

# Sydney Metro Greater West Business Case Assessment

Individual Assignment  
The University of Sydney

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## Executive Summary

The Sydney Metro Greater West is \$15-20 billion, highly prioritised, mega-project in its preliminary procurement stage, amidst a global crisis. This report assesses Greater West's business case, procurement, governance and risk allocation through publicly accessible information. Problems, possible and/or probable, were then derived.

Studies have concluded that outdated airport customer volumes, railway patronage and population growth forecasts have cast a shadow on the economic viability of Sydney Metro Greater West, while the market becomes increasingly averse to risk and lacks high-level skills. Australian government moves towards a more collaborative contracting strategy, while market performance drivers are low.

As a result, recommendation surrounding an updated patronage study of Sydney Airport, population growth in Western Sydney and rail patronage to justify and forecast when Sydney Metro Greater West will become economically viable and if it can become financially viable. Improved communication practices between government is also recommended due to a council outcry, recommendations to use franchise contracting with an incentivised performance regime for the operations and maintenance package and to join the rolling stock and signalling & train control procurement packages as it splits suitably for market appetites considering Sydney Metro Greater West has three stages announced so far.

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## Acronyms

PPP – Private-Public-Partnership

SIS – State Infrastructure Strategy

SMGW - Sydney Metro Greater West

WPC - Western Parkland City

WSA – Western Sydney Airport

WSCD – Western Sydney City Deal

WSIP – Western Sydney Infrastructure Plan

# 1. Introduction

The Sydney Metro Greater West is a massive NSW rail infrastructure mega-project in a tumultuous time, and in its early stages, making it a prime candidate for study. This report assesses the issues and problems that can be derived and indicated towards, for the Sydney Metro Greater West project. This project is assessed and examined in terms of its business case, governance structures, procurement strategy and risk allocation. Where information absent, derived solution and best indications based off available information will be determined. Recommendations to solve, remedy or mitigate realised and treatable issues are provided in the Recommendations section.

## 2. Project Assessment

The Sydney Metro Greater West (SMGW) business case, governance arrangements, procurement strategies and risk allocation will be assessed to identify and address issues. The project will be compared against similar projects to determine suitability of strategies, justifications of the project and approaches in the project. The Sydney Metro programme comprises of the following projects<sup>1</sup>:

- Sydney Metro Northwest - \$8.3 billion
- Sydney Metro City & Southwest - \$12.5 billion
- Sydney Metro West - ~\$6.4-10 billion
- Sydney Metro Greater West - ~\$15-20 Billion

### 2.1. Business Case

#### 2.1.1. *Project rationale and Problem Resolution*

The SMGW Project is intended to service the new Western Sydney Airport (WSA) purposed to serve the growing travel volumes experienced by Sydney International Airport. The proposed route is to run from Rouse Hill via Western Sydney Airport and Badgerys Creek Aerotropolis<sup>2</sup>.

#### 2.1.2. *Alignment with Government's Strategic Plans and Priorities*

This route serves multiple purposes supporting city shaping objectives in Western Sydney and help establish Western Parkland City (WPC) which aligns with Infrastructure NSW's State Infrastructure Strategy 2018-2038 (SIS) and the Western Sydney City Deal (WSCD). The railway develops Western Parkland City (WPC) connectivity by linking the Campbelltown – Macarthur region, the Western Sydney Aerotropolis and the Greater Penrith region depicted in route 1 in Figure 1<sup>3</sup> and Figure 2<sup>4</sup> below.

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<sup>1</sup> 'Project - Infrastructure Pipeline', in *Australian & New Zealand Infrastructure Pipeline*. May 2020, viewed on 25 May 2020, <https://infrastructurepipeline.org/project/sydney-metro/>

<sup>2</sup> 'Project - Infrastructure Pipeline', in *Australian & New Zealand Infrastructure Pipeline*. May 2020, viewed on 25 May 2020, <https://infrastructurepipeline.org/project/sydney-metro---greater-west/>

<sup>3</sup> Commonwealth of Australia, State of New South Wales, 2018, pp. 13-14

<sup>4</sup> Infrastructure NSW, 2018, pp. 104.

Figure 1 The Preferred Network for Western Sydney

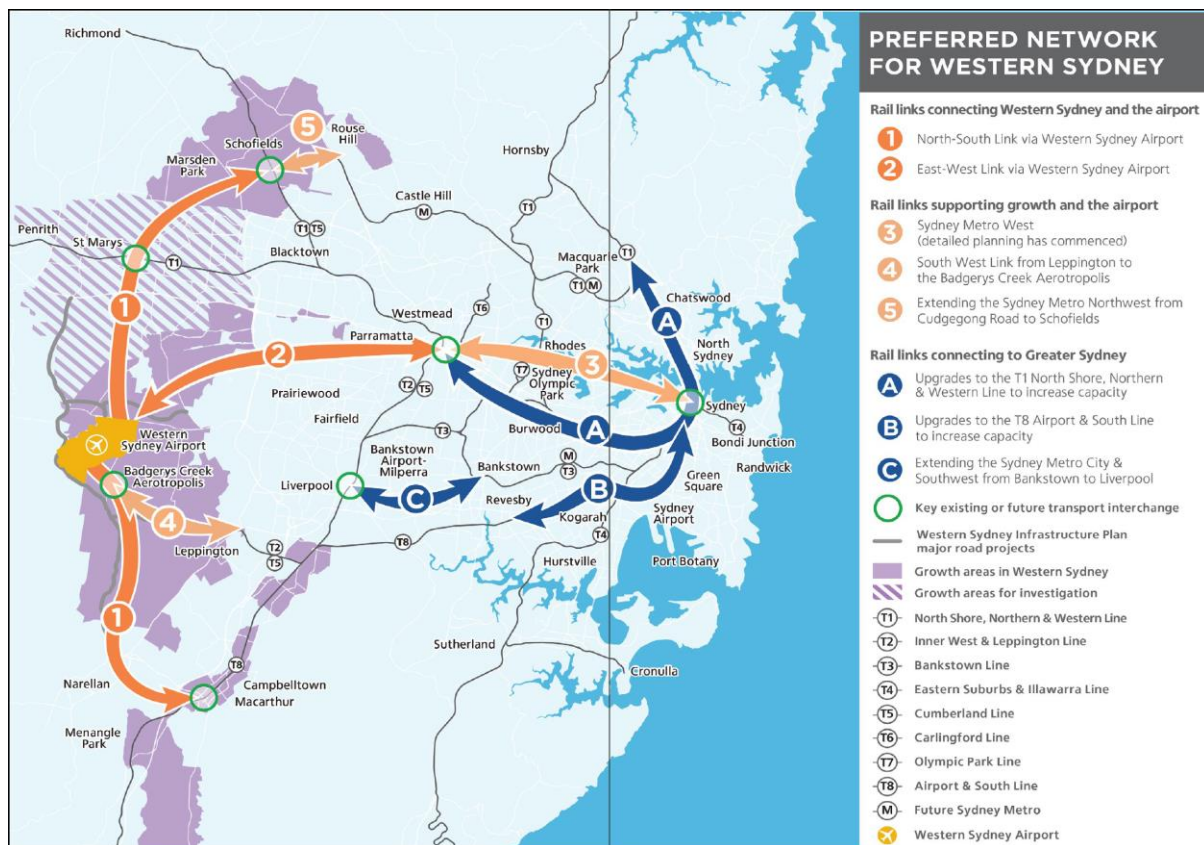
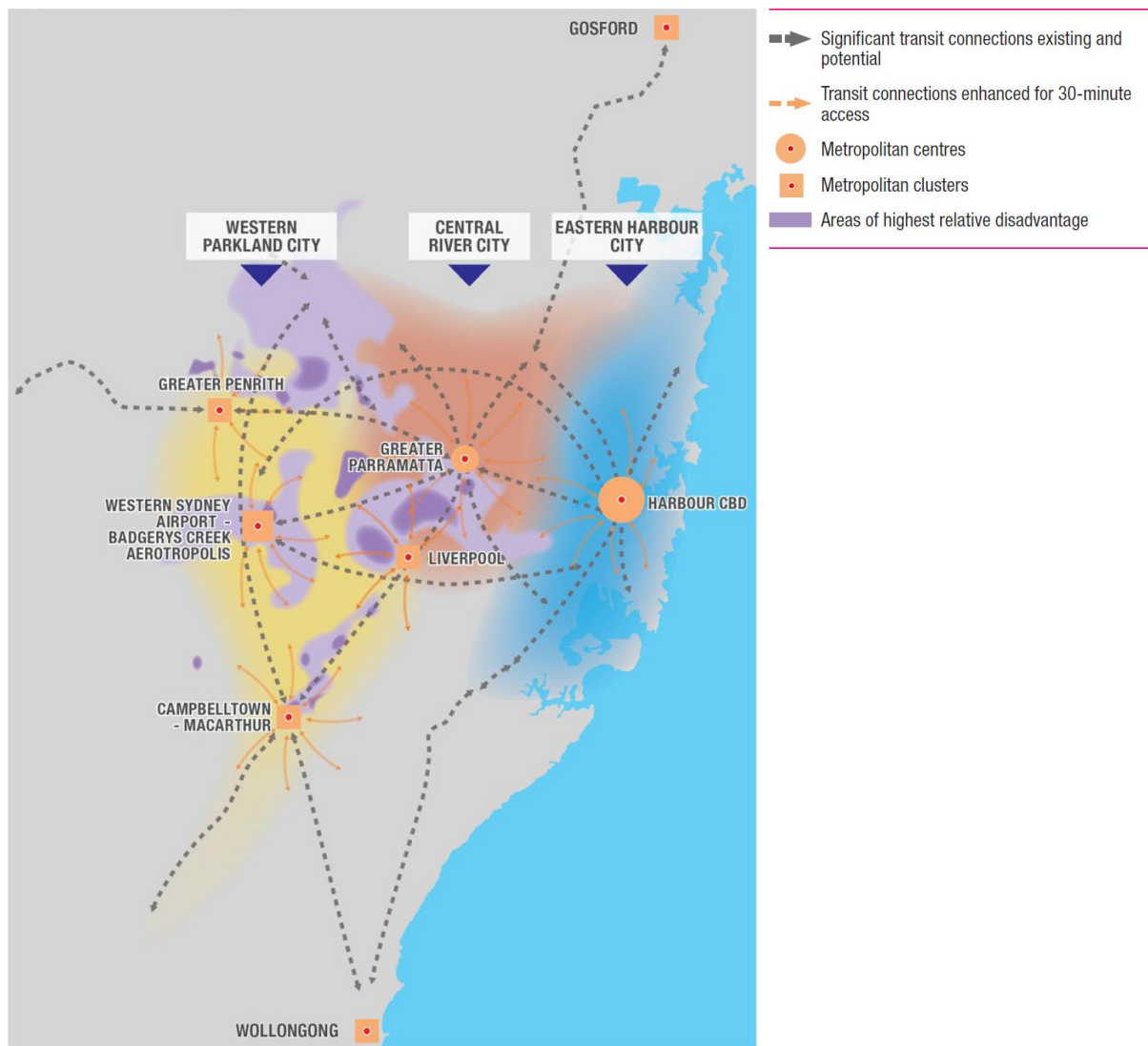


