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# 1. Project Charter

## 1.1. Purpose Statement

To support TfNSW's Future Transport Strategy in enhancing customer experience, improving connectivity, and enabling economic activity, this project will deploy thermal cameras, LiDAR, and AI technology to monitor platform occupancy on the Sydney T4 line (Central - Bondi Junction).

## 1.2. Requirements

This section lists key requirements, constraints, and functionalities that the project must deliver. These requirements ensure the solution provides Transport for NSW (TfNSW) necessary insights into platform occupancy and aligns with the TfNSW Future Transport Strategy objectives.

The requirements are as follows:

1. TfNSW Strategy Alignment: The project must directly support the goals of the TfNSW Future Transport Strategy.
2. Timeline: All project activities must be completed within the specific window, starting on or after 1st February 2027 and finishing by 31st December 2027.
3. Budget: The project operates under an accepted budget target of $700,000 AUD.
4. Hardware Scope: The project must install people-counting hardware at all seven stations on the T4 line between Central and Bondi Junction: Central, Town Hall, Martin Place, Kings Cross, Edgecliff, Woollahra, and Bondi Junction. For stations with multiple lines, only the T4 platforms are in scope.
5. Software Functionality: The software infrastructure developed must:
6. Perform anonymised occupancy counting on the platform.
7. Store all data securely and in compliance with Australian Standards.
8. Provide a public API endpoint with occupancy counts, integrated with the TfNSW Open Data Portal.
9. Include a feature to dynamically predict future patronage numbers via the API.
10. Display live and historical data on a downloadable mobile application.
11. Key Milestones (Gates): The project must meet the following mandatory deadlines for trial phases and deliverables:
    * 1. Small scale trial (Bondi Junction): 1st May 2027
      2. Large scale trial (3 additional stations and live API): 1st July 2027
      3. Verification trial (all seven stations and predictable API): 1st October 2027
      4. Dashboard (mobile app available): 1st November 2027

7. Project Closure and Handover: By 1st December 2027, the team must complete the handover to TfNSW staff. This includes providing all operational manuals and a final report detailing data insights, customer benefits, and future recommendations.

## 1.3. Assumptions

This section outlines key assumptions made during the planning of the project. These assumptions are crucial for defining the project scope, schedule, and budget. If any of these assumptions prove incorrect, it may impact the project’s execution and success.

**Site Access and Conditions:**

1. Platform Availability: TfNSW will grant necessary access to all seven T4 line station platforms for surveys and hardware installation within the project timeline.
2. Structural Suitability: Existing platform structures are suitable for mounting the selected hardware without requiring major structural modifications.
3. Power Availability: Suitable power sources are available or can be readily installed at designated hardware locations on each platform.
4. Network Connectivity: Adequate network connectivity is available or can be installed at hardware locations to transmit data back to the central system.
5. Heritage Constraints: For stations with heritage significance, it is assumed that installation methods acceptable to heritage requirements can be identified and approved without significant delays or cost impacts.

**Woollahra Station:**

1. Construction Status: It is assumed that construction progress at Woollahra Station will allow for safe access and timely installation of the required hardware between February and December 2027, aligning with project milestones.
2. Infrastructure Readiness: Power and network infrastructure at Woollahra Station will be sufficiently ready to support the installation and operation of the occupancy counting hardware during the project timeline.

**TfNSW Resources and Collaboration**

1. Stakeholder Availability: Relevant TfNSW and Sydney Trains personnel will be available for necessary consultations, reviews, and approvals.
2. System Access: Access to relevant TfNSW systems, specifically the Open Data Portal, will be granted for API integration. Technical specifications and support for integration will be provided in a timely manner.
3. Permitting Process: Standard processes for obtaining permits are understood, and approvals will be granted within expected timeframes.
4. Standards and Compliance: TfNSW will provide clear documentation regarding data security, privacy, and Australian Standards compliance requirements.

**Technology and Data:**

1. Hardware Performance: The selected hardware technologies are sufficiently mature and capable of accurately performing anonymised people counting under varying platform conditions.
2. Software Environment: Necessary computing resources will be available and provisioned for data storage, processing, analytics, and hosting the API and mobile app backend.
3. Data Quality: Data generated by the hardware will be of sufficient quality for the predictive analytics engine to function effectively.

## 1.4. Objectives

The primary objective of this project is to provide TfNSW with insights into customer platform usage on the T4 line by implementing an occupancy counting system. This supports the TfNSW Future Transport Strategy by optimising network understanding and exploring new technologies.

Specific project objectives include:

1. Hardware Deployment: Successfully install test, and commission people-counting hardware on all T4 platforms at the specified stations by the verification trial gate.
2. Anonymised Counting: Develop and implement software to accurately count platform occupants in an anonymised manner, meeting TfNSW privacy and data standards.
3. Secure Data Storage: Establish a secure data infrastructure compliant with Australian Standards for storing the collected occupancy data.
4. Public API Development: Create and deploy a publicly accessible API, integrated with the TfNSW Open Data Portal, providing live and historical occupancy counts by the large scale trial gate.
5. Predictive Analytics: Develop and integrate a predictive analytics engine into the API to forecast future platform patronage numbers by the verification trial gate.
6. Mobile Application Delivery: Deliver the mobile application as specified in the requirements by the Dashboard gate deadline.
7. Timeline Adherence: Complete all project activities and meet all specified milestone gate deadlines within the February 1, 2027, to December 31, 2027, timeframe.
8. Budget Management: Deliver the project functionalities while managing costs towards the budget.
9. Successful Handover: Achieve project closure by completing the handover requirements by the specified date.

## 1.5. Definition of Success

The success of this project will be measured against the achievement of its core requirements and objectives. The following table outlines the key criteria that define project success and their relative importance, based on the Project Priority Matrix:

|  |  |  |
| --- | --- | --- |
| **Requirement** | **Successful Outcome** | **Importance** |
| Timeline | All project milestones are met on or before their specified dates. | Constrain (High) |
| Final project handover is completed by December 31, 2027. | Constrain (High) |
| Scope | Hardware is successfully installed and operational on all seven platforms. | Optimise (Medium) |
| Software infrastructure delivers all required functionalities: anonymised counting, secure storage, public API with predictions, and a functional mobile app. | Optimise (Medium) |
| The delivered solution meets TfNSW's technical requirements and aligns with the strategic objectives of optimising networks and exploring new technologies. | Optimise (Medium) |
| Budget/Cost | Project costs are managed effectively and align with the accepted target of $700,000 AUD, with any necessary deviations properly justified and approved. | Accept (Low) |
| Quality/Functionality | The occupancy counting system provides accurate and reliable data. | Optimise (Medium) |
| The API integrates successfully with the TfNSW Open Data Portal. | Optimise (Medium) |
| The mobile application provides a user-friendly interface for accessing live and historical data. | Optimise (Medium) |
| All handover documentation is complete, accurate, and sufficient for TfNSW to operate and maintain the system. | Optimise (Medium) |
| Stakeholder Satisfaction | TfNSW stakeholders acknowledge that the project has met the defined requirements and objectives. | Optimise (Medium) |

