



January 25, 2016

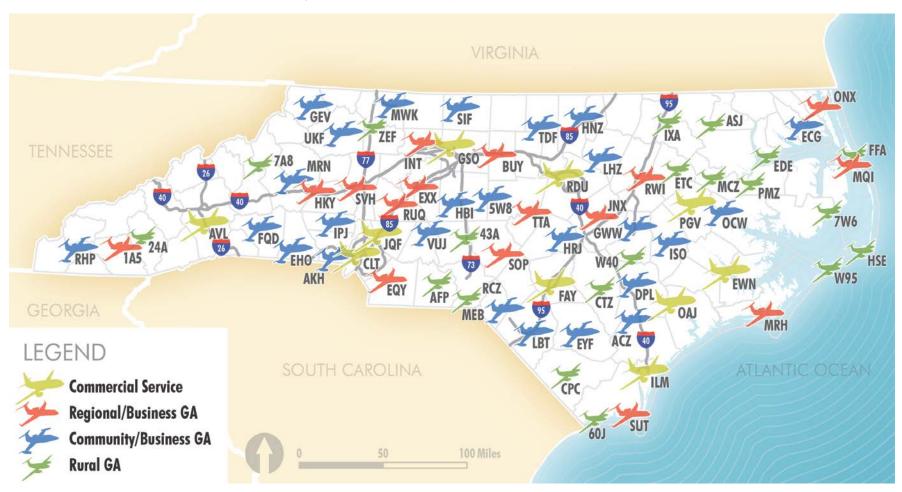
### NCDOT - Division of Aviation

Bobby Walston, PE, Aviation Director



## North Carolina's Aviation System

72 Publicly Owned Airports in North Carolina



## Economic Contribution of NC Airports

- Commercial and General Aviation Airports provide more than \$25.9 billion in economic impact each year.
- Commercial and General Aviation Airports support over <u>108,000</u>
   jobs throughout North Carolina.







Source: NC State University, Institute for Transportation Research and Education, 2012

# Benefits of Aviation in NC

- State and local governments received more than <u>\$770 million</u> in sales, property, corporate, and personal taxes due to airport activity.
- Local property tax related to airport activities is about \$277 million.
- North Carolina airports support more than <u>\$4 billion</u> in personal income for aviation-related jobs.







Source: NC State University, Institute for Transportation Research and Education, 2012

## Division of Aviation Core Functions

#### Provide:

- Aviation safety and education programs
- State and Federal Airport Project Grants
- Air transportation, operations, and support for state agencies
- Management of the state's Unmanned Aircraft System Program





### FY 2016 State Funding

Total SFY2016 Aviation Budget \$38,260,952

#### Legislative Directed Projects

\$3,500,000 for Airport Improvement at Cape Fear Regional Jetport

\$2,000,000 toward a new Air Traffic Control Tower at Albert J Ellis Airport

### Legislative Directed Programs \$2,500,000 in support of the NC Unmanned Aerial Systems (UAS) Program



Source: 2016 State Budget

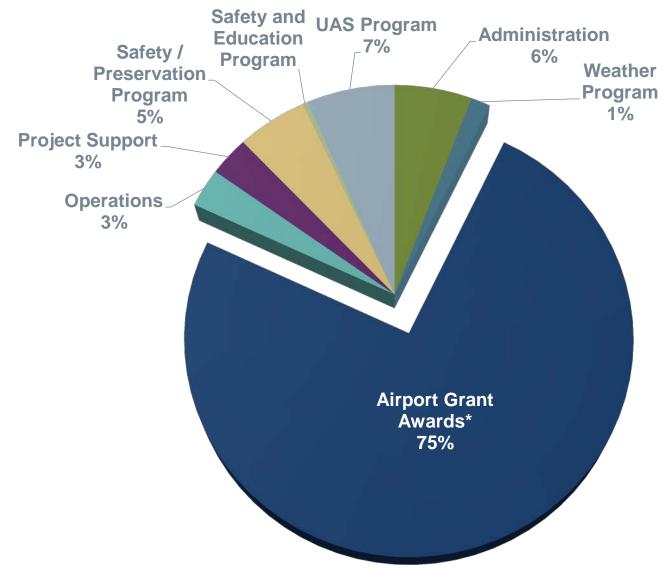
# Aviation Operations and Programs

Administration	\$2,200,000
Operations	\$1,115,000
AWOS Program	\$550,000
Project Support	\$1,145,000
Safety / Preservation Program	\$2,000,000
UAS Program	\$2,500,000
Safety and Education Program	\$155,000
Airport Grant Awards	\$ 28,600,000



Source: NCDOT – Division of Aviation

# Division of Aviation Budget





Source: NCDOT – Division of Aviation

# Airport Safety Preservation (Maintenance Program)







## State Funding

### Aviation SFY 2016

\$38.2M

Aid to Airports

\$36.0M

Administration

\$2.2M

- GA Airport Project Grants \$18.0M
- CS Airport Project Grants \$10.5M
- Unmanned Systems Program \$2.5M
- Statewide Programs \$3.9M
- Operations \$1.1M



### State Funding (in millions) SFY 2012-2016



### STI Legislation

- All capital expenditures, regardless of mode, will be funded from <u>Highway Trust Fund</u>.
- All modes must compete for the same funds.
- Projects (regardless of mode) will be scored on a 0-100 point scale.
- Local Input will be part of the scoring criteria for all Regional Impact and Division Needs projects.
- Operations and Maintenance expenditures will be funded from the Highway Fund.



