

# **Federal Regulation of Robotic Aircraft**

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# Are Drones Friendly and Commercial?

TacoCopter: One-click Taco Delivery in the SF Bay Area - Windows Internet Explorer

http://tacocopter.com


TacoCopter: One-click Taco ...

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Beer Drones To Deliver Brew to Concertgoers [VIDEO] - Windows Internet Explorer

http://mashable.com/2013/05/05/beer-drones

Timothy ... Beer ...

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Google drone beer delivery

Mashable

## Beer Drones To Deliver Brew to Concertgoers

6.6k / 3709 1887 606

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BY VIGNESH RAMACHANDRAN / MAY 05, 2013

Thirsty music festivalgoers in South Africa this summer may be able to get beer instantly delivered to them — via [drones](#).

During August's OppiKoppi Music Festival, attendees can [order beers from their phones](#) to be delivered the event's District 9 campsite. The beer-equipped drones will swoop down and deliver beer via parachute to the appropriate customer, as explained in the video above. The organizers say the beer drones are now hand-guided, but in the future they'll fly on a GPS grid.

But this 21st-century service might not fly without its share of turbulence: Targeting the right customer amongst [the crowds at OppiKoppi](#) will be an interesting challenge to overcome. And festival attendees might not have the greatest sense of motor control for catching their drink order, after having one too many.

## Are they Keeping US Safe?

# Los Angeles Times

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## Police employ Predator drone spy planes on home front

*Unmanned aircraft from an Air Force base in North Dakota help local police with surveillance, raising questions that trouble privacy advocates.*

December 10, 2011 | By Brian Bennett, Washington Bureau



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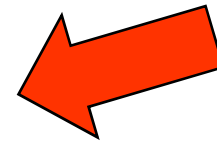
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Reporting from Washington — Armed with a search warrant, Nelson County Sheriff Kelly Janke went looking for six missing cows on the Brossart family farm in the early evening of June 23. Three men brandishing rifles chased him off, he said.

Janke knew the gunmen could be anywhere on the 3,000-acre spread in eastern North Dakota. Fearful of an armed standoff, he called in reinforcements from the state Highway Patrol, a regional SWAT team, a bomb squad, ambulances and deputy sheriffs from three other counties.

He also called in a Predator B drone.

As the unmanned aircraft circled 2 miles overhead the next morning, sophisticated sensors under the nose helped pinpoint the three suspects and showed they were unarmed. Police rushed in and made the first known arrests of U.S. citizens with help from a Predator, the spy drone that has helped revolutionize modern warfare.

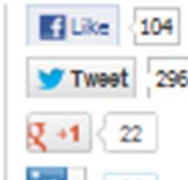




## Are they a Big Business Opportunity?

### Domestic-Drone Industry Prepares for Big Battle With Regulators

BY SPENCER ACKERMAN 02.13.13 6:37 PM

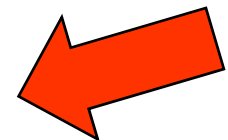


For a day, a sandy-haired Virginian named Jeremy Novara was the hero of the nascent domestic drone industry.

Novara went to the microphone at a ballroom in a Ritz-Carlton outside Washington, D.C. on Wednesday and did something many in his business want to do: tenaciously challenge the drone regulators at the Federal Aviation Administration to loosen restrictions on unmanned planes over the United States. Judging from the reaction he received, and from the stated intentions of the drone advocates who convened the forum, the domestic-drone industry expects to do a lot more of that in the coming months.

There's been a lot of hype around unmanned drones becoming a fixture over U.S. airspace, both for law enforcement use and for operations by businesses as varied as farmers and filmmakers. All have big implications for traditional conceptions of privacy, as unmanned planes can loiter over people's backyards and snap pictures for far longer than piloted aircraft. The government is anticipating that drone makers could generate a windfall of cash as drones move from a military to a civilian role: Jim Williams of the Federal Aviation Administration told the Wednesday conclave of the Association for Unmanned Vehicle Systems International (AUVSI) that the potential market for government and commercial drones could generate "nearly \$90 billion in economic activity" over the next decade. \$90 billion.

