Member of the Surbana Jurong Group

Technical Memorandum

Memo No.	3005854 -002	**Date of Issue**	29 October 2024
Subject	Traffic Assessment for Precinct Access EIS	**Discipline**	Traffic Modelling
Project Title	ANI Precinct Planning	**Project No.**	3005854
Document No.	N/A	**Revision**	B
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Attachments			

1. Purpose/Introduction/Exec Summary

SMEC were engaged by ANI to work in partnership with DIT to undertake an initial assessment of the Strategic impacts of the potential traffic demand associated with the ANI precinct development including a high-level review of options that may optimally manage this demand.

The area shown in *Figure 1 - Traffic Assessment Modelled Area* was established for the purpose of this assessment;

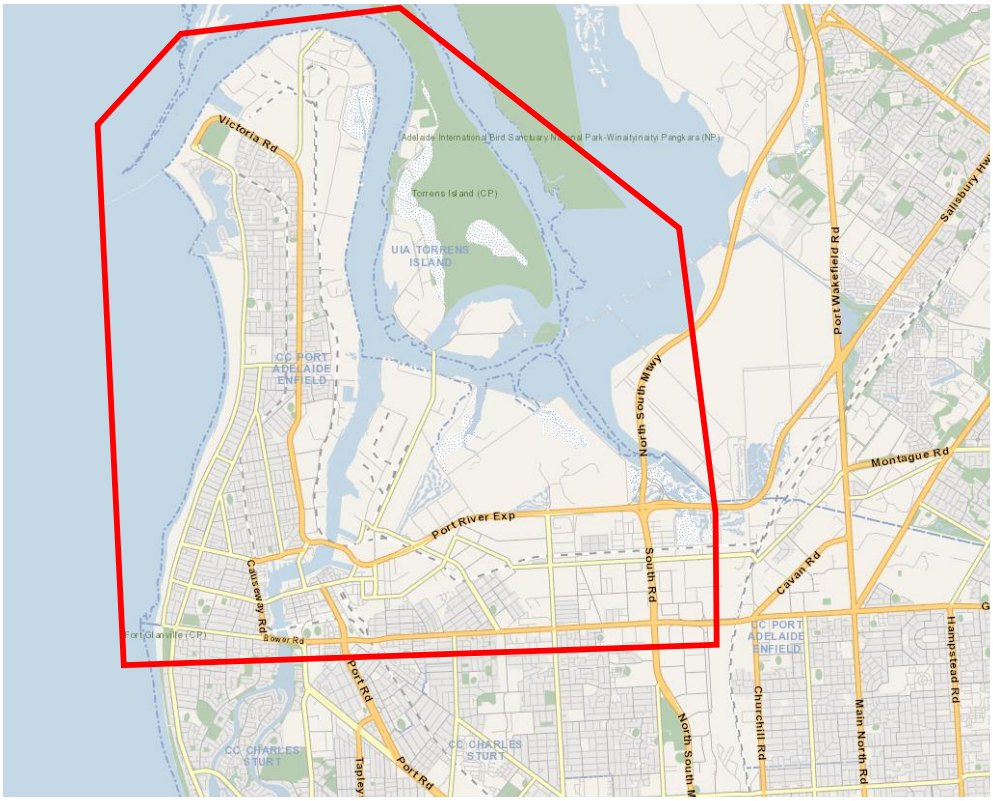

Figure 1 - Traffic Assessment Modelled Area

2. Process Adopted

The process to be adopted was developed with DIT in alignment with DIT's Integrated Modelling Framework, as follows;

