertainty that existed prior to the contract being in place. As noted in my previous update to Cabinet, the risks regarding foreign exchange and inflation pressure over time remain (and are not limited to the first satellite payload contract).

29. The award of the first satellite payload contract was originally forecast for early 2023. Contract negotiations took longer than expected. While this represents some slippage from the original schedule, the delay does not impact on the overall launch date of the first satellite payload (late 2027) and future critical SouthPAN milestones remain on track.

30. The 'Request for Tender' for the second satellite payload is expected to be released to market in Australia shortly.

An uplink centre and grounds stations are progressing

31. In March 2023, construction began on the uplink centre in Awarua, Southland. In June 2024, the centre will link to satellites, and to a partner uplink centre in Uralla, New South Wales. The centre will link to a network of ground stations across New Zealand and Australia as they come online and will form a critical component of the SouthPAN network.

32. SouthPAN requires five ground reference stations in New Zealand and one at Scott Base. These are planned for Auckland, Gisborne, Nelson, Timaru and Rēkohu/Chatham Islands. Site surveys, to confirm the suitability of the sites, began in Timaru on 11 April 2023 and have been completed in each site ending with Rēkohu/Chatham Islands on 11 May 2023.

33. Construction at the Gisborne site (located at the Gisborne airport) is scheduled to start late in 2024 and should not be impacted by cyclone damage or immediate recovery work. The site survey at the Gisborne site was undertaken following the recent extreme weather events and

LINZ will continue to work with the SouthPAN contractor and airport operator to ensure ongoing suitability of the site.

34. Local skilled employment opportunities in the regions are an additional benefit of SouthPAN. For example, work at ground sites will be completed by local contractors and, once construction is complete, the Awarua uplink centre will create at least six new roles in a team operating and monitoring the system 24-hours a day.

Benefits realisation remains a key focus

35. Officials have engaged with potential users and government agencies and there is strong interest in SouthPAN services.

36. LINZ has engaged specialists to ensure benefit realisation as services become available, including through active engagement with industry. This work has informed the development of a Benefits Realisation Management Plan which sets out how benefits are tracked and reported over time and which industries and sectors are engaged with and when.

37. The Benefits Realisation Management Plan will be used by LINZ to actively encourage uptake of SouthPAN services and monitor their use. The Benefits Realisation Management Plan will also be used to develop case studies to provide insight into the use of SouthPAN services.

38. There is also work underway to engage with equipment manufacturers to ensure GNSS receivers are capable of receiving SouthPAN signals.

Costs are tracking within budget

39. [redacted]

40. On 14 March 2023, joint Ministers approved an expense transfer of $30 million of operational funding from 2022/23 to 2023/24 as part of the March Baseline Update. An expense transfer of $6.44 million capital contribution from 2022/23 to 2023/24 was also approved.

41. These transfers do not affect the overall cost of the programme. They are necessary due to re-phasing of funding following the signing of the on-supply agreement and information gained from the ongoing procurement of satellites.

42. The year to date spend to 31 March 2023 is $60.643 million, largely due to commencing services and completing milestones under the Prime Contract such as preliminary system reviews, surveying for ground infrastructure sites, and the service contract for the satellite that provides early SouthPAN services. The forecast spend to 30 June 2023 is $67.770 million.

Risks and mitigations are being actively managed

43. SouthPAN governance arrangements are in place to identify, categorise and manage risks.

An Australia-New Zealand Joint Governance Board manages risks to the delivery of SouthPAN

44. A Joint Governance Board (the Board) owns and manages all risks pertaining to SouthPAN service delivery, financial management and system security. The Board consists of the Senior Responsible Officers of LINZ and GA and external independent members nominated by both LINZ and GA.

45. Through the Board, LINZ and GA have equal voice and equal decision rights. As a result, it is not possible for decisions to be made that have an impact on scope, cost or financial management without agreement from New Zealand officials.

46. There have been delays to certain key scheduled activities since November 2022. These activities were a Preliminary Design Review of the project and the finalisation of the contract for the first satellite payload. The Preliminary Design Review was completed in February 2023 and, as reported above, the contract for the first satellite was awarded on 1 May 2023. These delays moved the project status from ‘green’ to ‘amber’. However, the project status is reviewed regularly and the completion of these activities will be reflected in upcoming status review discussions with the Joint Governance Board.

47. Governance arrangements were put in place to provide oversight of the procurement process for the first satellite payload. This included close management of risks relating to schedule, cost and technical specification requirements. These risks were addressed when contract negotiations successfully concluded. The Board will monitor the progress of the second satellite payload.

