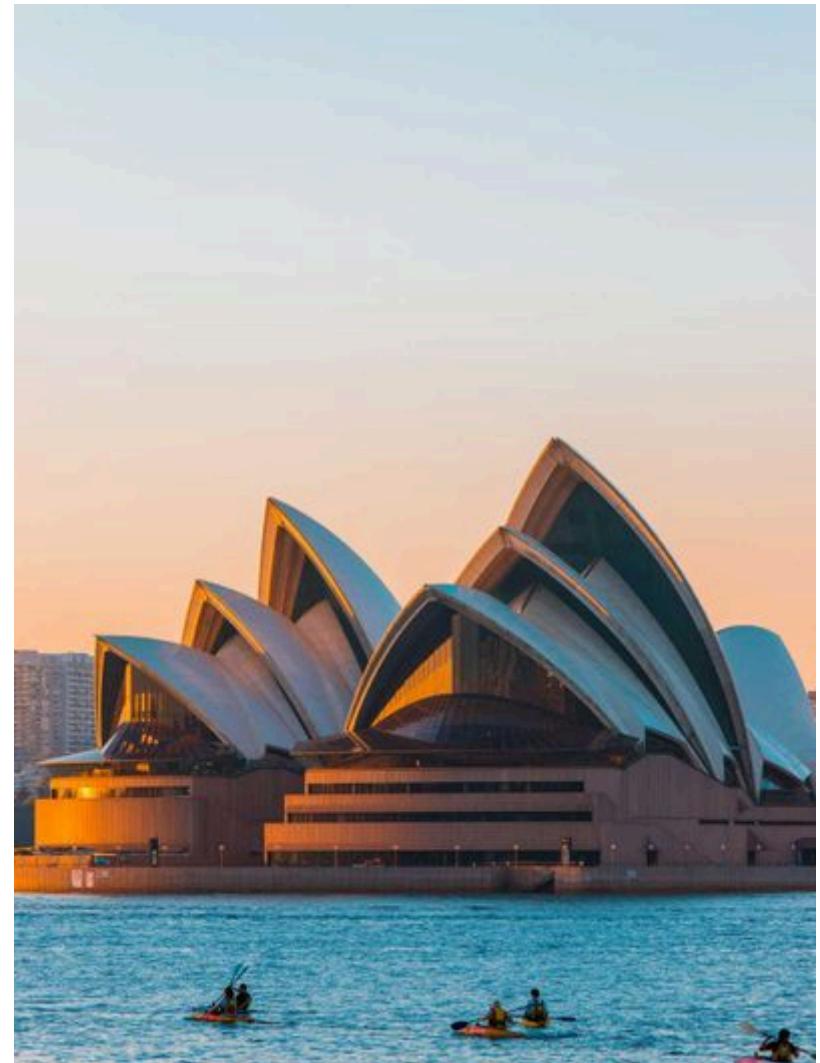
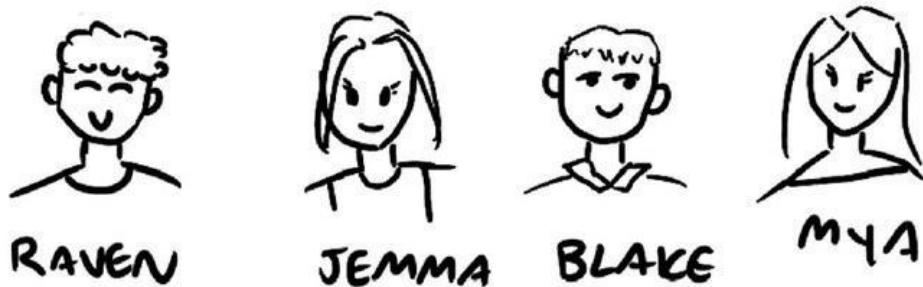


# SYDNEY OPERA HOUSE BUILD

Group 6



Raven Dashiell Scales | Blake Reed | Mya Tran | Jemma Cashel  
Monday 25th November - Friday 6th December 2024

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## Acknowledgement of the Land

We recognise the Tubowgule, the land where the Sydney Opera House is located, and the Gadigal people of the Eora Nation as the Traditional Custodians of this hallowed location. We honour their lasting connection to this land, which has been a site of storytelling, gathering, and creativity for more than 60,000 years, and pay our respects to their Elders, past, present, and emerging.

We are incredibly appreciative of the opportunity to grow and learn in this extraordinary location, which has great cultural and historical significance. We are motivated to participate in meaningful learning, creativity, and teamwork by the Gadigal people and Tubowgule's legacy. We value this legacy and work to protect and conserve the diverse cultural stories that still influence this region today.

# Day 1 - Storytelling: The Building and People

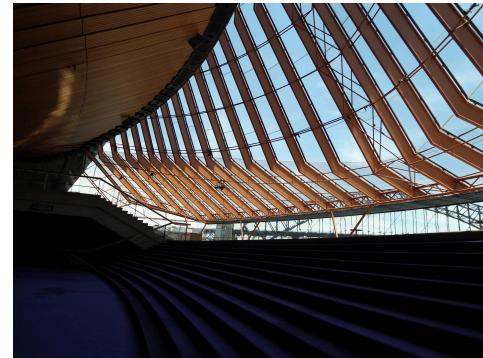
## Opera house tour

On the first day of this program, we were shown around the opera house with a tour where our tour guide gave us an in-depth talk about the opera house, its materials and history. We got to see theatre rooms and performers practising and hearing funny stories about the stages, such as the chicken story.

One of Australia's most recognisable buildings, the Sydney Opera House is renowned throughout the world for its architectural mastery and cultural relevance. The idea came from an international design competition in 1956, where Danish architect Jørn Utzon's daring, sail-like design was chosen from 233 submissions. Innovative engineering problems, such as the intricate design and assembly of the unique roof shells, were present during the construction phase, which started in 1959. On October 20, 1973, Queen Elizabeth II formally opened the Opera House in spite of these obstacles and large cost overruns.

For thousands of years, people have gathered and told stories on the land of Bennelong Point, which the Gadigal people refer to as Tubowgule. The setting of the Opera House exhibits a strong cultural resonance, connecting antiquated customs with modern inventiveness. The Opera House, which hosts more than 1,500 performances a year in a variety of disciplines, has developed over time into a symbol of creative quality.

It was acknowledged as "a masterpiece of human creative genius" and added to the UNESCO World Heritage List in 2007. The Sydney Opera House is a living example of creative design, teamwork, and the persistent spirit of creativity and culture.