Figure 2 Greater Sydney geographic direction



The rail link will also facilitate opportunities for the socio-economically disadvantaged areas characteristic in the WPC whilst aligning with the major road projects within the Western Sydney Infrastructure Plan (WSIP) depicted in Figure 3<sup>5</sup> and Figure 4<sup>6</sup> below.

<sup>5</sup> Infrastructure NSW, 2018, pp. 112.

<sup>6</sup> *ibid.*, pp. 113.

Figure 3 Western Parkland City Transportation Plan

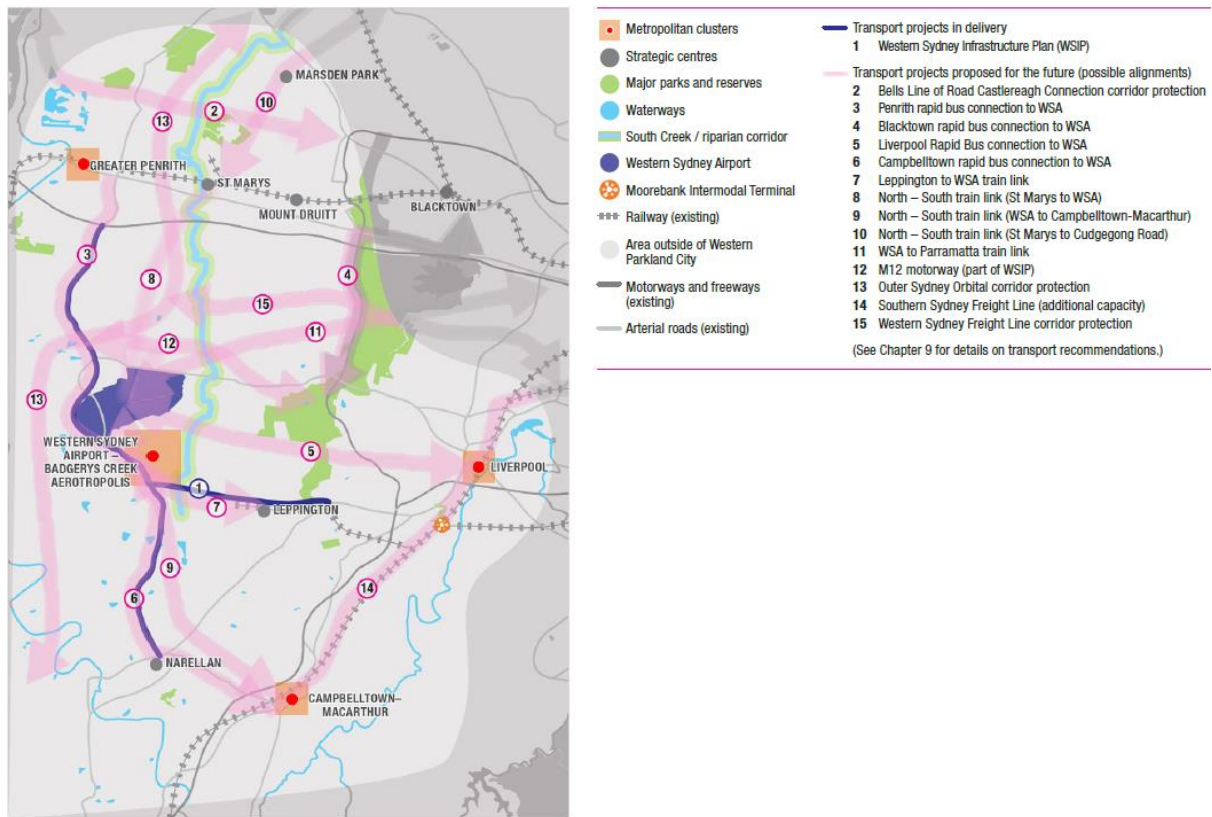
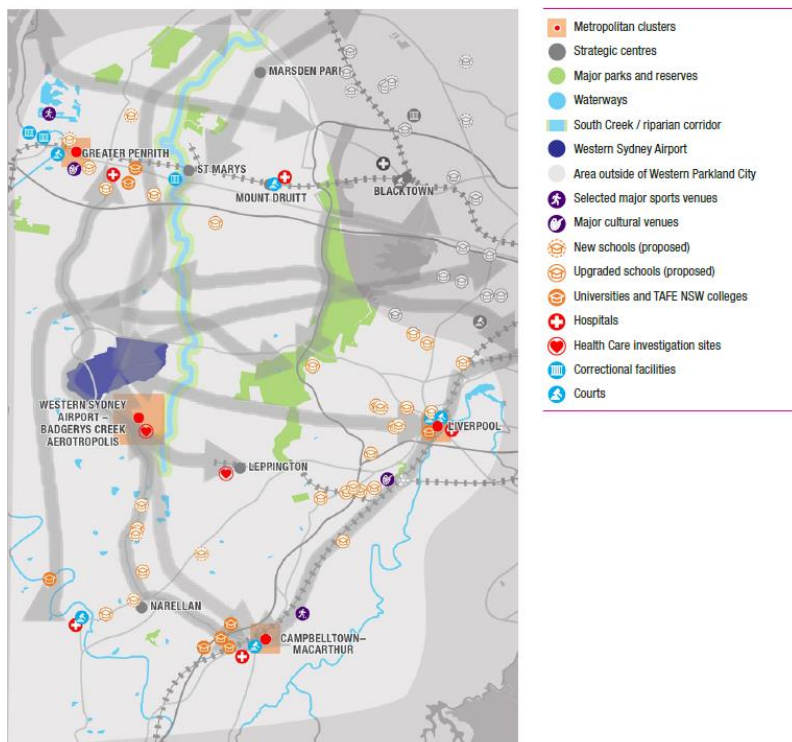


Figure 4 Western Parkland City Civil Plan





### 2.1.3. Current Economic Viability

The SMGW was predicated on the service of the WSA which was necessary for accommodation of the patronage exceeding capacity at Sydney Airport. The SMGW also hinged off forecasted Western Sydney population growth to achieve economic viability within the 2030s<sup>7</sup>. Due to COVID-19 lockdown measures stopping all private international and domestic travel, whilst destroying the global economy, travel patronage has grinded to a halt and the growth population has been left to internal factors, which have further been crippled by social distancing measures and economic ruin. The forecasted population growth assumed levels in aviation patronage through tourism and travel growth trends which were heavily impaired due to the draconian lockdown measures. With these lockdown measures in place, Australians are still highly susceptible to the disease and highly adverse to re-opening international travel, while slowly easing state boarder lockdowns and social distancing measures. The dynamic would allow for near term domestic and interstate travel which'll stimulate the economy but will not replace the \$60 billion travel and tourism industry Australia once had.

