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## Physical considerations in the operation of a university campus to meet Step 3 COVID-19 guidelines.

*An overview based on space data from eight  
Australian university campuses.*



Prepared by ARINA  
WHP Architects Pty Ltd  
Trading as ARINA™

Project Director: Geoff Hanmer  
[geoff.hanmer@arina.biz](mailto:geoff.hanmer@arina.biz)  
[www.arina.biz](http://www.arina.biz)

Enquiries: Geoff Hanmer 0419 700 033

ARINA™

Sydney, Adelaide, Perth and Singapore.  
Mail to: PO Box 1102 Crows Nest NSW  
ABN: 45 073 497 319

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4 sq m per person

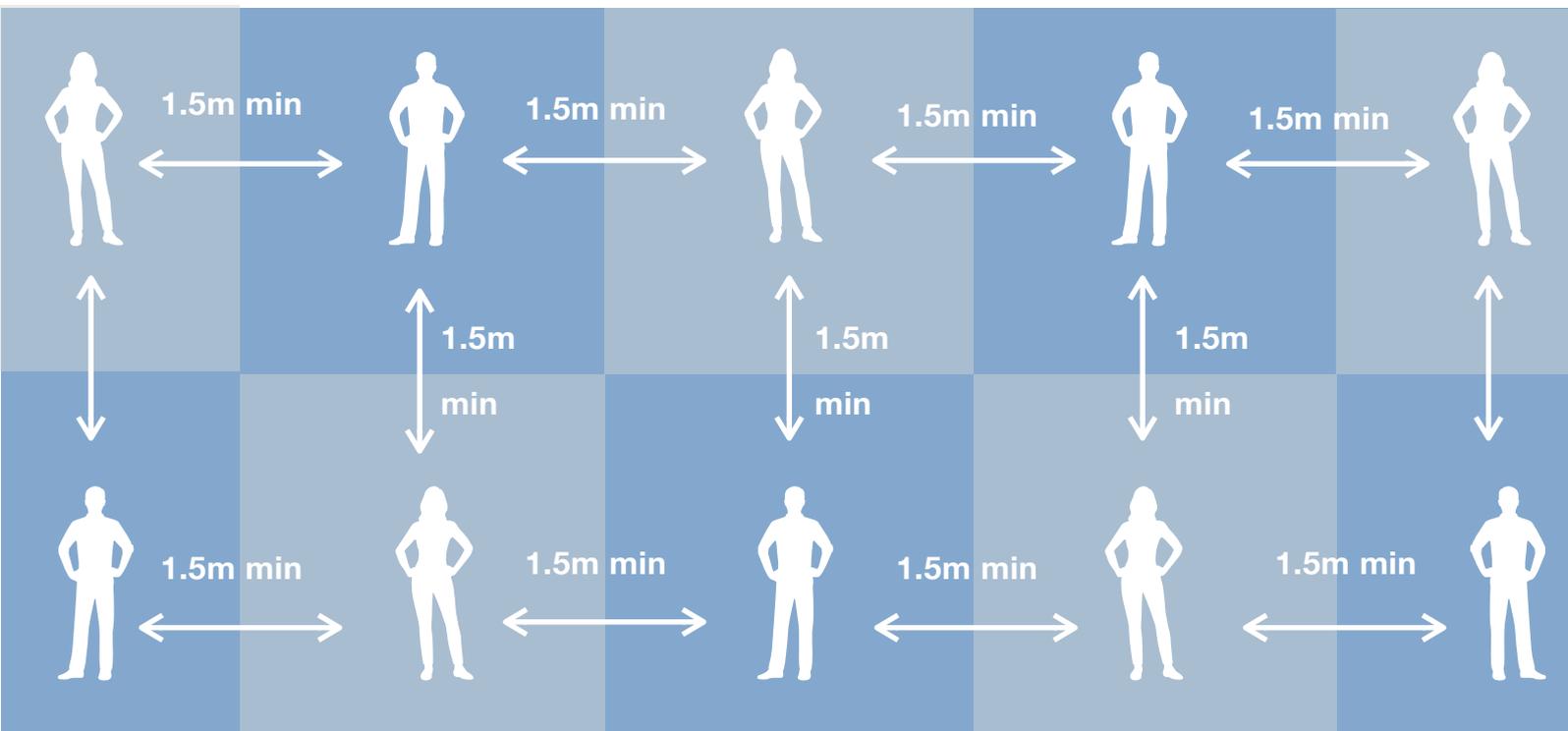


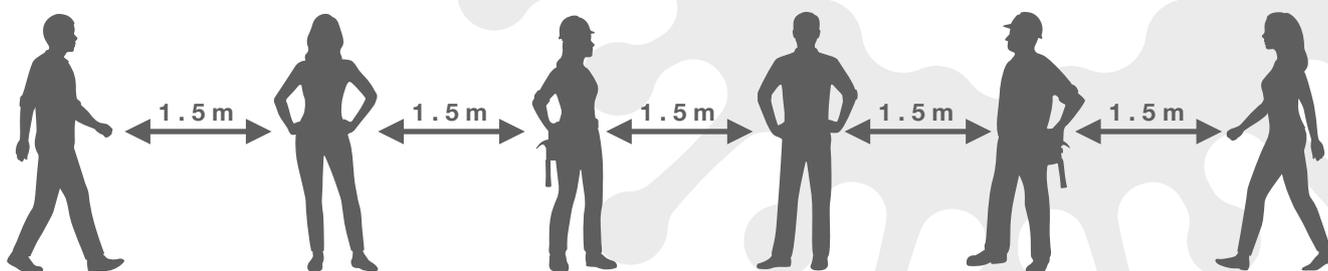
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# Summary