Upclose tiles of the sails

Theatre door

## Introduction to the Design Challenge + System Thinking + UNSDGs

We were given a brief of the design challenge and started brainstorming, however were told to pause on it as the tours didn't want us to start straight away and take the next few days learning and understanding everything first. As Nicola quoted from Einstein, "Use 95% of the time understanding the problem, and 5% solving it"

### Reflection

During the reflection, we were asked *What, How and Why do you capture data as a planner?*

Collaboratively we decided

- What

Statistics, trends, recent news, history, living situations, economy, demographics

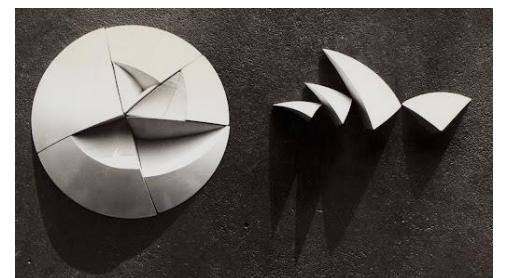
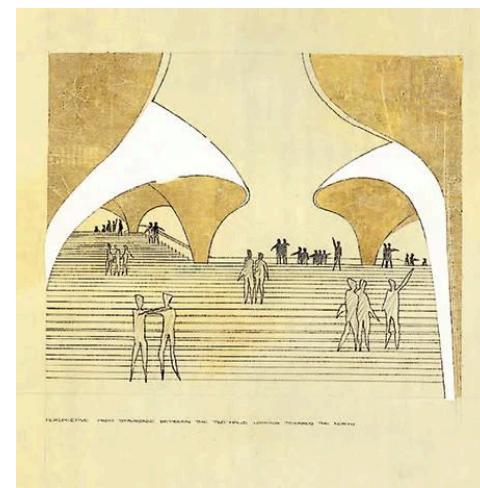
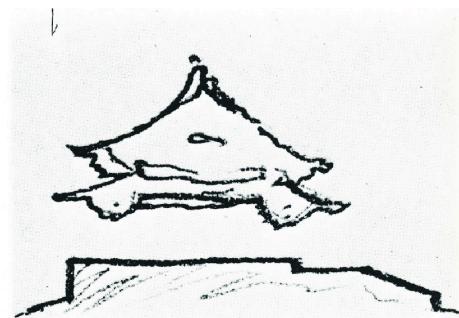
- How

Primary, and secondary information, individual physical investigations (field trip, survey, interview), readings from reliable sources such as ABs quick stats

- Why

Understand the working systems of society, know how social phenomena arise, ensure community consultation in the development of new things, and ensure socialism, environmental and economic sustainability.

Closing the day, we were given a 1-minute drawing exercise where we drew quick sketches on the prompts given, such as the opera house and harbour, mimicking Utzon's sketches. This exercise allowed us to become one with Utzon and immerse ourselves into his ideology and methodology.



## Day 2 - Storytelling: Country-Centred Design

### Introduction to Country-Centred Design

Our educational encounter with Matte Agar McConnel, an architectural graduate and proud Wiradjuri Dabee man, was incredibly enlightening and life-changing. Matte talked about his strong ties to his homeland and his proficiency in incorporating First Nations viewpoints into modern design. His lessons placed a strong emphasis on the value of country-centred design, which places an emphasis on cultural integrity, sustainability, and respect for the land.

The experience's high point was a practical garden tour in the Royal Botanical Gardens, where we learned about the importance of indigenous plants and how they relate to First Nations knowledge systems. Our tour guide was very connected to the land, and during the tour, he couldn't tell us all the information and history as it wasn't his right to speak about them. We all found it very considerate and respectful that he took into consideration the First Nations and how they should be the ones to tell specific stories and teachings. Matte helped us to view the environment as a living, breathing object that is essential to design and narrative, rather than merely a resource. Our knowledge of how First Nations customs support ecological balance and communal well-being has grown as a result of this walk.

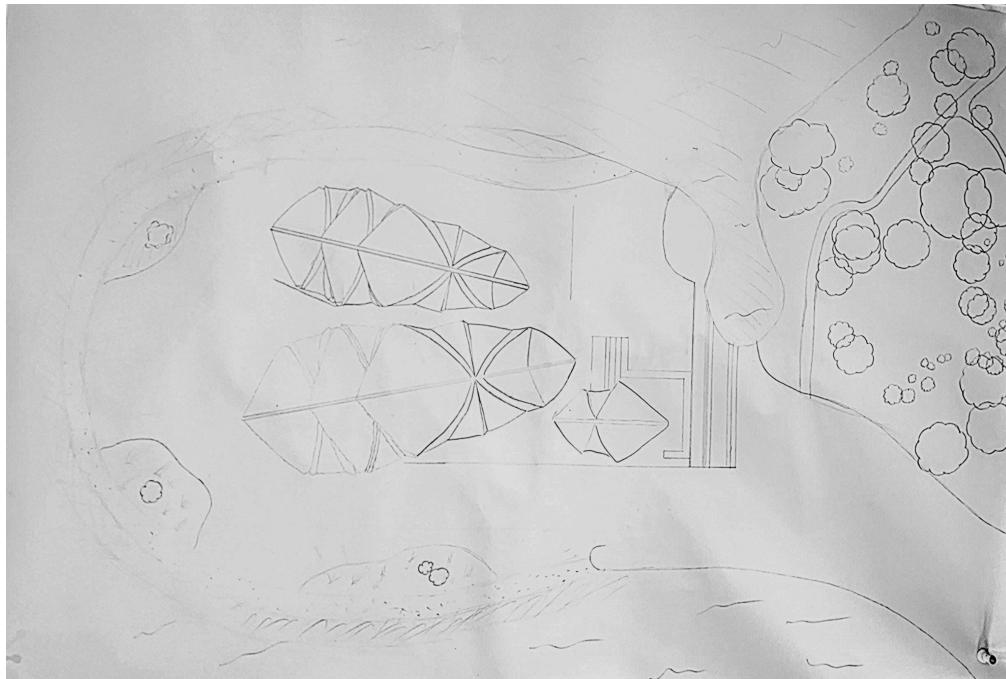
Matte also led an exercise in which we used First Nations concepts to rebuild the harbour of the Sydney Opera House. Through this activity, we were prompted to consider critically how to integrate Indigenous values into contemporary settings, including connection, reverence for natural landscapes, and the interaction of architecture and culture.

We developed a greater understanding of the wisdom of First Nations design philosophies and how they may motivate more deliberate, inclusive, and sustainable architectural practices as a result of Matte's lessons.

## Walk on Country



## Workshop + Reflection



During the workshop, we were asked to reinvent the Opera Harbour to be more of a country-centred design.

The changes we made were

- We broke down the harbour and created it to mimic the Barangaroo reserve, due to this a lagoon formed, showcasing elements of the original harbour years prior.
- Furthermore, we included more trees in the design.
- We removed the cliff of the botanical garden and turned it into a grass slope for individuals to walk and access the garden more seamlessly.

## Day 3 - Utzon Design Principles, Music and Nature

### Architecture and Music Tour

A tour of the relationship between architecture, design, and sound was provided during our visit to the Sydney Opera House with Mitchell Allen, a built environment specialist with expertise in acoustics. Mitchell's vast expertise provided a greater understanding of the iconic design of the Opera House by shedding light on the significant ways that architectural decisions influence acoustic experiences.

We investigated the acoustic dynamics of several areas within and outside the Opera House with the help of three musicians: a flautist, an oboist, and a double bassist. They gave performances in a private room, the foyer, and outside; each location revealed unique acoustic characteristics impacted by the materials, design, and size of the venue. We were able to experience the architecture both somatically and emotionally thanks to these live performances, which demonstrated how sound interacts with and changes environments.

Under Mitchell's direction, we learnt about the careful architectural choices that make the Opera House a unique location for performances and music. The music hall's lofty ceilings and wood-panelled interior, for example, beautifully enhance the sound, but the outside area faced the problem of open-air acoustics, which is influenced by the harbour and the surrounding landscape.

Our understanding of the connection between architecture and music has grown as a result of this encounter. It emphasised how sound's emotional and sensory impact is not only supported but also enhanced by design, resulting in environments that evoke wonder and a sense of community.



### The Originals afternoon tea

We had the opportunity to watch a film about the process of building the opera house and the social, physical and economic constraints it took. We were able to deepen our understanding of the process and visually see it, through the interviews and videos from the past.