# Eligibility Definitions – Highways

	Statewide	Regional	Division
Highway	<ul> <li>Interstates and Future Interstates</li> <li>Routes on the NHS as of July 1, 2012</li> <li>Routes on Department of Defense Strategic Highway Network (STRAHNET)</li> <li>Appalachian Development Highway System Routes</li> <li>Uncompleted Intrastate projects</li> <li>Designated Toll Facilities</li> </ul>	Other US and NC Routes	• All SR Routes



# Eligibility Definitions - Non Highways

	Statewide	Regional	Division
Aviation	Large Commercial Service Airports. Funding not to exceed \$500K per airport project per year	Other Commercial Service Airports not in Statewide. Funding not to exceed \$300K per airport project per year	All Airports without Commercial Service. Funding not to exceed \$18.5M for airports within this category
Bicycle- Pedestrian	N/A	N/A	All routes
Public Transportation	N/A	Service spanning two or more counties and serving more than one municipality. Funding amounts not to exceed 10% of regional allocation.	Service not included on Regional. Multimodal terminals and stations serving passenger transit systems
Ferry	N/A	State maintained routes, excluding replacement vessels	Replacement of vessels
Rail	Freight Capacity Service on Class I Railroad Corridors	Rail service spanning two or more counties not included on Statewide	Rail service not included on Statewide or Regional



### STI – Classification of Airports

#### **Statewide Mobility- Commercial Service Airports**

- International Service or 375,000 enplanements
- Federal Aviation Administration's National Plan of Integrated Airport Systems (NPIAS)
- \$500,000 per airport per project per year
- Charlotte Douglas International Airport, Raleigh Durham International Airport, Piedmont Triad International Airport, Wilmington International Airport

#### Regional Impacts – <u>Commercial Service Airports</u>

- NPIAS airports that are <u>not included in subdivision (1)</u> of this section
- \$300,000 per airport per project per year
- Asheville Regional Airport, Albert J. Ellis Airport, Coastal Carolina Airport, Concord Regional Airport, Pitt-Greenville Airport, Fayetteville Regional Airport

#### **Division Needs – General Aviation Airports**

- NPIAS airports that are <u>not included in subdivision (1) or (2)</u>
- General Aviation airports
- Statewide total funding not to exceed \$18,500,000



# Aviation STI Projects 2016-2020

Tier	Quantity	Cost
Statewide Mobility	9	\$4.5 M
Regional Impact	5	\$1.5 M
Division Needs	15	\$22.2 M
Total	29	\$28.2 M

Note: STI funds Capital Projects only



## Federal Funding

### FFY 2015 Funding

NC Block Grant Program administered by the Division of Aviation to 62 GA Airports:

\$18.3M

- Apportionment \$5.7M
- Discretionary \$3.4M
- Non-Primary Entitlement \$9.2M

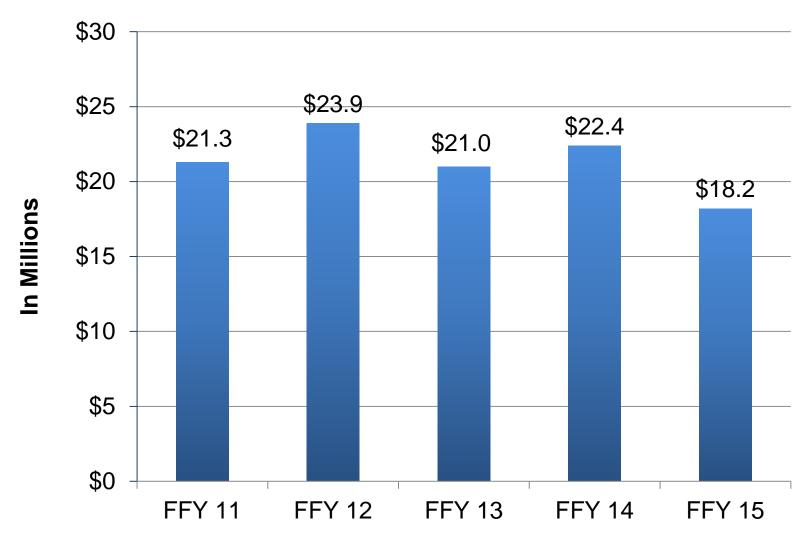
Airport Improvement Program (AIP) administered by FAA to 10 Commercial Service Airports:

\$83.8M





### FAA State Block Grants FFY 2010-2015





# Airport Project Funds

Source	Highway Funds	Highway Trust Funds
Project Types	Operations and Maintenance	Capital
Project Purpose(s)	Maintain Safety, Regulatory, and Standards Requirements	Expand and Increase Capacity of Facility beyond System Objectives
Project Example	Approach Obstruction Removal - Includes planning, land, permitting, and clearing	Runway Expansion Project Includes planning, design, land, permitting, and construction
Projects Prioritized Using	Airport Development Plan	Strategic Transportation Investment (STI) Formula

Note: FAA State Block Grant Funds are expended on O&M type projects, unless directed by FAA or the airport.