Physical considerations in the operation of a university campus to meet Australian Government Step 3 COVID-19 guidelines:

*An overview based on space data from eight Australian university campuses.*

1. ARINA has carried out space modelling based on space and student load data collected for eight campuses over the past five years. The identities of the campuses are confidential, but they range from medium to large Australian campuses and include two Go8 universities. The modelling focusses on the viability of space types to provide physical distancing requirements and its impact on the capacity to support the number of students which a campus may normally accommodate. The results are generalised and cannot be applied directly to any particular campus.
2. Physical distancing restrictions and decontamination requirements will substantially affect the capacity for campuses to support key campus activities at full capacity, in particular;
  - a. Teaching
  - b. Informal Learning and Library
  - c. Food and Beverage
3. Unsurprisingly, the largest impact occurs in activities with highest density of use, in particular lecture based teaching. Physical distancing options in tiered and fixed seating venues are problematic. Tiered lecture theatres in particular will have their capacity dramatically reduced.
4. Teaching laboratories and collaborative spaces which intrinsically have higher area to student ratios are less impacted, but capacity may still be reduced.
5. The key strategies suggested in this report are:
  - a. Continue to deliver lectures online to avoid the use of large tiered lecture spaces until COVID-19 restrictions end or are relaxed.
  - b. Conduct face-to-face teaching activities in flat floor spaces greater than 80 sq m in area. This will give a practical minimum of 19 students to a class. Only about one-third of normal load can be accommodated.
  - c. Use teaching spaces less than 80 sq m for collaborative learning, informal learning and social purposes.
  - d. Most teaching and research laboratories achieve or nearly achieve the 4 sq m per person requirement. It may be possible to adapt these spaces to cope with full loads.
  - e. Depending on a particular university circumstance and the availability of sub 80 sq m venues, libraries may need to implement 'compartmentalisation' to conform to the 100 person restrictions.
  - f. Academics and professional staff should continue to work from home where possible.
  - g. The load on transportation, whether public or car parking, must be reduced. See a, b and f above.
  - h. Implement vertical transport distancing policies.
  - i. Consider strategies to maintain the viability of retail outlets with a reduced campus population.



# Teaching Spaces

Existing configurations for nearly all teaching venues do not comply with current social distancing requirements.

Fig 1: Average area per teaching seat.

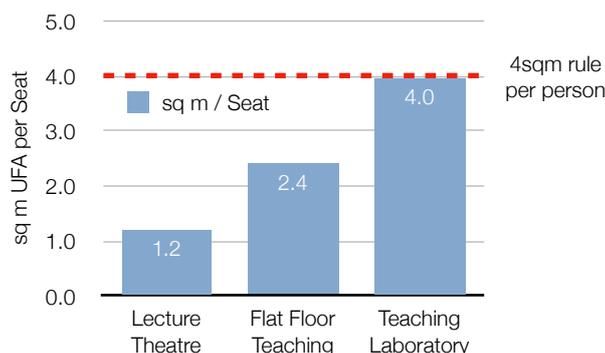
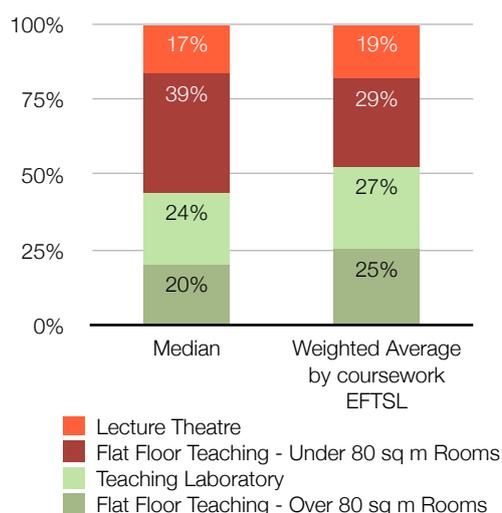


Fig 2: Current breakdown of floor space dedicated to teaching venues - green denotes floor space capable of providing meaningful teaching experience and social distancing measures.