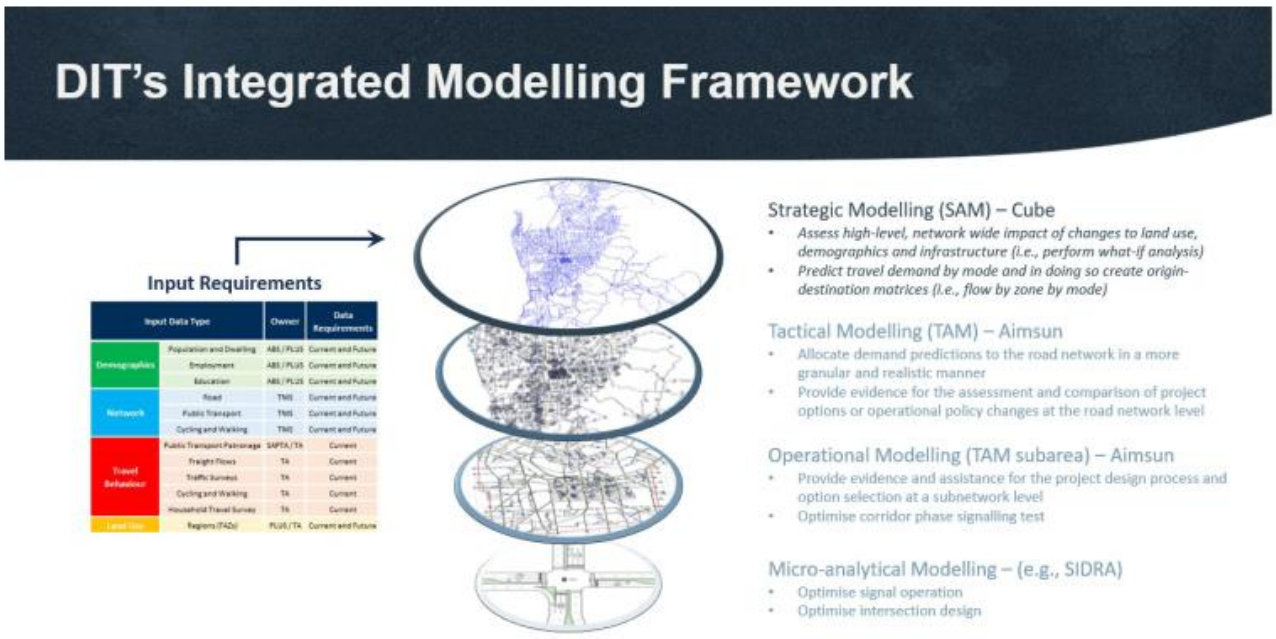

Figure 2 - DIT Modelling Framework

The following steps were established;

- Data Collection and establishment and alignment of assumptions
- Strategic Modelling (SAM);
  - Options Assessment;
    - Consider a range of years / times
    - Consider land use / employment inputs
    - Consider network improvements
  - Update the SAM model, including;
    - Subarea development
    - Zone refinement through the ANI precinct
  - SAM Modelling
- Tactical Modelling (TAM);
  - Options Assessment;
    - Inclusion of Origin / Destination matrices from SAM
    - Inclusion of network improvements
  - TAM Subarea Development
    - Calibration and validation
    - Zone refinement
  - TAM Modelling
  - Modelling analysis

2.1 Assumptions and Limitations

The following assumptions and limitations were noted and accepted in order to provide timely guidance to both ANI and DIT;

- The approach adopted is deliberately tailored to be appropriate for the current stage of planning and approvals, and as such is set at a strategic / high level to give an early assessment of possible traffic demand, the capacity of the existing network to accommodate such demand and whether or not there are feasible option/s to address this demand, and what these may be. The process also progresses model development as a part of the process for future more detailed assessment of scenarios.

- The modelling assumes ANI demand is spread across 3 hrs (6am – 9am) and (3pm – 6pm) representing potential shift patterns. This profile was determined based on the current ANI traffic profile and information from ANI around potential hourly start times. It is noted that this is subject to change as ANI's planning progresses.
- It is noted that the hour of 6am-7am is likely to be the highest volume hour in the AM peak period for workers accessing the ANI precinct. The proposed approach does not include an assessment of 6am to 7am as this is not possible within the current base model capabilities. The models used cover the AM Peak Period of 7am-9am where the majority of commuter and school trips occurs. This highlights the unique nature of the ANI precinct. Notwithstanding, the modelled outputs for the period from 7am to 9am provide an initial indication of potential performance and were considered suitable for this stage of the planning approvals process. More detailed modelling/analysis will be undertaken in future stage/s of the process.
- The modelling assumes ANI demand is spread across 3 hrs (6am – 9am) and (3pm – 6pm) representing potential shift patterns determined based on inputs from ANI.
- The proposed approach applied the distribution model currently utilised in SAM which is based on average behaviour across the Adelaide Metro area. It was noted that there is a potential risk that the distribution for the ANI precinct may vary from this. Accordingly, a review of the modelled distribution against Census information was completed to confirm if the SAM distribution was suitable for this level of assessment. Given the unique nature of movements to the precinct, a more detailed application of the distribution of ANI workers to the precinct may be required for future stage/s of the process.
- Workforce numbers for the ANI precinct are not tightly defined and may vary as planning and development progress. For the purpose of this assessment a conservative demand has been considered.
- An assumption that every worker that uses private vehicles will drive i.e. a vehicle occupancy of 1 for vehicles carrying ANI workers is applied. This again is considered to be a conservative assumption.
- All workers' vehicles travelling to the precinct will have a car park provided on-site.

