

## Development of A Safe, Profitable, and Fair Robotaxi Deployment Strategy

**Purpose:** The deployment of autonomous vehicles (AVs) has been troubled by the soaring cost of operations and the public's concerns about the safety and fairness issues potentially brought by the new technology. This project researched how to develop a safe, profitable, and fair deployment strategy for AV taxi fleets by studying the possibility of deploying vehicles with different functionalities.

**Approach:** The project team started by reviewing existing datasets that included information that labeled Pittsburgh roads by risk levels. To account for how humans might interact with a Robotaxi system, the team used the analysis of existing datasets and social conventions to visualize the complexity of different scenarios and risks. The researchers then developed strategies to minimize the costs by commanding AVs with different functionalities to appropriate routes.

**Key Findings:** The team developed a traffic scenario clustering method, which studies the human drivers' actions and social norms for safer and more socially compliant Robotaxi deployment. The team then deployed the approach on a real-world dataset to show that it can rebuild the parameters even with more complicated features and a longer-term time horizons.

**Conclusion:** The development of a traffic scenario clustering method, a method to study the human drivers' intrinsic utility function and social norms for safer and social compliant Robotaxi deployment appears to work well to plan for Robotaxi deployments.

Next steps will include extensive experiments to test the robotaxi agent method in simulators such as CARLA.



Photo by Fotis Fotopoulos on [Unsplash](#)

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### Project Record:

- <https://ppms.cit.cmu.edu/projects/detail/329>

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