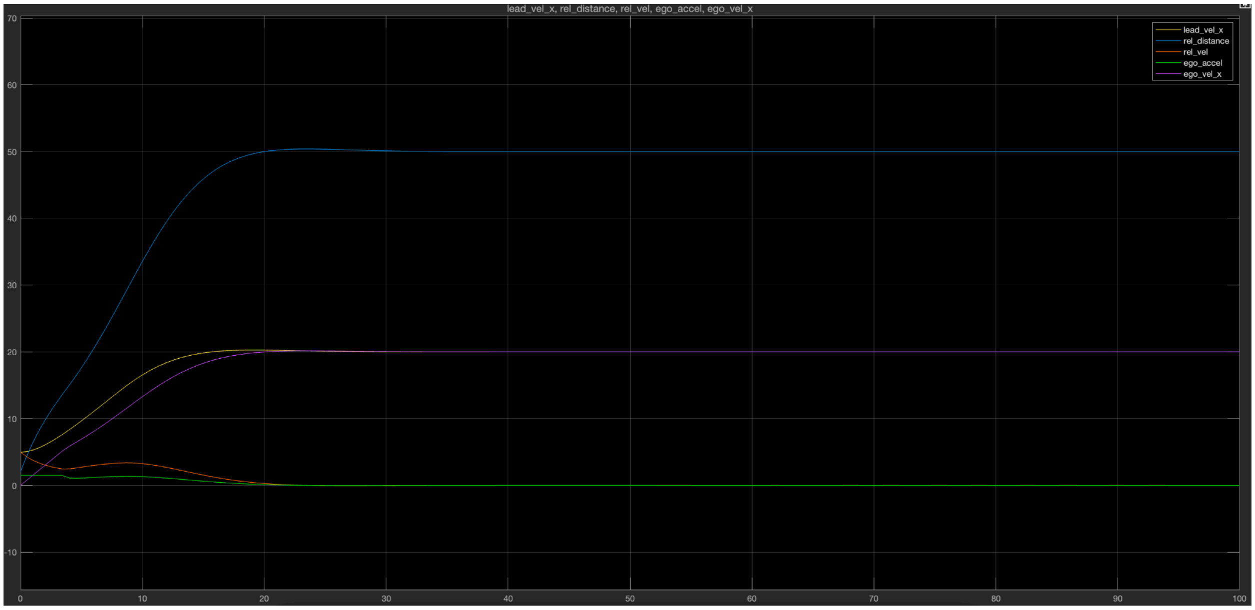
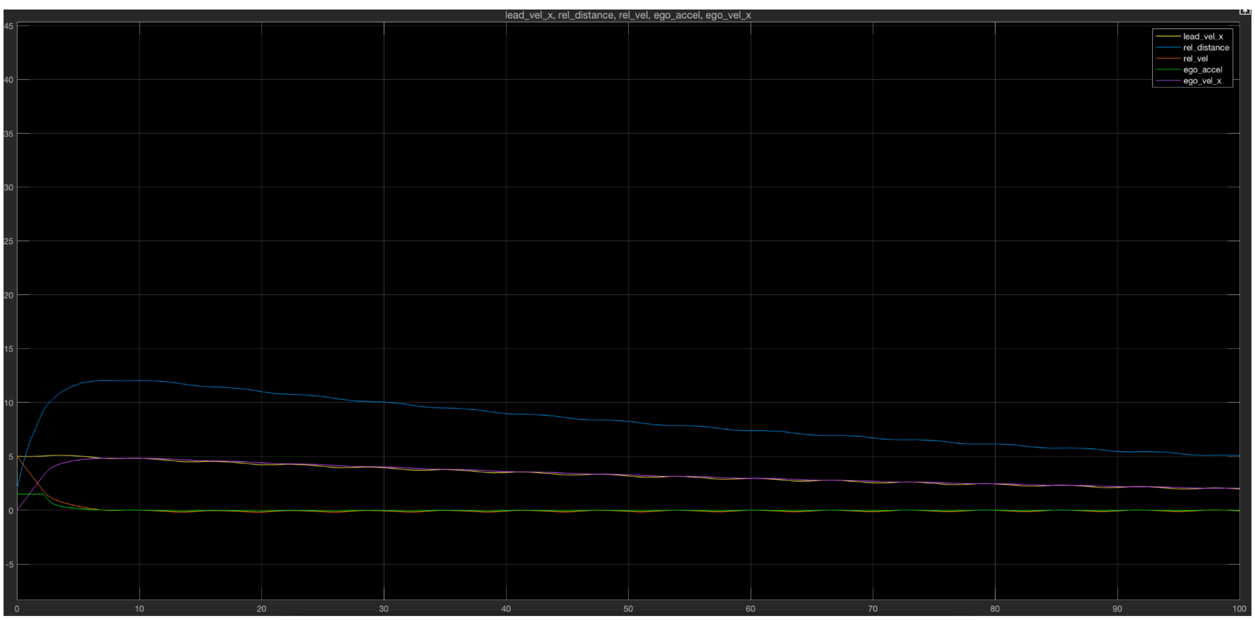
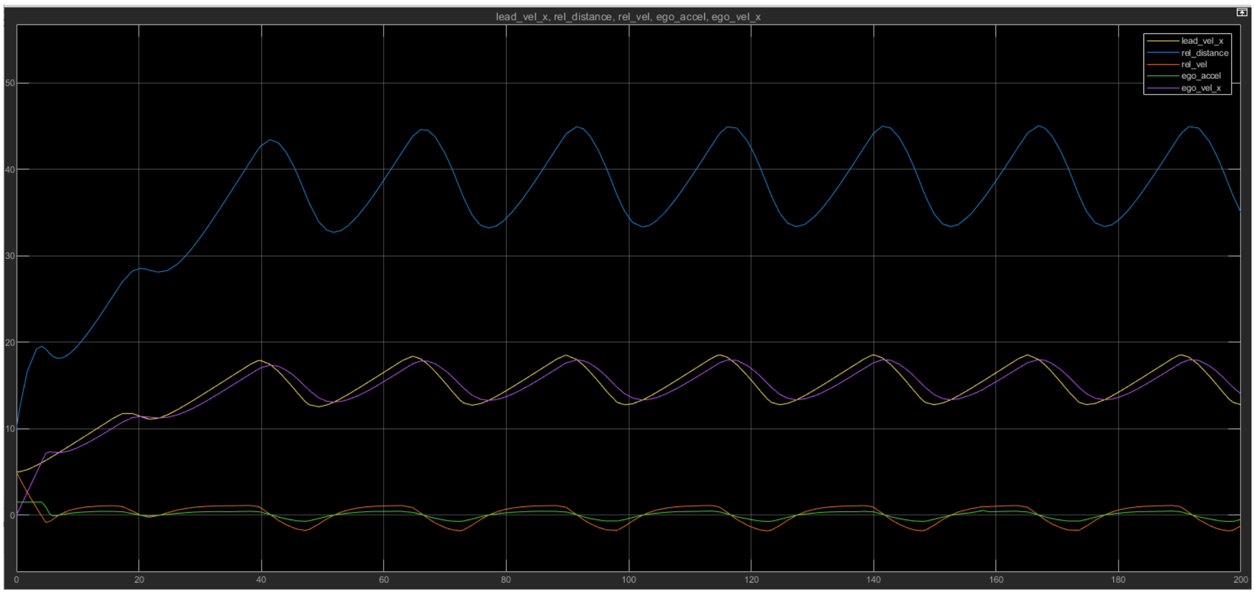