## Tapestry Collage Workshop

This vibrant artwork evokes a synthesis of music and nature, central to the design principles of Jørn Utzon, the architect of the Sydney Opera House. The dynamic brushstrokes and bold, organic shapes seem to mirror the rhythm and flow of a musical composition, suggesting a visual harmony akin to sound waves or natural landscapes. The colours—vivid greens, yellows, purples, and oranges—reflect the essence of nature, while the interplay of black lines adds contrast and movement, reminiscent of a musical score's structure.

Utzon's design philosophy emphasised the integration of architecture with its environment. Inspired by natural forms and cultural elements, his work sought to create spaces that resonate emotionally, much like music. The abstract shapes and colours in this mural celebrate that connection, translating the fluidity and unpredictability of nature and music into a static yet lively visual language. Together, this composition embodies the timeless dialogue between natural beauty and artistic expression.



## Day 4 - Regenerative Design

### Built environment SOH Solutions + Sustainability Tour



During our tour with Honeywell, we were taken to the under-systems of the Opera House, which is a great privilege and something that not many people know about.

We learned how Utzons's air conditioning systems work. It is quite interesting to see the unique system and how it makes use of the surrounding environment in a non-destructive way, yet it benefits from it.

#### First Nations knowledge systems

We talked in the CFC about how First Nations people relate to the country and understand it. As a modern society, we have lost touch with nature, First Nations people can read nature and learn from it, they can understand how to listen to nature, but we have lost this language.

#### Philosophy and Architecture

During our time with Tim Dean, we learned about Philosophy and how it can influence how we think as we design and concept.

We learned the importance of asking Why?

## Day 5 - Social Sustainability Value

### Access-Challenge and Guest Artist Presentations

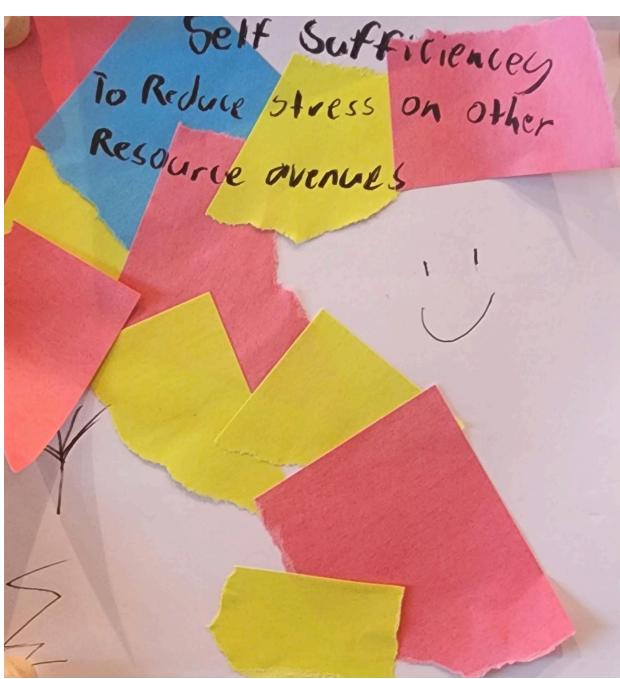
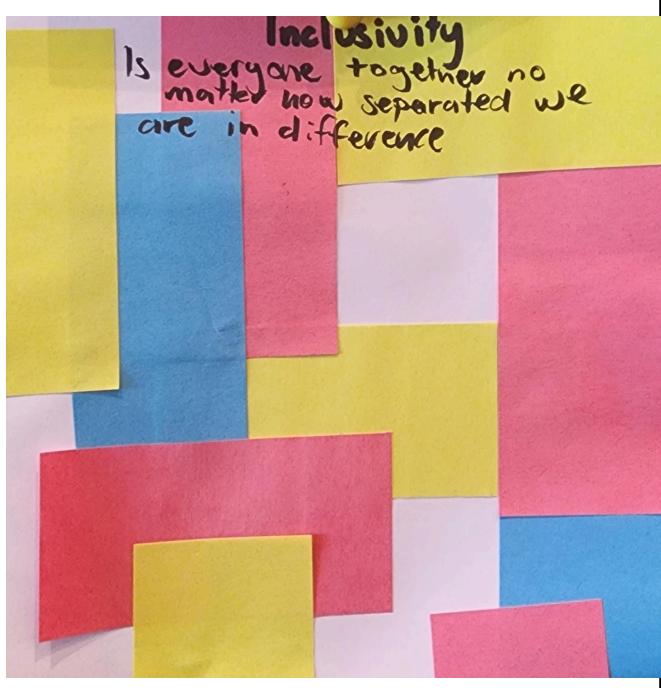
Janelle Ryan came to the CFC and talked to us about the experience of navigating the world with autism. During this time we learned existing and possible improvements to systems designed to assist and welcome people with autism.

### Visualising the Future through Comics WORKSHOP

THE CHANGE I'D LIKE TO MAKE  
IS TO ADD MORE NATURE. IT  
LOOKS TO INDUSTRIAL ANDS  
NEEDS SOME



To be more inclusive with  
all communities and increase  
the greenery/nature on the  
infrastructure and around  
the opera house.

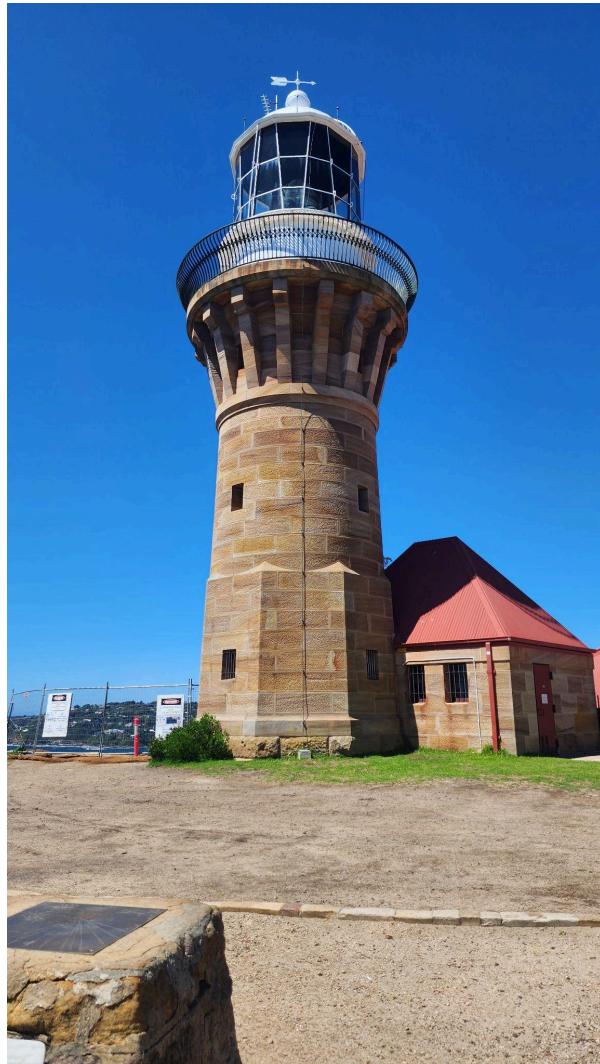


During this workshop with Fionn McCabe we learned how comics are designed and thought through, as well as how they help convey emotion.

We also learned how comics are useful to prototype and to get ideas down.