### Project Selection Process

#### 883 Project records in database

#### **Filters**

- Legislative Directed
- ➤ FAA Non-Primary Airport Entitlement Program Grants available for project costs estimated at or less than \$150,000
- Year Airport Sponsor desires project Projects requested beyond 2020 not considered this cycle
- System Plan Objectives by airport category
  - STI: Projects exceeding system plan objectives will be scored in SPOT On!ine



291 Projects considered for FY2016 State funding



Source: NCDOT - Division of Aviation

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### Current Project Requests

Projects entered into NC Partner Connect

890 projects totaling over \$1.6 billion

Projects being submitted for consideration in STI

176 projects totaling over \$597 million

Projects submitted for Operations & Maintenance consideration

300 projects totaling over \$680 million



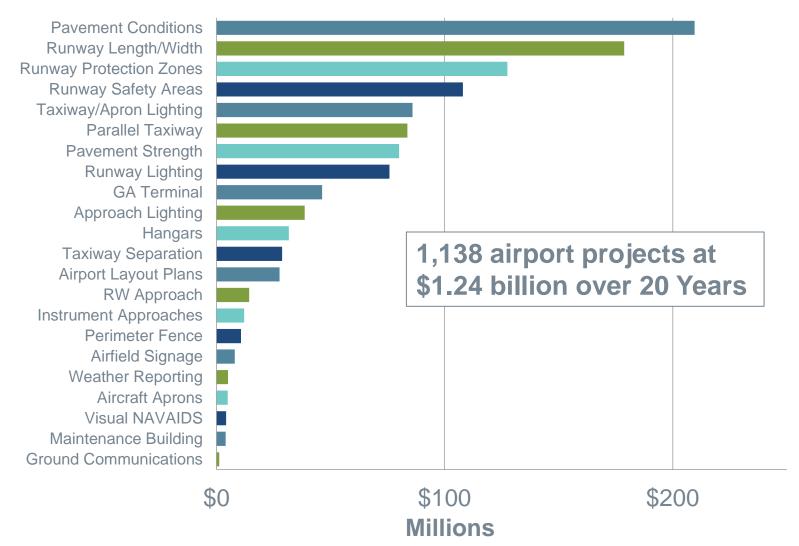
## NC Airports System Plan Study

- Top-down analysis of our airport system
- Comprehensive inventory of each airport's assets in our state system

- NCEAS P NORTH CAROLINA AIRPORTS SYSTEM PLAN
- 20-year forecast applied to all airports
- Established Performance Measures and System Objectives for all eligible project categories



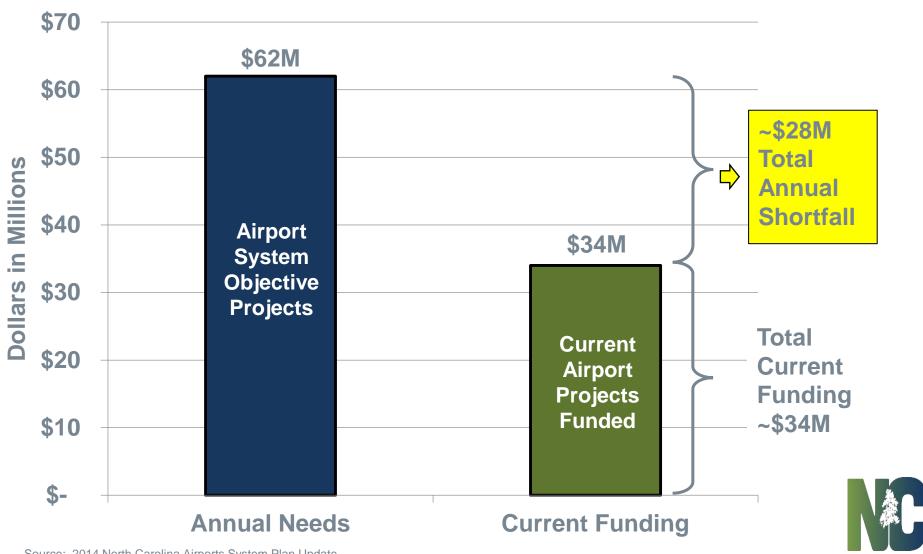
### Airport System Objective Projects by Development Plan Category





Source: 2014 North Carolina Airports System Plan Update

### NC Airports Annual Funding Gaps



Source: 2014 North Carolina Airports System Plan Update

### Questions?

Bobby Walston, PE Aviation Director

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### NCDOT - Division of Aviation UAS Program Office

Chris Gibson



### Unmanned Aircraft Systems (UAS) in NC Economic Impact

The state is poised to support an emerging private industry that would bring new jobs and related economic development.



FAA estimates that 7,500 commercial UAS will be viable within 5 years and nearly 30,000 by 2025.



Annual Market Sales of \$11B in the US



The Association for Unmanned Vehicle Systems Int'l estimates the UAS industry can create almost 1,200 jobs and \$600M in economic activity in NC by 2025.