But there's an obstacle: the Federal Aviation Administration.



## Are they Subject to “Big Politics?”



**Andrea Stone**  
andrea.stone@huffingtonpost.com

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# Drone Lobbying Ramps Up Among Industry Manufacturers, Developers

Posted: 05/25/2012 3:04 pm Updated: 05/28/2012 9:01 am



Rep. Buck McKeon

WASHINGTON -- It may be years before unmanned aircraft are common in the sky, but lobbyists for the industry that develops and manufactures the drones are already buzzing around Capitol Hill.

"This is one of the few areas where the government is still spending money and investing," said Alex Bronstein-Moffly, an analyst at [First Street Research](#), which collects lobbying data.

Lobbyists are pushing on legislation, regulations and appropriations, Bronstein-Moffly said. "This is the trifecta of lobbying."

## May the Debate begin!



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# Drones Moving From War Zones To The Home Front

April 17, 2012 1:00 PM

## Guests

**John Villasenor**, senior fellow at the Center for Technology Innovation, Brookings Institution

**Catherine Crump**, staff attorney with the American Civil Liberties Union's Speech, Privacy and Technology Project

## Related Reading

Read John Villasenor's blog post "[What Is A Drone, Anyway?](#)" for *Scientific American*.

Congress recently passed the FAA Modernization and Reform Act of 2012, which — along with funding the Federal Aviation Administration's budget through 2015 — encourages the acceleration of unmanned aircraft programs in U.S. airspace. Drones have taken on a large role in military operations in Afghanistan, Pakistan, Yemen and Somalia. The new legislation could make the technology more prevalent in several arenas, from local police departments to farmers monitoring crops. What exactly are drones, how are they used — now and potentially — and do they threaten people's rights to free speech and privacy?



## The Constitution / Federalism and Aircraft Design

- **The Constitution**

- Specifically calls out Admiralty Law, the Army, the Navy, the Post Office (but remains silent regarding aircraft)
- The Commerce Clause is important (Article I, Section 8, Clause 3):

The United States Congress shall have power ... to regulate Commerce ...among the several States.

- The Tenth-Amendment is important

The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people.

## History of Regulation of Aviation

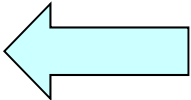
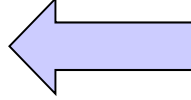
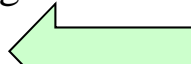
- **When Aviation was young, it was unregulated**
- **But then the First World War Happened...**
  - Airplanes could fly long distances, cross countries at will
  - Were a viable weapons delivery system
  - Crashed regularly (in war and peace) causing property damage
- **Initial Efforts to Regulate Aircraft in the US (failed)**
  - Treaty of Versailles
    - Not Ratified by Congress
  - Proposed Constitutional Amendment (Would have followed Woman's Suffrage)
    - Abandoned
- **Compromise Plan Enacted**
  - Defers to Federalism (10<sup>th</sup> Amendment) and the Commerce Power of Congress
    - The States voluntarily adopted basic laws covering aviation, states enforce violation of Federal laws, but defer to the Federal Government for Certification
    - Congress passed and President **Coolidge** (R) signed into law the "Air Commerce Act of 1926"





## Key Elements of the Air Commerce Act of 1926

- **Federal Regulation of Air Commerce**

- Transportation in whole or in part by aircraft of persons or property for hire, navigation of aircraft in furtherance of a business, or navigation of aircraft from one place to another in the conduct of business.
- Federal Government to
  - Encourage the establishment of airports, civil airways
  - Carry forward Research and Development
  - Investigate, record and make public the causes of accidents
  - Grant registration to eligible aircraft
  - Rate aircraft as to their airworthiness 
    - Design, calculations upon which the design is based
    - Materials and methods used in the construction
    - Periodic Inspection / Re-rate aircraft as to their airworthiness
  - Periodic examination and rating of airmen 
    - Federal Statutes & Regulations
  - Air Traffic Rules 

# The FAA Modernization and Reform Act of 2012

FAA Modernization and Reform Act of 2012, 112 PL 95 – Feb. 14, 2012.