On the other hand, the NSW government is recycling assets to raise funds to continue with its \$93 billion infrastructure project pipeline aimed at stimulating the economy over four years<sup>8</sup>, through to 2022-23. \$55.6 billion of this is aimed at road and transport projects<sup>9</sup>. The SMGW still aligns well with state and national strategic plans and priorities. As this subsidiary project finds ground though its alignment with state and national plans and priorities, its primary service, to serve the WSA is undermined by the void of its necessity. With WSA's economic viability in question, SMGW is also put into question by extension, specifically the route SMGW takes and its medium. With the lack of WSA patronage, residual Western Sydney Aerotropolis and WPC benefits remain to be realised as corporate commercial attractions in surrounding business parks will not experience growth due to travel restrictions that will not be lifted for years to come.

With significant economic benefits impaired, justification for the project dwindles and a new objective is required. Even if the project finds a new service, city building, and travel patronage growth is still suboptimal in COVID-19 conditions. The more, the draconian measures are lifted, the more SMGW can benefit.

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<sup>7</sup> Commonwealth of Australia, State of New South Wales, 2018, pp. 7.

<sup>8</sup> 'NSW Budget 2019-20: Building a better NSW', in *NSW Treasury*. June 2019, viewed on 25 May 2020, <https://www.treasury.nsw.gov.au/index.php/news/nsw-budget-2019-20-building-better-nsw>

<sup>9</sup> *ibid*.

#### 2.1.4. Project Alternatives

Post-COVID-19, alternative routes must suffice corridor needs and adhere to standard methodological procedures<sup>10</sup> including:

- Reviewing government policies and strategies
- Site constraints and opportunities
- Options and alignment assessment

Alternative routes will also need to accomplish the project's five strategic objectives<sup>11</sup>:

- Successful Engagement
- Delivery Commitments
- Operational Excellence
- Financial Responsibility
- Workforce Capability

The aforementioned factors in combination with strategic context and existing conditions will be used to derive project alternatives. The do minimum base case may not be the best option, dependant on the performance of recovery, if aviation patronage renormalises, exceeding capacity will become the main driver for SMGW project. SMGW has the added benefits of facilitating growth in the Greater Western region and facilitating travel to predicted areas of highest relative disadvantage (see Figure 2 above). The Western Sydney Infrastructure plan (WSIP) has already been proposed in parallel to the SMGW. The WSIP will provide buses with parallel routes with the SMGW corridors, achieving the same benefits as the SMGW. With bus fares being cheaper than train fares<sup>12</sup>, this 'alternative' serves the same service with greater benefits experienced for disadvantaged areas. While aviation patronage and Greater Sydney's population growth remains questionable, definitive wider economic benefits of SMGW cannot be determined, necessitating economic re-evaluation of the project, while validating the progression of the WSIP and accompanying bus services.

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<sup>10</sup> Ethos Urban Pty Ltd, Aurecon Australasia Pty Ltd, 2018, pp.6, 104-106.

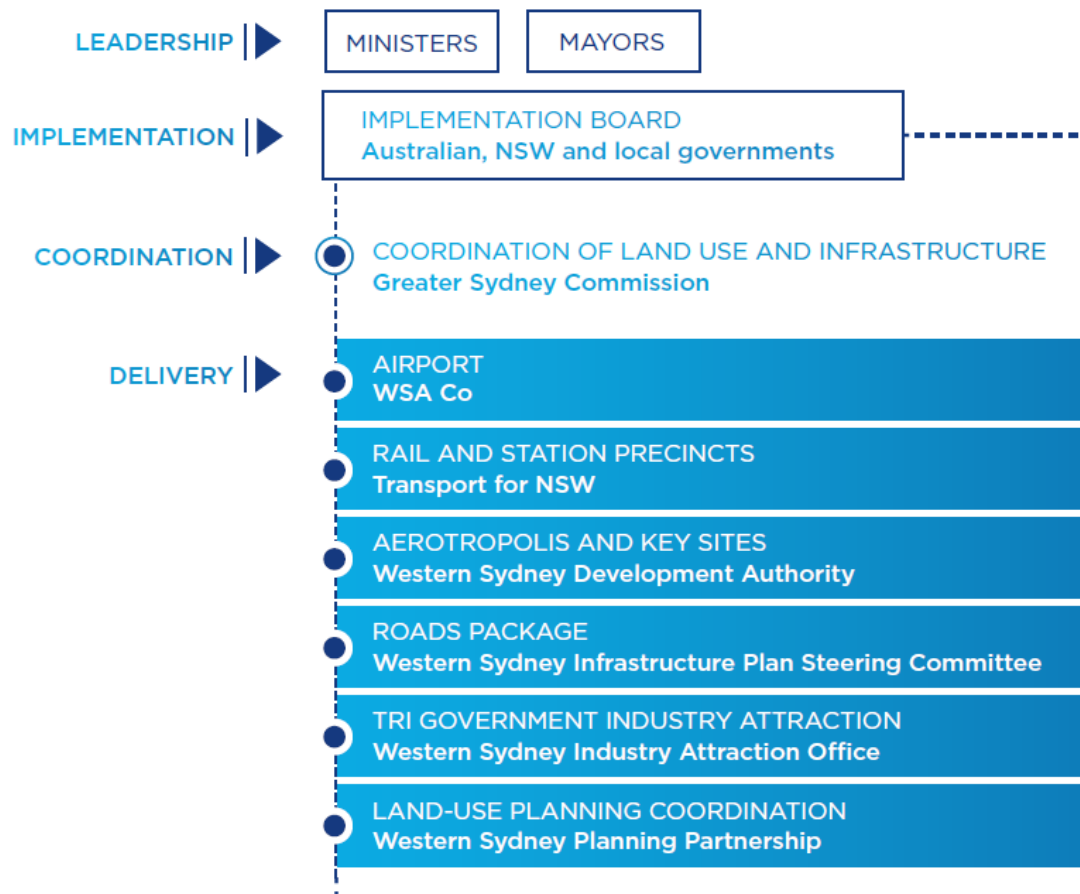
<sup>11</sup> Sydney Metro, 2019, pp.19-20.

<sup>12</sup> 'Adult fares', in *Transport NSW*. May 2020, viewed on 25 May 2020, <https://transportnsw.info/tickets-opal/opal/fares-payments/adult-fares>

## 2.2. Governance

The SMGW is part of the Sydney Metro programme which integrates with other projects within its environment. The programme along with the Western Parkland City development strategy is governed by the WSCD. Figure 5 below details the arranged government governance structure and what projects are included in the arrangement<sup>13</sup>. The local government councils involved in the SMGW project are Blacktown and Penrith City Council<sup>14</sup>.