NCDOT established a Taskforce to evaluate UAS impact in the State.

**April 2011** 



2012- Present

Conduct UAS research, establish UAS flight activities, and recommend applications for State agencies.



2013-2014

UAS Program
Office



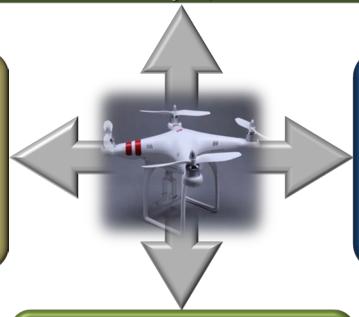
2015 - Present



### FAA's Role - Regulate the Airspace

Small UAS Rule FAR Part 107 Anticipated 2016 Notice of Proposed Rule Making
Operation and Certification of Small Unmanned
Aircraft Systems
14 CFR Parts 21, 43, 45, 47, 61, 91, 101, 107, and 183
February 15, 2015

Public: State, County, City, Military -COA



Commercial Operator:

FAA -Authorized Section 333 Exemption

Aircraft Registration

<u>Commercial & Gov't</u>

<u>Hobbyists – Dec 2015</u>

**Hobbyist:** 

Encouraged to operate using community based standards such as AMA Safety Guidelines. http://knowbeforeyoufly.org/





### Summary of NC S.L. 2014-100 regarding UAS,

### Updated by passage of NC S.L. 2015-232

Changes or additions to the following:

- Chapter 14 Criminal Law
  - §14-7.45 Crimes committed by use of UAS
  - §14.280.3 Interference with manned aircraft by UAS
  - §14.401.24 Unlawful possession and use of UAS (Weapon attached)
  - §14.401.25 Unlawful distribution of images
- Chapter 15A Criminal Procedure
  - §15A-300.1 Restrictions on use of UAS
  - §15A-300.2 Regulation of launch and recovery sites
- Chapter 63 Aeronautics
  - §63-95 Training required for operations of UAS (Knowledge Testing)
  - §63-96 Permit required for commercial operation of UAS
- Chapter 113 Conservation and Development
  - §113-295 Unlawful harassment of persons taking wildlife resources



# NC UAS Program Office

Provide safety, guidance, and educational materials and resources

Manage the UAS Working Group

Ensure UAS
operations in NC are
safe and comply with
NC law

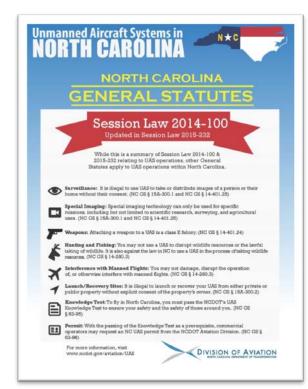
Support private sector growth by working with the Commerce Partnership

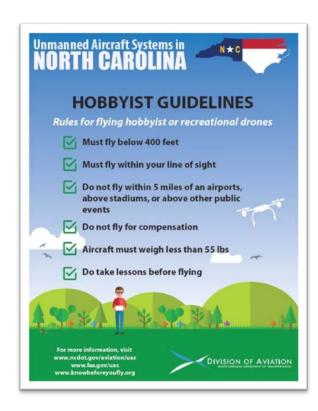
Implement operator testing and permitting as required by the General Statutes