## 1.6. Summary of Stakeholders (Stakeholder list)

|  |  |
| --- | --- |
| **Project Roles** | **Stakeholder** |
| Executive Sponsor | John Graham - Minister for Transport |
| Josh Murray- Secretary of Transport |
| Steering Committee | Matt Longland - Chief Executive of Sydney Trains |
| John Garrad - Chief Executive of Transport Asset Manager |
| Brenda Hoang - Deputy Secretary of Finance, Technology and Commercial |
| Project Owner | Sally Webb - Deputy Secretary of Safety, Policy, Environment and Regulation |
| Trudi Mares - Deputy Secretary of Planning, Integration and Passenger |
| Raquel Rubalcaba - A/Deputy Secretary of Infrastructure Projects and Engineering |
| Delivery / Implementation Partner | TfNSW Data & Analytics Division |
| TfNSW ICT Infrastructure & Systems Integration |
| Sydney Trains -Rail Operations Centre |
| TAM NSW - Transport Asset Manager |
| Surveyor |
| Design & Integration Vendors |
| Hardware supplier |
| RIW-certified Technicians |
| Structural / Civil Contractor |
| Electrical Contractor |
| Software/ System Integrator |
| Cloud Provider (AWS/Azure/GCP) or TfNSW on Prem Team |
| Regulator | Office of National Rail Safety Regulatory (ONRSR) |
| Digital NSW - AI Review Committee |
| Digital NSW - Cyber Security NSW |
| Heritage Council of NSW |
| Local councils (Woollahra council, Waverley, City of Sydney) |
| Advisor | Accessible Transport Advisory Committee (ATAC) |
| Auditor | Independent Certifier / QA Reviewer |
| Operator | Sydney Trains Maintenance Crews |
| Station Operation Managers |
| Station Staff |
| Community / Consumer | Passengers |
| Local residents & businesses |
| NSW Police & Emergency Services |
| Promoter | Media |
| Alex Greenwich, MP (Independent Member for Sydney - NSW Parliament) |

## 1.7. Summary of Schedule

## 1.8. Summary of Budget

## 1.9. High Level Risks

## 1.10. PMBOK Referenced PM Methods Used in Project Charter

The development of Project Charter followed processes outlined in the Project Management Body of Knowledge (PMBOK). Key methods used include:

1. Develop Project Charter (PMBOK Section 4.1): This overall process guided the formal authorisation of the project and the documentation of initial requirements, assumptions, constraints, objectives, and high-level risks based on the project brief provided by TfNSW.
2. Expert judgment (PMBOK Section 4.1.2.1): Input from individuals with knowledge of transport projects, technology deployment, and TfNSW processes was utilised throughout the charter development, particularly in defining initial scope, objectives, and potential challenges.
3. Data Gathering (PMBOK Section 4.1.2.2): Techniques such as brainstorming were used based on the project brief to help define the high-level scope, potential risks, and preliminary requirements.

# 2. Scope Management

The project aims to deploy thermal cameras, LiDAR, and AI to monitor platform occupancy on seven train stations of Sydney T4 line between Central and Bondi Junction, supporting TfNSW’s Future Transport Strategy for enhancing customer experience, better connectivity and enabling economic activity.

Scope Management defines what will be delivered, the boundaries and limits, applying the PM processes including Plan Scope Management (PMBOK Section 5.1), Collect Requirements (PMBOK Section 5.2), Define Scope (PMBOK Section 5.3), Create WBS (PMBOK Section 5.4), Validate Scope (PMBOK Section 5.5), and Control Scope (PMBOK Section 5.6) in PMBOK® 6. Methods used include Expert judgement, Meetings, Data Gathering, Interpersonal and team skills, Decomposition and Inspection.

## 2.1. Deliverables

The project will hand over the following deliverables which are identified through Collect Requirements (PMBOK Section 5.2).

### 2.1.1 Project Management Artefacts (WBS 1.1)

Project Management Artefacts are documents, reports and logs that define and track how the project is governed, how decisions and changes are controlled and how scope/schedule/cost is reported throughout the project execution in line with Control Scope (PMBOK Section 5.6). They include the Governance Plan, Communication Plan, Schedule Tracking Report, Monthly Cost Report, Risk & Issue Register, Change Control Log, and the Project Closeout Report.

### 2.1.2 Site Survey Artefacts (WBS 1.2)

Site Survey Artefacts are documents and reports that ensure safe access, capture platform specifications, and verify environmental, network and power readiness across all seven T4 stations per Collect Requirements (PMBOK Section 5.2). These include Access & Possession Plan, Survey Safety Pack, Platform Survey Pack, Environmental Assessment Report, Network Assessment Report, and Power Assessment Report.

### 2.1.3 Detailed Design Documentation (WBS 1.3)

Detailed Design Documentation are documents that define end-to-end technical solutions and verification methodology under Validate Scope (PMBOK Section 5.5). The deliverables include System Architecture Document, Hardware Design Pack, Software Design Pack, Integration Design Pack, and Test Strategy & Procedures Pack.

### 2.1.4 Procurement Plan & Supply Package (WBS 1.4)

The Procurement Plan secures all supply items required for deployment, covers purchase orders, logistics and factos0ry QA, enabling timely and defect-free supply to the sites. Supply Package includes thermal cameras, LiDAR sensors, tensor-core GPUs, PoE switches, optics & cabling, power supplies, and enclosures & mounts. Materials received are tracked, inspected, and recorded for allocation to work per Control Scope (PMBOK Section 5.6).

### 2.1.5 As-Built Deliverables (WBS 1.5)

As-built Deliverables are installation and configuration verification documents, including readiness checklists and baseline configurations. Deliverables include the Installation Method Statement & Permit Pack, the Pre-installation Readiness Checklist, the Installed Hardware Pack, the Configuration Baseline, and the As-built Drawings & Photo Pack. Acceptance reviews of these deliverables are carried out per Validate Scope (PMBOK Section 5.5).

### 2.1.6 Software Release Package (WBS 1.6)

The Software Release Package is versioned code, trained models, configuration and release notes. They include the Data Pipeline Specification, Training Dataset Pack, Trained Model Pack, Backend & Storage build, Web App Frontend Pack, Mobile App Frontend Pack, and the API Specification & Endpoint Catalogue. Each release follows an iterative approach under Control Scope (PMBOK Section 5.6).

### 2.1.7 Integrated System (WBS 1.7)

The Integrated System verifies end-to-end functionality of both hardware and software, with calibrated sensors and validated data flows from edge to backend/API. The deliverables cover the Platform Bring-Up Report, Calibration Record Pack, Deployed Software Image Pack, and End-to-End Test Logs. The integration is verified under Validate Scope (PMBOK Section 5.5).