- The *FAA Modernization and Reform Act of 2012* has **Federalism Problems**
  - It commands the FAA to allow robotic aircraft operations below 400-ft

BUT

- Airspace above 1200-ft is clearly Federally Regulated (above 500-ft has shared jurisdiction)
  - Federally regulated Airspace is that suitable for interstate commerce – U.S. Const., Art. I, Sec. 8.
- Airspace below 1200-ft is locally regulated (above 500-ft has shared jurisdiction)
  - Violation may constitute a **trespass**  
Swetland v. Curtiss Airports Corp., 41 F.2d 929 (N.D. Ohio 1930)
- This limit results from a legislative compromise made prior to the *Air Commerce Act of 1926*.
- This limit was key to the privacy holding in Florida v. Riley, 488 U.S. 445 (1989)

# The FAA Modernization and Reform Act of 2012

FAA Modernization and Reform Act of 2012, 112 PL 95 – Feb. 14, 2012.

- The *FAA Modernization and Reform Act of 2012* has **Separation of Powers Problems**
  - It commands the FAA to treat similar parties in dissimilar ways
    - FAA is expected to qualify the design, manufacture, maintenance and operations of **all** aircraft.
    - FAA is instructed not to qualify the design, manufacture or maintenance of **public drone** aircraft
    - FAA “may not promulgate **any** rule or regulation regarding a model aircraft, or an aircraft being developed as a model aircraft, if ... the aircraft is flown strictly for hobby or recreational use.”
  - An executive branch Agency cannot “pick and choose” how to follow conflicting statutory commands

Whitman v. Am. Trucking Associations, 531 U.S. 457 (2001)

## Where we stood in 2011

- The Federal Government pervasively regulates **all** aircraft design, manufacture, repair and operations
  - It publishes an elaborate set of rules as Title 14 in the Code of Federal Regulations (CFR).
  - The FAA regularly releases clarification and policy documents in the form of Agency Orders, Advisory Circulars, and Notice-to-Airmen (NOTAMs).
  - Today's Title 14 doesn't expressly differentiate between **manned** and **unmanned** systems



## The reach of the FAA (through the commerce power of the United States congress)

- **The FAA has jurisdiction to:**
  - Regulate Aircraft Design
    - Certified by the FAA – “Type Certificate”
  - Authorize Aircraft Manufacturers
    - Certified by the FAA – “Production Certificate”
  - Decide whether any individual aircraft can fly
    - Certified by the FAA – “Airworthiness Certificate”
  - Limit who has access to fix aircraft Aircraft Mechanics
    - Certified by the FAA
  - Designate “legal” Aircraft Repair Stations
    - Certified by the FAA
  - License Aircraft Pilots
    - Certified by the FAA
  - Direct where Aircraft Fly
    - The FAA runs the Nation’s Air Traffic Control System

**Constitutionality** affirmed: Neiswonger v. Goodyear Tire, 35 F.2d 761 (N.D. Ohio, 1929).

**Now, not only are there certification loopholes but there is an express “Model Aircraft” carve-out**

- The *Act* defines “Model Aircraft” so broadly as to encompass airframes that may be indistinguishable from a commercial or military Drone.
  - “[There is] virtually **no physical difference**, whether it be size or some other factor, between what constitutes a **model aircraft** and a **drone**. ... size is not the distinction. It’s what’s being collected, the data, that is critical.”
    - Michael Toscano, AUVSI President (2013)
- The rules forbidding the FAA from regulating any non-commercial unmanned aircraft no matter what its size, seem to open the door for unsavory elements to produce large ostensibly “hobbyist” airframes for use as weapons.