Maintain the state's long-term Strategic Plan to support UAS activities



# NC UAS Program Office





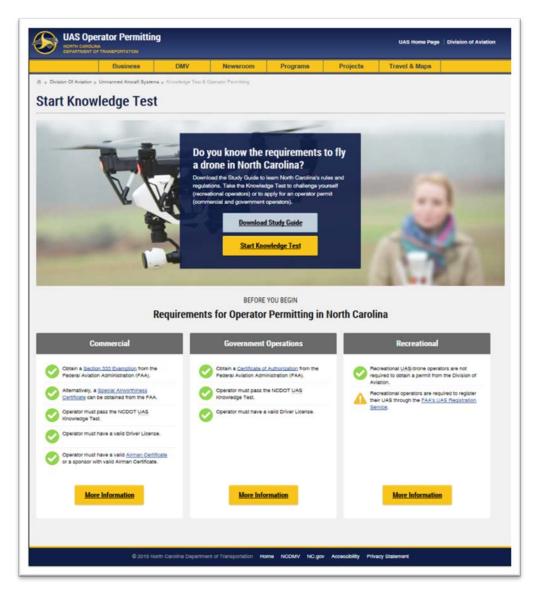


ncdot.gov/aviation/uas/

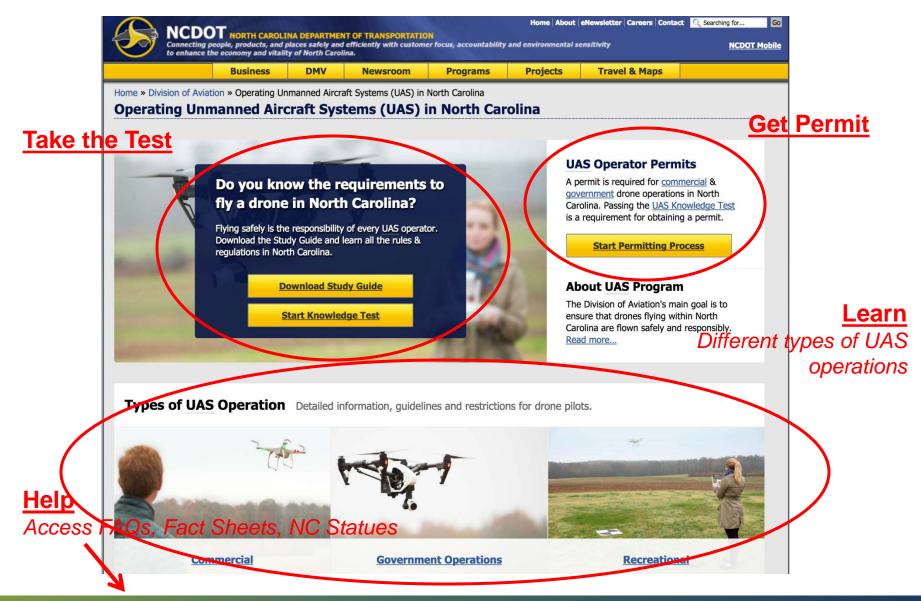
### New NC UAS Website

- Online administration of NC UAS Operators Knowledge Test
- Commercial and Government UAS Operator's Permits can be acquired online
- UAS Safety Guide and NC Statutes
- Helpful Links

ncdot.gov/aviation/uas/

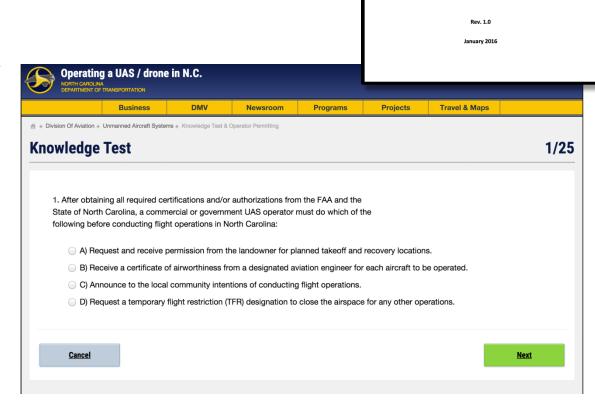


## New NC UAS Website - One Stop Shop



## NC UAS Operators Knowledge Test

- Ensures understanding of NC laws related to UAS Operations
- Download Study Guide, Take test and receive score immediately
- 25 questions, randomly selected from a 71 potential questions
- All UAS operators encouraged to take it
- Commercial and Government UAS Operators Required to Pass



DIVISION OF AVIATION

Study Guide for North Carolina Unmanned Aircraft Systems (UAS) Operators Knowledge Test

Published by the North Carolina Department of Transportation Division of Aviation in conjunction with the NC UAS Operators Knowledge Test and North Carolina UAS Operator Permitting System to ensure that UAS operators in North Carolina understand and comply with state laws related to UAS use.

## Operator Permits



Commercial and Government

Operator Permits/Credentials

Printed directly from website

Ts&Cs on Reverse

**Initially 1-year Expiration** 



Ts&Cs on Reverse

# Certificate for Recreational Operators



is awarded to

## Chris Gibson

for passing the Division of Aviation NC UAS Operators Knowledge Test.

January 14, 2016

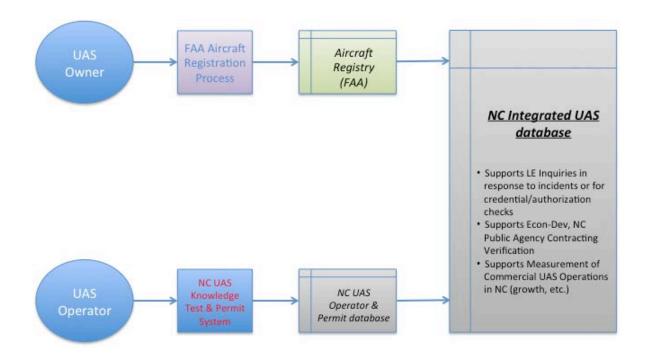




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# Next Steps & Ongoing

- Permitting System Version 2
  - Save, Manage & Update Profiles
  - Link with FAA Aircraft Registration, FAA Airman's Certificate and US Driver's License Databases
  - Searchable database for credentials verification support Law Enforcement
  - Fee for Commercial Permits



Transportation

# Next Steps & Ongoing

- Education:
  - Publish set of Recommended Best Practices for NC Government Agencies and Commercial Operators
  - Public Outreach
- Support: NC Public Agencies manage and navigate through Federal and State regulatory requirements
  - COA Application Support
  - Program, Team Stand-up
- UAS Operations Research
  - Beyond Line of Sight Operations
  - Smart, Interconnected Traffic Management

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# NGAT Overview for NC House Select Committee on Strategic Transportation Planning Meeting



