



The Autonomous TMA SELF-DRIVING VEHICLE FOR CONSTRUCTION

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Royal 
TRUCK & EQUIPMENT INC.



Exclusive Partnership



- Largest TMA truck manufacturer in N. America
- Technology innovation for work zones
- Specialize in safety trucks
 - Traffic Control/Cone Safety Trucks
 - TMA Trucks (Truck Mounted Attenuator)
 - Side Dump TMA Trucks
 - Multi-Purpose Work Zone Trucks



- Security systems engineering
- Technology innovation for national security
- Specialize in unmanned systems
 - Tactical UAVs
 - Small UAS (Unmanned Aerial Systems)
 - High Mobility Ground Vehicle Target
 - M-Pack Leader/Follower System

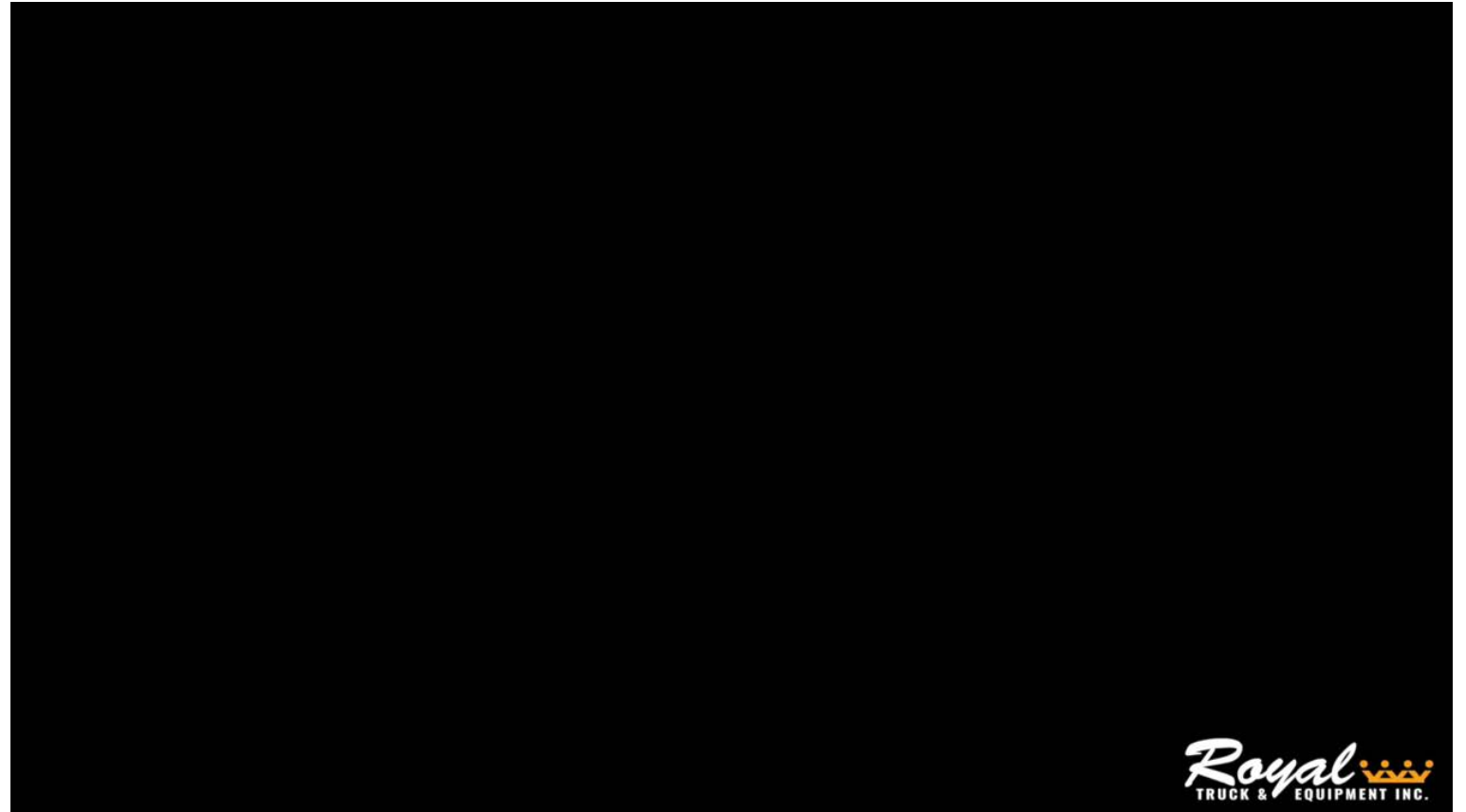


What is an ATMA?