*Figure 5 Western Sydney City Deal governance & implementation*

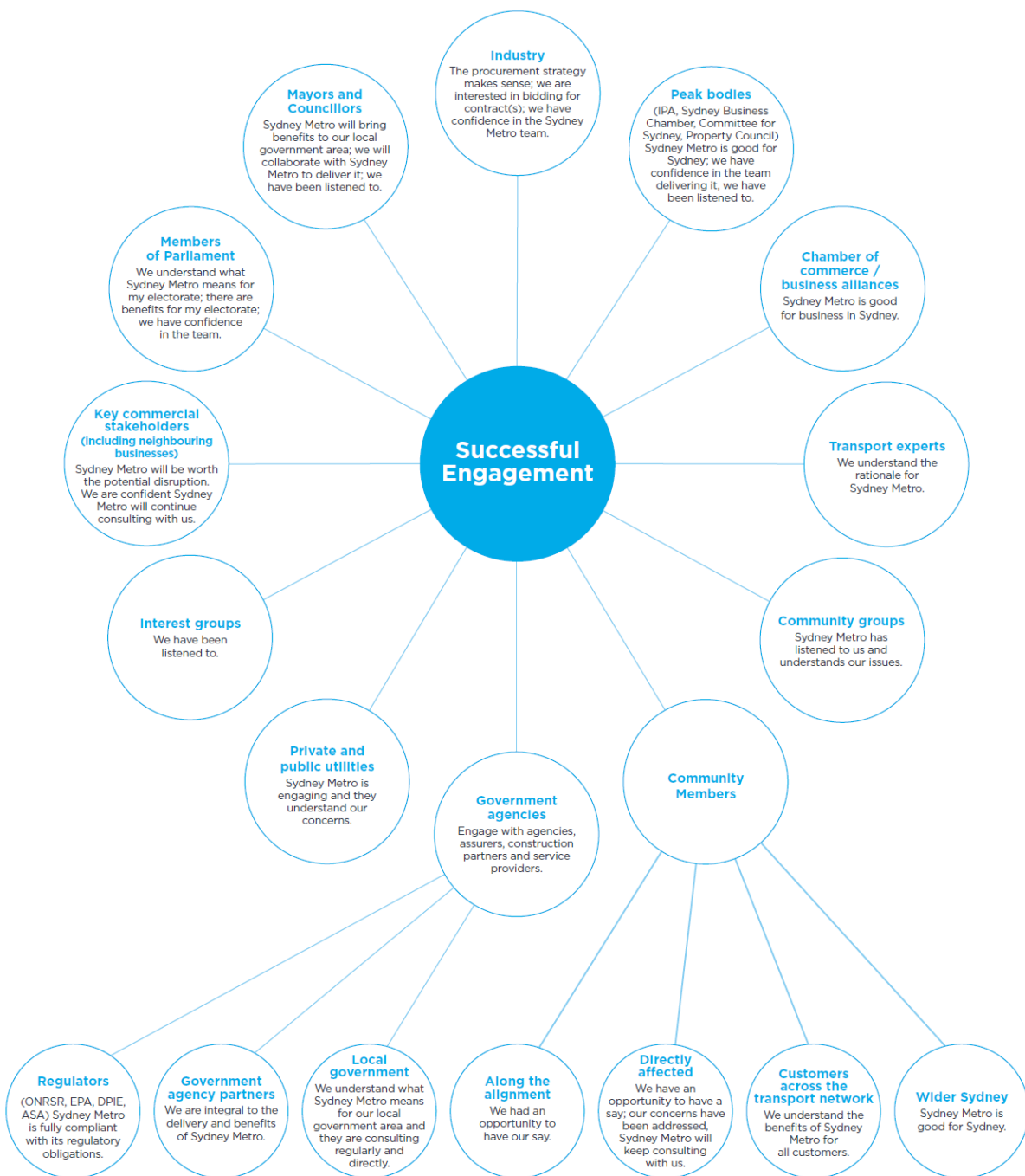


<sup>13</sup> Commonwealth of Australia, 2018, pp.21.

<sup>14</sup> 'Customer survey feedback', in *Sydney Metro*. February 2020, viewed on 26 May 2020, [https://www.sydneymetro.info/sites/default/files/Greater\\_West\\_community\\_survey\\_feedback\\_0.pdf](https://www.sydneymetro.info/sites/default/files/Greater_West_community_survey_feedback_0.pdf)

Sydney Metro's stakeholders are depicted in Figure 6 below<sup>15</sup>.

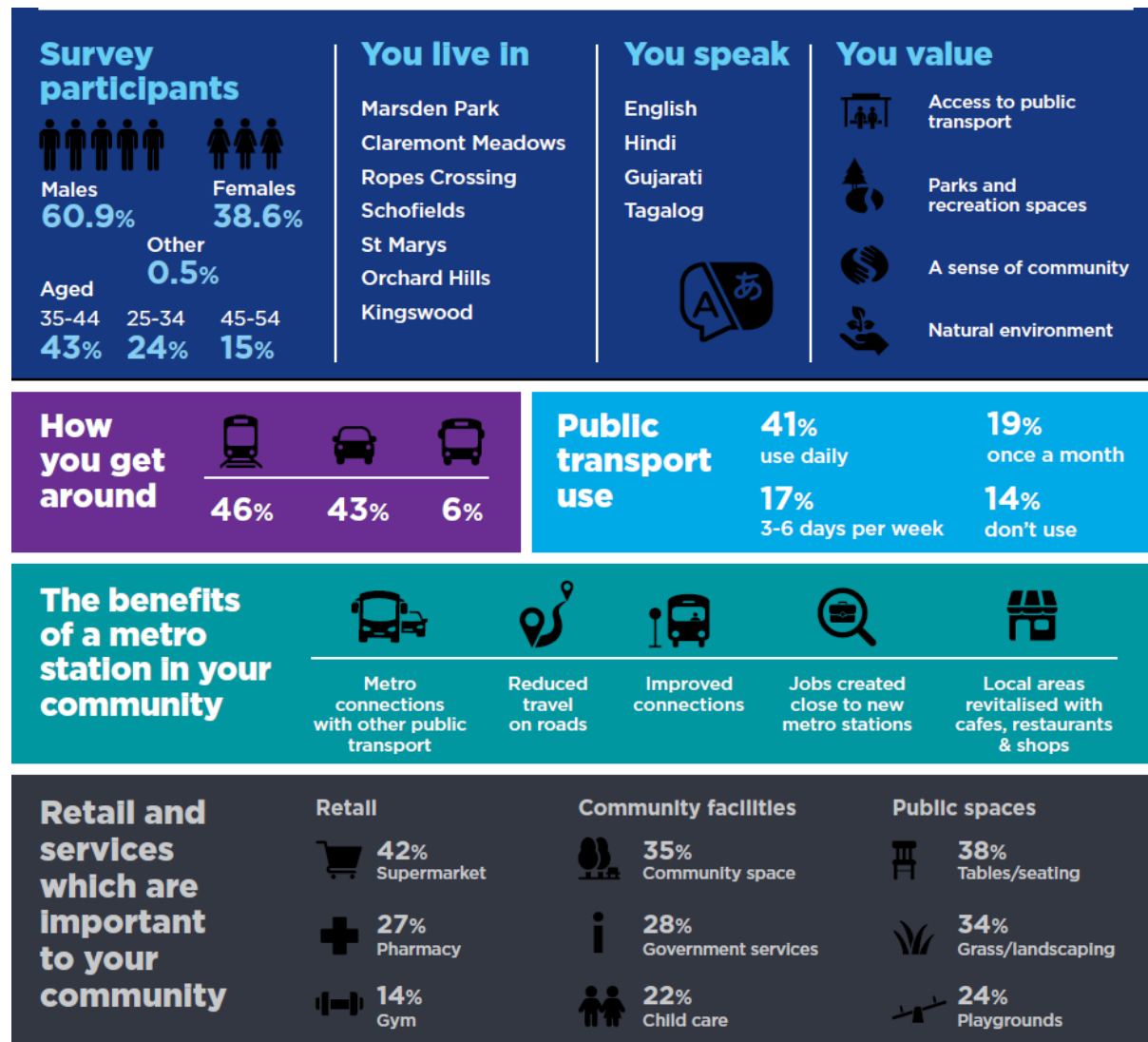
Figure 6 Sydney Metro Stakeholders



<sup>15</sup> Sydney Metro, 2020, pp. 36.

Stage two of industry engagement occurred in 2019<sup>16</sup> and in February 2020, a community survey was conducted to inform strategic planning and future station precincts<sup>17</sup>. Considerations and conclusions of this survey are depicted in Figure 7 and Figure 8 below<sup>18</sup>.