### 2.1.8 Commissioned System (WBS 1.8)

Commissioned System confirms transition to live service for each station. The deliverables comprise the Cutover Plan, Commissioning Certificate Pack, and the Operational Readiness Review (ORR) Pack. Deliverables are verified and accepted under Validate Scope (PMBOK Section 5.5).

### 2.1.9 Acceptance Test Pack (WBS 1.9)

The Acceptance Test Pack defines acceptance criteria and testing evidence at component, system, and operational levels. The deliverables include FAT, SAT, Performance & Peak-Event Tests, Reliability & Failover Tests, and the Pilot Trial Report, which are accepted and signed off per Validate Scope (PMBOK Section 5.5).

### 2.1.10 Engineering Documentation (WBS 1.10)

Engineering Documentation supports safe operations, maintenance, audit and future upgrades and is part of the handover. The deliverables include the Technical Manual, Operator & Administrator Guide, the Maintenance & Asset Register, and the Compliance Evidence Pack. Closure aligns with Close Project or Phase (PMBOK Section 4.7).

## 2.2. Constraints

Constraints determine trade-offs and decision making by fixing limits on budget, schedule, TfNSW gating, geographic coverage and required standards.

* Budget: AUD $700,000.
* Schedule window: from 1 February 2027 to 31 December 2027 (11 months).
* TfNSW Gate expectations:
  + Small-scale trial: A complete installation has been active for 1 or more months at Bondi Junction by 1 May 2027.
  + Large-scale trial: A complete installation has been active for 2 or more months at 3 additional stations and live/temporal occupancy data API endpoint is available by 1 July 2027.
  + Verification trial: all 7 stations are active and predictive future patronage capabilities and live/temporal occupancy data API endpoints are available by 1 October 2027.
  + Dashboard: downloadable mobile app displaying visualizations of live and temporal data is available by 1 November 2027.
  + Project closure by 1 December 2027.
* Geographic coverage: T4 platforms on seven T4 Eastern Suburbs & City line stations —Bondi Junction, Woollahra, Edgecliff, Kings Cross, Martin Place, Town Hall, Central.
* Must-have: Anonymized occupancy counting hardware and software, secure storage, public API (Open Data Portal), predictive analytics, and a mobile app with live/temporal views.

Any modification to these constraints requires review through Perform Integrated Change Control (PMBOK Section 4.6)

## 2.3. Exclusions

Exclusion is defined under Define Scope (PMBOK Section 5.3) to clearly distinguish non-included work items.

* Ticketing integration (e.g., Opal/ticketing systems).
* Non-T4 platforms (at multi-line stations, only T4 platforms are covered).
* Collection or storage of personally identifiable information (PII); all data products remain anonymized as per the constraints.
* Network-wide rollout beyond the seven specified stations and any commercialization activities beyond TfNSW’s operational use.
* Third-party customer apps or web portals beyond the specified public API and project mobile app deliverable set.

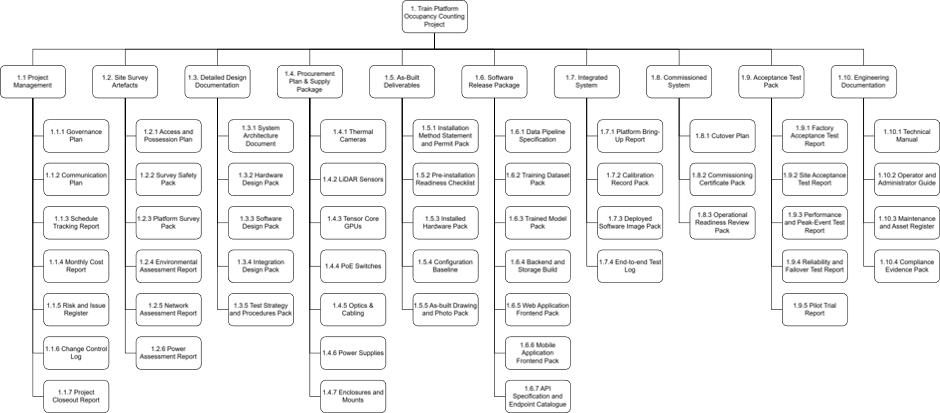
Changes to exclusions require approval through Control Scope (PMBOK Section 5.6).

## 2.4. Scope Statement

The Scope Statement describes deliverables, acceptance criteria and boundaries, and supports ongoing Validate Scope (PMBOK Section 5.5) and Control Scope (PMBOK Section 5.6) activities.

## 2.5 WBS (Work Breakdown Structure)

The WBS is developed following Create WBS (PMBOK Section 5.4) that outlines major project deliverables. It provides a structural foundation for measuring progress, aggregating costs, and validating acceptance.



## 2.6. PMBOK Referenced PM Methods Used in Scope Management

# 3. Stakeholder Management

This section defines how the project will identify, analyze, engage, and monitor stakeholders across the seven T4 stations within the scope. PM processes, including Identify Stakeholders (PMBOK Section 13.1), Plan Stakeholder Engagement (PMBOK Section 13.2), Manage Stakeholder Engagement (PMBOK Section 13.3), and Monitor Stakeholder Engagement (PMBOK Section 13.4) are implemented.

## 3.1 Stakeholder Identification

Project Stakeholders (PMBOK Section 1.6) defines stakeholders as “individual, group or organization that may affect, be affected by, or perceive itself to be affected by a decision, activity, or outcome of a project”. This definition led to the initial phase of stakeholder identification, along with methods including Expert Judgement (PMBOK Section 13.1.2.1), Data Gathering (PMBOK Section 13.1.2.2) and Data Analysis (PMBOK Section 13.1.2.3) to identify actual and potential stakeholders. A full list of internal, external, regulatory and community stakeholders has been included in the appendix.

## 3.2 Stakeholder Engagement

Engagement strategies were developed under Plan Stakeholder Engagement (PMBOK Section 13.2) using the Stakeholder Engagement Assessment Matrix to compare current versus desired engagement levels (Unaware, Resistant, Neutral, Supportive, Leading). The matrix makes a comparison of the current engagement levels of stakeholders and the desired engagement levels required for successful project delivery.

Engagement performance will be periodically reviewed under Monitor Stakeholder Engagement (PMBOK Section 13.4) to adapt to evolving stakeholder expectations.