1. The only existing teaching space types that largely comply with the four square metre per person rule are teaching laboratories [Fig 1,10], though some of these have benches that are too narrow or too close together to meet distance requirements without a reduction in capacity or adaptations with screens.
2. It will be difficult or impractical to provide safe social distancing in most stepped lecture theatres or auditoria. The aisle widths between two rows of seats in older theatres are often less than 1m with a seat pitch of only 0.5m. The only viable seats may be every third or fourth seat in a staggered configuration. This would still be problematic during entrance and exit where students may need to walk past each other using an 0.5m wide aisle to reach or leave their seat. Sanitisation will be necessary between uses.
3. A quarter to a third of an on-campus student's contact hours are typically spent in lectures. The data ARINA has processed strongly suggests that face-to-face lecture delivery will be unrealistic for Semester 2, 2020 if Stage 3 rules apply. (refer page 9: Restrictions)
4. Fig 2 shows that less than half of the current useable floor area of teaching venues is capable of providing complying social distancing, deliver an acceptable student experience and an economical class size. Spaces which could be used include most teaching laboratories and any flat floor teaching spaces of at least 80 sq m Usable Floor Area (UFA). An 80 sq m UFA room would permit a class of 19 students to be taught by one academic while complying with the four sq m per person rule.
5. Existing flat floor teaching rooms exceeding 80 sq m UFA will need to be reconfigured to comply with the four sq m rule. The data which ARINA has analysed suggests that a third of the teaching seats currently provided in these rooms will need to be removed [Fig 3]. To comply with COVID-19 distancing requirements, between a quarter to a third of teaching seats on a campus will be available for use [Fig 4]. With such a substantial decrease in teaching seat

Fig 3: COVID-19 useable seats in current flat floor teaching venues over 80 sq m

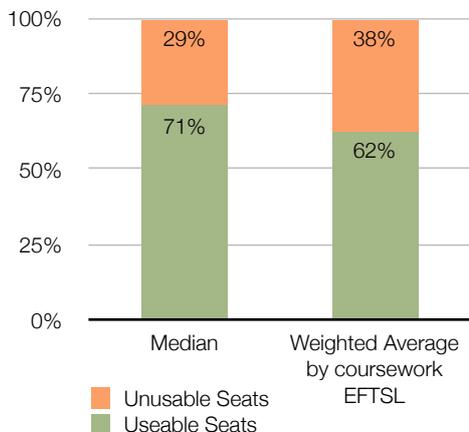


Fig 4: Overall COVID-19 useable teaching seats and remaining unusable teaching seats on Campus

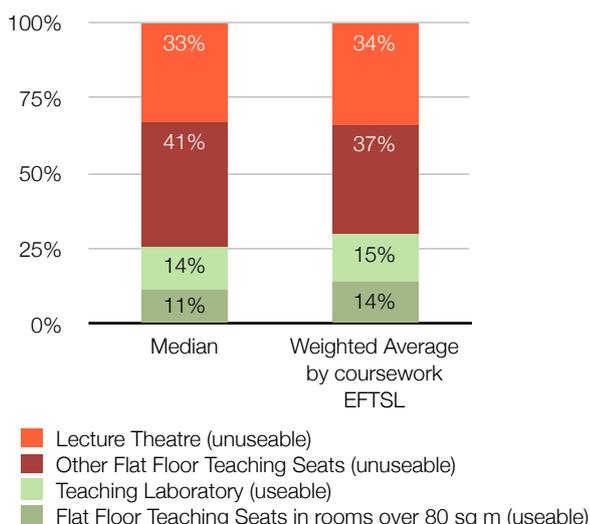
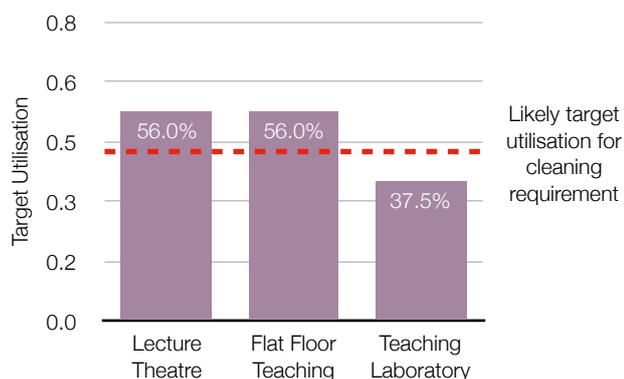


Fig 5: TEFMA target utilisation and estimated temporary target utilisation for cleaning requirement



capacity, it is unlikely that lectures can resume face-to-face in the second semester of this year. The delivery of lectures will need to remain online.

6. Face-to-face teaching will probably need to focus on tutorial groups of 18 students or more in flat floored rooms of over 80 sq UFA, plus laboratory practical teaching.
7. The recommendation to regularly sanitise public places is likely to further reduce usable teaching hours in general teaching venues [Fig 5]. Required cleaning of teaching venues will need to be timetabled, similar to normal practices for a wet teaching laboratory. To accomodate this, change-over may require an adjustment to traditional timetabling of general teaching spaces. Class timings with staggered intervals to accomodate cleaning may also reduce post and pre class crush, but substantially complicate the use of standard timetabling software.
8. The consequence of complying with Step 3 COVID-19 mitigation measures to the current teaching suite will be a reduction in capacity to deliver face-to-face course content to about one-third of the student load normally enrolled [Fig 6] even with all lectures delivered on line. The exact impact will vary from campus to campus. In arriving at this estimate, the following assumptions have been made:
  - a. Around an average of 6 hours of face-to-face teaching provided per full time equivalent student for non-lecture and non-laboratory classes.
  - b. Campus operation hours from 8am to 6pm, Monday to Friday. (50 hour week)
  - c. Only teaching laboratories and flat floor teaching spaces over 80 sq m UFA are available for use. Lectures are delivered online.
  - d. The allocation of teaching seats for any teaching space is at least 4 sq m per seat.
  - e. Utilisation for all available non laboratory teaching venues is set at 45% (60% Frequency, 75% Occupancy).
  - f. NOTE: Individual universities may be able to deliver more or less than the advised one third student load owing to their particular circumstances.
9. Other additional temporary strategies to consider include:

