

A world map with a blue background and red landmasses, overlaid with a white grid. The title "Unmanned/Robotic Systems" is written in white, italicized serif font across the center.

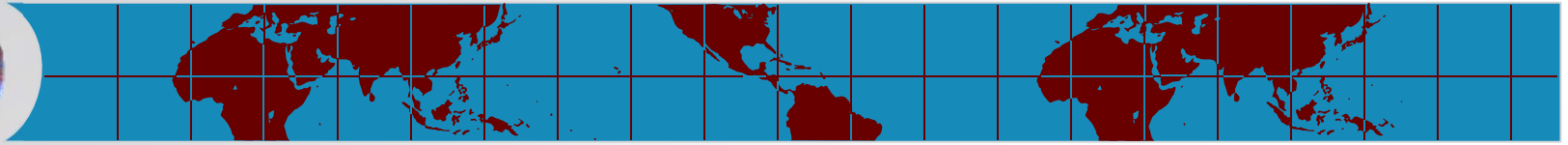
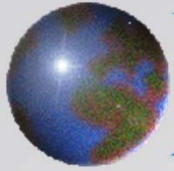
Unmanned/Robotic Systems

A small, realistic 3D rendering of the Earth, showing continents and oceans, positioned to the left of the main text.

A Revolutionary Technology on an Evolutionary Path

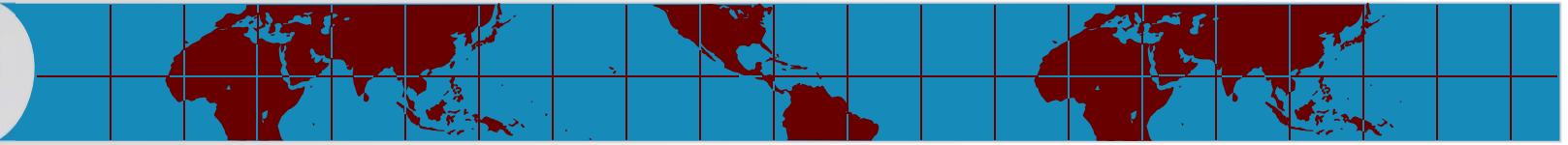
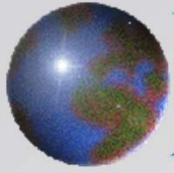
**Presentation to
AEROSPACE ARIZONA
SUMMIT 2018**

**Michael Toscano
USZ
(Unmanned Systems Zealot)**

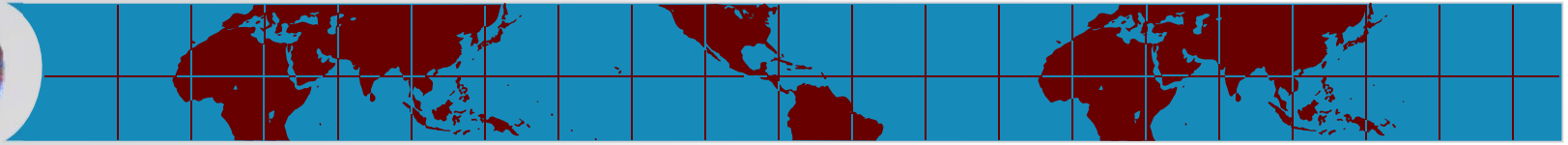
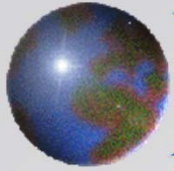


The Challenge

*When do you think
unmanned systems will
be part of your everyday
life?*

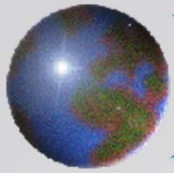


What Causes Change?


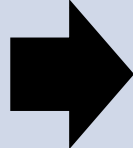
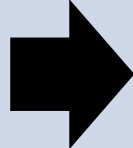
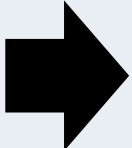

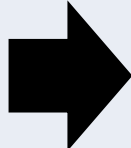
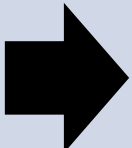
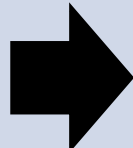