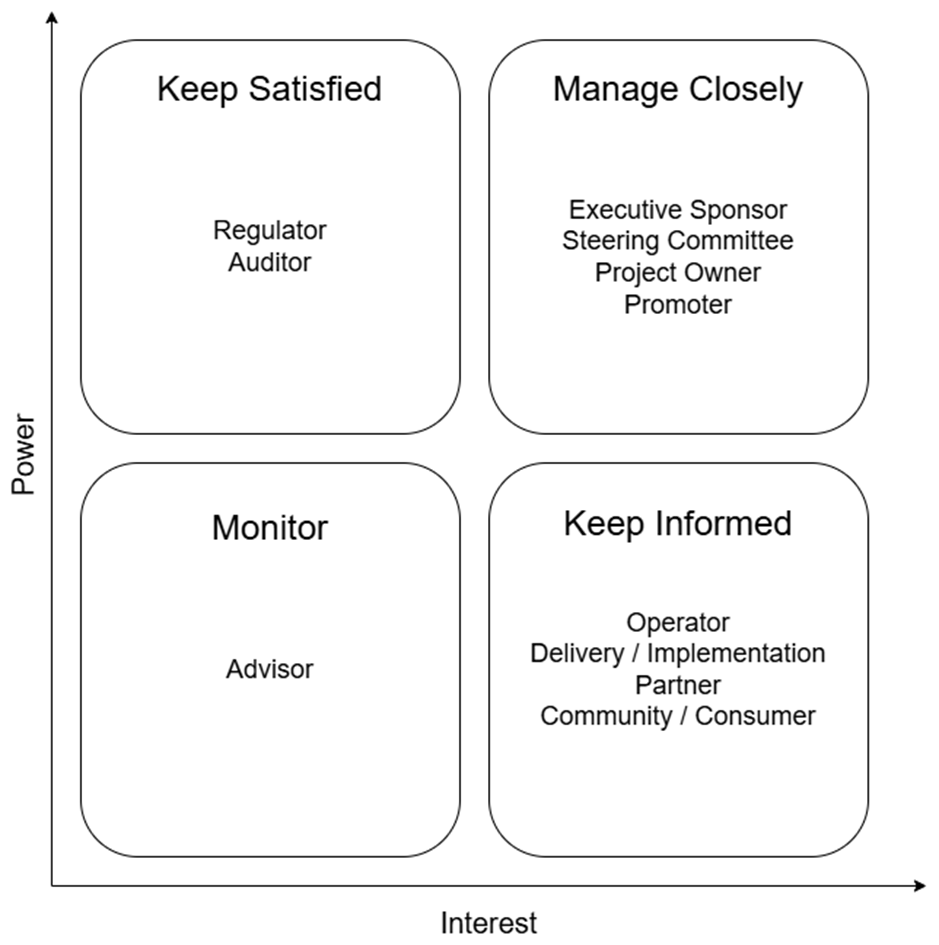
Table. Stakeholder Engagement Assessment Matrix

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Project Roles** | **Stakeholder** | **Unaware** | **Resistant** | **Neutral** | **Supportive** | **Leading** |
| Executive Sponsor | John Graham - Minister for Transport |  |  | C |  | D |
| Josh Murray- Secretary of Transport |  |  | C |  | D |
| Steering Committee | Matt Longland - Chief Executive of Sydney Trains |  |  | C |  | D |
| John Garrad - Chief Executive of Transport Asset Manager | C |  |  |  | D |
| Brenda Hoang - Deputy Secretary of Finance, Technology and Commercial |  |  |  | CD |  |
| Project Owner | Sally Webb - Deputy Secretary of Safety, Policy, Environmentand Regulation |  | C |  | C | D |
| Trudi Mares - Deputy Secretary of Planning, Integration and Passenger |  |  |  | C | D |
| Raquel Rubalcaba - A/Deputy Secretary of Infrastructure Projects and Engineering |  |  |  |  | D |
| Delivery / Implementation Partner | TfNSW Data & Analytics Division | C |  |  |  | D |
| TfNSW ICT Infrastructure & Systems Integration | C |  |  |  | D |
| Sydney Trains -Rail Operations Centre | C |  |  | D |  |
| TAM NSW - Transport Asset Manager | C |  |  |  | D |
| Surveyor | C |  |  |  | D |
| Design & Integration Vendors | C |  |  |  | D |
| Hardware suppiler | C |  | D |  |  |
| RIW-certified Technicians | C |  |  | D |  |
| Structural / Civil Contractor | C |  |  | D |  |
| Electrical Contractor | C |  |  | D |  |
| Software/ System Integrator | C |  |  |  | D |
| Cloud Provider (AWS/Azure/GCP) or TfNSW on Prem Team | C |  |  | D |  |
| Regulator | Office of National Rail Safety Regulatory (ONRSR) | C |  |  | D |  |
| Digital NSW - AI Review Committee | C |  |  | D |  |
| Digital NSW - Cyber Security NSW | C |  |  | D |  |
| Heritage Council of NSW | C |  |  | D |  |
| Local Councils (Wollahra council, Waverley, City of Sydney) | C |  |  | D |  |
| Advisor | Accessible Transport Advisory Committee (ATAC) | C |  |  | D |  |
| Auditor | Independent Certifier / QA Reviewer | C |  |  | D |  |
| Operator | Sydney Trains Maintenance Crews | C |  |  | D |  |
| Station Operation Managers | C |  |  | D |  |
| Station Staff | C |  |  | D |  |
| Community / Consumer | Passengers | C |  |  | D |  |
| Local Residents & Businesses | C |  |  | D |  |
| NSW Police & Emergency Services | C |  |  | D |  |
| Promoter | Media | C |  |  | D |  |
| Alex Greenwich, MP (Independent Member for Sydney - NSW Parliament) | C |  |  |  | D |

## 3.3 Stakeholder Assessment

Stakeholder engagement is managed and assessed through Manage Stakeholder Engagement (PMBOK Section 13.3) and Monitor Stakeholder Engagement (PMBOK Section 13.4), using methods like Expert Judgement (PMBOK Section 13.2.2.1), Data Analysis (PMBOK Section 13.2.2.3), Decision Making (PMBOK Section 13.2.2.4), and Data Representation (PMBOK Section 13.2.2.5). Stakeholders are prioritized by their roles in the project and categorized via metrics like Power and Interest, rated on a scale of 1 (lowest) to 5 (highest). A power/interest grid is developed for the illustration.

Figure. Power/Interest Grid



# 4. Schedule Management

# 5. Budget Management

## 5.1. Activity List

The Activity List defines the scope of all measurable work items forming the cost baseline. Each activity corresponds to the lowest-level WBS element (e.g., 1.1.1.1 Define Governance Structure through 1.10.4.2 Test & Calibration Certificates). Activities were decomposed using the Work Breakdown Structure (WBS) technique per PMBOK 7 – Scope & Schedule Management. Durations were expressed in working days (Monday–Friday, excluding NSW public holidays) and aligned with the project start of 1 Feb 2027 and end of 31 Dec 2027. Dependencies were mapped from the Network Diagram and reflected in the Gantt Chart, which underpin the time-phased budget.