January 2016



NC STATE UNIVERSITY





# Presentation Overview

- NGAT History
- UAS Program Overview
  - UAS Activities To Date
  - Program Funding Review
  - Future Plans
- Aviation Planning
  - NextGen in NC
  - The NC "Aeroscape"
  - Opportunities





# NGAT Program History

- Launched in 2012 under NCDOT Division of Aviation Leadership
  - · Primary Goal: Develop NC UAS Ecosystem
  - · Long term Goal: Prepare NC for Modern Aviation!
  - Home: Institute for Transportation Research and Education (ITRE)
- Began UAS flight operations March 2013 at Hyde County Airport, now weekly operations across the state
- Established as an NC State Consortium in 2015
  - NGAT Consortium at NC State University- a consortium of academia, industry, and government agencies created to provide a research and application—oriented, technology transfer-focused organization for conducting aviation technology development, investigations, and field trials
- Core member of ASSURE Alliance selected May 2015 for the FAA UAS Center of Excellence research program for 5 years.



Alliance for System Safety of UAS through Research Excellence







• Built here

Needed here







# "NextGen"

- Satellite Based Navigation and Surveillance (not radar)
- Digital Data Exchange (not voice)
- Automation Assisted Air Traffic Management (not Air Traffic Control)
- Improved Weather Decision Tools
- Reduced Aircraft Environmental Footprint
- System Wide Information Management and Automation Modernization
- Increased Airspace Capacity
  - More airport utilization
  - Rise of personal aircraft
  - **UAS** integration

#### NextGen Program Timeline

Research began as AGATE and SATS Programs in late 1990s

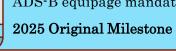
Officially launched in 2007

ADS-B baseline complete in 2014

Foundational infrastructure in 2015

ADS-B equipage mandate in 2020

2025 Original Milestone Goal





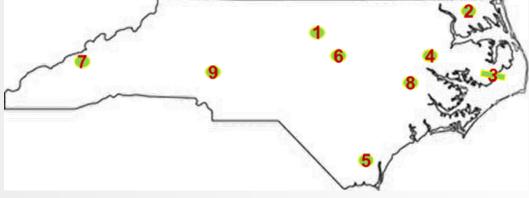


# NC STATE

## NGAT UAS Activities: To Date

- Flight summary
  - Started 3/21/2013
  - 20 approved COAs (8 more pending)
  - At least one flight per week
  - 600+ flights
  - ~140 hours of flight time
- Research:
  - Control and Communications
  - Surveillance Criticality
  - Airspace Integration
  - Statewide Integration
  - Agriculture
  - Surveying
  - Airworthiness Analysis
- Data Management
  - Structure
  - Reporting







