THE KYTC MISSION

To provide a safe, efficient, environmentally sound and fiscally responsible transportation system that delivers economic opportunity and enhances the quality of life in Kentucky.
Unmanned Aerial Systems (UAS)

Mission Statement

To facilitate the National Deployment of Unmanned Aerial Systems (UAS) to increase safety and efficiency, while saving time and money for the taxpayers.
FAA Rule Governing Drone Use
Government and Commercial Use

FAA link https://www.faa.gov/uas/

US Department of Transportation
FAA website screen shot
5/8/2019
What Program is right for your agency?

- Remote Pilot Certificate under the Part 107 Rule
- Public Aircraft Operation
  - Blanket Area Class G Public COA
  - Jurisdictional COA
- Special Government Interest (Emergency COA)

and make the coordination and see whether you can fly
Drone Selection

**Bridge Inspection Tool**
- HD video camera and photos
- Collision Avoidance
- Camera ability to look up, 90 deg
  Preferred but up 30 deg
- Simple Flight Operations
- Off-the-Self Equipment
Consumer Drone 2018/19

- 4K Video and 12 MP Camera for still photos
- 2x Optical & 2x Digital Zoom – 4x Total Zoom
- Camera gimbal range
  - 90 degrees down
  - 30 degrees up
  - 70 degrees left/right
- Collision avoidance/sensing
  - Forward – collision
  - Downward – sensing
  - Rear Collision
  - Upward Sensing
  - Right and Left Sensing
- Smart Controller
  - Built in Screen
  - High brightness screen
  - 4K HDMI live output
Drone Proof of Concept
+30 Deg. Camera and FPV Goggles

Pictures at +30 Deg. Up Camera and Large Image Format of FPV Goggles, Small Defect Detection
High Definition - FPV Goggles
High Definition - FPV Goggles

First Person Vision (FPV) is not Virtual or Augmented Reality

• Virtual/Augmented Reality
  • Images are computer generated or combination of computer generated and real images
  • Images viewer sees are not real, they are generated inside a computer and displayed, thus Virtual or Augmented reality

• First Person Vision
  • Images are real, same thing as watching evening news
  • Real time images transferred to viewer
  • Viewers perspective is that of the drones
Video of FPV view vs controller

Drone Field Use
Visual Image Comparison

Standard Tablet and First Person Vision Goggles
Drone + FPV Goggles
What does that do for Inspection?

• Great supplement to the inspection
  • Allows the inspector to focus on inspection of components
  • Improves inspector Safety
  • Improves the quality of documentation of access restricted components

• Allows Inspectors to see at a equivalent distance of 3 feet
  • Drone can Operate easily within 12 ft of most standard bridge components,
  • 2x optical + 2X digital zoom gives the FPV image equivalent to being 3 ft away from component.

• Give the inspection team easy access project site and to bridge components
  • Supplementing Bridge inspection allows inspectors to limits the need for Ladders, Snoopers, Climbing equipment, etc.
Bridge Inspector
FPV Goggle Perspective
Video of Supplementing Inspection
In House Chip Seal

- Apply chip seal treatments for at least 50 MP lane miles per year per chip seal crew
- Lower the overall chip seal treatment cost statewide
  - Establish master agreements for materials and equipment
  - Utilize KYTC employees to operate equipment and apply the treatment
- Increase expertise of chip seal applications statewide
  - Provide training in application, inspection and project selection
- Develop regional crews
  - Purchase additional equipment
  - Provide primary KYTC personnel
- Develop a sustained chip seal cycle
Building a new I-65 bridge with six northbound lanes

Reconfiguring Spaghetti Junction (I-64, I-65 and I-71)

Rehabbing the Kennedy Bridge (I-65) with six southbound lanes

East End Tunnel

Downtown River Bridge and East End Bridge tolled
QUESTIONS?

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