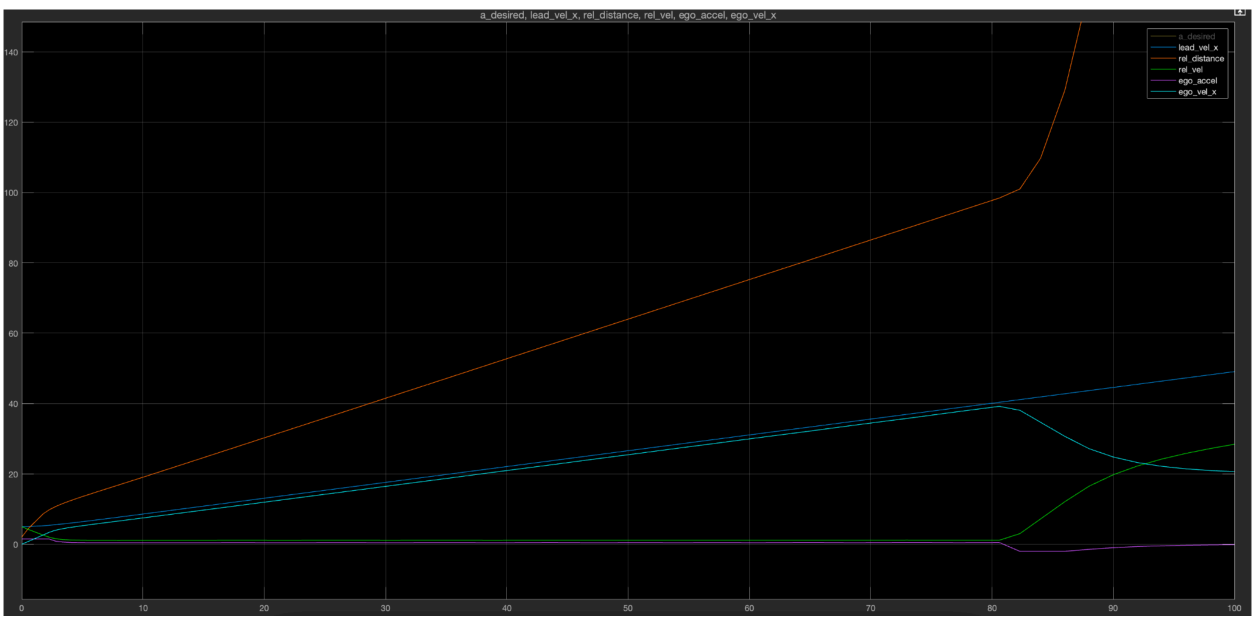
This is the normal constant lead car value. The ego car accelerates smoothly to match the lead car's speed, maintaining a stable relative distance. The behavior shows the system effectively achieving a steady following state, with minimal jerk and consistent speed matching.