# NC STATE

# NGAT Imagery from Hyde County

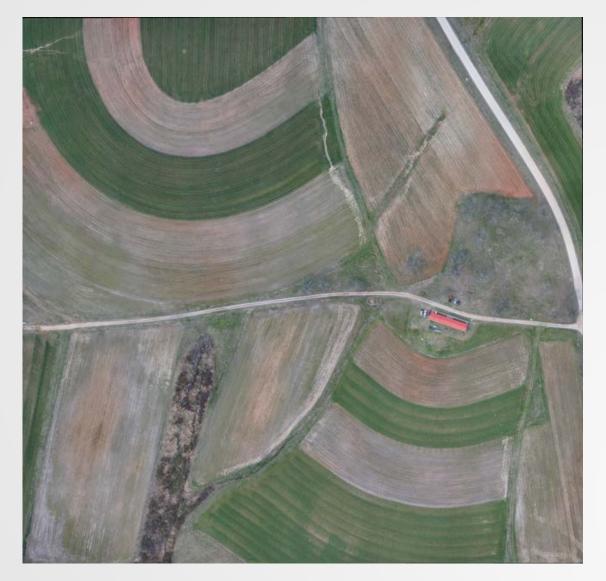


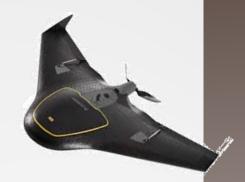






# NGAT Imagery from Lake Wheeler Farm

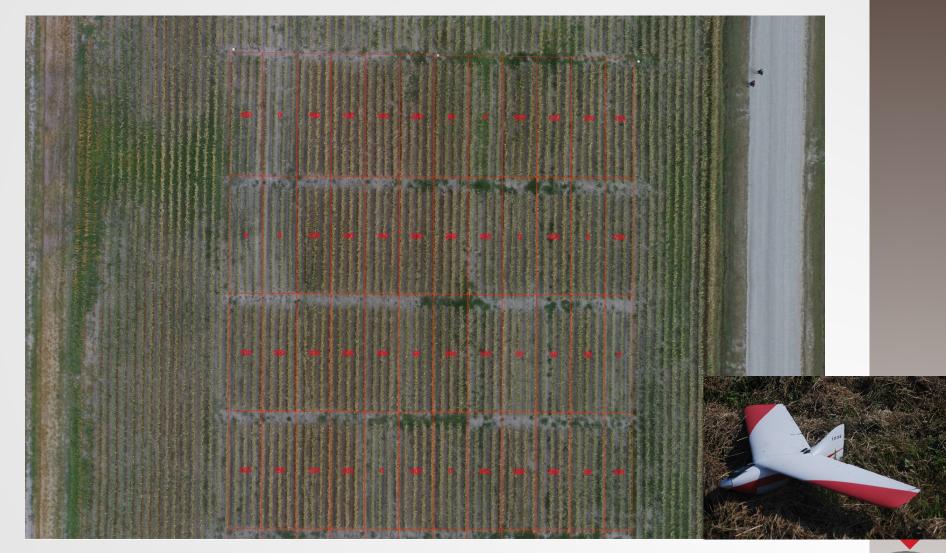






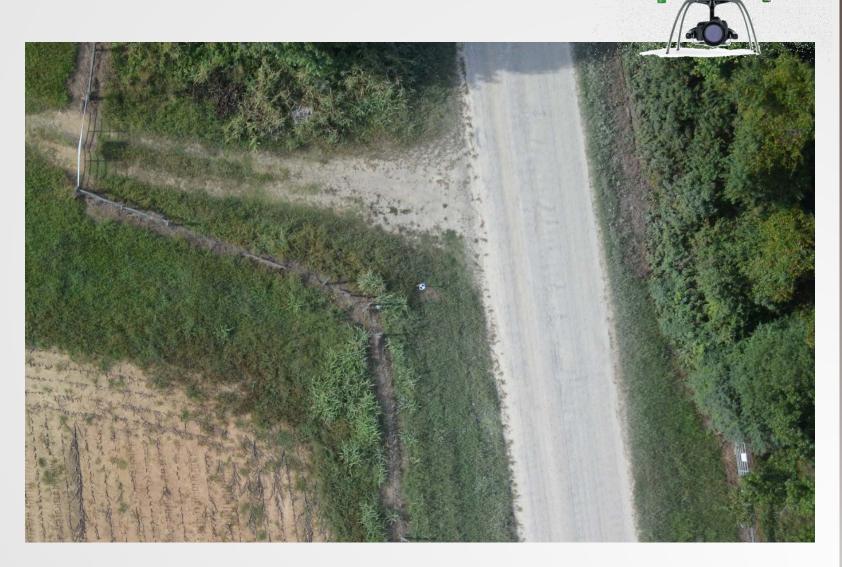
# NGAT Imagery from Vernon James N2 Research





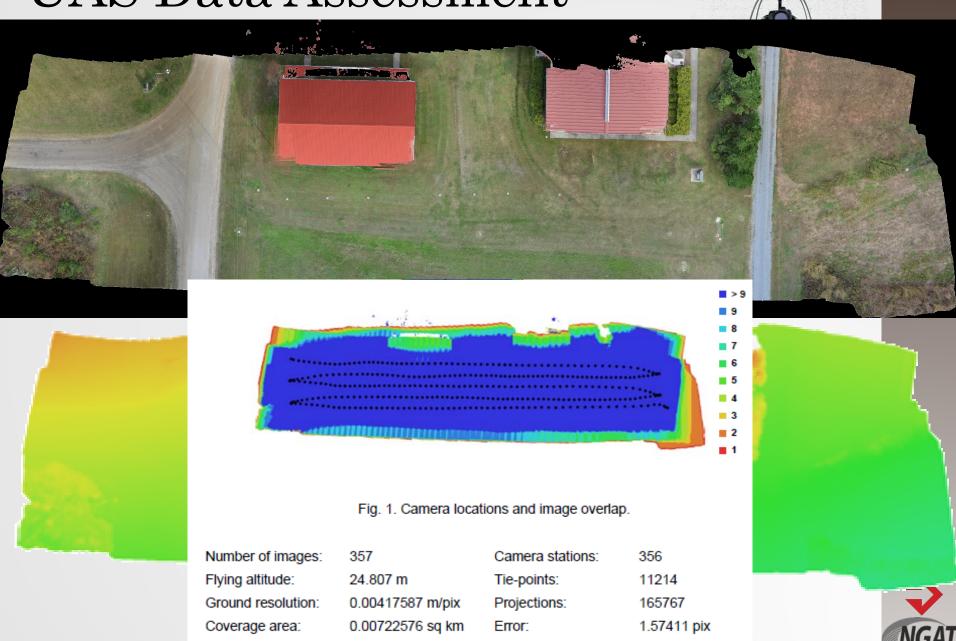
# NGAT Survey Imagery







# UAS Data Assessment





# NGAT Funding History

- NCDOT Division of Aviation
  - \$400K- 2012-2013- Launch NGAT
  - \$1.5M-2014-April 2016- UAS Test Facility Program Management
- ASSURE Center of Excellence (requires \$1:1 matching)
  - \$250K- Sept 2015-Nov 2016- Surveillance Criticality Project
- NCDOT Photogrammetry and Surveys
  - \$200K- Oct 2014-March 2016- UAS as an Inspection Tool Research
- Golden Leaf Foundation
  - \$200K-2013- Establish UAS Flight Research for Agriculture
- NCSU
  - \$140K- 2014-2015- Director salary matching, statewide COA development support
- NGAT Consortium Membership
  - \$50K 2015- 25 memberships (including industry, university, government agency)
  - \$15K 2015- UAS services for consortium members-only
  - \$19K-3 day MITRE Airworthiness Workshop with NCSU MAE Department
- ParsonsBrinckerhoff
  - \$13K- Sept 2015- Dec 2015- Washington State DOT UAS Plan
- TOTAL \$2,787,000