{Insert Budgeting Table I.e. Detailed Activity List from Budgeting tab in Excel}

|  |  |
| --- | --- |
|  |  |
| Where 1 = HR Cost  2 = Contingency Cost  3 = Material Cost  4 = Others (e.g. Freight) | Where 1 = Grade 1 Labour  2 = Grade 2 Labour  3 = Grade 3 Labour  4 = Grade 4 Labour  5 = Grade 5 Labour |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| \* Grade | Labour | hourly rate | superannuation (12%) | annual/sick leave etc. (15%) | workers' compensation and payroll tax (5%) | on-costs | References |
| 1 | Site technician/Electrician /Cabler | 50 | 6 | 7.5 | 2.5 | $66.00 | [Site Technician](https://www.seek.com.au/career-advice/role/technician/salary) |
| [Cable fitter](https://www.seek.com.au/career-advice/role/cable-jointer/salary/in-sydney) |
| 2 | Procurement/Doc control /Survey tech | 45 | 5.4 | 6.75 | 2.25 | $59.40 | [Procurement](https://www.seek.com.au/career-advice/role/document-controller/salary/in-sydney/) |
| 3 | Engineer (systems/software/test) | 60 | 7.2 | 9 | 3 | $79.20 | [Engineer](https://www.seek.com.au/career-advice/role/testing-engineer/salary) |
| 4 | PM/Senior engineer | 65 | 7.8 | 9.75 | 3.25 | $85.80 | [Project Manager](https://www.seek.com.au/career-advice/role/project-manager/salary/in-new-south-wales) |
| 5 | Lead architect/Data & security lead | 130 | 15.6 | 19.5 | 6.5 | $171.60 | [Lead Architect](https://clicks.com.au/job-salary/security-architect/) |

5.2. Budget Estimation Table  
{Insert Budgeting Table I.e. Detailed Activity List from Budgeting tab in Excel}

## 5.3. Time Phased Budgeting

{Insert Time phase Budgeting Table from Time phase Budgeting tab in Excel}

## 5.4. PMBOK Referenced PM Methods Used in Cost

Cost estimation for this project was carried out using a **Bottom-Up Estimating** technique, as recommended in the *PMBOK Guide – Seventh Edition* under the Cost Management Knowledge Area.

Each lowest-level WBS activity (e.g., *1.1.1.1 Define Governance Structure*, *1.2.3.2 Perform 3D Laser Scan*, *1.6.3.1 Train AI Model*) was assigned a **duration**, **labour grade**, and **resource rate**. The cost per task was then calculated as:

These individual estimates were aggregated upward through WBS levels to form control accounts and, finally, the overall **Project Cost Baseline**. This approach provides the highest accuracy because it captures all labour, material, and subcontractor costs explicitly, aligning with the *Cost Estimation & Control Processes* defined in PMBOK.

The bottom-up method was selected because the project includes many **heterogeneous components** hardware (thermal cameras, LiDAR), software modules, and civil/electrical installations each with distinct resource requirements. A top-down or analogous method would not yield sufficient accuracy for procurement and funding justification.

# 6. Risk Management Plan

## **6**.1 Risk Overview

According to the PMBOK Guide (PMI, 2017), An individual project risk has been described as un uncertain event or condition whose occurrence may affect one or more project objectives, either positively or negatively. Also, given that every project entails inherent uncertainty, it is almost inevitable that certain tasks may not be completed within the originally planned duration or budget. Hence, this chapter follows the PMBOK process to explain how the project identifies, assesses, responds to, monitors, and reports risks, and how those risks are linked with the WBS schedule and the budget.

## 6.2 Plan Risk Management

Risks were identified through brainstorming, and the identified risks were grouped into categories as shown in the RBS below. Level 1 categories are Cost, Funding, Compliance, Schedule, and Technical; Level 2 comprises the detailed sub-categories under each top risk category. In our project, the Project Management function is performed by our team, and the Sponsor is Transport for NSW (TfNSW).

A diagram of a company

Description automatically generated

## Risk Severity Matrix

A screenshot of a graph

Description automatically generated

### Footnotes:

Risk Likelihood:

1. Extremely Unlikely (<10 %): Almost never occurs, except under minor or exceptional conditions.
2. Remote Possibility (greater or equal to 10% and less then 40%): Not expected to happen, though weak precautions could leave a small chance.
3. Possible Occur (greater or equal to 40% and less then 60%): Could occur and has appeared in the history of comparable projects.
4. Will Probably Occur (greater or equal to 60% and less then 90%): Probable happen and has happened frequently on similar projects.
5. Almost Certain (greater then 90%): Expected to occur in most situations.

Risk Severity:

1. Insignificant: the cost impact is the lowest only around less then 1 percentage and schedule impact is also the lowest, will cause less then 3 days delay.
2. Minor: The cost impact is around 1 to 2 percentage, and will cause 3-7days delay
3. Moderate: The cost impact is around 2 to 5 percentage and will cause 1-2 weeks delay.
4. Major: The cost impact is around 5 to 10 percentage and will cause 2-4 weeks delay.
5. Critical: The cost impact is more than 10 percentage and will cause more than 4 weeks delay.

Risk Assessment Rating:

Risk Assessment Rate = Risk Likelihood \* Risk Severity. Risk Assessment Rate can be classified into four levels: from 0 to 5 is low risk, from 6 to10 is moderate risk, from 11 to 15 is high risk and from 16-25 are unacceptable risk.

# Risk Register

Since there are 53 risk cases, hence only top 10 of them are shows here and rest of them are show in Approach.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Task ID** | **Risk Code** | **Category** | **Risk Event** | **Score** | **Strategy** | **Response** | **Contingency** | **Owner** | **Contingency Fund** |
| 1.4.1; 1.4.2; 1.4.3; 1.4.4; 1.4.5; 1.4.6; 1.4.7 | S1 | Schedule | Limited/cancelled access windows | 20 | Mitigate | Plan to possessions process; Flexible sequencing; Prefabrication | Smaller install windows; 10% schedule buffer | Sydney Trains – Rail Operations Centre | $102.70 |
| 1.3.3; 1.6.2; 1.6.3; 1.7.2; 1.9.3 | S3 | Schedule | Procurement lead times slip due to supply chain | 16 | Mitigate | Early POs; multi-vendor options; Framework stock | Expedite budget; pre-qualified alternates | Hardware supplier | $5,024.84 |
| 1.6.4; 1.6.7; 1.10.4; 1.7.3; 1.3.5 | T1 | Technical | Sensor occlusion causes blind spots/degraded counts | 16 | Mitigate | Multi-angle LiDAR + thermal overlap; Tune models; Monitor thresholds | Design redundancy; 10% extra sensors; Scheduled retraining | Hardware supplier | $3,647.16 |
| 1.4.1; 1.4.2; 1.4.3; 1.4.4; 1.4.5; 1.4.6; 1.4.7 | T8 | Technical | Cybersecurity vulnerabilities | 15 | Mitigate | Align with NSW cyber policy; MFA; Hardening | Annual pen test; SOC monitoring; Isolation runbook | Digital NSW – Cyber Security NSW | $234.43 |
| 1.2.1; 1.5.1; 1.1.3 | C1 | Cost | Hardware cost increases (GPU/camera/LiDAR, FX) | 12 | Transfer | FX hedging; Price locks; pre-approved alternates | hardware contingency | Design & Integration Vendors | $12,562.10 |
| 1.3.1; 1.3.2; 1.3.3; 1.3.4; 1.3.5; 1.1.1; 1.10.4 | C4 | Cost | Possession over-runs cause extra fees | 12 | Mitigate | Tight method statements; Pre-staging; Go | Contingency weekend shift allowance | Design & Integration Vendors | $1,211.76 |
| 1.1.6; 1.1.3; 1.3.1; 1.3.2; 1.3.3; 1.3.4; 1.3.5 | S2 | Schedule | Design approvals/waivers take longer | 12 | Mitigate | Engage standards portal early; Track approvals on critical path | 2–3 weeks float; Escalation path | Design & Integration Vendors | $735.11 |
| 1.9.4; 1.7.4; 1.7.3; 1.8.3 | S6 | Schedule | Late stakeholders change requests | 12 | Mitigate | Change board; Freeze windows; Early demos | Scope buffer; Next release deferral | Design & Integration Vendors | $8468.37 |
| 1.6.4; 1.6.7; 1.7.4; 1.9.4 | T10 | Technical | Reliability/failover gaps during events | 12 | Mitigate | HA design; Watchdogs; Auto-restart | Spare node; Runbook; Extra on-call for events | Design & Integration Vendors | $258.19 |
| 1.4.1; 1.4.2; 1.4.3; 1.4.4; 1.4.5; 1.4.6; 1.4.7 | T20 | Technical | Cloud/managed service outage degrades availability | 12 | Mitigate | Multi-AZ/Region; SLOs | Edge caching; Degraded mode; Rollback plan | Design & Integration Vendors | $305.71 |

