



2017 World Solar Challenge

This project focuses on the logistics involved in ANU attending the biennial Bridgestone World Solar Challenge (BWSC).

A comprehensive requirements analysis revealed cost as the most important design requirement to the ANU team. The solution designed involves an analysis between hiring and buying the equipment as well as ways to mitigate the costs involved.

Motivations

- Attending and competing in the challenge is an expensive logistical exercise with Australian teams spending just over \$30,000 and international teams spending \$50,000. [1]
- Encourages the development and experimentation of research into solar technology, lighter and cost effective materials and electric vehicles.
- Aligns with Canberra's green vision of relying on 90% renewable energy by 2020. [2]
- Fits in with ANU's status as a world leader in solar technology and research.

3 Time in Darwin and Scrutineering

Time: 10 days (5/10/2017 - 14/10/2017)

Details: Allows team to acclimatise and prepare and practise for scrutineering. [3]

4 The Race

Time: 6 days (15/10/2017 - 20/10/2017)

Details: The team competes in the challenge.

5 Time in Adelaide

Time: 7 days (21/10/2017 - 27/10/2017)

Details: The electric vehicle is displayed to fulfil sponsor requirements.

2 Travelling from Canberra to Darwin

Time: 7 days (28/09/2017 - 4/10/2017)

Details: Some team members travel by car via Adelaide, others by aeroplane from Sydney.

1 Training in Canberra

Time: 3 days

Details: Complete a mock 3 day race, allowing testing of electric vehicle under race conditions.

6 Travelling from Adelaide to Canberra

Time: 2 days (28/10/2017 - 29/10/2017)

Details: Some team members drive to Canberra, others are flown back.

Recommendations

Buy Equipment Outright

It will take just over 6 years (3 races) to pay off the investment of buying equipment, compared to hiring for each race. As ANU will compete in the WSC for the foreseeable future, buying outright is a economical investment.

Apply Mitigation Strategies

Major mitigation strategies recommended to reduce cost:

- Use of ANU Cars
- Qantas sponsorship
- Use of accommodation at ANU Darwin Campus
- Stocking up on water before departure