LINZ manages New Zealand centric risks

48. LINZ manages New Zealand centric risks (such as managing funding for the New Zealand portion of SouthPAN and ensuring that LINZ meets its contractual obligations with GA), and the interdependencies with the strategic risks managed by the Board.

49. LINZ continues to manage areas of cost uncertainty such as the impact of inflation and foreign exchange fluctuations on the budget. As I reported to you last year, there are mitigations in place to manage cost uncertainty, including:

    49.1. The Prime Contract and satellite payload contracts are or will be largely ‘firm fixed price’ contracts. Firm fixed price contracts offer a higher degree of certainty for the whole of life costs. These contracts make up more than 80 percent of SouthPAN costs.

    49.2. Foreign exchange contracts have been entered into giving certainty of the exchange rate on payments for the first 5 years of the Prime Contract. Similar contracts will be entered into for the first satellite contract.

    49.3. The SouthPAN and satellite payload contract costs are adjusted for inflation in line with the Australian CPI. The inflation rate for shared costs is in line with GA’s financial modelling assumption. While the Reserve Bank of Australia’s inflation forecast is currently higher than modelled in year one, this will be monitored across the longer term of the programme.

    49.4. Approved funding considers the risk from inflation and foreign exchange movements. Joint Ministers agreed that movements that exceed the funding allocated will be addressed through a Budget technical package [BRF 22-298

refers]. The impact of inflation continues to be monitored and LINZ will engage with joint Ministers should there be a need to address this through a technical package.

50. This is a Trans-Tasman project and good relationships are fundamental to its success. Trans-Tasman relationships within the project are actively monitored and maintained through clear roles, responsibilities, and escalation processes. Through this collaborative and transparent approach, no issues have arisen.

A recent outage was a chance to ensure that contracts are robust

51. In April 2023 there was a disruption to SouthPAN Early Open Services. The disruption lasted four days and was caused by a power outage to the satellite that provides the SouthPAN signal. SouthPAN was one of a number of customers that were impacted by the outage. Inmarsat (UK), the satellite operator, is continuing to investigate the root cause of the outage and optimise performance of the satellite.

52. Officials have used this experience to ensure that contracts for two future SouthPAN satellite services are robust and provide appropriate mitigations for potential impacts to services. While not every possible issue can be predicted, officials will ensure that contractors have robust practices in place.

53. The outage demonstrated how critical it is to build-in redundancy of critical parts of the system. SouthPAN's investment in two new satellite payloads on new satellites will greatly improve the resilience of the SouthPAN network when full capacity is reached in late 2028. This redundancy is also necessary for SouthPAN to be certified for use in the aviation industry.

Consultation

54. The following agencies were consulted on this paper: The Treasury, Department of the Prime Minister and Cabinet, Ministry of Transport, Ministry of Business, Innovation and Employment, Department of Conservation, Ministry of Foreign Affairs and Trade, Ministry for Primary Industries, Ministry for the Environment, New Zealand Customs Service, Department of Internal Affairs, and the Ministry of Education.

Financial Implications

55. This paper has no financial implications.

Legislative Implications

56. There are no legislative implications resulting from this paper.

Human Rights

57. This paper is not inconsistent with the New Zealand Bill of Rights 1990 or the Human Rights Act 1993.

Gender Implications and disability perspective

58. There are no gender or disability implications as a result of this paper.

Publicity

59. SouthPAN was formally announced on 16 September 2022 following the signing of the prime contract and On Supply Agreement between New Zealand and Australia.

60. Further communications were released on 24 March 2023 to mark the start of construction of the SouthPAN uplink centre in Awarua, Southland.

61. On 1 May 2023 the contract for the first satellite payload was signed, and public announcements are expected to occur shortly.

Proactive Release

62. I propose to release this paper proactively. Release is subject to due diligence process and redactions as appropriate under the Official Information Act 1982.

Recommendations

63. I recommend that the Committee:

63.1. **note** that the Southern Positioning Augmentation Network (SouthPAN) is an initiative to deliver a satellite-based augmentation system to Australasia, in partnership with Geoscience Australia;

63.2. **note** that the development of SouthPAN infrastructure is underway and services will be improved over time, with full operating capability to be delivered in late 2028;

63.3. **note** that Geoscience Australia has formally awarded the contract for the first satellite payload with LINZ's endorsement and Geoscience Australia will shortly begin procurement for the second satellite payload;

63.4. **note** that, delays negotiating the first satellite payload contract have not affected the overall delivery of critical SouthPAN milestones which are on track and within LINZ's budget for SouthPAN;

63.5. **note** that cost escalation and other key risks are being actively managed; and

63.6. [redacted]

Authorised for lodgement

Hon Damien O'Connor

Minister for Land Information