## Day 6 - Pittwater Excursion

### Barrenjoey Head and Lighthouse Walk



During our time on our excursion, we were given the opportunity to hike up to Barrenjoey Head and experience the view and get a close-up experience of the Lighthouse. We also had the opportunity to experience some wildlife encounters, which connected us to the land during our trip.



## Chartered Ferry



## House Tour



We were transported from Palm Beach to Coasters Retreat via ferry. During this time we took in the views of the water and experienced travelling along the water.

When we arrived at Coasters Retreat we were greeted by Karen Lambert. We were taken around the house and experienced open-concept house design and the things that influenced Utzon during his time in Australia.

## Day 7 - Consolidate Learning

Movement session #5 performance and procession: The Utzon Room and tapestry

Creative learning workshop: make a manifesto

- What is the central message [or provocation, 'call to action] of the manifesto? What is the manifesto making a stance for and/or against?
- How have they used language and design elements to advertise their message?
- What do you think is working well here? What is not working so well?

Dissent By Design 2022 - "A-Z Manifesto of Equitable, Inclusive & Human Design for Built Environment"

- Focuses on the perspective of what a design to build for the environment would require through the lens of equity and inclusion
- States

WAI 2008 "Un-making architecture - an anti-architect manifesto"

- The central message is that "buildings are never just buildings". It is making a stance for how they are intertwined with politics and institutions, how they are the physical embodiment of manifestos
- They've condensed their topic into three small paragraphs to get their key points across
- It's very concise but some statistics, quotes, or images could help digest the excerpts more easily

IFIXIT. "Repair Manifesto"

- The repair manifesto pushes the message that the ability and facilities to repair the items that you own are paramount. The manifesto suggests that if you are unable to repair your items, you don't actually own them. Additionally, it states the positive personal, economic, social and environmental positives of repairability.
- This particular manifesto mimics the style of soviet propaganda, this strong art and text style jumps out at the viewer, with strong and possibly controversial statements.
- The art style and mimicry of Soviet Propaganda works well, the short phrases also work well. However, there is too much text present, and the main message of the manifesto may be lost within its own text, either due to viewer boredom and/or confusion and the overwhelming nature of the text.

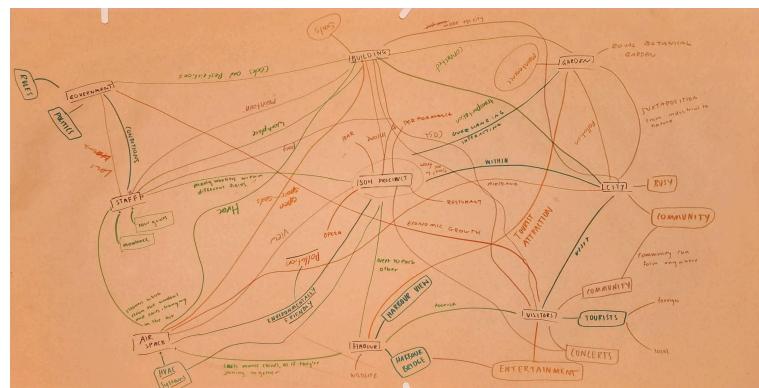
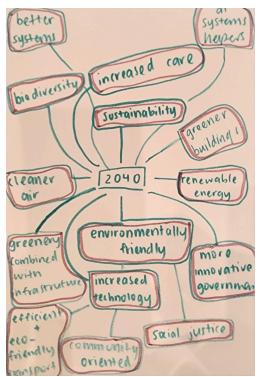
Bread and Puppet Glover (1994). "Cheap Art Manifesto"

- This manifesto states the belief that art has become too expensive. It states that art should be made easily available and attainable to all. This manifesto states that art has become too much of a privilege, and that goes against the very nature of art itself, which is something to be shared and enjoyed by all.

- The manifesto makes use of selective fonts, either changing the size of particular phrases/words or making them bold. Additionally the font changes throughout the text.
- The changing in font style helps keep the reader interested and engaged, the bolding assists in promoting the main ideas of the manifesto. However, the changing of font style does not become very prevalent until halfway through the text.

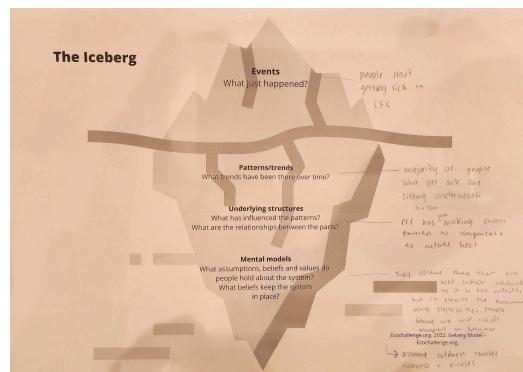


# Design Challenge



## 2040 Systems Map

current systems mapped



Iceberg

## 2040 What if?

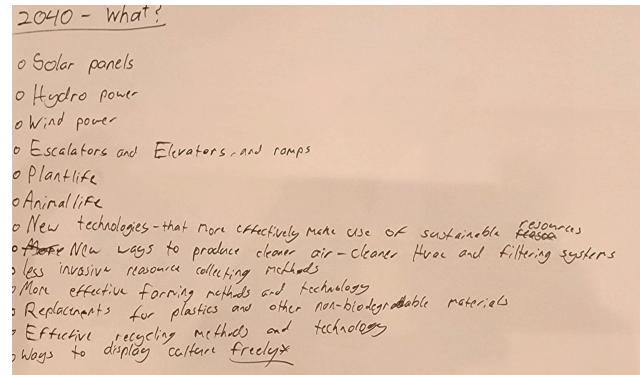
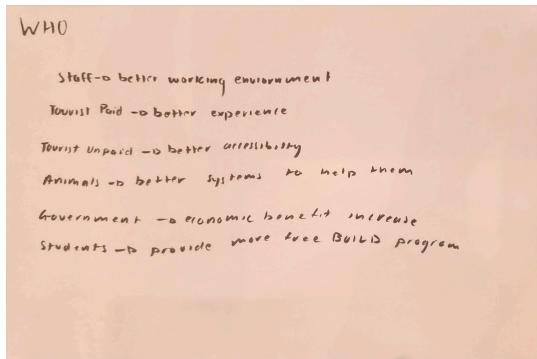
(Factor - Relation to Opera House)

- Increase in renewable energy - Cheaper and cleaner energy
- Increased awareness and care for sustainability - Opera house advertises care for sustainability
- Increase in renewable technology and investment - Technology incorporated into the building
- More Innovative government - Less red tape involved in altering the building
- Cleaner air - better view
- More biodiversity - animals closer to the building
- Cities incorporate nature - the garden is made closer to the building
- Technology works with nature more effectively - Opera House and its systems have a lessened effect on the surrounding environment (aircon, foot traffic)
- Less traffic - more effective public transport
- More care for disability - fewer steps