# Monitor and Risk Control

To monitoring and controlling risk, we decided to perform internal risk audits every two weeks, or whenever requested by project stakeholders and perform external risk audits whenever the steering committee considers it necessary or at key milestones. Additional, applying quantitative analysis to iteratively update the Risk Register as more data arises throughout the process.

# 7. Communication Plan

## 7.1. Project Information System Table

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Communication  Level | Type | Objective | Owner | Recipient | Frequency | Method | Notes |
| Governance & Control | Steering Committee Meeting | Approve stage gates, resolve escalations, monitor value delivery | Project Sponsor | Minister for Transport, Secretary of Transport, Sydney Trains CEO, TfNSW Deputies | Monthly and at stage gates | Face-to-face meeting with presentation | Minutes distributed within 24 hours; decisions logged in governance plan (1.1.1) |
| Project Status Report | Track schedule/cost performance, risks, issues, milestones | Project Manager | Steering Committee, Project Director, Key Stakeholders | Weekly | Email with attached report | Use EVA metrics (1.1.4.2); escalate if SPI/CPI < 0.9 |
| Risk & Issue Register Update | Identify, assess, monitor project risks and issues | Project Manager | Project Director, Systems Architect, Steering Committee | Weekly and as needed | Shared register with email alerts | High risks (>15) escalated to Steering Committee (1.1.5) |
| Change Request Notice | Approve or reject changes to scope, schedule, or budget | Project Manager | Project Sponsor, Steering Committee, affected stakeholders | As required | Email with change request form | Changes above threshold need Sponsor approval; log maintained (1.1.6) |
| Primary Stakeholders | Kick-off Meeting | Introduce project, confirm objectives, roles, governance | Project Manager | All internal stakeholders, key external partners | Once at project start | Face to face workshop | RACI confirmed (1.1.2.1); attendance recorded |
| Technical Review Meeting | Review and approve architecture, integration, security design | Project Director / Chief Architect | Systems Architect, Design Lead, Engineers, Cyber Security NSW | At design milestones | Face to face meeting with technical documents | Sign-off required for architecture (1.3.1.2), integration (1.3.4), AI ethics (1.6.3.2) |
| Operational Readiness Review | Confirm go-live readiness: runbooks, support, training, rollback | Operational Readiness Lead | Sydney Trains Rail Ops, Station Ops Managers, Maintenance | Before commissioning | Face to face meeting with handover documents | SOPs, operator guides (1.10.2), maintenance schedule (1.10.3) delivered |
| Secondary Stakeholders | Safety Review & Approval | Ensure safety compliance for installation and operation | Field installation supervisor / commissioning engineer | ONRSR, Sally Webb, WHS team | Before site work and commissioning | Meeting with safety documentation | Job Safety Analysis (1.2.2.1), Method Statement (1.5.1.1); ONRSR sign-off required |
| Cyber Security Review | Validate security architecture, data protection, compliance | Systems Architect | Cyber Security NSW, ICT Infrastructure team | At design and deployment | Meeting with security documentation | NSW Cyber Security Policy compliance (1.10.4.1); penetration testing if required |
| AI Ethics Review Workshop | Assess AI model for bias, fairness, privacy, ethics | Data / Algorithms Engineers | Digital NSW AI Committee, Project Director, ATAC | Once during model training | Workshop with assessment documents | Model evaluation metrics reviewed; ethics sign-off required before deployment (1.6.3.2) |
| Community Consultation | Inform local residents/businesses about installation activities and benefits | Project Manager | Local residents, businesses, local councils | Before site work and quarterly | Information sessions, notices, website updates | Address noise and privacy concerns per environmental assessment (1.2.4) |
| Technical Coordination | Site Access & Possession Coordination | Coordinate site access windows, safety requirements, possession schedules | Site Access & Liaison Officer | TAM NSW, Station Ops Managers, Installation Supervisor | Weekly and 48 hours before site work | Email with shared schedule | Apply for possessions (1.2.1.1); communicate window changes immediately |
| Installation Progress Meeting | Monitor installation progress, resolve site issues, confirm quality | Field Installation Supervisor | Electricians, Data Cablers, PM, Systems Engineer | Daily during installation | Toolbox talk and site walkthrough | Pre-installation checklist sign-off (1.5.2); smoke tests logged (1.5.3.3) |
| Integration & Test Coordination | Plan and execute integration, calibration, end-to-end tests, defects | Test / QA Engineer | Systems Engineers, Software teams, Commissioning Engineer | Weekly during integration/test phases | Meeting with test log | Test procedures defined (1.3.5); test logs maintained (1.7.4.1); defects tracked |
| Commissioning & Acceptance Briefing | Present test results, acceptance criteria, certification | Commissioning Engineer / PM | Project Sponsor, Independent Certifier, ONRSR | At Factory Acceptance Test, Site Acceptance Test, Go-Live | Formal presentation with test reports | FAT, SAT, performance, reliability, pilot reports reviewed; acceptance checklist signed (1.1.7.1) |

## 7.2. PMBOK Referenced PM Methods Used in Communications

1. Plan Communications Management (PMBOK Section 10.1): Planning communications involved determining the information needs of stakeholders and defining the communication approach. It included analysing stakeholder requirements to establish types of information to be communicated, frequency, methods, and responsibilities, as documented in the Project Information System Table.
2. Manage Communications (PMBOK Section 10.2): Management of communications will ensure the effective creation, collection, distribution, storage, access, and final handling of project information. The methods documented in the Project Information System Table will be used to ensure timely and appropriate distribution of information to stakeholders.
3. Monitor Communications (PMBOK Section 10.3): Throughout the project, communications will be monitored to ensure that the planned approach is effectively meeting stakeholder needs and project objectives. Feedback mechanisms and regular reviews will be used to assess communication effectiveness and make adjustments as necessary.