2.2 Modelling Approach

The initial proposed model study area was reviewed by DIT to confirm it was suitable and to ensure a seamless process for switching between SAM and TAM. A total of 69 zones were defined for the modelled area, comprising of 42 internal zones and 27 external zones. DIT undertook the process of developing the sub-area model from TAM to provide to SMEC, along with applying the strategic model to provide the demand matrices to be used in TAM.

Consistent with the agreed methodology, the development of a calibrated sub-area base model was based on a simplified approach. As the modelling would be of a macroscopic nature, the calibration approach mirrored that of a strategic model with a slight enhancement, being the review of performance at a turn level, rather than a link / segment level. Matrix estimation was ultimately adopted to improve the fit of the base model.

The sub-area model was to be used for strategic planning at a network level, thus validation criteria was based on that adopted for SAM. The calibration was completed in a collaborative manner with the Department and was deemed suitable for the purpose of the assessment. The calibrated matrices formed the basis for the development of the future year matrices.

Model years of 2021 and 2041 were used for the modelling tasks. A combination of traffic counts, traffic signal count data and factored data was used for the validation dataset. The 2041 model year assumes growth across Metropolitan Adelaide. For the ANI precinct, job numbers were developed to represent a conservative workforce for the purpose of this exercise. SMEC worked with ANI to inform the Department of updated assumed 2041 employment totals by the SAM employment categories. To provide alignment between SAM and TAM, the SAM zoning system was modified for the ANI precinct to represent the access points to the precincts drivers would have. A total of six access/egress points were developed.

The model time periods were:

- 7am-8am and 8am-9am for the morning peak; and
- 4pm-5pm and 5pm-6pm for the evening peak.

Although the SAM demand is transferred to the TAM sub-area, as mentioned above, processing of this demand based on the estimated base year TAM matrices is applied. As there are specific target vehicle volumes by hour entering and exiting the precinct, manual factoring of the various parking zones was applied to uplift the number of vehicle trips to match the calculated traffic volumes.

3. Existing Network

The existing network is characterised by the following;

- Victoria Road is the main arterial road to access the ANI precinct and has very tidal movements.
- The peak ANI demand occurs for the 6am to 7am period. It is noted that this coincides with the lowest network wide volume.
- Approximately 70% of the traffic wanting to access the ANI precinct approaches via the PRExy.
- The PRExy / Victoria / Nelson intersection is the key access point to the peninsula.
- The PRExy /Perkins / Francis intersection is the key transition point between the expressway and arterial network.
- The southern end of the LeFevre Peninsula is the most congested.
- These key intersections are nearing capacity in peak periods due to existing local movements and the current ANI demand.

Figure 3 - Existing traffic peak volumes shows the current vehicles per hour across a number of example locations.

