# SYSTEM PROJECTS & QUALITY MANAGEMENT (7173)

Project Proposal

Semester 2, 2025

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| **Student ID** | U3284513 |
| **Project Title** | Use of Surveillance and GPS to Develop Interactive Map for Wildlife Activity |
| **Tutorial Time** | Wednesday, 3:30 – 5:30pm |
| **Tutor Name** | Yasaman |
| **Number of Pages** | 12 |

**Declaration of AI in the document:**

**I have used the following GenAI tool in this assignment as permitted by the Unit Convenor:**

* **GenAI name: ChatGPT – 5**
* **Link:** [**https://chatgpt.com/**](https://chatgpt.com/)
* **Ways that the AI was used: Used to estimate the duration of activities of similar projects, assistance in report structure, initial draft response for the assignment**

**I confirm that I have not used GenAI in the preparation of this assessment for any purpose other than what I have acknowledged above, and I have cited and referenced any GenAI content in my assessment submission, applying the relevant referencing style.  I understand that providing false or misleading information in this Gen AI Acknowledgement Statement my constitute a breach of the University of Canberra (Student Conduct) Rules 2023.**

**I declare that this assignment is solely my own work, except where due acknowledgements are made. I acknowledge that the assessor of this assignment may provide a copy of this assignment to another member of the University, and/or to a plagiarism checking service whilst assessing this assignment. I have read and understood the University Policies in respect of Student Academic Honesty.**

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| **Sign:** | **Date: 14/09/2025** |

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# Project Summary

Canberra faces a high percentage of wildlife – vehicle collision (WVC) and pet – related traffic incidents, with the city having the highest number of collisions out of all Australian cities (AAMI, 2022). These collisions could result in numerous damages, including but not limited to minor to serious injuries such as bleeding and broken bones, financial costs of health check-up and vehicle damages, and loss of wildlife (Bissonette et al., 2008). This project proposed a hybrid solution that combines camera technology, mobile applications, GPS technology, network technology and database system for the domains of accident management of wildlife, interactive real time map and tracking and monitoring system. The proposed project aims to improve the survival rate of both wildlife and drivers and improve the response methodology for accidents. The project will begin with a pilot testing phase on the 10 busiest roads in Canberra as presented by dataACT (2020). The project aims to deliver a safer road experience for both drivers and the wildlife population, reducing the WVC incidents and raise awareness of the citizen about these incidents.

# Project and IT Project Management

## Problems addressed

* **High percentage of WVC in Canberra**: According to a report made by the ACT government, out of 5582 accidents reported in 2022, 1.45% of them is a collision with animal (ACT Government, 2022). This is an increase from the previous year of 0.94% (ACT Government, 2021).
* **Lack of detection and alert system:** Drivers and wildlife conservation authorities does not have a real time alert system to coordinate wildlife rescue efforts in the case of a WVC.

## Project solutions

The project provides the following solutions for the problem addressed above:

* Deploy animal detection system such as thermal/radar/LiDAR detection sensors (Townsend et al., 2024) that can identify wildlife movements near a road and trigger warnings in the mobile application.
* Present a platform with an interactive map that citizens can view hot spots and make reports on wildlife activities.
* Integrating alerts into traffic management systems to help authorities act on incident reports.

## Project domains and values

The proposed project spans the following domains:

* **Accident management of wildlife/pets**: Actively reducing the number WVC incidents in Canberra by having a monitoring and tracking system.
* **Interactive real-time map**: Real-time map data that displays hotspots of wildlife activity.
* **Tracking and monitoring system**: Camera and sensors to survey and capture wildlife activity.

Values: The project aims to reduce the risk of a WVC incident, therefore reducing the financial burden on the driver for the damage caused, increasing driver safety and awareness about wildlife movement and hotspots, and thus reducing the mortality rate of animals within WVC incidents.