# 8. Human Resources (HR) Management Plan

8.1. Project Organisation Chart

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8.2 Roles and Responsibilities Table

|  |  |
| --- | --- |
| Role | Responsibilities |
| Project Sponsor | Approval stage gates and final acceptance  Define business objectives and budget limits  Resolve escalations across agencies  Oversee value delivery and compliance |
| Project Director / Chief Architect | Govern architecture and privacy/security-by-design  Chair critical technical reviews and gates  Approve technical direction and waivers  Monitor technical impact of high-risk changes |
| Project Manager | Own scope, schedule, cost, and quality  Run governance, comms, risk and change control  Coordinate access and possession windows  Organise cutover, readiness, and acceptance |
| Systems Architect / Design Lead | Produce and review system/interface/security designs  Govern compute, network and compatibility choices  Establish configuration baselines and version locks  Guide integration, calibration and E2E approach |
| Systems / Integration Engineers | Draft detailed HW design and cabling plans  Perform PoE budgeting and UPS/enclosure checks  Execute integration, calibration and E2E tests  Produce redlines and asset tagging |
| Data / Algorithms Engineers | Design data pipeline and monitoring  Govern and version datasets  Train and evaluate models, report metrics  Provide model risk/bias notes |
| Backend / Platform Engineers | Build service skeleton and authentication  Design databases and migrations  Deploy cloud resources and observability  Ensure performance and stability |
| Web Frontend Engineers | Implement web UI and interactions  Integrate APIs and data binding  Ensure accessibility and responsiveness  Support integration and bug fixes |
| Mobile Engineers | Develop core mobile features  Handle packaging and store compliance  Integrate backend and notifications  Optimise performance and compatibility |
| API / SDK Engineers | Define and maintain Open API specifications  Design endpoints, pagination and error contracts  Coordinate front-end and back-end integration  Ensure security, quotas and versioning |
| Procurement Officer | Run RFQs, POs and expediting  Manage warranty, spares and supplier performance  Maintain inventory and goods-in records  Ensure materials/tools readiness |
| Document Controller | Enforce document control and versions  Compile publications, sign-offs and month-end inputs  Collect test/commissioning/acceptance evidence  Maintain asset and maintenance registers |
| Survey Technician | Perform walkthroughs and 3D laser scans  Process imagery/point cloud to maps.  Produce survey reports and annotations  Share data with design/installation |
| Site Access & Liaison Officer | Apply for and manage possessions/passes  Coordinate station schedules and constraints  Manage access control and safety briefings  Communicate window changes and impacts |
| Field Installation Supervisor | Enforce method statement and safety  Schedule crews and control quality/progress  Verify materials/tools readiness  Drive issue closure and re-tests |
| Electrician / Data Cabler | Install enclosures, mounts and cameras  Pull and terminate power/data cables  Dress/label cables and smoke tests  Support calibration and on-site tweaks |
| Commissioning Engineer | Execute commissioning checklists and evidence  Coordinate multi-discipline testing and drills  Produce and submit commissioning certificates  Assist rectifications and re-tests |
| Test / QA Engineer | Define test strategy and procedures  Run bring-up, logging and calibration  Execute E2E tests and defect closure  Deliver performance/reliability/pilot reports |
| Operational Readiness Lead | Write operation manuals and SOPs  Organise support handover and training  Define alerting, backup and rollback  Verify support and duty arrangement |

8.3 Position Descriptions

**Project Sponsor**

Responsibility Overview

The Project Sponsor provides strategic direction and funding stewardship, aligning project outcomes with the agency’s mission and public value. Acting as the executive escalation bridge, the Sponsor approves irreversible decisions at key milestones while overseeing compliance and overall risk posture.

WBS Responsibilities

Approval stage gates and final acceptance: 1.1.1.4, 1.8.2.1, 1.9.1.1–1.9.1.2, 1.9.2.1–1.9.2.2

Define business objectives and budget limits：1.1.1.1–1.1.1.3

Resolve escalations across agencies：1.8.1.1–1.8.1.2

Oversee value delivery and compliance：1.8.3.1–1.8.3.2, 1.9.3.1, 1.9.4.1, 1.9.5.1–1.9.5.2

**Project Director / Chief Architect**

Responsibility Overview

Owns system architecture and privacy/security-by-design, ensuring technical direction is feasible, compliant, and operable. Chairs critical reviews and stage gates, approves technical waivers, and controls the impact of high-risk changes. Oversees integration and testing to maintain coherence and technical quality end-to-end.

WBS Responsibilities

Govern architecture and privacy/security-by-design：1.3.1.1, 1.3.1.3, 1.10.4.1

Chair critical technical reviews and gate: 1.1.1.4, 1.7.1.1–1.7.4.2

Approve technical direction and waivers: 1.4.3.1–1.4.3.3, 1.6.4.1–1.6.4.3, 1.6.7.1–1.6.7.2

Monitor technical impact of high-risk changes: 1.6.1.1–1.6.3.3

**Project Manager**

Responsibility Overview

The PM owns scope, schedule, cost, and quality, keeping plans transparent and variances controlled for on-time value delivery. They operate governance, communications, risk and change control, and coordinate access, cutover and acceptance to ensure operational readiness.

WBS Responsibilities

Own scope, schedule, cost, and quality: 1.1.3.2–1.1.3.3, 1.1.4.2

Run governance, comms, risk and change control: 1.1.1.1–1.1.1.3, 1.1.2.1–1.1.2.2, 1.1.5.1, 1.1.5.3, 1.1.6.1

Coordinate access and possession windows: 1.2.1.1–1.2.1.2, 1.5.1.1–1.5.1.2

Organize cut-over, readiness, and acceptance: 1.8.1.1–1.8.1.2, 1.1.7.1, 1.9.5.1, 1.10.2.1

**Systems Architect / Design Lead**

Responsibility Overview

Owns system/interface/security design to ensure feasibility, operability and compliance; establishes configuration baselines and version locks for stable delivery; and guides integration, calibration and end-to-end test approach to keep the solution coherent.

WBS Responsibilities

Produce and review system/interface/security designs: 1.3.1.1–1.3.1.3, 1.3.2.1, 1.3.2.3

Govern compute, network and compatibility choices: 1.4.3.1–1.4.3.2, 1.4.4.1, 1.4.6.1, 1.4.7.2

Establish configuration baselines and version locks: 1.5.4.1–1.5.4.2

Guide integration, calibration and E2E approach: 1.7.1.1, 1.7.2.1, 1.7.3.1–1.7.3.2, 1.7.4.1–1.7.4.2

**Systems / Integration Engineers**

Responsibility Overview

Deliver detailed HW design and cabling, drive physical/logic integration across subsystems, and resolve interface/performance issues through bring-up, calibration, and E2E testing. Produce redlines and asset tagging to support commissioning and operations handover.

