



ROBOCIST

MOBILITY & ROBOTIC CONSULTING

Autonomous Vehicles Civilian & Military

ITS Carolinas Annual Meeting
September 12, 2016

Jeffrey Barghout
CEO, Robocist, Inc.



Comprehensive, market based **solutions** to today's mobility and robotic challenges

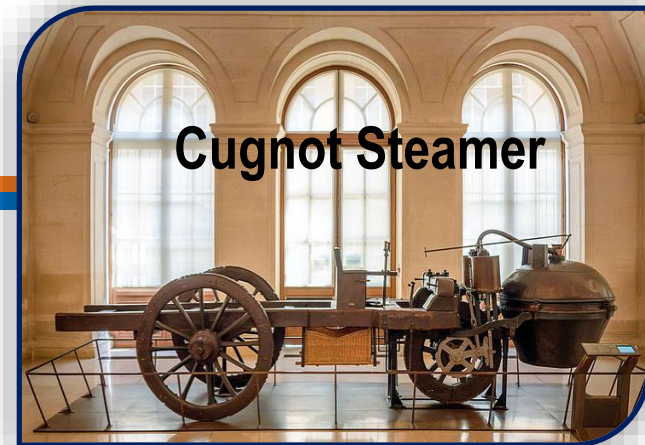
- Technology Scouting & Feasibility Analysis
- Implementation Planning & Road-mapping
- Technology Demonstration & Evaluation



Saving our clients and their communities **money** while **improving safety** and **efficiency**



Automotive History



1769: Cugnot Steamer

1834: First electric car (Davenport)

1898: Nicola Tesla – radio controlled vehicles, boats & torpedoes

1908: Henry Ford - Model T

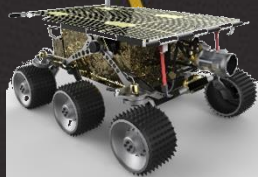
1930's: USSR remote controlled 'teletank'

1960: Shakey Mobile Robot - Defense Advanced Research Projects Agency for Artificial Intelligence (DARPA-AI)

1990: Unmanned Ground Vehicles/Systems Joint Program Office (UGV/S JPO)

1996: NASA Mars Pathfinder / Sojourner Rover

2016- 2021: Mass market autonomous vehicles





247 Years Later: Civilian Transportation

32,000+ Fatalities
2.3+ Million Injuries



**6.9 Billion Lost
Hours in Traffic**

**3.1 Billion Gal.
Wasted Fuel**

**\$400 - \$900 Billion
Annual Price Tag**

So



Who's at Fault?

- **90% +** of accidents are human error
- **1%** of drivers applied the brakes at full force
- **1/3** of drivers didn't apply the brakes at all

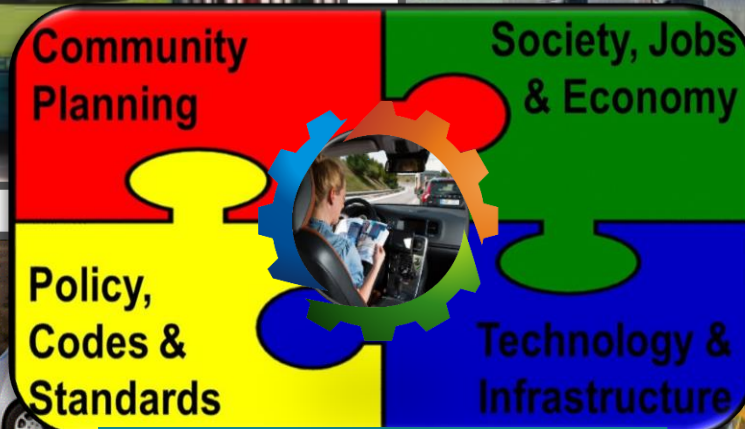


Source: National Highway Traffic and Safety Administration (NHTSA)