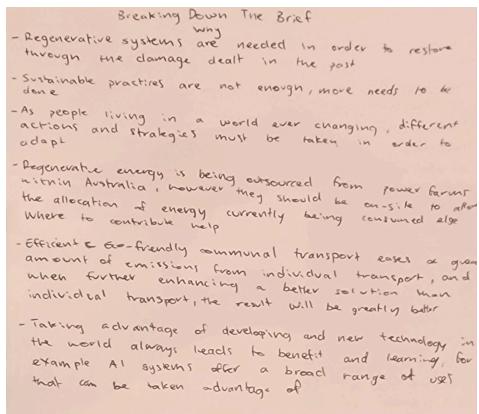
# Day 8 - Design Challenge

## Group Work

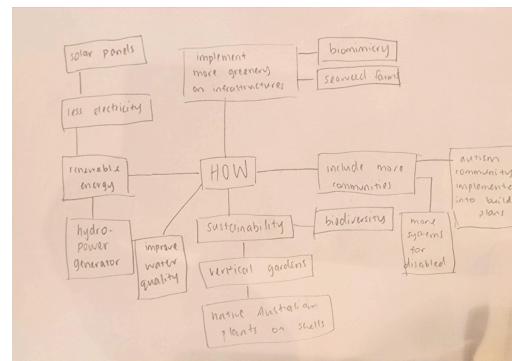
### 2040 Who, What, Why, How



## Who



## What



## Why

## How

# The City (As a system)

User (city as a system)

Does:

- Provides a place to share goods and services
- Allows people to socialise and meet
- Creates a disconnect between the people and the local environment
- Provides transportation

SAYS - city as system (what it serves)

City says it's a home system

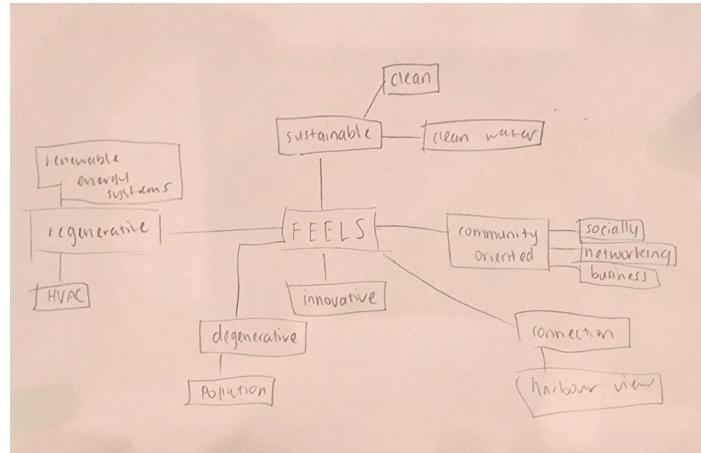
- it serves as a social, economical + physical
  - how people meet, social status
  - places to meet
- makes money for government
  - tourist attractions
  - job centre
    - where most people make money
- physical embodiment of systems

Does

Empathy Building  
User  
The City

- The City wants...
- Innovation
  - Improvement
  - Globalisation
  - Socialising
  - Entertainment
  - Recreation
  - Capitalism
  - Sharing of Ideas
  - Expanding Urban Area
  - Adds contribution to people
  - Being the Main Character
  - Attraction
  - Business Oriented Meetings
  - Community Fostering
  - Creating Culture

Says



Thinks

Feels

## Assumptions

### **Assumption 1: You can only live in the city and visit the opera house if you can afford it and are wealthy.**

False. While Sydney is an expensive city, and tickets to the Opera House can be pricey, it's not exclusively for the wealthy.

**Living in Sydney:** Many people from diverse socioeconomic backgrounds live in Sydney. There's a range of housing options, from expensive harborside apartments to more affordable suburbs further from the city centre.

**Visiting the Opera House:** The Opera House offers a variety of performances and events, with ticket prices ranging from affordable to high-end. Additionally, there are free public spaces within the Opera House complex that everyone can enjoy, such as the forecourt, the Western Broadwalk, and some exhibitions.

Why?

**Media portrayals:** Sydney often gets portrayed in media as a playground for the rich and famous, with glamorous harborside mansions and expensive lifestyles.

**High property prices:** Sydney has some of the highest property prices in the world, which can create the impression that only the wealthy can afford to live there.

**High-profile events:** The Opera House often hosts high-profile events with expensive tickets, reinforcing the idea of exclusivity.

### **Assumption 2: The city and Sydney Opera House have no regenerative systems that are making a change for the future.**

False. Both the city of Sydney and the Sydney Opera House are actively implementing sustainable practices.

**City of Sydney:** The city has a Sustainable Sydney 2030 plan with ambitious goals for renewable energy, waste reduction, and green infrastructure. They're investing in solar power, cycling infrastructure, and energy-efficient buildings.

**Sydney Opera House:** The Opera House has its own Environmental Sustainability Plan with initiatives for water conservation, waste management, and energy efficiency. They use seawater for cooling, have a rainwater harvesting system, and are working towards carbon neutrality.

Why?

**Focus on challenges:** Media coverage often focuses on the environmental challenges facing Sydney, such as urban sprawl and pollution.

**Lack of visibility:** Sustainable initiatives may not be as visible or well-publicized as other aspects of the city.

**Perception of iconic buildings:** People might assume that older, iconic buildings like the Opera House can't be easily adapted for sustainability.

### **Assumption 3: You come to the city of Sydney for prestigious works of art and culture.**

True (but not only). Sydney is renowned for its vibrant arts and culture scene, with the Opera House being a major drawcard.

World-class performances: The Opera House hosts world-class opera, ballet, theatre, and music performances, attracting international visitors.

Museums and galleries: Sydney boasts numerous museums and art galleries showcasing diverse collections and exhibitions.

Beyond the prestigious: However, Sydney offers much more than highbrow culture. There's a thriving live music scene, diverse festivals, and a rich Aboriginal cultural heritage to explore. People also visit Sydney for its beautiful harbour, iconic beaches, and outdoor lifestyle.

In conclusion, while Sydney has a reputation for being expensive and attracting those interested in high culture, it's a diverse city with something to offer everyone. Furthermore, both the city and the Opera House are actively working towards a more sustainable future.

Why?

**The iconic status of the Opera House:** The Sydney Opera House is a globally recognized symbol of arts and culture.

**Marketing and tourism:** Sydney promotes its cultural attractions to attract tourists.

**World-class institutions:** Sydney has renowned museums, galleries, and theatres that draw international acclaim.

### **Assumption 4: The City is only available for those who are rich**

True, the city is exclusive and prestigious. It is a luxury to live there, as there is limited supply with a strong demand. The location is prime with attractions such as the opera house and harbour bridge. Not only is it sought out for living but for investment too, adding more to its exclusivity.

### **Assumption 5: The city benefits from the Opera House because it brings more people to the city**

True. The Opera House brings tourists to the city, therefore due to the proximity to the Opera House the city can grow its economy through providing goods and services, (Food, Clothes, etc)

### **Assumption 5: The city has increased in monetary and personal value due to the Opera House**

True. The city has become more expensive to live in due to the Opera House, therefore its overall monetary value has increased, this is further influenced by the ability to sell merchandise and other items. Furthermore, the Opera House has become a symbol of the city, this has given the city its own unique and meaningful identity, increasing its value.

## **Assumption 6: The city is influenced by the Opera House, both physically and culturally**

True. When planning building sites within the city, contractors plan to face the House, as merely the view of the structure increases the value of the building. Additionally, merchandise shops sell items related to the Opera House, changing the shopping culture and look of the city. The Opera House also brings a culture of music and dance to the city, being a place to share, the building brings musicians, dancers, etc to the city, changing its culture as a whole.

## **Root Cause Analysis**

Insight: Designers plan the buildings to face the Opera House

Why? Because it increases the building's Value

Why? Because the Opera House is Beautiful

Why? Because it was designed to be beautiful

Why? Because society places value on outer beauty

Why? People want their surroundings to visually please them

Why? Because society as a whole prefers to be happy

Why? It is easier to get through life when you are happy.