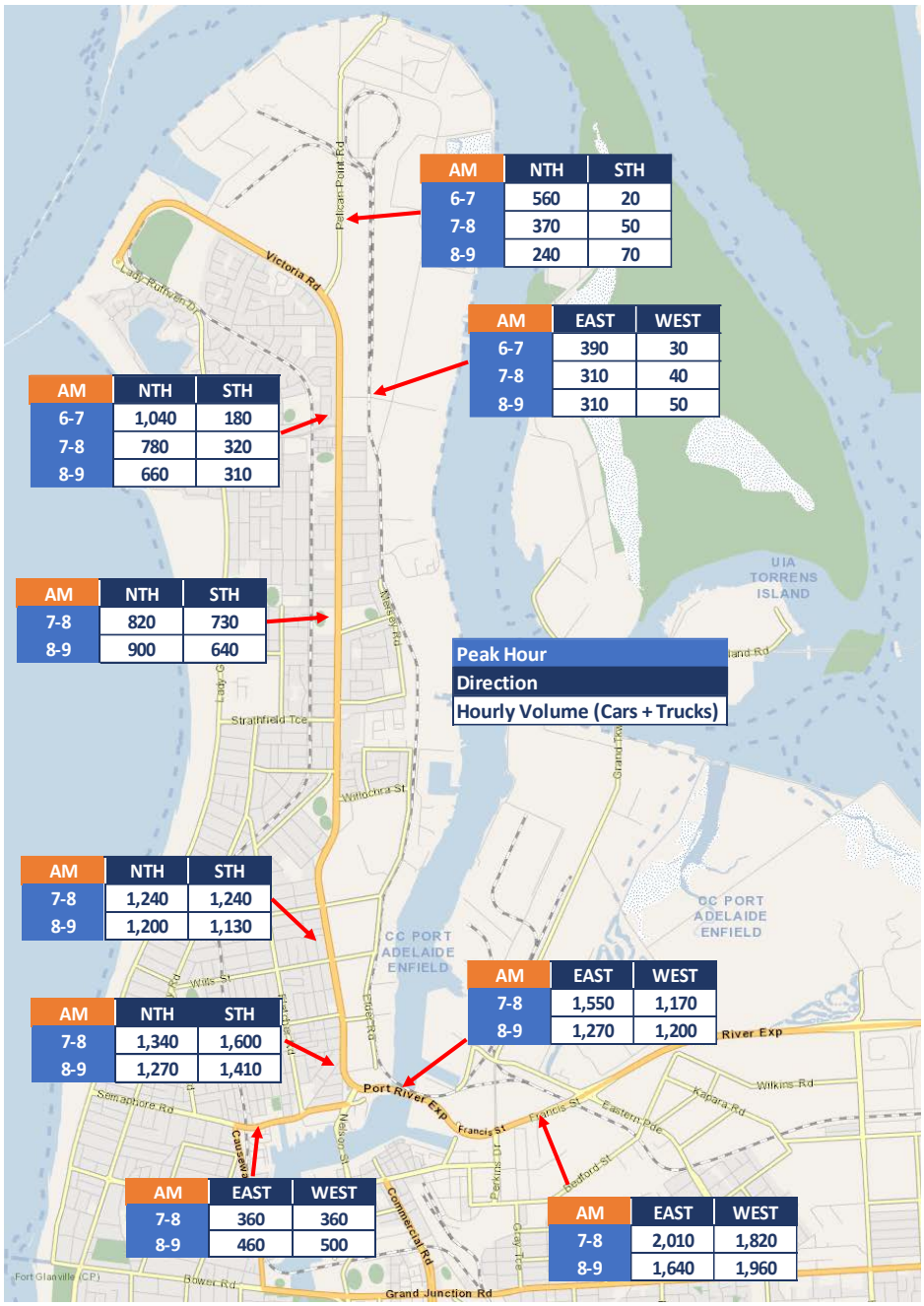

Figure 3 - Existing traffic peak volumes

4. Future Demand

4.1 With ANI traffic

Modelling in accordance with the process described above, shows the potential ANI Precinct demand generates significantly higher volumes on Victoria Road by 2041. An indication of this demand is provided in *Figure 4 - Potential future demand volumes* below and it is noted that for the peak period this demand exceeds the overall capacity of Victoria Road, the Port River Expressway and the existing Junctions of PRExy / Victoria / Nelson and PRExy /Perkins / Francis.