# Statewide UAS Operations: Goal 2016

- NGAT/NCSU Provides structure
  - FAA mechanism/reporting
  - Training to meet NCSU and NCDOT requirements
  - SOPs/Best Practices
  - Data Management
  - SMARTeams = SMall Aircraft Research Teams

## FAA coordination

- Section 333 Exemption is expected in Feb
- Statewide COA request to be submitted before the end of January- Class G Airspace, 400' altitude, 8 aircraft types (all less than 20 lbs), daylight ops only

## Enables

- Applied researchers to conduct approved operations
- Safe airspace integration in NC
- More performance data for researchers (ASSURE)

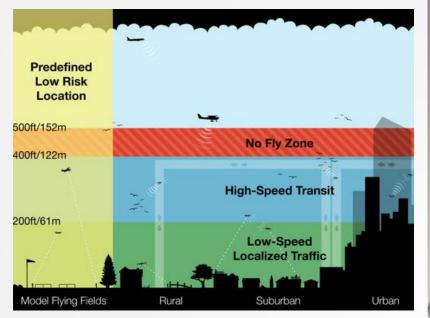


## NGAT ASSURE Research

- Command and Control Research Leadership
  - UAS C2 Testbed
    - Including use of Optionally Pilot aircraft
  - ADS-B Sense and Avoid Performance Analysis
  - Spectrum Management Research

- Disaster Response Research
- Airworthiness Research
- Air Traffic Integration Research







# NC STATE

# NextGen in North Carolina

- 7/1/2010- Spirit Aerosystems announces opening of composites manufacturing facility in Kinston to produce Airbus A350 fuselage and wing components.
- 10/15/2014 GE Engines manufacturing plant in Asheville opened
- 12/8/2015- Honda aircraft receives final type certification for HondaJet
- 12/23/2015 Honda aircraft begins deliveries
- 1/9/2016- "Charlotte is really the first NextGen city, because every major NextGen initiative is coming or already is in Charlotte." FAA
  - DataComm
  - ERAM (En Route Automation Modernization)
- Olaeris is here for autonomous emergency response
- Big Data is something NC is very prepared for...
  - 'Big Data' From Aircraft? Great. But For What? (AvWeek, 12/11/2015)
  - Internet Of Aircraft Things: An Industry Set To Be Transformed (AvWeek, 1/18/16)





# The NC "Aeroscape"

## Aerospace Employment in NC\*

- Air Transportation 54.5%
- Support for Air Transportation- 23.1%
- Manufacturing 22.5

## Education

- Universities
- Community Colleges
- Private Flight Schools

### DOD Installations

- Ft Bragg
- Cherry Point, New River
- Seymour Johnson
- Elizabeth City Coast Guard Air Station
- NC National Guard

## Community

- NC AAIA
- NC Aerospace
- NC DBA
- ASA
- AUVSI
- NCAAA

## Dozens of Companies

- Large
- · Small
- Nontraditional Aerospace

## 72 Public Airports\*\*

- 100,000+ jobs
- \$26B annual impact



<sup>\*-</sup> Aerospace in the Southeast, SC Aerospace Conference, August 2015

<sup>\*\*-</sup> Economic Contribution of Airports in North Carolina Report, ITRE, 2012



# Aerospace/Aviation Opportunities

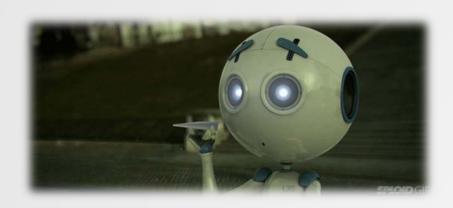
- 1. Need a Long Term Aviation Strategic Plan ASAP ("Wrights+125")
- 2. Advanced Aviation Command and Control (A2C2) Test Area
  - · MacKall AAF to Stanly County
  - Supports- DOD, ASSURE/FAA, NASA (UTM), Industry
- 3. Statewide UAS Agency Common Practices
  - · SOPs, training, reporting, management
- 4. UAS Integration Exercises
  - Disaster response
  - Planned event response
  - Routine operations
  - Supports- NCEM, NCDOT, DHS, FEMA, NOAA, local communities, industry
- 5. Autonomous Vehicle Integration
  - Leadership in adoption and integration of UAS, driverless cars with research, policy, and recruitment strategies
- 6. Line between manned and unmanned aviation (especially GA) is going to get blurry fast. Build the infrastructure to connect the NC aviation network (airports, heliports, potential drone warehouses) ahead of the competition
- Risks
  - National need for a Aerospace/Aviation Strategic Plans (Aviation Week, January 18, 2016)
  - Other neighbor states are committing resources to Aerospace industry-SC, VA







## For More Information



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(Tanisha Wyatt)

It is not really necessary to look too far into the future; we see enough already to be certain it will be magnificent. Only let us hurry and open the roads.