Fig 6: Estimate of face to face student load returning to the campus based on available small teaching seats satisfying COVID-19 physical distancing requirements

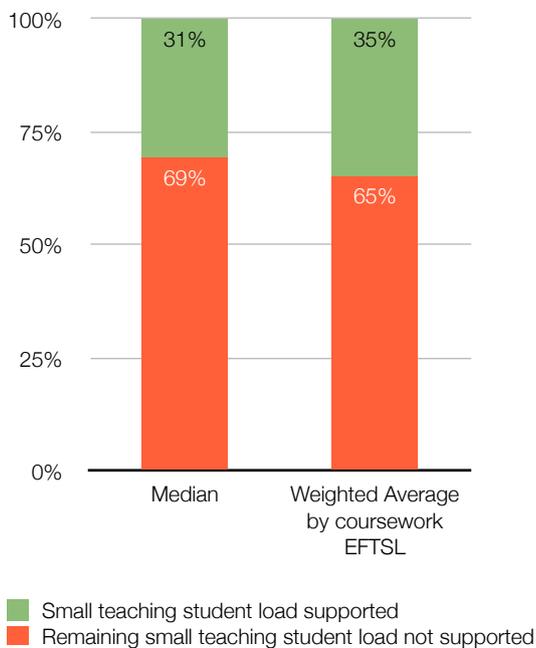
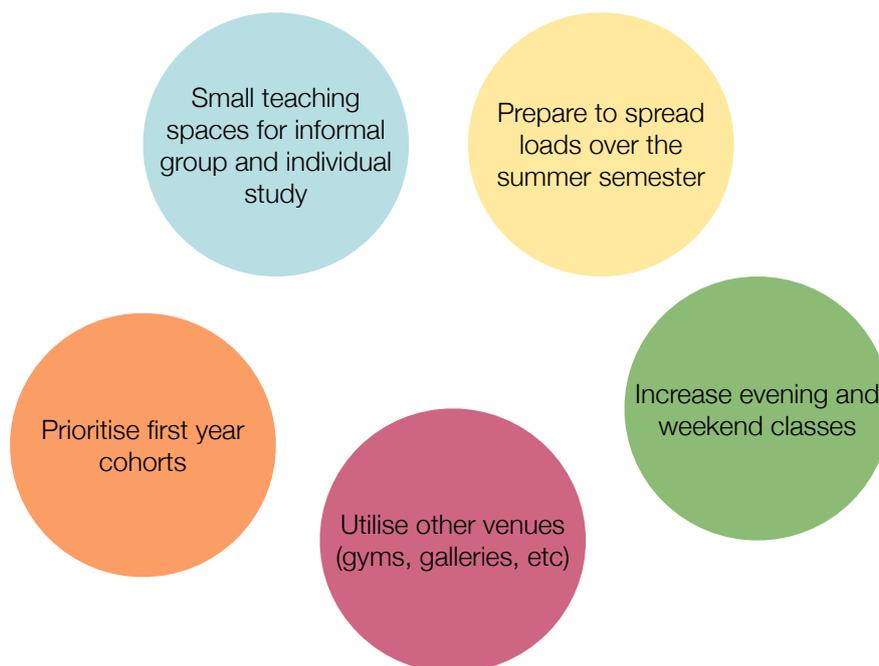