# Privacy Concerns Dominate Press Coverage

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**Todd Woody**, Forbes Staff  
 I cover environmental and green technology issues from San Francisco.  
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## Drone Wars: Berkeley Considers Ban On Robotic Aircraft

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The city of Berkeley, Calif., this week took the first steps toward a ban on drones as the autonomous aircraft deployed in the war on terrorism are being embraced for local law enforcement.

The debate over creating a No Drone Zone in this famously left-wing stronghold is likely to be repeated across the U.S. as ever-smaller drones equipped with high-definition cameras and sensors take to the skies with the ability to collect vast amounts of data on citizens.

While the Federal Aviation Administration is drafting rules for the deployment of drones in domestic airspace the use of drones to collect information remains largely unregulated.

On Tuesday, the Berkeley City Council considered a [resolution drafted by the city's Peace and Justice Commission](#) that would create an ordinance to ban the use of drones in Berkeley airspace and bar the police department and any other municipal agency from deploying drones. An exemption would be made for hobbyists as long as their drones are flown in non-urban areas and don't carry cameras. Violators could be fined \$10,000 and sentenced to a year in



AFP/Getty Images via @daylife

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## Minnesota police drones target of lawmakers

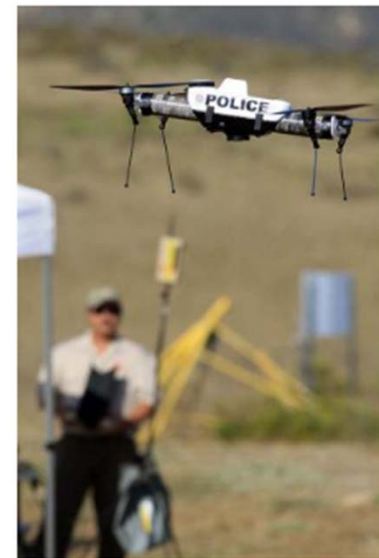
Associated Press  
 Posted: 02/14/2013 12:01:00 AM CST  
 Updated: 02/14/2013 12:37:36 PM CST

A trio of Republican state senators is pushing to bar law enforcers from using remotely piloted drones in Minnesota for evidence gathering except in rare circumstances.

Legislation introduced Thursday, Feb. 14, would allow people to sue if a law enforcement agency violates the restrictions and would prohibit evidence gained from a drone from being used in a criminal trial.

The Minnesota bill is part of a crop of anti-drone measures. At least a dozen states are considering curbs on domestic use of the powered aerial vehicles that gained fame for use in war zones.

The bill from Cambridge Sen. Sean Nienow and two colleagues provides exceptions for terrorism investigations, when a warrant has been obtained and when there is imminent danger to life, property or ability to apprehend a suspect.



Nowell Siegel, a flight test pilot, helps guide the Qube police drone in Simi Valley, California, in 2011. (Gary Friedman)

**PUT ALL OF THIS TOGETHER  
AND YOU'VE GOT A MESS...**



- **Drones do not fleet across the sky like “vagrant clouds;” they leave permanent contrails across cyberspace. - Takahashi (2013)**
  - Equipped with high resolution cameras, the possibility of a private or government Drone obtaining information that breaches a citizen’s “reasonable expectation of privacy” seems likely.
  - This data will make its way into cyberspace, where it will be archived, subject to mining and potential mischief.

## Existing Federal Guidelines Restrict Law-Enforcement Surveillance Opportunities

### The Fourth Amendment states that:

“the right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no warrants shall issue, but upon probable cause, supported by oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized.”