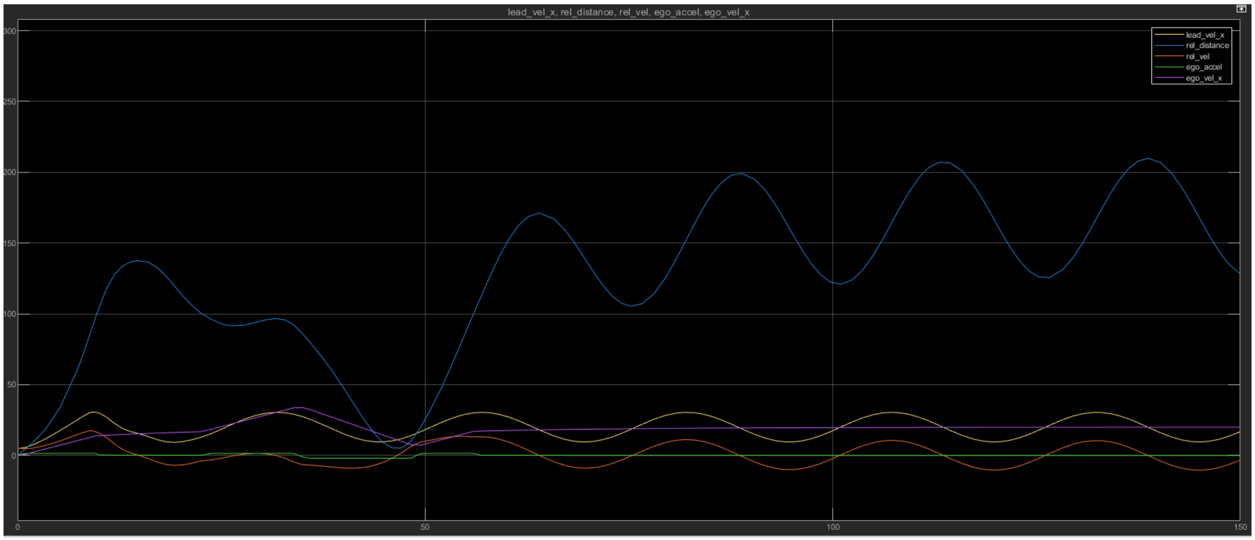
This is the decaying oscillating lead car value. The ego car effectively keeps up with the lead vehicle, which has an oscillating and decaying velocity. The ego car adjusts its speed to maintain a safe gap as the lead car slows down over time, demonstrating smooth adaptation without overshooting or aggressive changes.



This is a relatively constant oscillating velocity for the lead car. The ego car follows the lead car's oscillating speed changes effectively, adjusting its speed to maintain a safe distance. The ego vehicle's responses show stability, with minimal lag and no excessive corrections, highlighting the controller's ability to deal with continuous oscillations in lead speed.



This simulation demonstrates the eco-driving model's cruising functionality. When the lead car moves more than 100 meters away, the ego car transitions to an eco-driving mode, maintaining a constant speed of 20 m/s. This approach ensures fuel efficiency while being ready to resume following when the lead car re-enters the range, recognizing that matching high speeds is unnecessary in an urban environment.



The ego car oscillates with the lead car until the relative distance reaches 100 meters, at which point it cruises at 20 m/s to drive at an eco-speed. Once the lead car comes within 100 meters again, the ego car resumes the car-following model. It switches back to cruising one more time when the lead car gets too far. This demonstrates the system's effective transition between eco-driving and active following.