Fig 7: Options to support more on campus load

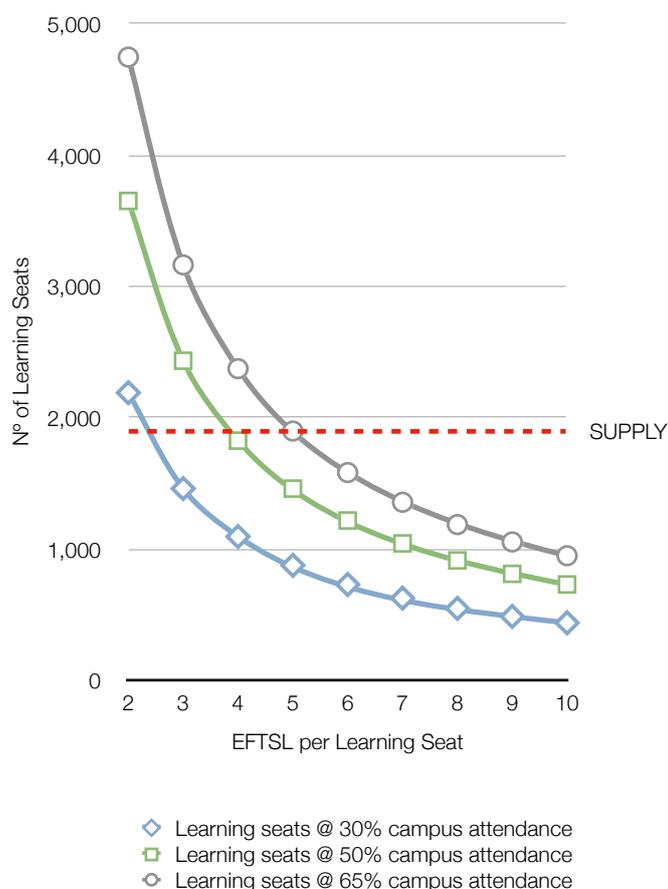


- Campuses may choose to temporarily spread face to face teaching loads to evenings. One benefit of this is that it allows for travel time outside peak hours; in line with current recommendations by state governments which are requesting commuters to avoid peak hour where possible. Students who live a considerable distance from campus or have other evening commitments, such as work or parenting, may be disadvantaged by this arrangement. Teaching costs will, of course, rise.
- Flat floor teaching rooms that are under 80 sq m may be temporarily repurposed to provide small group learning spaces. This could provide a temporary replacement for learning seat capacity that will be lost in libraries. (Refer the following section).
- Gyms, gallery spaces and other enclosed flat floor assembly venues may in some cases be temporarily repurposed as learning or teaching venues, depending on demand.
- The reduced capacity to bring students back onto campus in Semester 2 may mean that some subjects may need to be offered again in the Summer semester.
- Universities may need to set priorities on which courses should be taught on campus. One option could be to favour first year students over later years, but this would raise many issues.

# Learning Seats

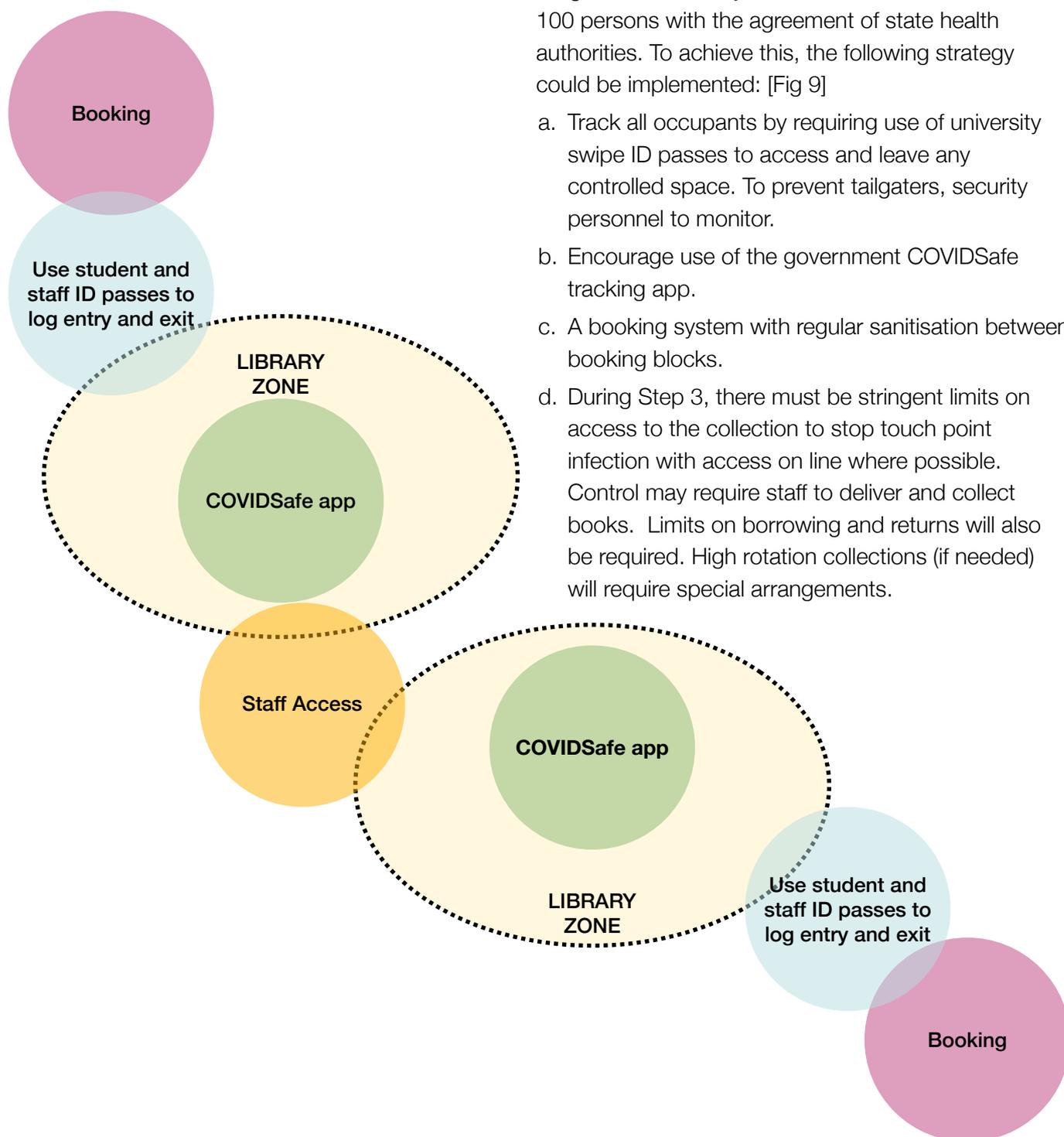
After teaching, one of the key spaces on campus are libraries and informal learning spaces and seats.