#### **Warrant Clause:**

All Warrants Must “Particularly Describe” the intended nature of the Search

#### **Search Clause:**

All Searches must be “Reasonable”

**With a Valid Warrant, based upon Probable Cause, there is no reason why Police can’t use a “Drone” in Law Enforcement**

## But what about Warrantless Police Searches?

A **Police Patrol cannot violate the Fourth Amendment** because an inspection “that involves merely looking at what is already exposed to view - ... is not a ‘search’ ... and ... does not even require reasonable suspicion.” Arizona v. Hicks, 480 U.S. 321 (1987).

- “A police officer could conduct binocular surveillance ... provided that he only observes and reports on items that are within his **plain-view**.” Coolidge v. New Hampshire, 403 U.S. 443 (1971).
- “In an age where private and commercial **flight in the public airways** is routine ... The Fourth Amendment simply does not require the police traveling in the public airways ... to obtain a warrant ... to observe what is **visible to the naked eye**.” California v. Ciarolo, 476 U.S. 207 (1986).
- “Any member of the public could **legally** have been **flying** over Riley's property in a helicopter at the altitude of 400 feet and could have **observed** Riley's greenhouse. The police officer did no more.” Florida v. Riley, 488 U.S. 445 (1989).

**BUT!**

• “Surveillance of private property by using **highly sophisticated surveillance** equipment ... might be **constitutionally proscribed absent a warrant**.” Dow Chemical v. U.S., 476 U.S. 227 (1986).

• When “the Government uses a **device that is not in general public use**, to explore details of the home that would previously have been unknowable without physical intrusion, the **surveillance is a ‘search’** and is presumptively **unreasonable without a warrant**.” Kyllo v. U.S., 533 U.S. 21 (2001).

**WARRANTLESS POLICE PATROLS W/ DRONES WILL  
CAUSE THESE TWO LEGAL THEORIES TO COLLIDE!**

## But what about Warrantless Police Trespass?

Warrantless Police Trespass does not inherently violate the Fourth Amendment because

- No legitimate expectation of privacy in an **open field**. Oliver v. United States, 466 U.S. 170 (1984)
- No legitimate expectation of privacy in **curb-side trash**. California v. Greenwood, 486 U.S. 35 (1989)
- **Exigent Circumstances** may allow Police to search without a warrant. Minnesota v. Olson, 495 U.S. 91 (1990)
- Warrantless inspections of ‘closely **regulated** [private] **business**’ allowed. N.Y. v. Burger, 482 U.S. 691 (1987)

**BUT!**

- “Fourth Amendment rights do not rise or fall with... [Justice Harlan’s] *Katz* formulation. *Katz* may add to the baseline, it does not subtract anything from the [Fourth] Amendment’s protection.”” United States v. Jones, 132 S. Ct. 945 (2012)
- A warrant is necessary when police conduct amounts to a **trespass at common law** AND police invade a **constitutionally protected area** enumerated in the Fourth Amendment (persons/houses/papers/effects) AND police perform such an act **for the purpose of gathering information**. Florida v. Jardines, 133 S. Ct. 1409 (2013)

**WARRANTLESS POLICE TRESPASS W/ SURVEILLANCE DRONES  
WILL CAUSE THESE TWO LEGAL THEORIES TO COLLIDE!**



## But what about Warrantless Access to Business Records?

There is no Fourth Amendment protection for any incriminating information voluntarily transferred to a third party. No warrant is needed because there is **No Legitimate Expectation of Privacy** in:

- **numbers** dialed into a **telephone** system. Smith v. Maryland, 442 U.S. 735 (1979).
- **cheques** and **deposit slips** sent through the banking system. Cal Bankers v. Shultz, 416 U.S. 21 (1974).
- **E-mail headers** sent over the internet. United States v. Forrester, 512 F.3d 500 (9th Cir. 2008).