## Project and Project Management Definition

A project is a temporary endeavour which have a defined start and end date, and created to address a certain problem, service or solution. In this proposal, the project involves designing and employing a pilot surveillance system with interactive map to raise awareness about areas with high wildlife activity in Canberra roads. The project is expected to run as a 2-year pilot test to guarantee that the system meets a certain accuracy in classifying animals and performs without major errors. Similarly, project management is the application of knowledge, skills, processes and resources to achieve the project’s objective within time, scope and budget. Using this framework, the project will employ the help of professionals from fields such as software and hardware development, wildlife experts. Kwak et al. (2014) outlines that project management follows the structure of planning, execution and closing state. The proposal will adopt the Agile methodology throughout the development cycle for software development and machine learning, along with other processes such as installations and data collection methodology. Similar projects in the past such as the surveillance program by Transport NSW required a budget upwards of 2 million AUD, and as such the proposal will use this as a benchmark for the budget and set a budget of 1.5 million AUD.

## Project and Project Management Success

The success of a project can be measured against the overall objectives of the project while project management success is measured against time, cost and quality of the project (Shokri-Ghasabeh & Kavousi-Chabok, 2016). Similarly, Lamprou and Vagiona (2018) also showed that time, cost and budget are the most important criteria when evaluating a project success. Following this, the evaluation of the project success is as follows:

* Reducing the number of reported WVC incident by 25% within the first 12 months of deployment
* The surveillance system to achieve an accuracy of 80% when detecting an animal in both day and nighttime
* The reported userbase should encompass at least 20% of all drivers in Canberra

Following the principles of time, cost, scopes and constraints listed above, the success of project management is defined as follows:

* Deliver the complete project without any issues or major faults within the 2-year timeframe
* Deliver all products within the scope of the project
* Not exceeding the maximum budget of 2 million AUD

# Project Scope and Measurable Organisational Values (MOV)

## Project scopes and out of scope

The project considers the following in the scope:

* Pilot deployments on roads with major wildlife activities
* Interactive map for citizen feedback and reports
* Alert system for drivers and authorities

The project considers the following out of scope:

* City-wide implementation beyond initial pilot testing deployment
* Maintenance of sensors and cameras
* Regulation changes regarding roads infrastructure or upgrades

## Six steps of MOV

### Area of Impact

The main focus of the proposed project is to improve the society aspect, particularly in reducing the number of WVC incidents on Canberra roads, improve the safety of drivers when participating in traffic and conserve the wildlife population and activity.

### Desired Value

The project aims to bring a safer road condition for Canberra drivers and reduce the risk of collision for animals on the road, regardless of time of day. This can be achieved with the real-time monitoring app and alert system proposed by the project.

### Project Metrics

The following metrics will be used to measure the project progress:

* Reducing the number of reported WVC incidents by at least 25% within the first 12 months of testing.
* Achieve a classification score of at least 80% during the day and 70% during the night when reporting animal activity.
* Reported at least 20% of all drivers in Canberra using the platform within the first 12 months.

### Timeframe

The project begins with the process of deciding the type of camera, sensors, cloud platform, database solutions and ML algorithms. Then we proceed to implement the necessary programs, database and classification algorithms begin the testing phase. This first phase of the project is expected to take 6 months out of the 2-year pilot testing period. The remaining 1.5 year will be used for pilot testing, which the equipment, i.e. camera and sensors, the interactive map and features will be tested and assessed based on the feedback, quality of data and the speed of transfer. The remaining year will be used to refine the system and implement said system into the hotspots on Canberra roads.

### MOV Verification

The project, it’s metrics, values, scope, timeframes and budget has been verified and approved by stakeholders.

### MOV Summary

The project is considered successful if the number of WVC incidents are reduced by 25% and the number of users reach 20% of all drivers within 12 months, and the system is to reach an accuracy in animal classification of 80% during the day and 70% during the night.

## MOV Summary and Contribution to the Domain and Project’s Success

The summary of the MOV statement defines its contribution of the project, in this case the surveillance system for wildlife detection to the domain of accident management for wildlife, interactive map and tracking technology. The project aims to contribute by reducing the rate of WVC incidents by 25% when deployed with its interactive map to report on areas with high wildlife activity. This presents a clear and specific goal for both stakeholders and team members to guide the decision-making process and implementation of the project. These metrics ensure that all phases of the project follow the same goal, and all decisions align with the motive to ensure wildlife safety, while also communicating this to all party involved in the project to provide a clear directive and expectation for the project. The MOV also serve as a benchmark for the progress of the project. The targeted reduction rate serves as a comparison metric for the development cycle of the project, and if reached will demonstrates that the project has successfully improved the safety of Canberra’s Road and wildlife and helped conserve the wildlife population by protecting them from WVC. And reaching the classification accuracy rating proves that the project has been implemented correctly and did not encounter major setback or errors during the development process. To conclude, the MOV statement help direct the project’s effort into the right direction with the correct metrics, while also providing a clear benchmark to compare the project process and ensure that the project delivers on its metrics and values to the domain.