Fig 8: This chart shows a comparison of potential SUPPLY seats if existing teaching spaces less than 80 sq m were used as informal spaces compared to the learning seat DEMAND required on campus based on a range of learning seat to EFTSL ratios and various campus attendance options. Chart lines below the SUPPLY seats represent potential options.



- At most university campuses, informal learning seats are distributed across all student occupied spaces with a substantial percentage of these within libraries.
- University libraries are not directly considered in either federal or state based COVID-19 physical restriction guidelines. However, based on advised restrictions for community libraries and general gathering spaces, 100 persons is likely to be considered the maximum number at Step 3. At full campus attendance and a metric of 1 seat per 5 EFTSL the median sample of our eight universities would require just under 3,000 seats of which 1,500 could be expected in library locations. With reduced availability of seats in the library due to a 100 person restriction, additional seats will be required elsewhere.
- ARINA has identified strategies to deal with the loss of learning seats;
  - Utilise the teaching spaces which have been identified as too small for face-to-face learning (less than 80 sq m). These spaces are suitable for both small and medium group study and individual study. Using the 4 sq m rule for the area of these spaces and a reduction factor for inefficiency of smaller spaces, our comparison universities have a median supply of just over 1,900 seats, which will be adequate for a reduced campus load.
  - Implement strategies to reduce the campus load as indicated in the Teaching Space Section.
  - Use library space to its maximum capacity. Many universities have multiple libraries on campus and each of these could accommodate 100 people.
  - Subject to possible agreement by regulators, libraries may be 'compartmentalised' (eg floor by floor) to provide multiple 100 person zones (see below).
- Fig 8 shows that enough learning spaces can be provided by utilising flat floor teaching rooms that are under 80 sq m, though a strategy to increase the library capacity could also be considered.

Fig 9: Functional arrangement to compartmentalise a library



5. Under the guidelines, access to university libraries is restricted to up to 100 persons regardless of whether or not they can physically accommodate more using the 4 sq m rule. The reason for a blanket 100 person rule regardless of the size of a venue is not clear, but this may be a measure to assist in contact tracing should a student test positive to COVID-19.
6. The main libraries of universities are almost all multi-level. By implementing controlled and monitored occupation zones, either floor by floor or wing by wing, each zone may be allowed to accommodate 100 persons with the agreement of state health authorities. To achieve this, the following strategy could be implemented: [Fig 9]
  - a. Track all occupants by requiring use of university swipe ID passes to access and leave any controlled space. To prevent tailgaters, security personnel to monitor.
  - b. Encourage use of the government COVIDSafe tracking app.
  - c. A booking system with regular sanitisation between booking blocks.
  - d. During Step 3, there must be stringent limits on access to the collection to stop touch point infection with access on line where possible. Control may require staff to deliver and collect books. Limits on borrowing and returns will also be required. High rotation collections (if needed) will require special arrangements.

# Research Laboratory Spaces

As an arithmetic mean, the amount of useable research laboratory and ancillary floor space exceeds the four square meter per person rule.

Fig 10: Average research laboratory and ancillary area per researcher

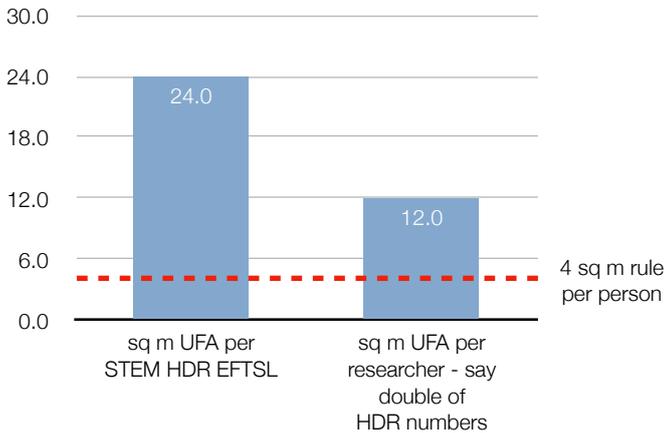


Fig 11: Typical layout of a contemporary research laboratory open bench workspace.