**BUT!**

- “I would not assume that all information voluntarily disclosed to some member of the public for a limited purpose is for that reason alone disentitled to fourth amendment protection.” United States v. Jones, 132 S. Ct. 945, 950 (2012) (Sotomayor, concurrence)
- “In the pre-computer age, the greatest protections of privacy were neither constitutional nor statutory, but practical. Traditional surveillance for any extended period of time was difficult and costly and therefore rarely undertaken.” United States v. Jones, 132 S. Ct. 945, 950 (2012) (Alito, concurrence)
- There exists a “reasonable societal expectation of privacy in the sum of one’s public movements.” United States v. Jones, 132 S. Ct. 945, 950 (2012) (Sotomayor, concurrence)

**WARRANTLESS ACCESS TO THIRD PARTY DRONE TELEMETRY  
WILL CAUSE THESE TWO LEGAL THEORIES TO COLLIDE!**

# WHERE ARE WE GOING?

## Passing Local Laws asserting Local jurisdiction of Class-G airspace...

# LAWFARE

### HARD NATIONAL SECURITY CHOICES

#### Will Berkeley Become A Drone-Free Zone?

By [Benjamin Wittes](#)

Friday, December 28, 2012 at 10:13 AM

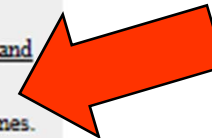
From the vanguard of the revolution, [reports Forbes](#), comes this very important effort to prevent our robot overlords from spying on us:

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## Passing State Laws forbidding Law Enforcement use of Drones without a Warrant

The Miami Herald  Florida

Saturday, 05.18.13

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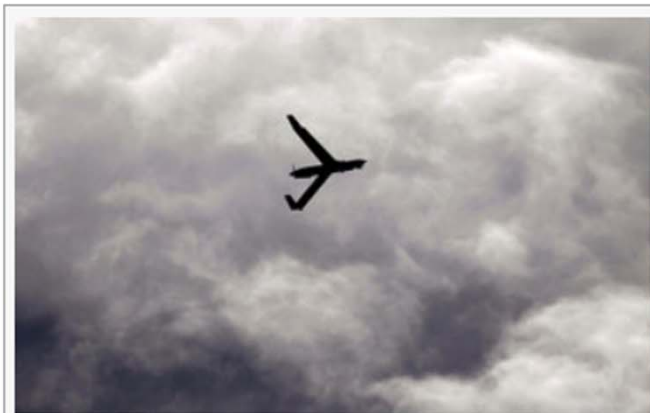
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2013 LEGISLATURE

### Gov. Rick Scott signs drones bill into law 490



This photo taken March 26, 2013, show an Insitu ScanEagle unmanned aircraft flying over the airport in Arlington, Ore. On Thursday, Gov. Rick Scott signed into law limiting how police can use unmanned drones for surveillance. DON RYAN / AP

BY MICHAEL VAN SICKLER  
HERALD/TIMES TALLAHASSEE BUREAU

TALLAHASSEE -- Look up in the sky, Florida, it's okay. The odds of getting caught on a state or local government-operated camera just went down.

On Thursday, Gov. Rick Scott signed into law limiting how police can use unmanned drones for surveillance.

"This is something all Floridians should be proud of," Scott said. "We shouldn't have unreasonable surveillance of ourselves."

The legislation taps into national anxieties that span across all political ideologies, from tea party

© 2013 – T. Takahashi Slide 24



**WHAT ELSE DO WE NEED TO  
DO?**

## Extend *Jones* and *Jardines* to the Sky

- ***Riley* seems ripe to be further distinguished.**
  - *Jones* and *Jardines* hold that a warrant is necessary when police conduct amounts to a **trespass** at common law AND police **invade a constitutionally protected area** enumerated in the Fourth Amendment (persons/houses/papers/effects) AND police perform such an act for the purpose **gathering information**.
  - *Riley* fact pattern
    - Police surveillance at < 500-ft → **Constructive Trespass**
    - Used to look within the curtilage → **invade Constitutionally Protected Area**
    - Looking for Marijuana Plants → **Gathering information** without a warrant
- “It is inconceivable that the government can intrude so far into an individual's home that it can detect the material he is reading and still not be considered to have engaged in a search. ... If government agents have probable cause to suspect criminal activity and feel the need for telescopic surveillance, they may apply for a warrant; otherwise, they have no right to peer into people's windows with special equipment not generally in use.”) United States v. Kim, 415 F. Supp. 1252, 1256-1257 (D. Haw. 1976)