WBS Responsibilities

Draft detailed HW design and cabling plans: 1.3.2.1, 1.3.2.3, 1.3.4.1–1.3.4.2, 1.6.7.1–1.6.7.2

Perform PoE budgeting and UPS/enclosure checks: 1.4.4.1, 1.4.6.1, 1.4.7.2

Execute integration, calibration and E2E tests: 1.3.5.1–1.3.5.2, 1.5.3.3, 1.7.1.1–1.7.4.2, 1.8.2.1, 1.9.1.1–1.9.2.2, 1.9.3.1, 1.9.4.1

Produce red-lines and asset tagging: 1.5.5.1, 1.8.3.1

**Data / Algorithms Engineers**

Responsibility Overview

Own the implementation and operability of the data pipeline and monitoring to ensure data quality and traceability. Govern and version datasets for reproducible training/evaluation, and provide auditable evidence and notes on model performance and risk/bias.

WBS Responsibilities

Design data pipeline and monitoring: 1.6.1.1–1.6.1.2

Govern and version datasets: 1.6.2.2

Train and evaluate models, report metrics: 1.6.3.1

Provide model risk/bias notes: 1.6.3.3

**Back-end / Platform Engineers**

Responsibility Overview  
English: Deliver back-end services and auth frameworks, design databases and migrations for evolvability, and deploy cloud infrastructure with observability. Maintain performance and stability through logging/monitoring and capacity management.

WBS Responsibilities

Build service skeleton and authentication: 1.6.4.1

Design databases and migrations: 1.6.4.2

Deploy cloud resources and observability: 1.6.4.3

Ensure performance and stability: 1.7.1.2

**Web Front-end Engineers**

Responsibility Overview  
Deliver maintainable web UI and interactions; integrate with back end; improve usability and experience; support integration and bug fixing.

WBS Responsibilities

Implement web UI and interactions: 1.6.5.1

Integrate APIs and data binding: 1.6.5.1

Ensure accessibility and responsiveness: 1.6.5.1

Support integration and bug fixes: 1.6.5.1

**Mobile Engineers**

Responsibility Overview  
Deliver maintainable core mobile features, integrate reliably with back-end and notifications, and meet app-store compliance; continuously optimise performance and compatibility for a coherent end-to-end experience.

WBS Responsibilities

Develop core mobile features: 1.6.6.1

Handle packaging and store compliance: 1.6.6.2

Integrate back-end and notifications: 1.6.6.1

Optimize performance and compatibility: 1.6.6.1

**API / SDK Engineers**

Responsibility Overview  
Accountable for standardized, maintainable Open APIs with clear, stable, and auditable contracts. Acts as the interface gatekeeper across front-end and back-end, governing security, quotas, and versioning to reduce integration and evolution risks.

WBS Responsibilities

Define and maintain Open API specifications: 1.6.7.1

Design endpoints, pagination and error contracts: 1.6.7.2

Coordinate front-end and back-end integration: 1.6.7.1

Ensure security, quotas and versioning: 1.6.7.2

**Procurement Officer**

Responsibility Overview

Owns end-to-end procurement delivery—from RFQs and POs to expediting and receipt—while managing warranty/spares and supplier performance. Maintains material ledgers/goods-in records and ensures all materials/tools are ready before installation.

WBS Responsibilities

Run RFQs, POs and expediting; 1.4.1.1, 1.4.1.2, 1.4.2.1, 1.4.2.2, 1.4.4.2, 1.4.4.3, 1.4.7.3

Manage warranty, spares and supplier performance: 1.4.1.3, 1.4.7.1

Maintain inventory and goods-in records: 1.4.5.1, 1.4.5.2

Ensure materials/tools readiness: 1.5.2.1, 1.5.2.2, 1.4.6.2

**Document Controller**

Responsibility Overview

Establishes and enforces document control to keep deliverables traceable, auditable, and version-consistent; compiles publications/signoffs and month-end inputs; archives test/commissioning/acceptance evidence; and maintains asset and maintenance registers for operational handover.

WBS Responsibilities

Enforce document control and versions: 1.8.3.2

Compile publications, signoffs and month-end inputs: 1.1.2.3, 1.1.4.1, 1.10.2.2, 1.9.5.2

Collect test/commissioning/acceptance evidence: 1.5.5.2, 1.8.2.2, 1.10.4.2

Maintain asset and maintenance registers: 1.10.3.1–1.10.3.2

**Survey Technician**

Responsibility Overview  
Conducts platform walkthroughs and 3D laser scans, ensuring complete and usable data capture; processes imagery/point clouds into maps and delivers survey reports, sharing outputs with design and installation teams.

WBS Responsibilities

Perform walkthroughs and 3D laser scans: 1.2.3.1, 1.2.3.2

Process imagery/point cloud to maps: 1.2.3.2

Produce survey reports and annotations: 1.2.3.3

Share data with design/installation: 1.2.3.3

**Site Access & Liaison Officer**

Responsibility Overview  
Applies for and manages possessions/passes and acts as the single point of contact with the station, coordinating work windows and on-site constraints. Orchestrates access and safety communication and promptly communicates impacts/mitigations when windows change.

WBS Responsibilities

Apply for and manage possessions/passes: 1.2.1.1

Coordinate station schedules and constraints: 1.2.1.2

Manage access control and safety briefings: 1.2.1.2

Communicate window changes and impacts: 1.2.1.2

**Field Installation Supervisor**

Responsibility Overview  
Enforces the method statement and safety controls on site, scheduling crews and pacing work to meet quality and progress targets. Verifies materials/tools readiness before start, and drives prompt rectification and re-tests to clear issues ahead of installation and commissioning.

WBS Responsibilities

Enforce method statement and safety: 1.5.1.1

Schedule crews and control quality/progress: 1.5.1.2

Verify materials/tools readiness: 1.5.2.1

Drive issue closure and re-tests: 1.5.2.2

**Commissioning Engineer**

Responsibility Overview

Executes commissioning checklists with proper evidence, coordinates multi-discipline FAT/SAT and drills, and supports defect rectification and re-tests to bring the system to an operational standard.

WBS Responsibilities

Execute commissioning checklists and evidence: 1.8.2.1

Coordinate multi-discipline testing and drills: 1.9.1.1–1.9.1.2, 1.9.2.1–1.9.2.2

Produce and submit commissioning certificates: 1.8.2.1

Assist rectifications and re-tests: 1.9.3.1, 1.9.4.1

8.4 Project Staffing Strategy

8.5 PMBOK Referenced PM Methods Used in HR Plan