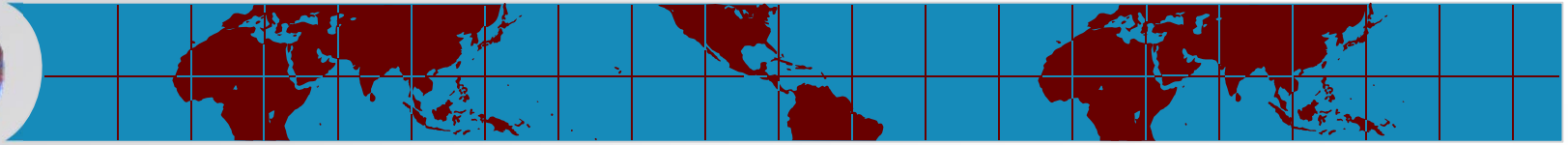
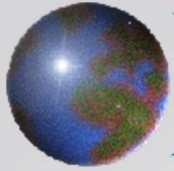
What Causes Change?

- ⊕ Human Injustice
- ⊕ Social Awareness
- ⊕ Revolutionary Technology



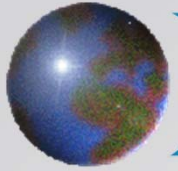
Game-Changing Technology

Cost	Service	Risk
		
		
		



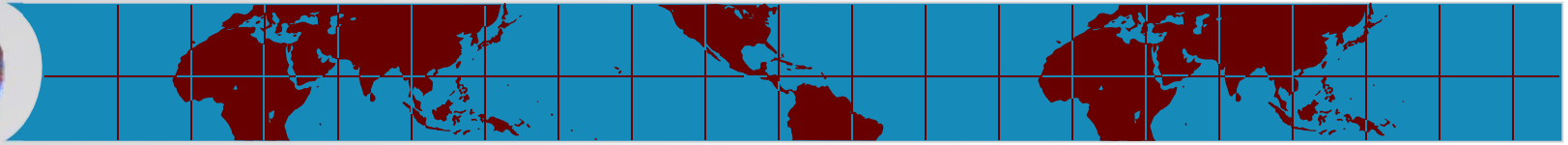
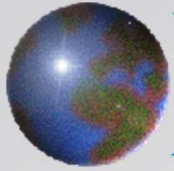
Revolutionary/Disruptive Technology

- ✚ Improves Existing Capabilities
- ✚ Creates New Jobs
- ✚ Eliminates Some Jobs
- ✚ Requires New Laws or Policies



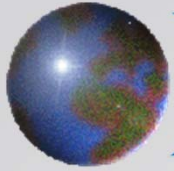
Assumptions

- ✦ This is a Revolutionary Technology
 - ▣ Technology Always Wins
- ✦ Different Level of Autonomy
 - ▣ Smart Cars will get Smarter
- ✦ There will be a Traffic Management System



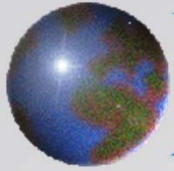
Unmanned Aircraft Systems (UAS) or Drones

- ✦ Do Two Things Very Well
 - ▣ Situational Awareness
 - ▣ Delivery



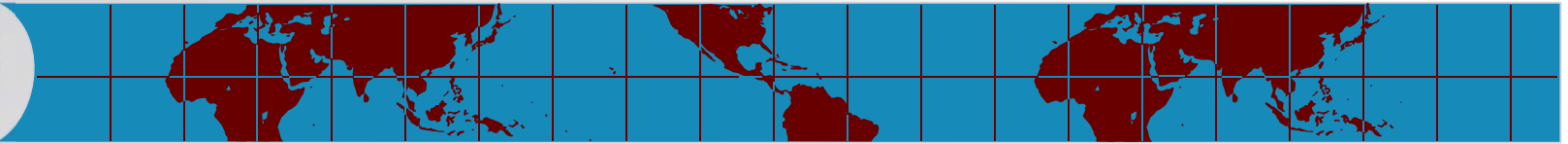
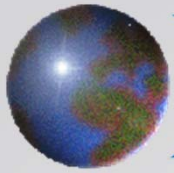
Automated Vehicle Systems (AVS) or Driverless Cars