## Narrowly distinguish the breadth of the “Third Party Doctrine”

- **Modern society compels us to make use of third party data providers.**
- **Permanent “contrails in cyberspace” arise from:**
  - Telephone Calls & Text Messages
  - E-mail Messages
  - ATM & Credit Card Use
  - Airline Flights / Hotel Stays
  - Google Maps searches

“All of these interactions create records in the hands of third parties about our interests, problems, loves and losses, finances, associates, family moments, and even our location at any moment.” - Orin Kerr and Greg Nojeim, *The Data Question: Should the Third-Party Records Doctrine Be Revisited?*, ABA JOURNAL, Aug.2012

## Grant the FAA the Authority to Regulate Privacy

- **Amend the Current FAA Organic Act**

49 USC § 40101 - Policy

(a) Economic Regulation. ... the Secretary of Transportation shall consider the following matters ...

(1) assigning and maintaining safety as the highest priority in air commerce.

...

(3) preventing deterioration in established safety procedures, recognizing the clear intent, encouragement, and dedication of Congress to further the highest degree of safety in air transportation and air commerce, and to maintain the safety vigilance that has evolved in air transportation and air commerce and has come to be expected by the traveling and shipping public.

...

(7) developing and maintaining a sound regulatory system that is responsive to the needs of the public and in which decisions are reached promptly to make it easier to adapt the air transportation system to the present and future needs of ... (A) the commerce of the United States;

**PRIVACY MATTERS EXCEED THE CURRENT STATUTORY  
AUTHORITY OF THE FAA!**

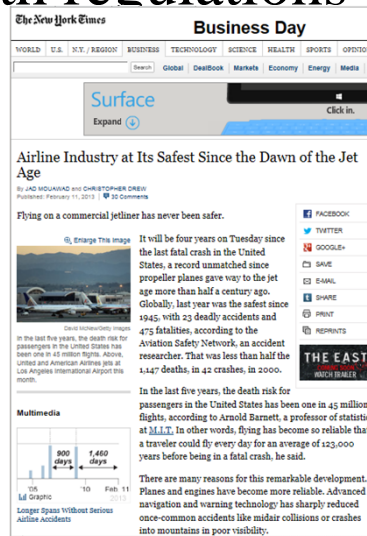
## Retain Comprehensive Federal Certification of ALL AIRCRAFT, NO DRONES CARVE-OUT!

- Drones have “got to be regulated. ... It's one thing for governments, who have some legitimacy in what they're doing [to operate Drones], but [to] have other people doing it ... It's not going to happen.” – Eric Schmidt, Google (2013).
- Petition the FAA to establish a Federal code of “best practices” so that decisions regarding design, construction, operations, repair, maintenance and workmanship, **must be made by certified** technically trained personnel.
- Conventional aircraft safely transport their passengers precisely because they do not crash
  - Unsafe aircraft ➔ Liability to Manufacturers & Operators



## Would you fly on an uncertified pre-1926 airplane?

- Comprehensive Federal regulation of aviation inspired, rather than restricted, great advances in technology and safety.
  - In 1926, without regulations
  - By 1935, with regulations
  - Today...



## Sum Up

**“Planes do not wander about in the sky like vagrant clouds. They move only by federal permission, subject to federal inspection, in the hands of federally certified personnel and under an intricate system of federal commands.”**

- Northwest Airlines v. Minnesota, 322 U.S. 292 (1944), (J. Jackson concurring)

Why should Drones be any different?