Figure 7 Greater Western Community survey feedback results



<sup>16</sup> 'eTendering - Archived Tender Detail View - SM 2019/010', in NSW Government. May 2019, viewed on 25 May 2020,

<https://tenders.nsw.gov.au/?event=public.rft.showArchived&RFTUID=68B36F94-BC80-E292-A8FA6E09F8073AF3>

<sup>17</sup> 'Project Overview | Sydney Metro', in Sydney Metro. February 2020, viewed on 25 May 2020, <https://www.sydneymetro.info/greaterwest#pid-891651>

<sup>18</sup> 'Community survey feedback', in Sydney Metro. February 2020, viewed on 25 May 2020, [https://www.sydneymetro.info/sites/default/files/Greater\\_West\\_community\\_survey\\_feedback\\_0.pdf](https://www.sydneymetro.info/sites/default/files/Greater_West_community_survey_feedback_0.pdf)

Figure 8 Greater Western Community survey feedback

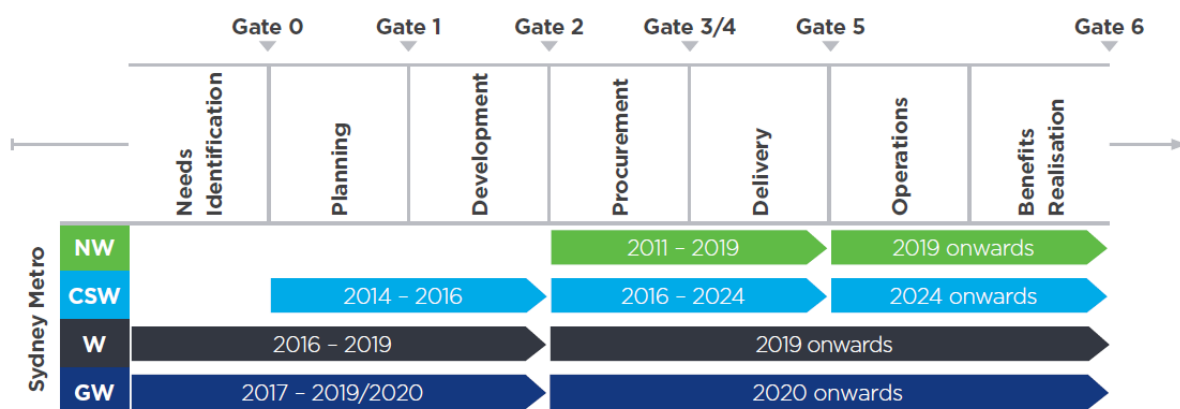


All levels of stakeholders have been addressed in the development of the SMGW project appropriately. The only contention that can be brought to light is the public declaration by Penrith Council of being left in the dark regarding stations and line details<sup>19</sup>.

### 2.3. Procurement strategy

Sydney Metro's 2020 Corporate plan<sup>20</sup> shows (in Figure 9) that procurement methods are in development.

Figure 9 Sydney Metro Project's lifecycle summary



There is no publicly available information surrounding the procurement package nor contracting strategy. In the absence of a publicly accessible procurement strategy, the process for developing a packaging and procurement recommendation will need to be followed to

<sup>19</sup> 'Penrith council calls out government on Western Sydney Airport train infrastructure', in *Gazette*. May 2019, viewed on 25 May 2020, <https://www.bluemountainsgazette.com.au/story/6652910/penrith-council-calls-out-government-on-western-sydney-airport-train-infrastructure/>

<sup>20</sup> Sydney Metro, 2020, pp. 26.

determine the best fit of procurement and packaging methodologies, indicated in Figure 10 below<sup>21</sup>.

*Figure 10 Process for developing packaging and procurement recommendation*



### 2.3.1. Data Gathering

Stages alluded to include:

- Stage 1 – Rouse Hill through WSA to the Aerotropolis
- Stage 2 – St Marys to Schofields and Sydney Metro North West
- Stage 3 – Bringelly in the Aerotropolis to Macarthur

It is also important to consider, in addition to aforementioned project details that:

- NSW government is heading towards more collaborative project procurement and management methods<sup>22</sup>
- The proposed train type of automated, requiring an integrated station
- Industry's reduced appetite for risk<sup>23</sup>
- Government's reduced appetite for interface risks

### 2.3.2. Packaging analysis and procurement options assessment

The justification of adopting the base model for Sydney Metro West's delivery strategy model (Figure 11 on the next page)<sup>24</sup> will be explored. With automated rolling stock and increased focus on decreasing interface risks, an argument towards joining the rolling stock and signalling and train control packages starts to build. A counterargument would be, that this aggregation would lead to increased bidding costs, which industry would be against, as COVID-19 continues to strangle the finances of companies across the board. Government would also be averse to this, as its 5<sup>th</sup> commitment of their commitments to industry is to decrease bidding costs<sup>25</sup>. A counter counterargument would be that since this SMGW is broken up into 3 stages, the aggregation should be more palatable for industry.

Operations and maintenance packaging would have ideally suited the Private-Public-Partnership (PPP) contracting model, but since multiple stages are included, and automated trains require a singular operator, an alternative model would be better value for money. The franchise contract with an incentivised performance regime spanning 5-7 years would provide an enticing contract for SMGW, as the project is planned to span from 2021 to 2026<sup>26</sup>. The proposed model removes the inflexibilities of the PPP model, while preserving key benefits like the implementation of the incentivisation regime.

<sup>21</sup> Economic, Development, Jobs, Transport and Resources, 2016, pp. 229.

<sup>22</sup> NSW Government, 2018, pp. 3.

<sup>23</sup> Preiss & Jacks, 2020

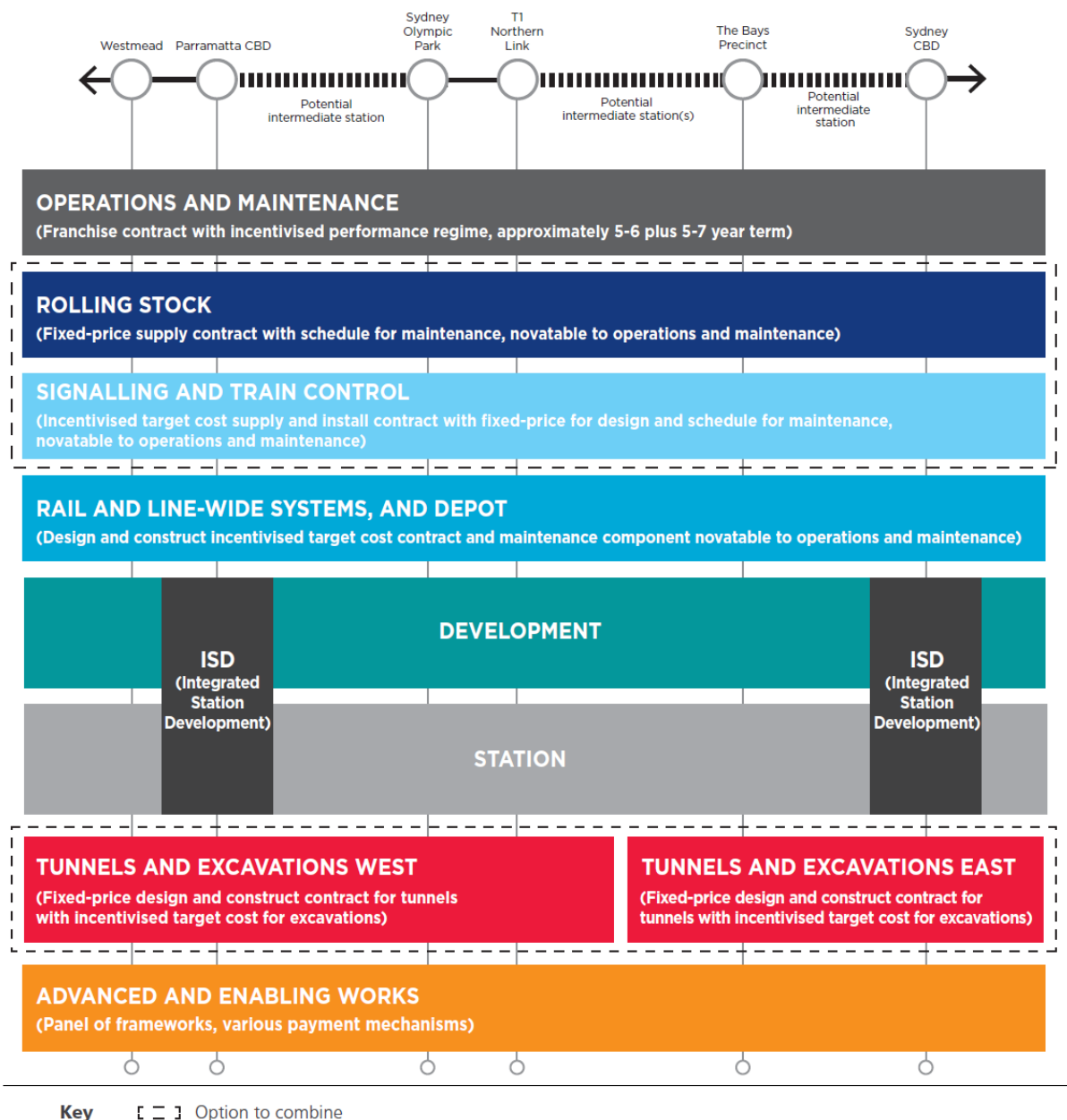
<sup>24</sup> Sydney Metro, 2018, pp. 17.