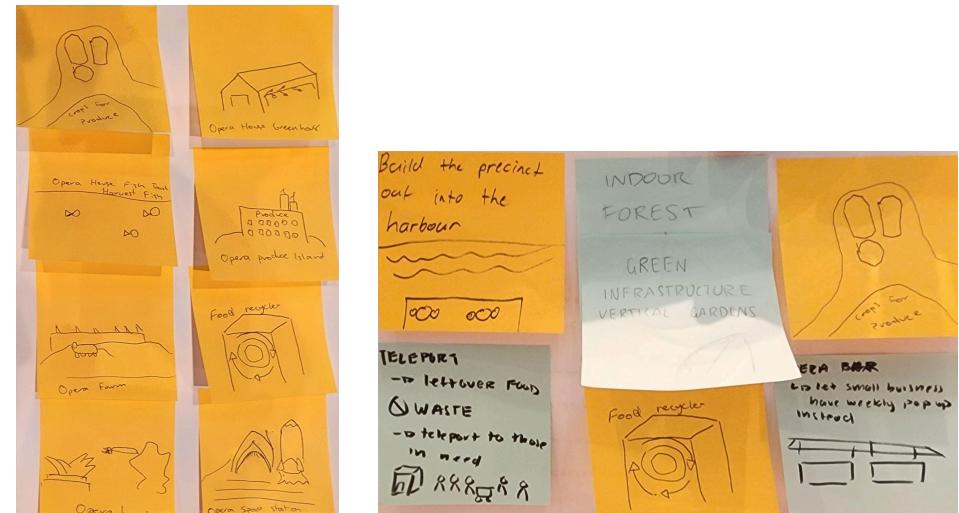
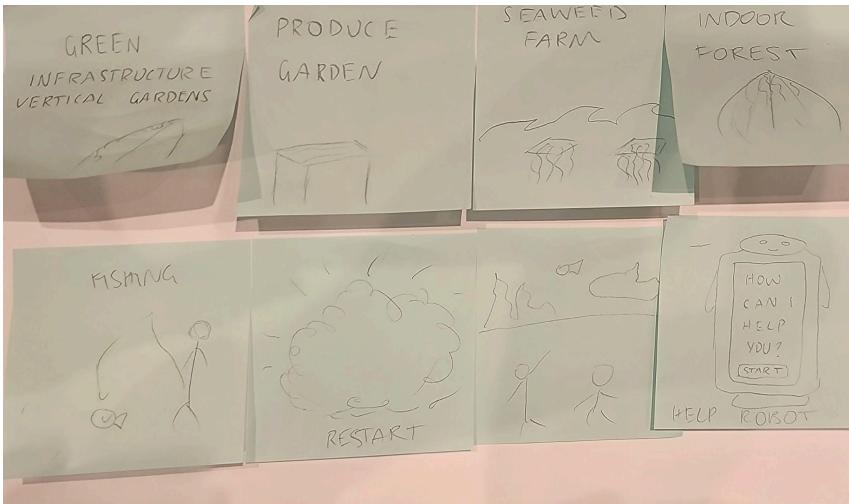
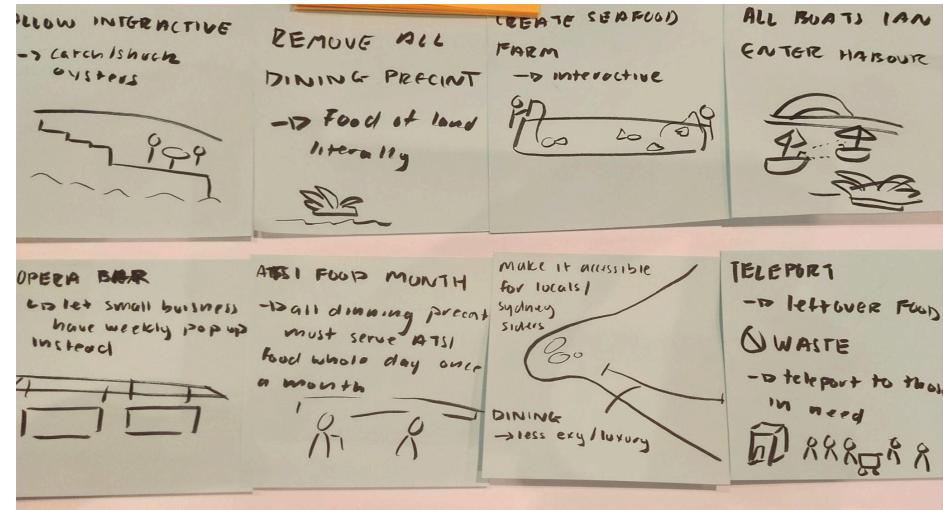
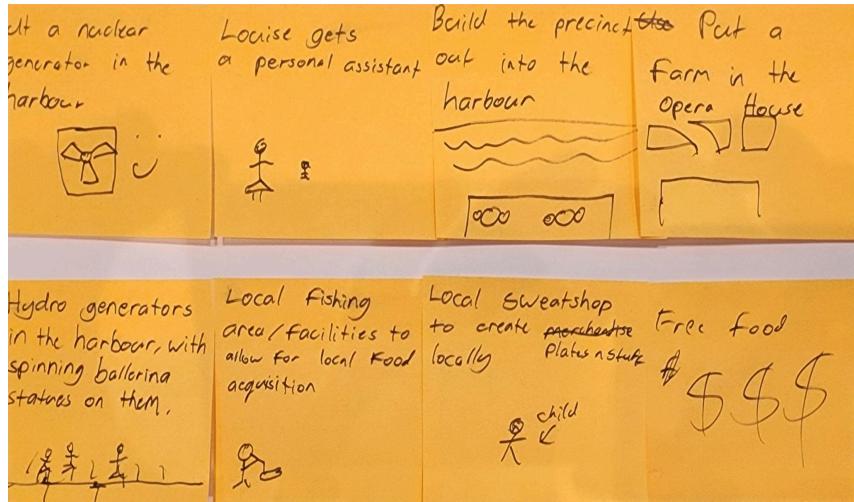
## **How might we statements**

How might we create a regenerative energy system so that the SOH has a lessened impact on the environment and improves the surrounding ecosystem and culture?

How might we redesign the exterior of the SOH so that Sydney can become more regenerative and lead to a more sustainable environment?

How might we redesign the SOH so that the Sydney community can be more connected to the land and foster a better understanding of our history and culture?

# Crazy 8s



## Concept canvas

- **name your intervention and describe it in one sentence**

Operation Harbour Harvest. It is a strategy to utilise sustainable practices and technology within the garden and surrounding area for the dining precinct to use.

- **Why is it important? Describe how this intervention solves the problem for the precinct.**

- Reduces carbon footprint - reduces transportation distances and minimises greenhouse gas emissions
- Waste reduction - minimises food waste and compost back into a garden
- Sustainable growing practices - organic farming, water conservation etc.
- Education and awareness - The visible garden acts as a showcase and raises public awareness
- Supports local economy - promotes regional food systems
- Reduced costs
- Increased revenue
- Community building
- Improved health and wellbeing
- It will allow for the sustainable acquisition of produce used within the precinct.

- **How does it work? Outline at least 3 steps to achieve this implementation.**

Building farms within premises, involving the repurposing of the botanical gardens into a fresh produce farm, the implementation of a fish tank, harvesting and serving products seasonally and within production constraints.

There will be a food recycling system that will compost for the gardens. As well as septic tank systems to recycle waste nutrients in crops. Furthermore, leftover food items that will perish on the day will be redistributed to food shelters around the city.