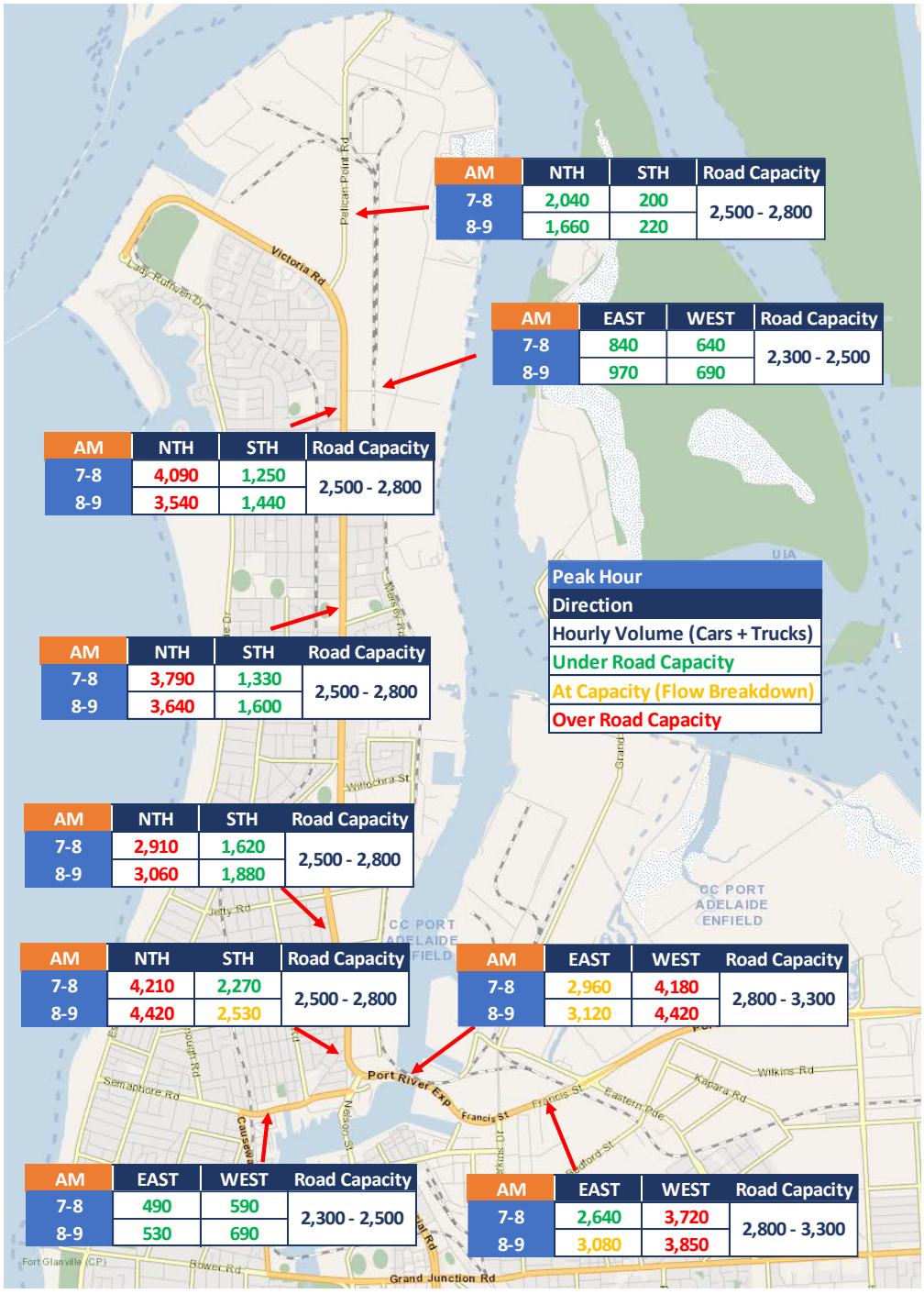

Figure 4 - Potential future demand volumes

4.2 ANI Link Road

The Traffic Planning Assessment Report prepared for the ANI Link Road Development Application (refer Figure 5 below) demonstrated that the Link Road (now under construction) will operate acceptably across a range of traffic scenarios. This included assessment of a 'Future Year Sensitivity Project Case' which applied a theoretical level of future network upgrade (noting that such upgrade is not planned or funded at present). This earlier assessment process was undertaken in a manner consistent with this current assessment and provides confidence that the Link Road itself will appropriately integrate with a range of options to best manage access to the ANI precinct.