Also referred to as:
ATMA (Autonomous TMA)
AIPV (Autonomous Impact Protection Vehicle)
Driverless TMA | Self-Driving TMA



- Utilizes technology developed for U.S. military
- Driverless TMA (unmanned/requires no driver)
- Operates on Leader/Follower system
- Provides protection in the work zone (workers & motorists)



Royal TRUCK & EQUIPMENT INC.

SWEEPERS | WATER TRUCKS | LINE STRIPERS | MAINTENANCE TRUCKS | MOWING OPERATIONS | PLOW TRUCKS

Royal TRUCK & EQUIPMENT INC.

Core Benefits



IMPROVE WORKER SAFETY

1. Eliminates putting a driver in harm's way
2. Avoids human instinct (stays on course)
3. Maintains proper roll-ahead distance with precision and accuracy



REDUCE LIABILITY & COSTS

1. Reduces possibility for an accident
2. Reduces potential for injuries and fatalities
3. Reduces costs for medical and insurance claims

67%

of Highway Contractors
reported crashes into their construction
work zones in 2019¹

754

Fatalities
in work zones in 2018
across the U.S.²

31k

Injury-Involved
work zone crashes reported
in 2018 across the country³

1. <https://www.workzonebarriers.com/work-zone-crash-facts.html#:~:text=The%20Associated%20General%20Contractors%20of,%2C%20and%2070%25%20public%20injuries>

2. <https://www.workzonesafety.org/crash-information/work-zone-fatal-crashes-fatalities/#national>

3. <https://www.workzonesafety.org/crash-information/work-zone-injuries-injury-property-damage-crashes>

How does it work?

LEADER VEHICLE

- Leader vehicle is **human-driven**
- **Transmits GPS** position data called “eCrumbs” back to the Follower vehicle
- Outfitted with a NAV Module that contains a GPS receiver, system computer, digital compass, and transceiver

FOLLOWER VEHICLE

- Follower vehicle is **self-driven**
- **Uses GPS** data to replicate velocity, heading and position of the Leader vehicle
- Configured to follow most fleet vehicles used in rolling operations (e.g. maintenance, line striping, sweeping, mowing)





Components & Installation

Leader Vehicle



OPERATOR CONTROL UNIT



VEHICLE CONTROL MOD.



GPS & DATA-LINK ANTENNA

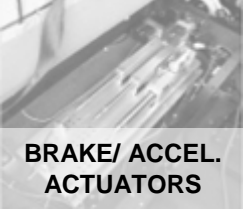
Follower Vehicle (ATMA/AIPV)



STEERING ACTUATOR



OPERATOR CONTROL UNIT



BRAKE/ ACCEL. ACTUATORS



VEHICLE CONTROL MOD.



GPS ANTENNA



EMERGENCY STOP (E-STOP)