<sup>25</sup> NSW Government, 2018, pp. 6.

<sup>26</sup> PWC, 2017, pp. 13.



Figure 11 Sydney Metro West delivery strategy



### 2.3.3. Market validation

A snapshot of the heavy industry and other non-building construction in Australia (E3109) industry is provided in Figure 12<sup>27</sup> and Australian transport project performance between 2008 and 2013 is summarised in Figure 13<sup>28</sup> below. Trends indicate low performance drivers and frequent cost overruns, despite performing exceptionally in railway construction compared to other nations. Therefore, Australia has the capacity to deliver SMGW and the incentivised performance regime helps remedy low performance drivers.

<sup>27</sup> 'AUSTRALIA INDUSTRY (ANZSIC) REPORT E3109 | Heavy Industry and Other Non-Building Construction in Australia', in *IBISWorld*. May 2020, viewed on 25 May 2020, <https://www.ibisworld.com/>

<sup>28</sup> L Danks, 2017, pp. 12.



Figure 12 E3109 Industry at a Glance

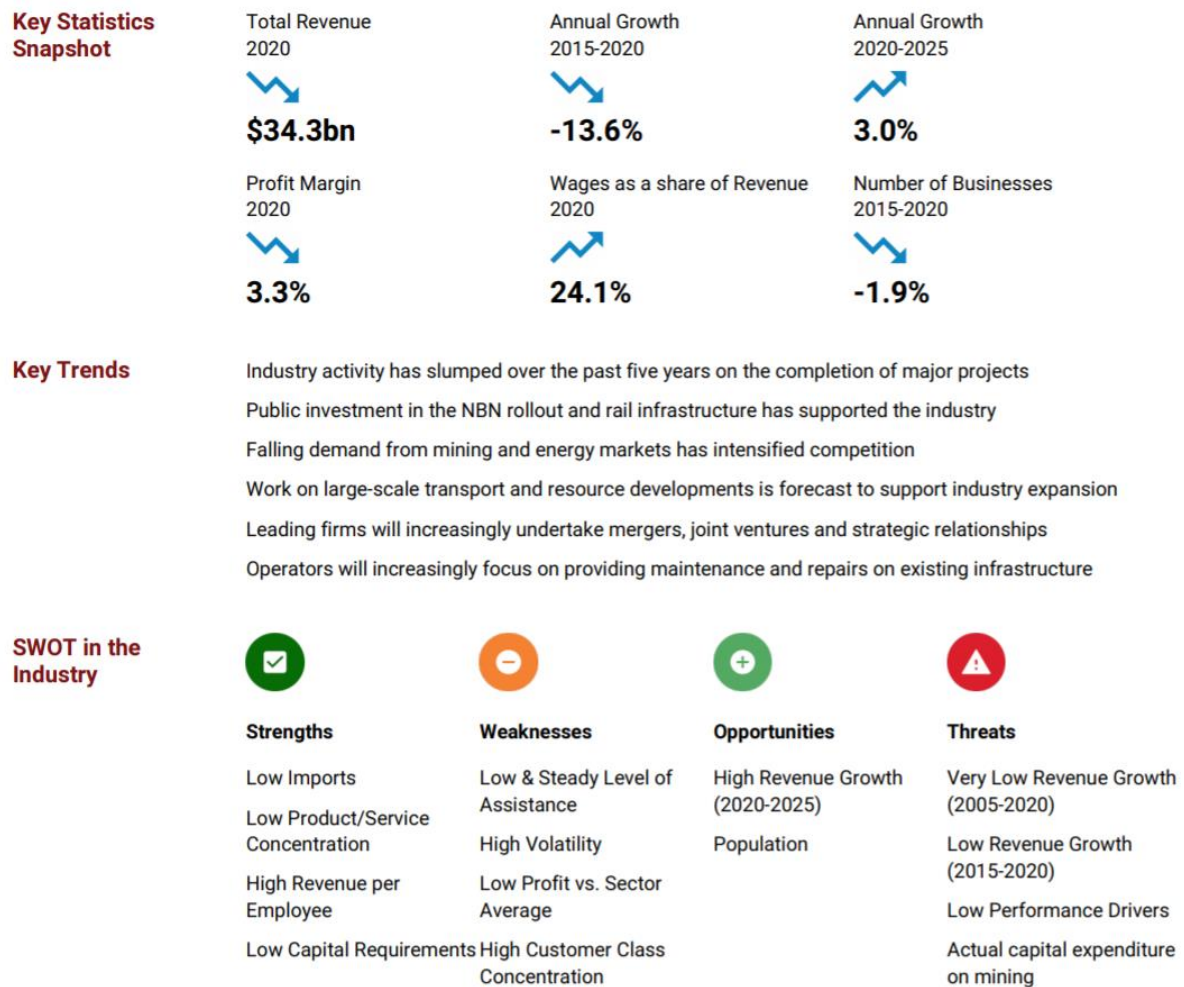
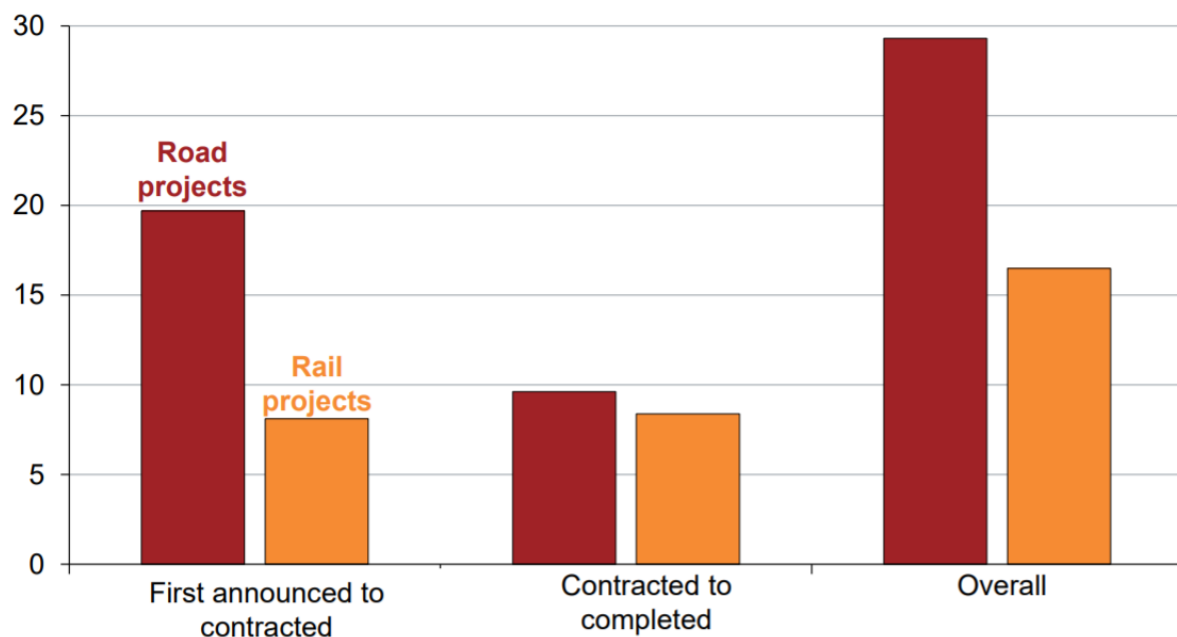


Figure 13 Average magnitude of cost overruns per cent



In addition to factors mentioned in part 2.3.1, there is a skills shortage, which is summarised in Figure 14<sup>29</sup> below.