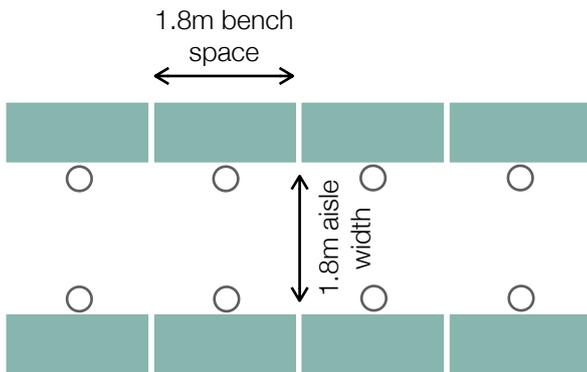
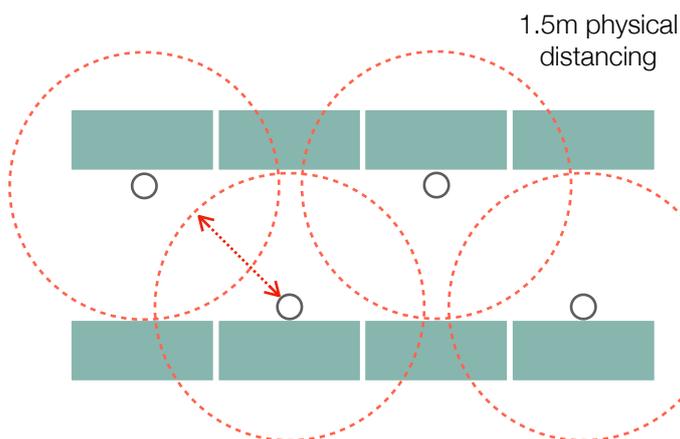


Fig 12: Capacity to occupy bench space at any one time whilst observing COVID-19 physical distancing requirements.



1. ARINA's mean data on eight Australian Campuses indicate an average allocation of research laboratory and ancillary floor space of 24 sq m per Higher Degree by Research student. This reduces to 12 sq m per researcher, if it is assumed that the maximum number of researchers is double the number of HDR's. This would include Academics, PostDocs, visiting researchers, honours and other students assisting in research projects [Fig 10].
2. It is important to note that it is rare for research laboratory spaces to be occupied by researchers at the same time, but where this is the case, special management protocols will be required to maintain Step 3 guidelines.
3. While in the aggregate, the average area provided for research is sufficient for continuing research activities, a temporary task management regime will be required to ensure that people do not breach Step 3 guidelines.
4. Social distancing rules may require a separation of laboratory bench workspace so that a 1.5m physical distancing rule is observed [Figs 11 & 12]. This may entail:
  - a. A temporary rearrangement of bench workspaces so seating is staggered rather than back to back or side by side, with every other bench space being used for shared equipment or the laying out of samples.
  - b. Enforcing a cap on the number of persons in a laboratory space at any one time.
5. Overall, these constraints are likely to have a manageable impact on existing research laboratory activities, even though they may require additional management effort to implement.
6. In some cases, the fitment of screens and other devices will be desirable to limit the risk of infection.

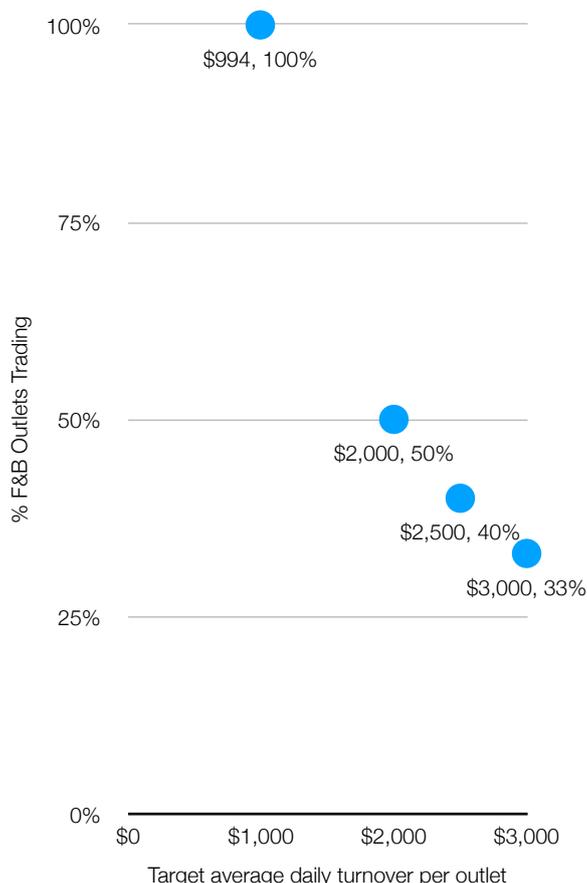
# Food and Beverage Outlets

Under a scenario where all food and beverage outlets are trading with one third of normal student load, an average turnover of around \$1,000 per day would be an optimistic estimate. This is unlikely to be sufficient to make them all viable.