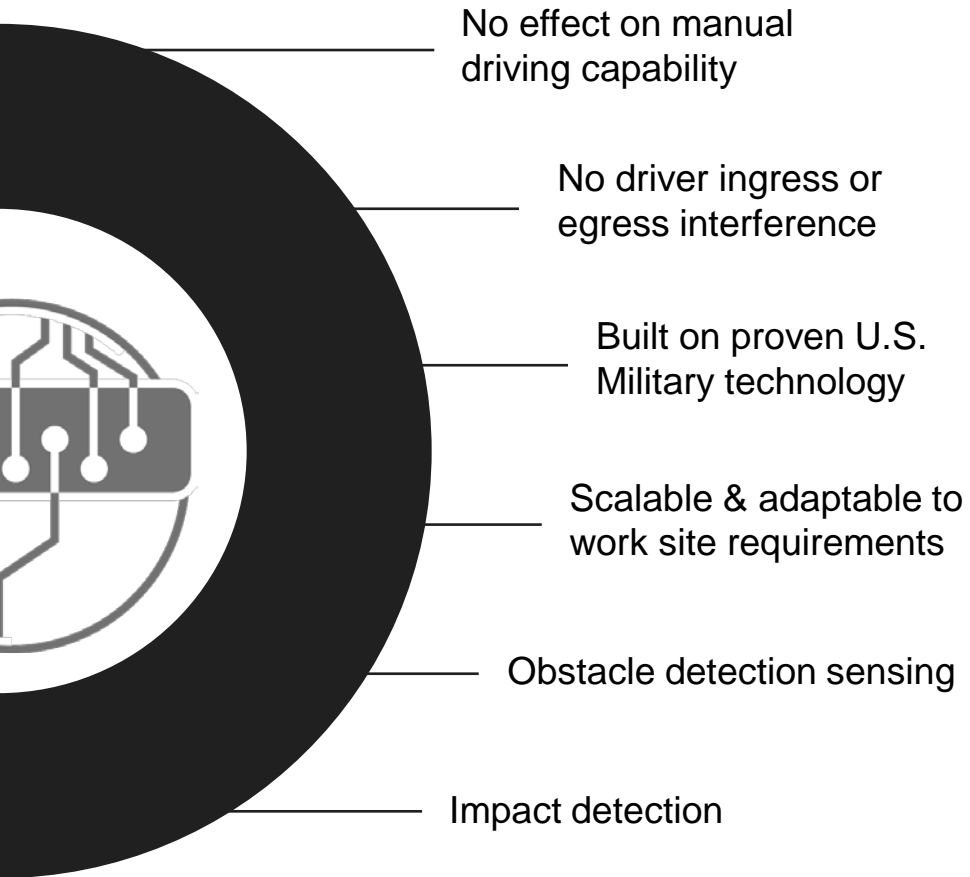


OBSTACLE DETECTION



DATALINK ANTENNA

Key Features & Specs



TECHNICAL SPECIFICATIONS	
Maximum Speed	15mph
Lane Accuracy	+/-6 inches (max. relative to leader vehicle)
Vehicle Gap	25ft–150ft (velocity dependent)
Turn Radius	100ft (min)
System Initialization	Less than 5 minutes
Power	12 VDC, 30A Fuse
Transmit Frequency	915MHz (options available)
Navigation	GPS-based
E-stops	3 cab external, 1 cab internal
Road Surface	Improved Federal Highway Standards

Deployments & Testing

HIGHLIGHTS

2,000+ Miles of
Operation since
2017

In Operation for
3+ Years

Deployed in 7 U.S.
States & the UK

Colorado DOT JUL 2017

Project: Live deployment
for statewide operation



Colas U.K. AUG 2017

Project: Live deployment
and being evaluated for
additional deployments



Missouri DOT AUG 2019

Project: Currently under
evaluation for highway
maintenance operations



Caltrans NOV 2019

Project: Currently under
evaluation for highway
maintenance operations



Tennessee DOT NOV 2019

Project: Currently under
evaluation for highway
maintenance operations



Florida DOT MAR 2020

Project: 2 test & evaluation
projects including more than
28 miles on the interstate



Minnesota DOT JUN 2020

Project: Currently under
evaluation for highway
maintenance operations



North Dakota DOT SEP 2020

Project: Live deployment for
highway maintenance
operations





Locations



Ideal for CAV Programs

Operates in Specific Environment:
Mobile highway maintenance operations

Requires Zero Mods to Existing Infrastructure:
Easily deployable within its own proprietary system

Positive Public Awareness:
Promotes a feel-good story that everyone can appreciate

The ATMA aligns with Federal Highways work zone safety objectives and exemplifies how CAV technologies can improve the day-to-day lives of highway construction workers.

ATMA In the News

articles & NEWS



feature SEGMENTS



CDOT



[CDOT deploys world's first autonomous work zone impact protection truck](#)

FDOT



[New self-driving construction trucks provide life-saving barrier](#)

TNDOT



[Driverless roadside safety vehicles undergo testing in Tennessee](#)

NDDOT



[NDDOT says new autonomous impact protection vehicle will improve road safety](#)

WORLD'S FIRST SELF-DRIVING TMA Vehicle for Road Construction

"Our Mission is to help eliminate fatalities in Active Work Zones"

For more info about the Autonomous TMA Truck, contact:

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