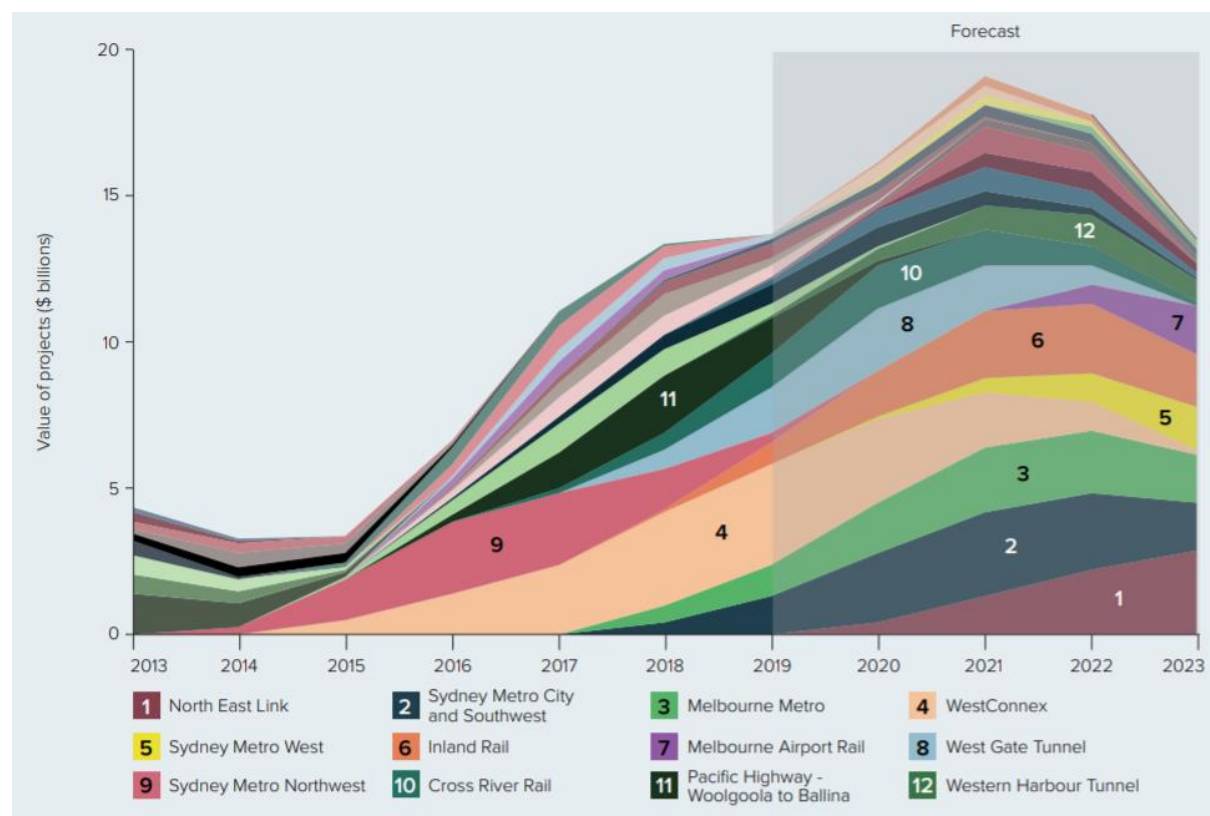
*Figure 14 Skills shortage summary*

**Design, Engineering, Science and Transport Professionals**

Occupation	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	AUS
<a href="#">232111 Architect</a>	NS	NS	-	S	CNR	-	-	NS	NS
<a href="#">232212 Surveyor</a>	S	S	-	S	S	-	-	-	S
<a href="#">232611 Urban and Regional Planner</a>	-	-	-	-	-	-	-	-	NS
<a href="#">233211,12,14,15 Civil Engineering Professionals</a>	NS	NS	S	NS	NS	S	S	S	NS
<a href="#">233213 Quantity Surveyor</a>	-	-	-	-	-	-	-	-	S
<a href="#">233311 Electrical Engineer</a>	S	NS	S	NS	NS	-	S	-	S
<a href="#">233512 Mechanical Engineer</a>	S	NS	NS	S	NS	-	-	-	R
<a href="#">2336 Mining Engineers</a>	-	-	-	-	-	-	-	-	S
<a href="#">234111,12 Agricultural Consultant/Scientist</a>	-	-	-	-	-	-	-	-	NS
<a href="#">234411,12 Geologist/Geophysicist</a>	-	-	-	-	-	-	-	-	D

This shortage can be explained in by the increase in both volume and magnitude of projects in Australia (Figure 15)<sup>30</sup>.

*Figure 15 Major Road and Rail Projects Pipeline*



Therefore, the Australian market will need to attract external talent and skills to cover to the deficit.

<sup>29</sup> Department of Employment, Skills, Small and Family Business, 2019, pp. 1.

<sup>30</sup> Infrastructure Australia, 2019, pp. 232.

## 2.4. Risk allocation

Key project risks include:

- Acid sulphate and contaminated soils
- WSA and rail patronage due to COVID-19 restrictions
- Value capture vulnerability due to slumps in property pricing

Contaminated soil issues have caused major issues in similar projects like the West Gate tunnel and WestConnex. Concerns are exacerbated by the greenfield nature of the site and its proximity to recorded acid sulphate soils shown on NSW Government's Planning Spatial Viewer shown below. Figure 16<sup>31</sup> shows the proximity of the northern most section of stage 1 of the SMGW project, whereas Figure 17<sup>32</sup> shows the recommended corridor, and Figure 18<sup>33</sup>, large sections of greenfield area. Stage 2 is further exposed to this issue. Whilst surrounding developments shield the project from uncertainty, a lot of the site is greenfield. The increased geotechnical risk can be mitigated through delivering the Rail, Line-Wide Systems, and Depot package through a design and build contract<sup>34</sup>.

The destabilising effects COVID-19 has had on population growth, rail patronage and airport customers need to be re-evaluated before commencing with procurement, as the project's success hinges off patronage to become economically beneficial. COVID-19 has also caused housing and property markets to slump. Government can exploit slumping property prices, by buying at a trough and selling, post-COVID-19, post-economic recession. This strategy incentivises the fast-tracking of value-capturing through land acquisition.

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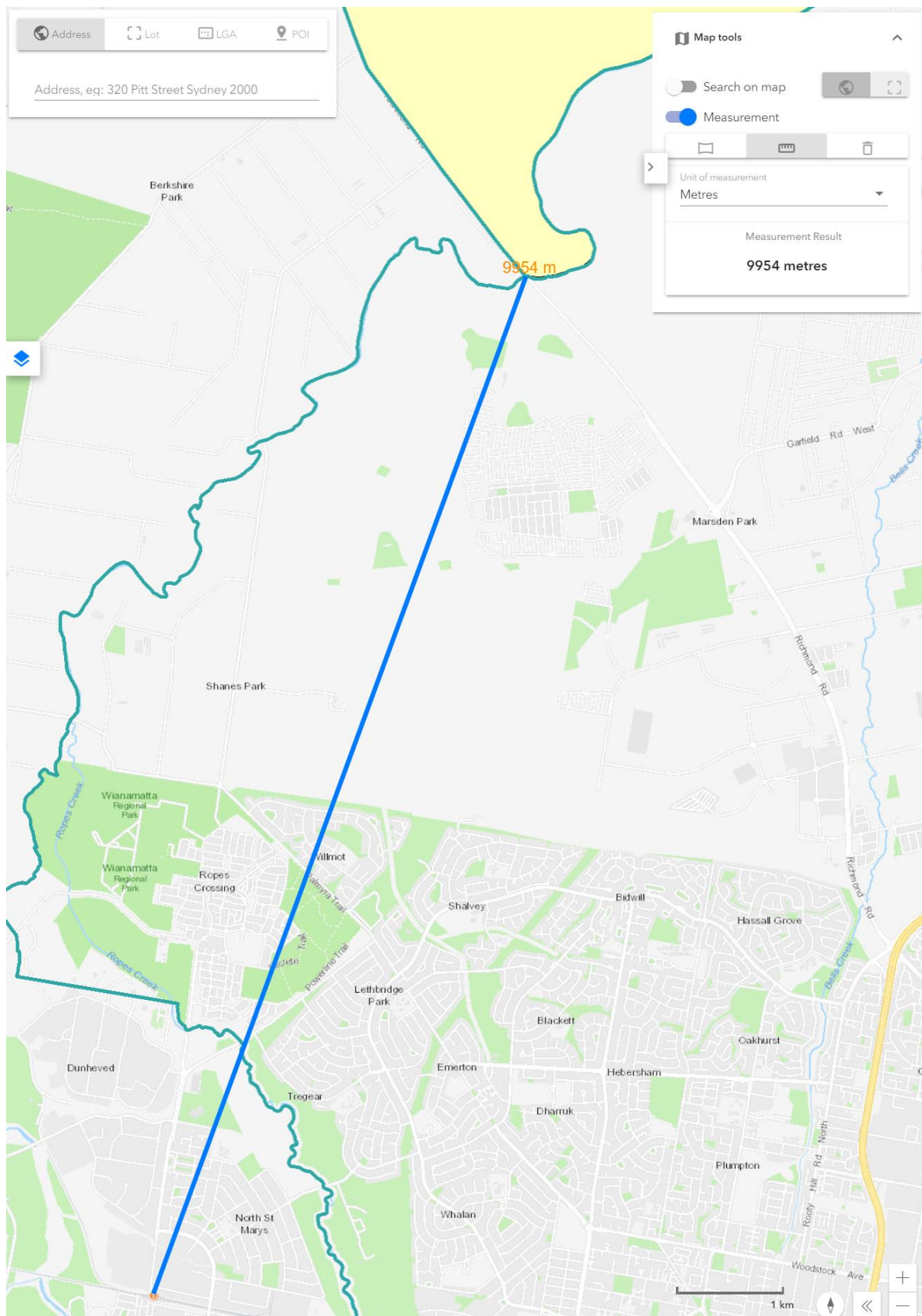
<sup>31</sup> 'ePlanning Spatial Viewer', in *NSW Planning Portal*, may 2020, viewed on 27 May 2020, <https://www.planningportal.nsw.gov.au/spatialviewer/#/find-a-property/address>

