Roadmap:-

Initial Setup (Completed):

- Environment setup (Python, CUDA, PyTorch)
- YOLOv5 repository setup
- Development tools configuration

Dataset Preparation (Completed):

- Collection of road scene images
- Annotation of vehicles, pedestrians, etc.
- Dataset organization and splitting

Model Development (Completed):

- Initial YOLOv5 training
- Hyperparameter optimization
- Low-light enhancement implementation
- Model performance optimization

Testing & Validation (Completed):

- Metrics analysis (precision, recall)
- Real-world scenario testing
- Edge case identification and handling
- Model refinement

Current Status (Completed):

- Real-time processing implementation
- System integration
- Performance monitoring system

Future: Lane Detection (Planned):

- Core algorithm development
- Lane tracking system
- Warning system implementation

Future: Collision Detection (Planned):

- Distance estimation development
- Motion prediction implementation
- Warning system integration

Final Integration (Planned):

- Complete system integration
- Performance optimization
- Final testing and deployment