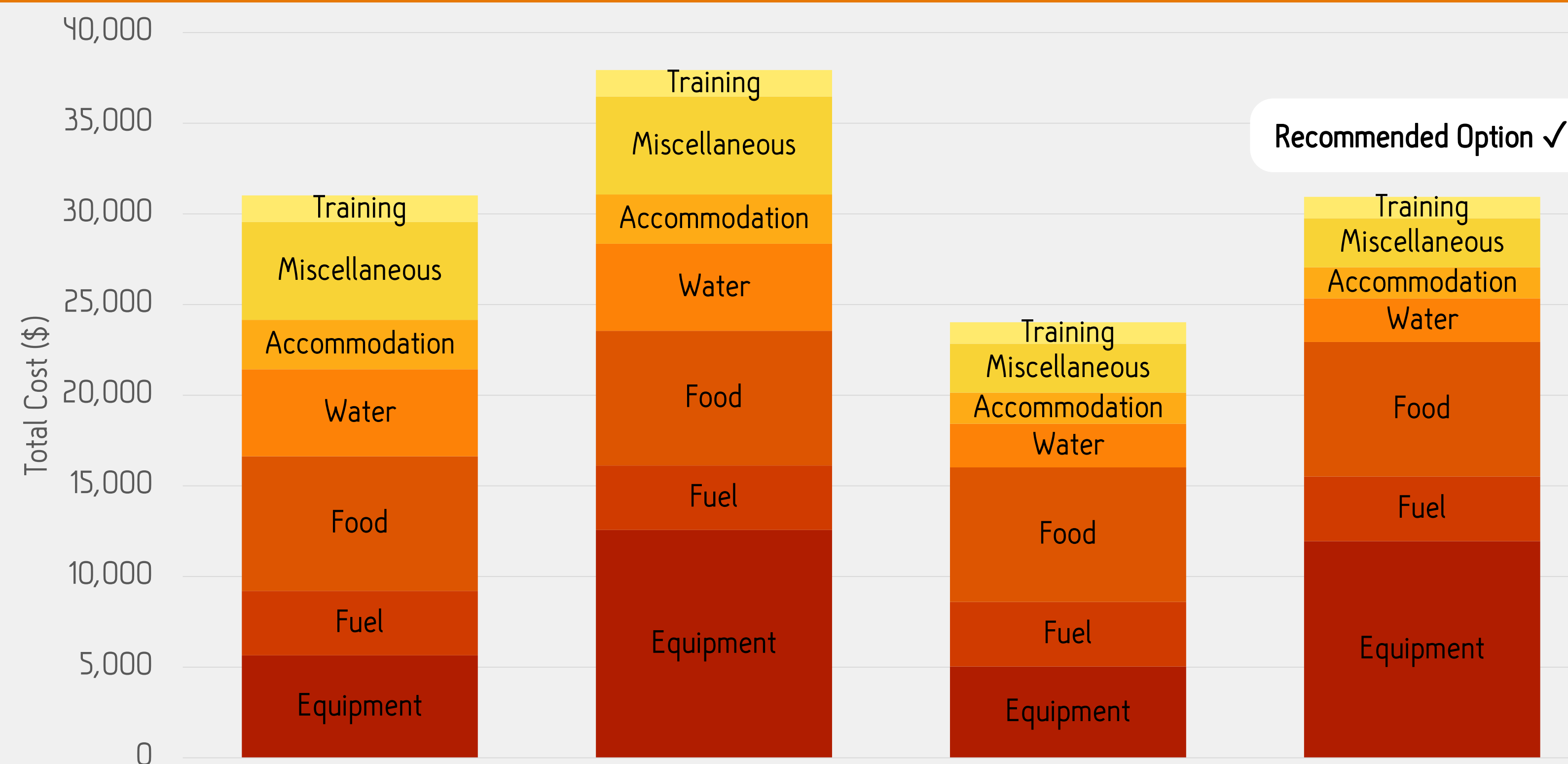
Preference for Commercial-Off-The-Shelf (COTS)

Utilize COTS products to reduce costs. The trailer for the electric vehicle, equipment and catering system should be considered for COTS.

Training Should be Completed

Training is 4-5% of the total cost in the mitigated budget plans. This is a low cost for team training under mock conditions, the completion of which positively correlates with a cohesive and experienced team.

Budget



*** Items in budget that allowed for mitigation strategies were assumed to cost 50% less than original items

Further Work

- A suitable area to conduct training sessions needs to found and organised with the government.
- A list of the technical equipment should be compiled and costed. This has effects on the current logistics budget, such as additional transportation costs.
- The amount of storage to transport required equipment needs to be determined as well as the method for storing food in the desert.
- Development of processes, policies and procedures that can be followed both during and before the race.
- A detailed timeline for the race should be constructed, that takes into account the locations of shops, petrol stations, control stops and more specific elements.
- The budget needs to be reviewed regularly. For example after mock training has been completed a budget review should be implemented to catch any mistakes early.

Summary

The engineering design process was used to create the logistical plan for the race. The main final recommendation is to utilise mitigation strategies to reduce cost and therefore use the 'Mitigation Buy' option with a payback period of just over 6 years. The estimated cost of \$31,000 is within the ANU WSC operations budget of \$30,000-\$40,000. Training was identified as crucial for developing a race strategy and providing practical experience for team members.

Works Cited

- 1) Stabler, B. (2016). ANU's World Solar Car Challenge. [email].
- 2) Towell, N. (2012). ACT Labor's bid for 90pc clean energy. *The Canberra Times*, 19 September.
- 3) World Solar Challenge (WSC) 2015, "2015 Regulations", South Australian Motor Sport Board, Dulwich, South Australia.