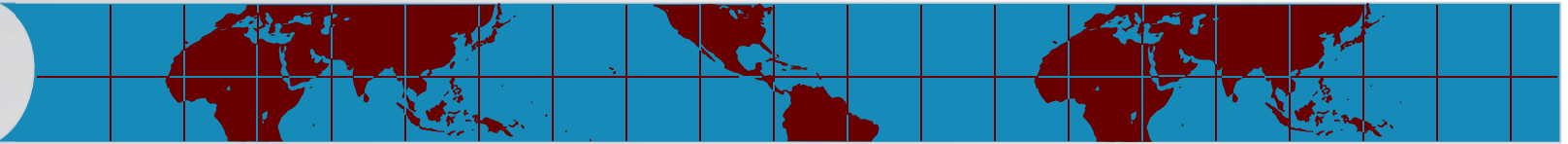
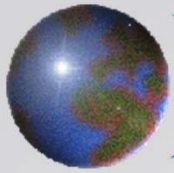
- ⊕ Revolutionize Mobility
- ⊕ Create New Business Model

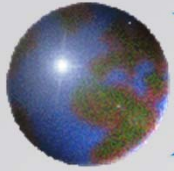


*Rate of Infusion/Acceptance of
UAS and Driverless Cars is
Based on*

SAFETY

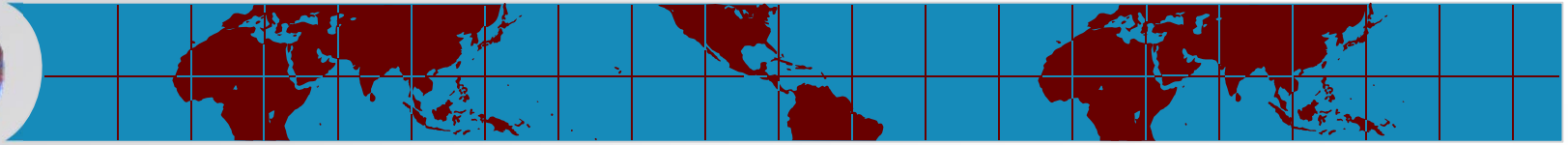
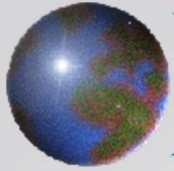






Safety of Unmanned Systems Depends on

- ✚ Hardware
- ✚ Software

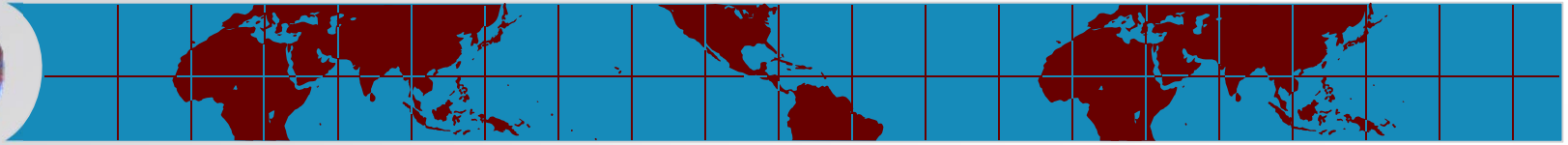
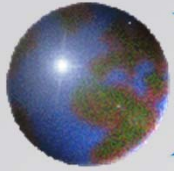


Hardware

- ✦ The more you use it, sooner or later
IT BREAKS

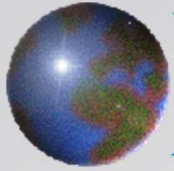
Software

- ✦ The more you use it, sooner or later
IT WORKS



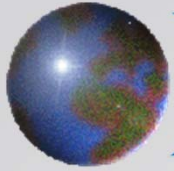
Software Will Get Better

- ⊕ Moore's Law
- ⊕ Metcalf's Law
- ⊕ Artificial Intelligence
- ⊕ Learning Machines



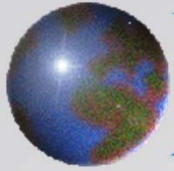
What Major Factors Affect Policies and Laws of Unmanned Systems?

- ✦ Technology Maturation
- ✦ Risk Acceptance
- ✦ Leadership



Challenges

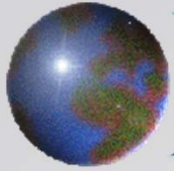
- ✦ UAS Regulations on Commercial Use of UAS
- ✦ Current Privacy Issues in the Civil Market
 - ✦ “Lettuce doesn’t care if it’s watched”
- ✦ Solutions Need to Meet the Triple Bottom Line
 - ✦ Cost-effective and more efficient
 - ✦ Beneficial to society – save lives
 - ✦ Good for environment
- ✦ Cost-effectiveness of sensors for UAS and UGS
 - ✦ Not many available
- ✦ Dexterous manipulation
 - ✦ Robotic technology can fly a 747 across the country, but is challenged with the simple task of picking a strawberry