### Assumptions:

1. 31% of full time equivalent students return to the campus.
2. Each full time equivalent student who are able to be taught on campus will turn up on average 2 days a week for small group teaching or laboratory practicals.
3. Allowance for staff and visitors at 20% of student numbers.
4. Average expenditure on food and beverage per headcount on an average day is \$7.50. This ranges from a \$15.00 meal to persons who would not make a purchase.

Fig 13: Estimate of average daily turnover per food and beverage outlet under various scenarios. Average across eight Australian University Campuses



1. Profits will be challenged for a standard food premise which may under normal circumstances employ 3-5 staff per day and operate at a cost of goods sold (COGS) percentage of 30%. A combination of rent relief and JobKeeper support may contribute to the ability to trade, though this will be highly dependent on the employment situation of the F&B staff and whether or not they are eligible residents for government support. Around 50% to 65% of existing outlets may refrain from trading [Fig 13], depending on viable sale targets and other factors.
2. Other measures currently adopted by universities for food and beverage operations in response to COVID-19 measures include:
  - a. At the time of writing, most universities only have take-away measures in place.
  - b. Under Step 3, up to 100 people may be seated in a single space but the application of this is unclear. Social distancing measures will need to be maintained.
  - c. Discounts are being offered by vendors supported by JobKeeper to encourage food and beverage spending.
3. With dine-in options limited by capacity under Step 3, take away food will predominate. Access to temporary seating areas may be required to accommodate the loss of existing space due to physical distancing requirements. In certain circumstances access to teaching spaces not required by learning and teaching options could be utilised.
4. Access to microwave and self serve stations is problematic because of the need for sanitisation after every use. In most instances, these shared facilities will need to be discontinued until health authorities can provide clearer guidance on touch point infection, or 'no touch' appliances can be delivered.

# Restrictions

## Summary of current State and Federal road maps

UNO All numbers are maximum and subject to the overriding 4 sqm and 1.5m physical distance rule.

NOTE Restriction are subject change and this table is a guide only. Refer to local jurisdiction for up to date information.

	WA	SA	NT	QLD	NSW	VIC	ACT	TAS	AUS
	Stage 2	Stage 1	Stage 2	Stage 1	Stage 1	Stage 1	Stage 1	Stage 1	Stage 1
Start	18 May	22 May	15 May	15 May	15 May	01 June	15 May	19 May	No specific date
Public gathering	20	10	2 hr time limit	10	10	20	10	10	10
F&B	20	10 (outdoor) +10 (Indoor)	2 hr time limit	10	10	20 per enclosed pace	10	10	10
Food Courts / vans/markets			2 hr time limit			Markets			No Seated
Outdoor gathering	20	10	2 hr time limit		10	20	10	10	10
Libraries	20	10 (local government)	2 hr time limit	10	?	20 per space	10	10	Nothing specific
Auditorium/Theatre	No specific advice	No specific advice	2 hr time limit	No specific advice	No specific advice	100 (specific uni advice)	Closed	No specific advice	Roadmap describes auditorium as "entertainment and amusement". Closed
University spatial advice	None	Face to face tutorials	None		None	Avoid libraries and study areas			Increase face to face where possible, prioritise hands on skills based learning
	Stage 3	Stage 2	Stage 3	Stage 2	Stage 2	Stage 2	Stage 2	Stage 2	Stage 2
Start	Mid June	*01 June and 5 June 20	5 June	12 June	01 June	22 June	No Advice	15 June	No specific date
Public gathering	Further relaxation		Lifted		no change			20	20
F&B	Further relaxation	*20	Lifted	20	50	50 per enclosed pace		20	20 but no seated food court
Outdoor gathering	Further relaxation		Lifted	20	no change			20	20
Libraries	Further relaxation	no advice	Lifted	20	4 sq m per person			20	Nothing specific
Auditorium/Theatre/Cinema	Further relaxation	20 (Theatres/ Cinemas)	Over 500 with safety plan	20*	No specific advice	50 per space		20	20
University or other spatial advice	None	Face to face tutorials	None	*Possible COVIDSafe plans to approval					Increase face to face where possible, prioritise hands on skills based learning
	Stage 4	Stage 3	-	Stage 3	Stage 3	Stage 3	Stage 3	Stage 3	
Start	No Date	No Date		10 July	Assessing	Late July (possible)	No Advice	13 July	No specific date
Public gathering	Lifting of restrictions	Larger gatherings		100				50-100 TBC	100
F&B	Lifting of restrictions			100		100		50-100 TBC	100
Food Courts and vans	Lifting of restrictions	Lifted						Lifted	Restrictions lifted
Outdoor gathering	Lifting of restrictions			100				50-100 TBC	100
Libraries	Lifting of restrictions			100				50-100 TBC	Nothing specific
Auditorium/Theatre	Lifting of restrictions	Larger venues		100				50-100 TBC	
University spatial advice	None	International students returning	None		None				Increase face to face where possible, prioritise hands on skills based learning. Consider international travel for students and reopening of residential colleges
Links	Roadmap	Govt Website Roadmap	Roadmap	Govt Website	Govt Website	Govt Website	Govt Website	Roadmap	Govt Website