<sup>32</sup> Transport for NSW, 2018, pp. 3.

<sup>33</sup> *ibid.*, pp. 4.

<sup>34</sup> Puerto, et al., 2017, pp. 6.

*Figure 16 Proximity to Acid Sulphate soils*



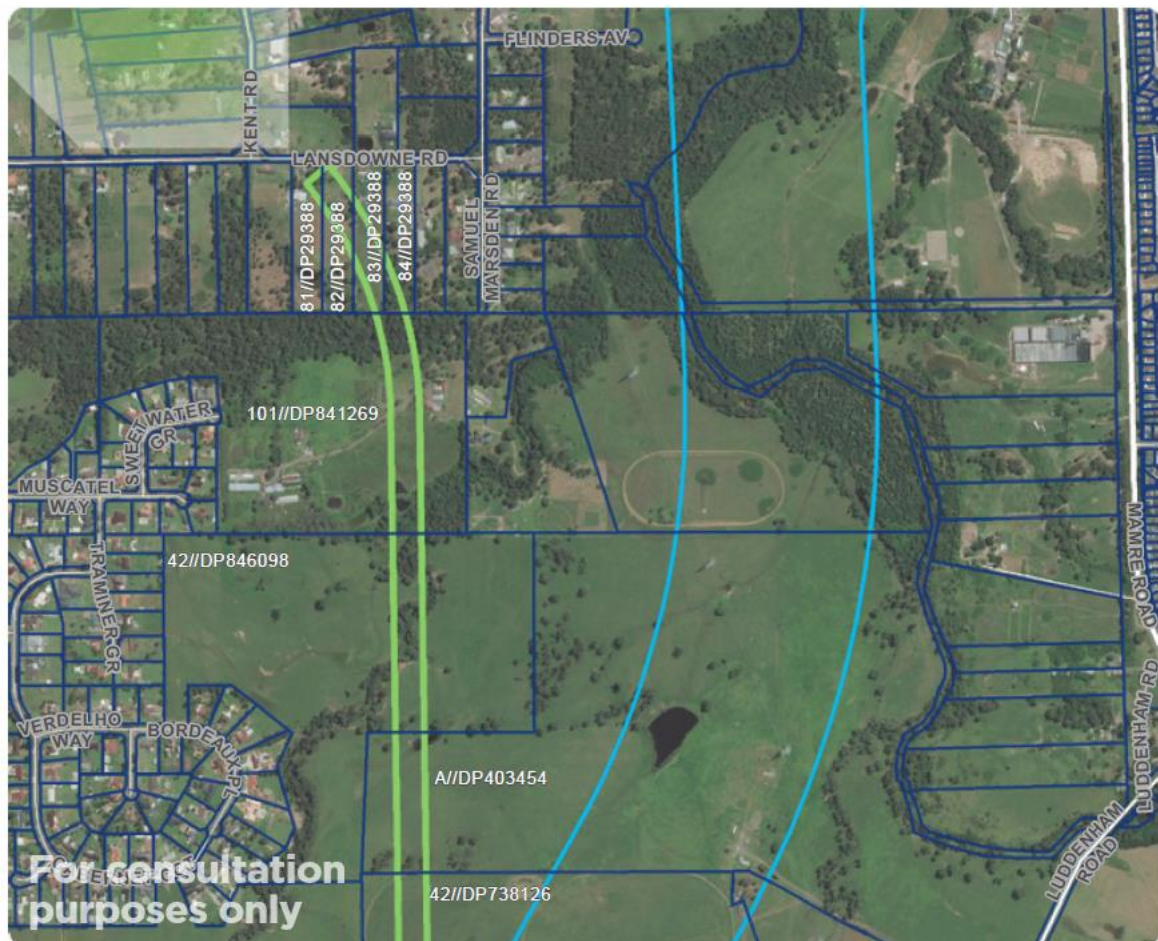


*Figure 17 Recommended SMGW North Bound Corridor*





Figure 18 Recommended SMGW Orchard Hills Corridor

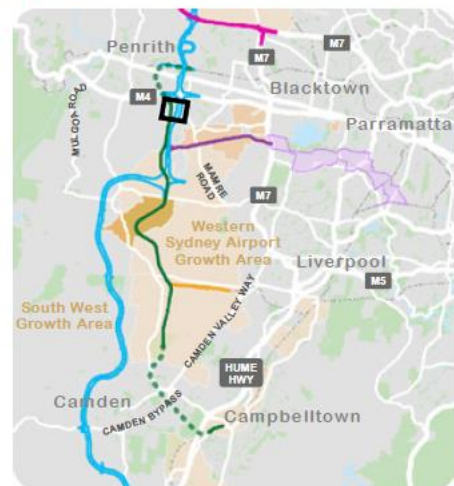


- North South Rail Line corridor
- North South Rail Line tunnel - indicative and subject to detailed design
- Outer Sydney Orbital corridor
- Property boundary



0 75 150 300 m 1: 13000

Aerial imagery (Feb 2016) © Esri, DigitalGlobe, CNES/Airbus DS



### 3. Conclusion

In conclusion, SMGW is:

- A \$15-20 billion project, with its construction phase spanning 5 years
- Highly prioritised by Infrastructure Australia
- Intended to service WSA and develop interconnectivity between regions in the WPC
- In its procurement stage
- In a market adverse to risk and lacking highly level skills
- In a bear market with outdated patronage forecasts
- Facing increased collaborative contracting from governing forces

SMGW faces many challenges if it wishes to become economic and financial beneficial. With a well-established business case, adequate governance, risk allocation, packaging and procurement, SMGW can overcome these challenges. Actions to remedy the problems that have arisen, are addressed in the Recommendations below. Market alignment and stakeholder management form the crux of SMGW and without adequate airport customer and rail patronage volumes, population growth and collaboration of stakeholders, it will fail to become economically and financially viable. SMGW is very familiar to Sydney Metro West and lessons learned there can and should be applied here.

### 4. Recommendations

Recommendations formed from this report's assessment to remedy the project's derived issues, based off existing project information, publicly and freely available, are provided below.

1. Delay construction commencement until local lockdown laws are lifted, normalcy is restored, and a forecast in aviation and rail patronage, as well as population growth is conducted to justifying the need for the added infrastructure.
2. Improve local government communications and transparency through a stakeholder communication plan.
3. Use franchise contracting with an incentivised performance regime for the operations and maintenance package.
4. Aggregate Rolling stock and Signalling & train control procurement packages.

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