Civilian Environments

Benign, Permissive, and Structured



Robo-Planning-Matrix





Military Environments

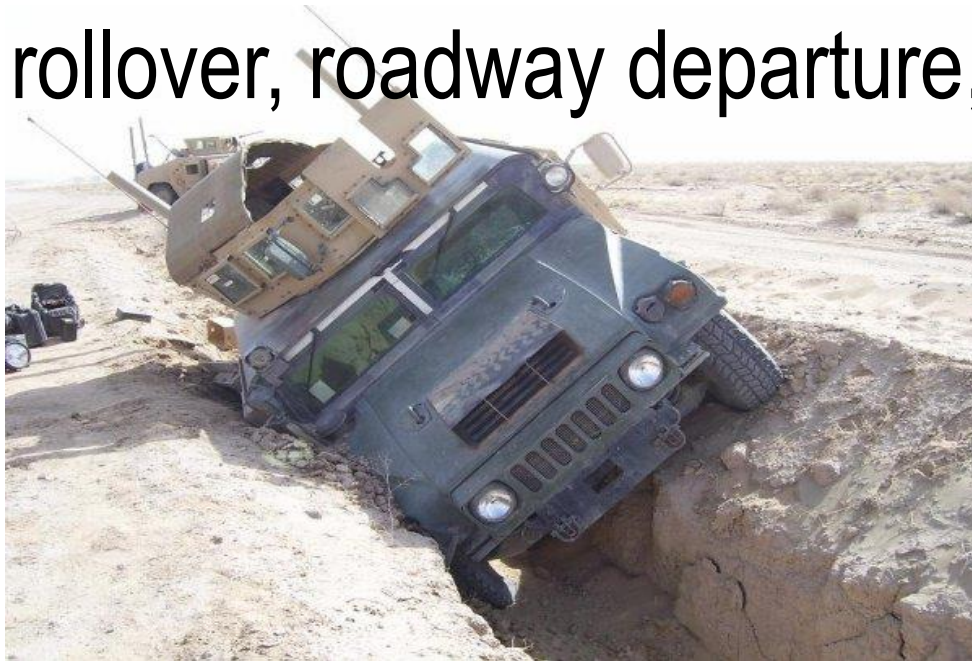
Adversarial, Highly Dynamic, and Unstructured





Driver Error

- 10 - 14 hour convoy missions
- Complicated, unpaved, rugged terrain
- Inexperienced drivers (age 18+)
- Collision, rollover, roadway departure, etc.



- Asymmetric warfare
- Improvised explosive devices (IEDs)
- Coordinated threat attack





Dangerous - Convoy Operations

Between 2003 – 2007
over **3,000** American soldiers & contractors were killed
in Iraq and Afghanistan **supply convoys**



Source: CNN Money



PUBLIC LAW 106-398 – OCT. 30, 2000,
NATIONAL DEFENSE AUTHORIZATION ACT FOR
FISCAL YEAR 2001 SEC. 220



- Save Lives
- Increase Combat Power
- Increase Situational Awareness
- Reduce Accidents
- Save Fuel
- Support Logistics Operations



FORCE MULTIPLIER



Advantages

Manned (Driving is automated with override option)

- Decrease Mental / Cognitive / Physical Load
- Increase Situational Awareness
- Reduce Accidents 25% - 50% (estimated)
- Estimated \$2.5 Billion Dollars Net Savings

Unmanned Mode (Platooning, Reconnaissance, Support)

- Significantly Decrease Casualties From Accidents, IEDs
- Significantly Increase Situational Awareness
- Estimated \$3.7 Billion Net Savings for the Army



Multitude of Applications





Convoy Operation





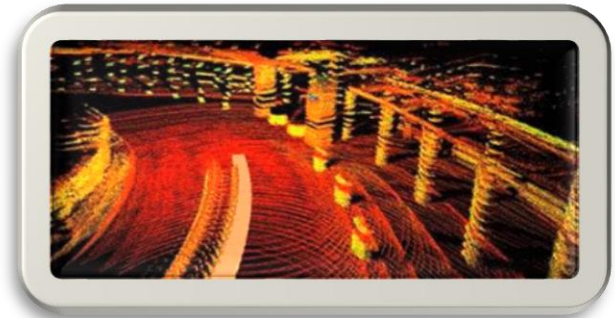
Robocist Implementation: Technology Demonstration

Applied Robotics for Installations and Base Operations (ARIBO)





- Autonomous Warrior Transport On-base (AWTO)
- Address real-world needs of the Warrior Transition Battalion
- Soldier transport between Barracks and Hospital





ROBOCIST

MOBILITY & ROBOTIC CONSULTING

Thank You

Jeff Barghout

Jeff.Barghout@Robocist.com

www.Robocist.com





Robocist Initiatives: Robo Planning Matrix (RPM)

Comprehensive platform for understanding, planning-for, and **implementing** autonomous vehicle technologies

- Decision Matrix
- Best Practices
- Stakeholder Collaboration

Easy to use with **superior** results at a **fraction of the cost**





RoboLogger: Connecting America's Fleet