Furthermore, we will be extending the pier to the harbour to allow for more table space, with the opera bar reinvented to change every two weeks, as local businesses will get the chance to showcase their products using the Opera kitchens and agriculture.

Individually sourcing products from self will allow the relocation of funds that would initially be given as processes toward other food providers, allowing the food to be of less cost and attract more customers around the city.

## Elevator pitch

Hey, I'm... Nice to meet you. I have a great proposition and I will only take this elevator ride to explain to you. At the Opera House, we're turning over a new leaf! "Harbour Harvest" transforms our opera house into a vibrant garden, overflowing with fresh, sustainable produce for the Opera House Kitchen. Imagine delicious meals made with ingredients grown just steps away, minimizing waste and our carbon footprint. But it's not just about the food. Harbour Harvest creates a thriving and forever adapting community space, where you can connect with nature and learn about sustainable living. If you're interested in cultivating a greener future, one delicious bite at a time. Support Harbour Harvest at the Sydney Opera House!

What if the Sydney Opera House could be a place where art and sustainability intertwine? Harbour Harvest aims to cultivate more than just world-class performances at the opera house. Harbour Harvest is a revolutionary sustainable garden, that supplies the Opera Kitchen with fresh, hyperlocal produce. Just like our stage performances, Harbour Harvest is a platform for innovation, showcasing sustainable practices and cutting-edge technology. This living masterpiece engages all your senses, offering a tranquil escape and inspiring creativity. But it's more than just a garden, it's a community, bringing together artists, nature lovers, and food enthusiasts. Experience the harmony of art and nature, where every bite tells a story of passion, responsibility and the magic of the opera house.

When you go to the Opera House, you go to watch the ballet and symphonies, but do you ever think about eating at the great restaurant we have on-site? With a key spot in the city and a revolutionary menu, everyone will want to come. My proposition is a self-sustainable restaurant, serving a seasonal menu, with in-house produce sourcing, ensuring the best ingredients, the best service and the best experience, with the food, will be serving as an extension of the world-class art being performed.

Introducing Operation Harbour Harvest. In 2040 we are gonna struggle to source good resources with overpopulation.

Transforming the Bennelong restaurant into an indoor farm and repurposing the botanical gardens into another fresh produce farm, the implementation of a fish tank, harvesting and serving products seasonally and within production constraints.

I believe that we at the Opera House are missing out on so much potential revenue without realising the true possibilities of our dining precinct, are you willing to help us bring that out?



To be researched:

- Regenerative farming practices - wilding <https://rewilding.org/wilding-returning-nature-to-our-farm/>
- Potential issues in 2040 that will relate to food production -
- Septic tanks
- Relate to the arts and culture of the opera house
- Cooking as an art form - cooking sections <https://www.cooking-sections.com/>
- Ingredients that represent
- Utzon design principles

## Current How Might We Statement

How might we create a self-sustainable dining precinct so that local sourcing boosts the local economy and we ensure responsible sourcing and invest in green jobs to create a sustainable workforce?

## Day 9 - Design Challenge

### Movement Session #7

Offshore wind farm

Take away parking and have hydro farming

### Group Work

- Contextualise our Future Scenario
- What is the ecosystem of the opera house (ecological, financial, human, non-human)
- Refine the how might we statement
- Importance and art form within the creation of food. (efficiency cover art)
- Relate it all together.

UNSDG Goals:

2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, help maintain ecosystems, strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and progressively improve land and soil quality.

9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities

15.9 By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts

## Future Scenario (What does the world look like in 2040?)

- Overpopulation - 9.2 Billion by 2040 - fertility rates, mortality rates, migration patterns, evolving lifestyle -  
<https://www.un.org/en/desa/world-population-projected-reach-98-billion-2050-and-112-billion-2100>
- Permanent environmental damage (there will be regenerative practices in place, however the lack of immediate action toward the 2030 SDGs has made permanent sea level rise, temperature increase, weather phenomena, and improper waste management)
- Sea levels lead to the mix of water in the sea leading to catastrophic death of marine life
  - Osmotic stress
  - Disruption of food chains
  - Habitat loss
    - Supporting Studies:
    - Studies on Coastal Freshwater Inflows
    - Climate Change Research
    - <https://www.tutorchase.com/answers/igcse/biology/how-do-marine-organisms-adapt-to-high-salinity>
    - [https://bio.libretexts.org/Bookshelves/Introductory\\_and\\_General\\_Biology/General\\_Biology\\_\(Boundless\)/44%3A\\_Ecology\\_and\\_the\\_Biosphere/44.04%3A\\_\\_Aquatic\\_Biomes/44.4C%3A\\_Estuaries-\\_Where\\_the\\_Ocean\\_Meets\\_Fresh\\_Water#:~:text=Therefore%2C%20both%20fresh%20water%20and,a%20diluted%20\(brackish\)%20saltwater](https://bio.libretexts.org/Bookshelves/Introductory_and_General_Biology/General_Biology_(Boundless)/44%3A_Ecology_and_the_Biosphere/44.04%3A__Aquatic_Biomes/44.4C%3A_Estuaries-_Where_the_Ocean_Meets_Fresh_Water#:~:text=Therefore%2C%20both%20fresh%20water%20and,a%20diluted%20(brackish)%20saltwater)
    - <https://www.sciencefocus.com/nature/why-cant-marine-animals-survive-in-fresh-water>
    - <https://www.noaa.gov/education/resource-collections/marine-life/aquatic-food-webs>
- Intergovernmental Panel on Climate Change (IPCC) Reports
  - Their reports, such as the Sixth Assessment Report (AR6), outline potential scenarios for the future, including increased global temperatures, rising sea levels, extreme weather events, and biodiversity loss.
- United Nations Environment Programme (UNEP)
- World Meteorological Organization (WMO)
  - Release regular reports on the state of the environment and future trends. These reports often include detailed projections for specific regions and countries.
- World Resources Institute (WRI)
- The International Institute for Applied Systems Analysis (IIASA)
- Potsdam Institute for Climate Impact Research (PIK)
  - Conduct research on climate change and environmental issues. Their reports and studies provide valuable insights into potential future scenarios.

- Diet plans curated by AI
  - Analysing the health data of individuals and curating a specific diet that is optimal for them
  - "Snapcalorie" is a current AI calorie logbook
- Nutritionally altered food
  - Items of particular unhealthiness will be altered to be more healthily consumable and nutritious for the body
- Drone Delivery
  - Produce can be transported from the field to the kitchen efficiently
- Technology will remove the human component from tasks such as cooking
  - AI management systems will monitor what needs to be done in the kitchen to optimise cookery operations, minimising potential risks or mistakes when making food
  - Sensory and IOT technology monitor humidity, and temperature, reducing the risk of foodborne illness
- Smart Packaging
  - Monitoring product freshness, safeness to eat
- 3D food printing - efficiency is more important than the process and beautifulness, loss of the art form of cooking
- Technologically articulated ingredients - artificial nature is more prevalent due to the need for efficiency and demand due to overpopulation
- Blockchain Farming
  - AI systems advance the efficiency of systems, removing the human component of simple systems (farming), and tracking the entire process of the ingredient from farm to table.
- Wilding and Vertical Farming
- Global Food Network
  - AI can ease the communication of recipes around the world
- Virtual Reality
  - People can be immersed in different cultures
  - Promotes inclusivity, diversity and cultural understanding
- Holographic Technology
  - Creating visuals capable of mimicking real-life features
- Job displacement
  - As the advancement of AI renders certain roles inefficient, mass layoffs will take place leading to the redistribution of professional workers.
- Streamlined living
  - Technology will increase the efficiency of everything, allowing more time for recreation and creativity.
- Green Jobs
  - Organic Farmers