Figure 5 - New Link Road

4.3 Options

A range of options were considered for the assessment. Options are categorised below into differing infrastructure and access scenarios.

4.3.1 Road Infrastructure Upgrades

One option to address the increased demand is to upgrade the existing road network to suitably accommodate the demand. Such infrastructure upgrades could include Grade Separations at key intersections, at-grade road intersection widenings and/or restricted access or restricted movements at various locations. The modelling analysis indicates significant traffic performance improvements can be achieved in this way.

It is noted that this option is likely to provide benefits for users other than ANI in the subject area including other businesses and the local community. However, this option will also have a range of potential impacts including construction disruption, possible land acquisition and changes to some local movements or access arrangements.

4.3.2 Public Transport

An alternative approach is to establish new or enhanced Public Transport services (rail and/or bus) to the precinct to reduce the private car transport demand. The extent of private car demand reduction (ie; mode transfer) will depend on the quality of public transport services provided. This considers frequency of service, reliability of service, pick and drop off locations etc.

The challenges that will face this option include:

- Services would be heading in a counter-peak direction, thus would be mostly only beneficial to workers at Osborne;
- The catchment of possible workers will be limited for direct services, especially those who would use rail;
- Workers who would need to catch multiple services may have very long commute times without integrated coordination of services that need to overlap. This is exacerbated by the broad catchment of workers;

- Employees access the site early in the morning. Current service provisions are unlikely to provide viable choice for some workers as a result and therefore service changes would be likely to be required; and
- Workers who need to take equipment to site would have difficulty using public transport and would be more likely to drive instead.
- Public transport connectivity to the 'front of site' will be an important consideration, including linkage to internal personnel transfer such as shuttle bus movements.

4.3.3 Car Park and Dedicated ANI Services

An alternative to the public transport option would be to provide dedicated services for ANI staff (bus or train) which could include off-site car parks, to enable simple and effective transfer from car to dedicated PT service.

Considerations would include:

- Who would operate the service;
- How frequent would the service be;
- Where would workers park their cars; and
- What priority would be given to these services.

4.3.4 ANI Operations

The approach adopted to date includes a range of assumptions about potential workforce demand, shift allocations, start and finish times and on-site car parking facilities. Likely conservative assumptions have generally been applied for the stage of planning. Noting this and that these elements are not tightly planned at this early stage of precinct planning and development, variations in the approach to these aspects may form an important contribution to the overall traffic operation outcomes.

4.3.5 Combinations

A combination of the above approaches is considered likely to provide the optimal solution, noting each has its own benefits, impacts, constraints and challenges noted above. This could provide a range of access options for workers, help optimise use of existing assets, share the load to reduce network impacts for workers and the local community, and may improve the transport network for not only Osborne workers, but the broader community.

5. Conclusion and Next Steps

The existing network performs to an acceptable Level of Service with localised periods and locations of congestion focussed mostly at the southern end of Victoria Road, including the PRExy / Victoria / Nelson intersection and the PRExy /Perkins / Francis intersection locations. The existing network is also susceptible to extended delays and congestion as a result of incidents and disruptions, including periods of bridge opening.

Allocation of ANI precinct forecast workforce demand will result in excessive congestion / delays to the existing network, noting that some of the peak periods for this (6am – 9am, and 3pm to 6pm) occur outside of the current network peak hours (8am to 9am, and 4pm to 5pm).

The initial high-level assessment of strategic options to date shows that a range of options can be further explored which will mitigate both the demand and delay induced by the additional traffic volumes. These options include;

- Road infrastructure upgrades to improve capacity and efficiency of the road network.
- Provision or enhancement of 'non-driving' options to access the site, such as through use of rail or bus services.
- Operational considerations such as staggered start/ finish times for workers.
- Combinations of the above.

The next phase of assessment will include;

- Ongoing model development and refinement consistent with that needed for more detailed option assessment and comparison,

- Ongoing refinement of assumptions for the ANI precinct (eg; workforce demand, shift times etc) as the parallel process of progressing the site operational planning occurs, and
- More detailed modelling and assessment of specific options aimed at short-listing to a small number of viable approaches ahead of progression towards a preferred overall network approach.