# Project Schedule Plan with WBS, Time, Resource, Cost

## Phases and Activities

The phases and activities for this project proposal have been outlined in the attached Microsoft Project file.

## Chose Project Management Methodology

The chosen project management methodology for this project is Agile development. Agile is a way to develop software while relying on changes, feedback loops and frequent communications with customers and stakeholders as it facilitates that ability to rapidly adapt to changes. This principle of prioritizing delivery allows business to change their development direction to the most value-adding decisions for the project (Adzgauskaite, Tam and Martins, 2024). Due to the multiple part nature of the project which contains camera and sensor installation, machine learning model development and mobile platform for interactive map, Agile allows the development process to deliver on small sprints such as prototypes and beta early for testing. Similarly, the project’s nature with wildlife and other relevant authorities presents the need for constant adaptation, mainly due the movement of the wildlife populations and changing policies. As of such, the Agile development method allows the team to change its features on a moment’s notice to adjust to these changes. The constant deliveries can be compared against the MOV to determine the process of the project and adjust the priority to facilitate engagement from both customers and stakeholders. In conclusion, the rapid development cycle and delivery of Agile development allow for rapid updates and managing the uncertain nature of the project.

## Activities Duration Estimation

The project proposal used the bottom-up techniques to estimate the duration of activities in the project. This approach breaks down the project into smaller tasks and estimates how many days it would take to complete each task, along with the resources needed to complete it. This approach also takes weekends and holidays into account. Detailed information for the activities is available in the Microsoft Project file attached.

## WBS With Start and End Date

Details for the WBS can be found in the attached Microsoft Project file.

## Human, Hardware and Software Resources, Funds and Time of the Project

The table below displays the required human resources, along with hardware and software, with the amount of funds needed and how long will each resource be used for.

### Human Resources

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Human Resources | Role/Skill | Quantity and Estimated Hours | Hourly Payment | Estimated Total Cost |
| PM | Project manager | 1 FTE – 960 hours | $93.75/hour | $90,000 |
| ARCH | Systems architect | 1 FTE – 424 hours | $106.25/hour | $45,000 |
| SDEV | Software developer | 2 FTE – 1486 hours | $87.50/hour | $130,000 |
| MDEV | Mobile developer | 1.2 FTE – 914 hours | $87.50/hour | $80,000 |
| MLE | Machine learning engineer | 1 FTE – 674 hours | $118.75/hour | $80,000 |
| DEVOPS | DevOps | 1 FTE – 500 hours | $100.00/hour | $50,000 |
| EMB | Edge engineer | 1 FTE – 282 hours | $106.75/hour | $30,000 |
| TECH | Field technician | 2 FTE – 509 hours | $68.75/hour | $35,000 |
| CIV | Civil contractor | Contract based – 267 hours | $150.00/hour | $40,000 |
| QA | Quality assurance | 1 FTE – 400 hours | $75.00/hour | $30,000 |
| BIO | Biologist | 0.5 FTE – 229 hours | $87.50/hour | $20,000 |
| SEC | Cybersecurity consultant | 0.2 FTE – 89 hours | $112.50/hour | $10,000 |
| Total Cost | Approx. 6,249 hours or 260 working days | | $640,000 | |

### Hardware

|  |  |  |
| --- | --- | --- |
| Hardware | Task | Estimated cost (in AUD) |
| Cameras with thermal imaging | Purchasing & shipping cameras to 10 different sites | $38,250 at $3,825 each |
| Radar units for monitoring | Purchase & shipping to 10 sites | $32,000 at $3,128 each + shipping costs |
| Edge gateways and NAS devices | 10 gateways and 10 NAS near each site to collect and send data | $8,290 for 10 edge gateways and $33,219.5 for NAS devices |
| Power and communication kits for camera | Network switches, cables, battery, router | $24,000 at $2,400 each |
| Installation contract | Installing cameras and IoT devices in each site | $82,500 at $8,250 per site |
| Product prototype | Contract to produce product prototype for testing | $13,500 |
| Total hardware cost | $231,759.5 | |