- Produce healthy food without the use of harmful chemicals, improving soil health, and reducing pollution.
- Using a streamlined system for efficiency, reducing the use of water, waste and electrical power.
- Agronomists
  - Develop sustainable farming practices, with knowledge of certain cultivation systems within history and developing new ones.
- Food Scientists
  - Research and develop innovative food products with reduced environmental impact and improved nutritional value.
- Packaging Engineers
  - Design eco-friendly packaging materials to minimise waste and pollution.
- Supply Chain Managers
  - Implement sustainable sourcing practices, minimising waste and ensuring ethical production.
- Sustainable Chefs
  - Create menus that prioritise local, seasonal ingredients and reduce food waste.
- Waste Reduction Specialists
  - Develop strategies to minimize food waste and maximize recycling efforts.
- Environmental Scientists
  - Monitor environmental impacts and develop strategies for mitigation and adaptation.

## What is the ecosystem of the Opera House in 2040

- The Opera House makes most of its revenue from sales of merchandise and food rather than through the appreciation of culture and art, such as concerts and opera “The total revenues of the 20 opera companies illustrated were £1.5 billion in 2016. Less than 30% of this total came from ticket sales” <https://theoperastory.wordpress.com/2018/01/21/economics-of-opera/>
- The Opera House sees a vastly larger number of visitors when compared to actual ticket sales. “more than 10.9 million visitors a year on-site and hosting more than 1,800 performances attended by more than 1.4 million people.”  
<https://www.sydneyoperahouse.com/about-us/how-we-work/governance-policies-and-corporate-information/annual-reports>
- The number of visitors increases year by year. Over a 16-year period from 318,000 (2008) to 383,000 (2024) tour visitors.  
<https://www.sydneyoperahouse.com/about-us/how-we-work/governance-policies-and-corporate-information/annual-reports>  
That is an increase of 65 000, therefore we can estimate that by 2040 there will be a total of 448 000 tour visitors.

- “The number of people who call NSW home is expected to grow by a third in the next 20 years, topping 10.6 million in 2041”  
<https://www.abc.net.au/news/2022-02-10/population-growth-outstrips-infrastructure-in-outer-sydney/100816952>  
Therefore we need to consider the infrastructure to facilitate the increase in population, namely the public transportation system.
  - Will the Opera House be crowded?
  - Will there be enough food?
  - Is there enough seating?
- “A study published in Nature Food has found that 6% of global greenhouse gas emissions are related to food transport”  
<https://cosmosmagazine.com/earth/food-transport-emissions-cost/>  
Therefore if the produce used by the Opera House is produced on-site, It would significantly decrease the environmental impact caused by the dining precinct.
- “The Opera House produces 1000 tonnes of waste annually (25 semi-trailers full) with 80 per cent from food and beverage”  
<https://www.smh.com.au/environment/sustainability/how-35-kilometres-of-pipe-helped-opera-house-win-a-6-star-green-rating-20230503-p5d5b8.htm>  
All of this produce is collected offsite and transported, meaning that there is a great effect on the transportation of both fresh produce and food waste.
- The addition of onsite composting facilities will decrease this transportation factor. The compost will be used within the garden, this will assist in the on-site farming activities as well as assist in helping maintain the health of the native plant life. Additionally, leftover compost can be sold for additional revenue, leading to additional sustainable endeavours.

## Prototype Problem Statements

In the year 2040, issues in history such as overpopulation, rapid urbanisation, pollution, global warming, and conflict, have led to major technological advancements, reshaping the global landscape and way of living. As globalisation encapsulates major cities, countries share similarities and differences. In the case of Australia, similarities share socio-cultural traits, economy, and environment. Every country shares bridges, but only Sydney has the Opera House. How can the iconic Sydney Opera House evolve into a stronger economic hub with a sustainable dining precinct that not only preserves its cultural heritage but also addresses the contemporary issues of this time?

In the year 2040 overpopulation has led to society caring about efficiency more than the art and culture of food. In a future where resources are scarce and 3D printers are making our food, how can we keep the art of mealtime alive? Our Opera House currently serves millions of people each year, and how many of them think about where their food comes from and the impact it has, almost none. Therefore we ask, how can the Sydney Opera House become a place for food culture and understanding while using and promoting sustainable technologies and practices?

In a future where resource scarcity, overpopulation and technological advancements have reshaped our food systems, how can we preserve the cultural significance of food and dining experiences? While 3D-printed food offers efficiency, it risks diminishing the artistry and social connection related to mealtime. AI streamlining systems and infrastructure has created perfect efficiency, this is good however it disconnects society from the processes and impacts of food creation. The Sydney Opera House, a global cultural icon, currently serves millions annually. Yet, few patrons consider the origins and impact of their food choices. How can this iconic venue evolve to become a hub for sustainable food culture, fostering a deeper appreciation for food's artistry, history, and environmental implications?

In the year 2040, many technological advancements have reshaped our way of living. Resource scarcity has led to the priority of consumption solely for sustenance, blinding society to the cultural significance of food and dining experiences. The development of 3D-printed food has overprioritised efficiency, convenience and cost. This is due to AI streamlining systems and creating perfect efficiency, allowing more time for society toward recreation and creativity. The Sydney Opera House, a global cultural icon, currently serves millions annually. Yet, few patrons consider the origins and impact of their food choices. How can this iconic venue evolve to become a hub for sustainable food culture, highlighting the diminishing art of creating dishes, whilst keeping historical significance, and considering environmental implications?

## **Problem Statement**

In a future where resource scarcity, overpopulation and technological advancements have reshaped our food systems, how can we preserve the cultural significance of food and dining experiences? While 3D-printed food offers efficiency, it risks diminishing the artistry and social connection related to mealtime. AI streamlining systems and infrastructure has created perfect efficiency, this is good however it disconnects society from the processes and impacts of food creation. The Sydney Opera House, a global cultural icon, currently serves millions annually. Yet, few patrons consider the origins and impact of their food choices. How can this iconic venue evolve to become a hub for sustainable food culture, fostering a deeper appreciation for food's artistry, history, and environmental implications?

The dining precinct should:

- **Champion Sustainable Food Systems:** Prioritise local, sustainable food sources to reduce carbon emissions, support local economies, and enhance food security.
- **Embrace Innovative Technologies:** Implement cutting-edge technologies to minimise waste, optimise energy consumption, and create immersive dining experiences.
- **Foster Community Engagement:** Empower local communities through educational programs, urban agriculture initiatives, and cultural exchanges.
- **Build Climate Resilience:** Develop adaptive strategies to mitigate the impacts of climate change, ensuring the long-term viability of the precinct.

As the Opera House is a stage commonly viewed by the world, by addressing these challenges and opportunities, the Sydney Opera House will bring its true potential as a global model for sustainable dining and a beacon of hope for a more resilient future.

## Day 10 - Design Challenge

### Group Presentation



We didn't get many photos and notes down during presentation days, as we were stressed about our presentation, but here's a group photo taken at the end.

<https://youtu.be/waU4AojNAww?si=b9ZL1mKn-3XpPv88>

A link to our presentation

We appreciate you taking the time to read through our report - Opera House Build 2024 Group 6