Back to Assumptions

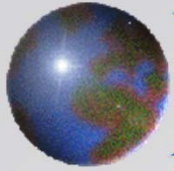
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There will be a Traffic Management System



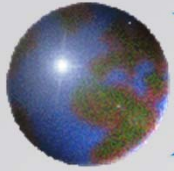
UAS Traffic Management (UTM) System (same for AVS/DC)

- ✦ Federally Created
- ✦ Government and Industry
- ✦ Works for Manned and Unmanned Systems



Summary

- ✦ Unmanned Systems/Robotics is a revolutionary technology
 - ✦ Major economic drive/job maker
 - ✦ Significant improvement to quality of life – 4 Ds
 - ✦ Improve national security/defense operations
- ✦ The White House (OSTP) and Congress are supportive/encouraging unmanned systems/robotics
- ✦ Unmanned Systems will continue to grow and be part of our future – Technology always wins!!

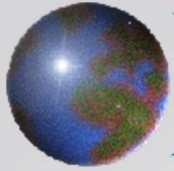


I Wish I Was 30 Years Younger!

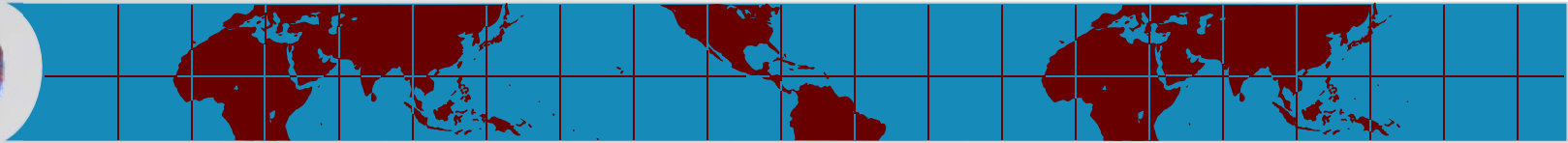
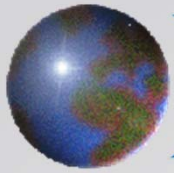
Michael Toscano

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Back-up Slides



Position on UAS Privacy

All stakeholders can work together to advance UAS technology, while protecting Americans' safety, as well as their rights

✦ Transparency Measures

- ✦ Register unmanned aircraft and pilots with the Federal Aviation Administration (FAA)

✦ Prohibiting Weaponization

- ✦ FAA already prohibits the deployment of weapons on civil aircraft

✦ Data Retention Policies

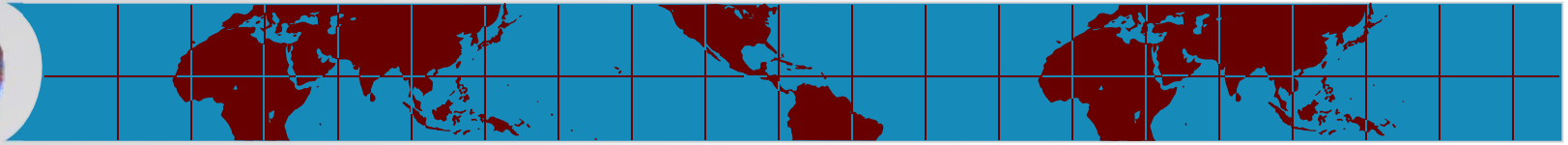
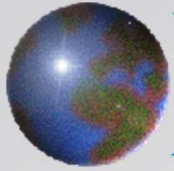
- ✦ Governing the collection, use, storage, sharing, and deletion of data
- ✦ Policies should be available for public review and comment
- ✦ Policies should outline strict accountability
- ✦ Requires government and industry standards

✦ Accountability

- ✦ Fourth Amendment already protects against unreasonable searches
- ✦ People should be prosecuted for violating privacy laws

✦ Technology Neutral Laws

- ✦ Any new laws or regulations should focus on whether the government can collect and use data, not how it is collected



Why Automated Vehicles?

✚ Safety

- ✚ 32,719 highway deaths
- ✚ 6,300,000 crashes/year
- ✚ Leading cause of death for ages 4-34

✚ Mobility

- ✚ 4,200,000,000 hours of travel delay
- ✚ \$80,000,000,000 cost of urban congestion
- ✚ \$242,000,000,000 annual economic cost

✚ Environment

- ✚ 2,900,000,000 gallons of wasted fuel

(2013 Data)²⁴

