

ADVANCED DRIVER ASSISTANCE SYSTEMS (ADAS) FOR TRANSIT BUSES DEMONSTRATION PROJECT



**COLORADO**  
Department of Transportation

# ADAS FOR BUSTANG INTERCITY AND REGIONAL BUS TRANSIT

**COLORADO DEPARTMENT OF TRANSPORTATION (CDOT)**

IN PARTNERSHIP WITH COLORADO STATE UNIVERSITY AND THE UNIVERSITY OF IOWA



U.S. Department of Transportation  
**Federal Transit Administration**

## PROJECT SUMMARY

### Automation Level(s): 1-2

The “ADAS for Bustang Intercity and Regional Bus Transit” project is an innovative effort to improve public transit safety, reliability, and workforce support through a deeper understanding and practical application of advanced driver-assistance systems (ADAS). The Colorado Department of Transportation (CDOT) will leverage ADAS technology to improve safety on its state-run regional transit service, Bustang. CDOT has selected three different transit vehicle types for implementing this technology, ranging from a 51-passenger motorcoach to an 11 passenger No-Cal Ford Transit. These vehicles will follow routes that are highly traveled, feature difficult mountainous terrain, and connect rural communities to larger population centers along the Front Range and Western Slope of Colorado. CDOT will apply and evaluate the following ADAS technologies:

- Adaptive cruise control
- Smooth acceleration and deceleration
- Automatic emergency braking
- Blind spot intervention
- Lane keeping assistance

The project will be broken up into five tasks:

- **Task 1:** Project Initiation and Kick-off and Requirements Gathering
- **Task 2:** ADAS Technology Integration on Transit Vehicles
- **Task 3:** Pre-Demonstration Testing and Workforce Development - Operator Training
- **Task 4:** Operational Deployment and Research Data Collection
- **Task 5:** Final Report and Outreach

## PROJECT GOALS

Project goals include improving public transit safety and reliability, reducing congestion and greenhouse gas emissions, promoting economic vitality in rural areas, and providing workforce support through a deeper understanding and practical application of ADAS. The project will feature stops in or adjacent to disproportionately impacted block groups. The vehicles and their associated routes represent those with some of the greatest ridership in the CDOT Bustang transit program.

## VEHICLE INFORMATION

CDOT will utilize the following vehicle types:

- **11-passenger (2021 Nor-Cal Ford Transit 350 Wagon)**
- **51 Passenger Motorcoach (2019 Motor Coach Industries (MCI) D4500 Commuter)**
- **41-passenger (2019 VanHool CX35)**

## DATA COLLECTION, MANAGEMENT, & SHARING

CDOT staff will closely monitor transit service and host (at minimum) weekly check-ins with the contracted transit operator (ACE Express Coaches) during the initial quarter of the 12-month demonstration period. As the project continues, CDOT will identify the best project management check-in cadence with the operators. CDOT will collect and disseminate service, operational and performance metrics on the three routes with the ADAS technology that may be required or helpful for federal reporting. Monthly (or at frequency requested by the USDOT FTA), CDOT will host a monthly check-in meeting to provide a status update on the overall project. During the half-way point (six months) of the operational demonstration in revenue service, CDOT will deliver an interim report to the USDOT FTA featuring all project aspects to date, including but not limited to: operational service, performance aspects, early research data collection findings (preliminary and not complete), ridership, operator feedback, and over elements that may be requested by USDOT FTA.

CDOT believes widespread information sharing and collaboration to the broader transportation transit community will facilitate great adoption of the technology. CDOT’s interim, final report, and any other project documents or artifacts that are able to be made publicly available, will be available on the CDOT hosted project webpage.

## PROJECT STATUS & SCHEDULE

The project has a 23-month timeline, featuring the 12-month operational revenue service.

ADAS for Bustang Intercity and Regional Transit	2023				2024				2025			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<b>Task Description</b>												
Task 1: Project Initiation, Kick-off and Requirements Gathering												
Task 2: ADAS Technology Integration on Transit Vehicles												
Task 3: Pre-Demonstration Testing and Workforce Development												
Task 4: Operational Deployment and Research Data Collection												
Task 5: Final Report and Outreach												

## BUDGET

Grant Request	State Match	Total Project Cost
\$1,253,952	\$915,060	\$2,169,012