### Software and Services

|  |  |  |
| --- | --- | --- |
| Software | Task | Cost |
| Cloud based database | Hosting cloud database for backup and data analysis purpose | $18,865.68 for $786.07 per month |
| Maps API | Mapping locations with notifications | $12,867.83 |
| ML training | GPU cost, preparing dataset | $2,260.32 for high end GPUs and additional $17,289.27 to prepare the custom model, defining parameters and training the model |
| Application platform | Application hosting, application pipelines for data processing and code bases | $6,500 |
| Monitoring and alerting platform | Sending alerts and notifications, reporting services | $4,500 |
| Maintenance | Updates, patches, features | $20,000 |
| Software maintenance | Maintaining the codebase | $5,250 per month for 2 years equating to $126,000 |
| Total software cost | $208,283.1 | |

### Total Cost

Human Resources cost: $640,000

Hardware costs: $231,759.5

Software costs: $208,283.1

Total cost of the project: $1,080,042.6 AUD

# References:

1. AAMI (2022). *Animal collisions: What you need to know*. [online] @AAMI. Available at: <https://www.aami.com.au/aami-informed/on-the-road/safe-driving/aami-reveals-peak-periods-for-animal-collisions.html>
2. Bissonette, J.A., Kassar, C.A. and Cook, L.J. (2008). Human death and injury, vehicle damage, and deer loss. *HumanWildlife Conflicts*, [online] 2(1), pp.17–27. doi: <https://doi.org/10.2307/24875102>
3. dataACT (2020). *Traffic Route Stats | Open Data Portal*. [online] www.data.act.gov.au. Available at: <https://www.data.act.gov.au/Transport/Traffic-Route-Stats/mgzi-6f8j/about_data>
4. ACT Government (2022 Version). ACT CRASH REPORT Transport Canberra and City Services Directorate. [online] Available at: <https://www.cityservices.act.gov.au/__data/assets/pdf_file/0005/2550965/2022-ACT-Crash-Report-access.pdf>
5. ACT Government (2021 Version). ACT CRASH REPORT Transport Canberra and City Services Directorate. [online] Available at: <https://www.cityservices.act.gov.au/__data/assets/pdf_file/0011/2550962/2021-ACT-Crash-Report-access.pdf>
6. Townsend, T., Scicluna, D., Low, G., George, C., Baunmann, J., Galbrach, T. and Ree, R. van der (2024). Transport for New South Wales Using technology to reduce wildlife- vehicle collisions. [online] Available at: <https://www.transport.nsw.gov.au/system/files/media/documents/2025/Using-technology-to-reduce-wildlife-vehicle-collisions-Directions-Report.pdf>
7. Kwak, Y.H., Walewski, J., Sleeper, D. and Sadatsafavi, H. (2014). What Can We Learn from the Hoover Dam Project That Influenced Modern Project management? International Journal of Project Management, 32(2), pp.256–264. doi: <https://doi.org/10.1016/j.ijproman.2013.04.002>
8. ACT Government (2024). 2024 - Chief Minister, Treasury and Economic Development Directorate. [online] Act.gov.au. Available at: <https://www.cmtedd.act.gov.au/open_government/inform/act_government_media_releases/cheyne/2024/>
9. Shokri-Ghasabeh, M. and Kavousi-Chabok, K., 2016. Generic project success and project management success criteria and factors: Literature review and survey. Available at: <https://www.researchgate.net/publication/228353003_Generic_project_success_and_project_management_success_criteria_and_factors_Literature_review_and_survey>
10. Lamprou, A. and Vagiona, D. (2018). Success Criteria and Critical Success Factors in Project success: a Literature Review. RELAND: International Journal of Real Estate & Land Planning, [online] 1(0), pp.276–284. doi: <https://doi.org/10.26262/reland.v1i0.6483>
11. Adzgauskaite, M., Tam, C. and Martins, R. (2024). What helps Agile remote teams to be successful in developing software? Empirical evidence. Information and Software Technology, 177, p.107593. doi: <https://doi.org/10.1016/j.infsof.2024.107593>