

Topic: N133-149

Poseidon Systems, LLC

Dynamic Vehicle Center-of-Gravity and Gross Weight Estimation Using Readily Available Sensors

Poseidon Systems develops and manufactures real-time condition-based monitoring solutions that provide the user information that can lead to reduced O&M costs and improved asset reliability, availability and maintainability. Our core expertise is fluid diagnostics, particularly metallic wear debris monitoring and oil condition monitoring; we offer condition monitoring systems that assesses the condition of a lubricant through real-time, online measurements, specifically: oil quality monitors; metal wear sensors; and water contamination monitors. The USMC desires a system that provides real-time vehicle gross-weight and center-of-gravity measurements for medium and heavy tactical vehicles. Poseidon's system uses low-cost motion sensing nodes in combination with physics based kinematic relationships to provide real-time information to the vehicle operator. This information can be utilized to optimize loading, prevent vehicle roll-overs, and provide early warning of impending unsafe operations.

Technology Category Alignment:

Maintainability/Sustainability

Mobility

Personalized Assessment, Education, and Training

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SYSCOM: MARCOR

Contract: M67854-15-C-0202

 Corporate Brochure: https://navystp.com/vtm/open_file?type=brochure&id=M67854-15-C-0202

Department of the Navy SBIR/STTR Transition Program

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WHO

SYSCOM: MARCOR

Sponsoring Program: PEO Land Systems

Transition Target: MTVR

TPOC:

sbir.admin@usmc.mil

Other transition opportunities:

PM LAV

PM M&HTV

LVSF

FMTV

JLTV

Notes:

Acronyms:

MTVR: Medium Tactical Vehicle Replacement

PM LAV: Program Manager Light Armored Vehicles

HMMWV: High Mobility Multipurpose Wheeled Vehicle

MRAP: Mine-Resistant Ambush Protected

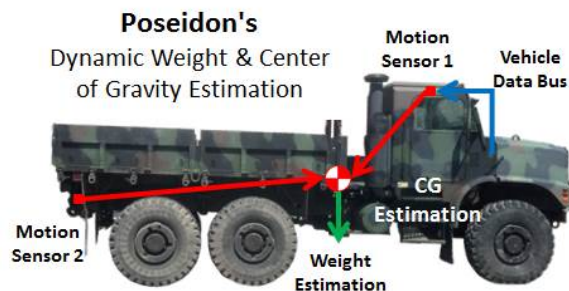
PM M&HTV: Program Manager Medium and Heavy Tactical Vehicles

FMTV: Family of Medium Tactical Vehicles

LVSF: Logistics Vehicle System Replacement

JLTV: Joint Light Tactical Vehicle

W&CG: Weight and Center of Gravity



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WHAT

Operational Need and Improvement:

The Marine Corps seeks innovative approaches toward the development of a real-time or near real-time on-board sensor system that measures, calculates and displays a tactical vehicles' weight and longitudinal, lateral, and vertical Center of Gravity. The resulting system can improve vehicle reliability, safety of operation, and optimize loading.

Specifications Required:

Weight estimation within 3% of actual

CG estimation within 3% of actual in all axes

Suitable for military vehicle environmental and operational conditions

Minimal maintenance and acquisition costs

Ease of integration

Technology Developed:

System combines existing vehicle sensor data with real-time acceleration and rate gyro measurements to determine a vehicle's Gross Weight (GW) and Center of Gravity (CG). These 3 sensing nodes monitor vehicle motion, yaw, pitch and roll on 3-axes, providing the driver with real-time status of vehicle stability.

Warfighter Value:

Safety: Prevent vehicle roll-over accidents

Operational: Prevent overloading vehicle's axles and braking system

Logistics: Optimize vehicle payloads

WHEN

Contract Number: M67854-15-C-0202 **Ending on:** November 20, 2016

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Field Data Collection	Med	Validated on-vehicle data acquisition	4	3rd QTR FY16
Preliminary Design Review	Low	Design approved by MC for prototype manufacturing	4	1st QTR FY17
Manufacture & Assembly	Med	Functional units build and ready for field trials	4	1st QTR FY17
Prototype Integration Testing	Med	System installed on MTVR platform collecting data for verification testing	5	2nd QTR FY17
Prototype Design Verification Testing	Med	System installed on MTVR platform and providing accurate measurements	6	3rd QTR FY17

HOW

Projected Business Model:

Develop technology and license back to prime manufacturer to integrate into vehicle

Company Objectives:

Poseidon Systems is a leading developer of sensing solutions for condition monitoring with a primary focus on oil health monitoring. The W&CG monitoring solution extends our reach on vehicle beyond the drivetrain. Our objective is to work with vehicle primes to offer this technology as an enhancement to new and existing vehicle platforms. In the DoD space, this technology can be extended to cover land, sea, and air vehicles.

Potential Commercial Applications:

On and off highway vehicles where overloading and roll-overs are a significant concern. E.g. haul trucks, tanker trucks, box trucks, and cement trucks.

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