WEATHER RESILIENCY IN URBAN CANYONS

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TruWeather SOLUTIONS

URBAN WEATHER CHALLENGES

WINDS

Ground level and above ground level (invisible threat)

- Turbulent eddies, building induced wake turbulence
- Venturi effect—extreme rapid changes in wind speed/direction
- Micro-burst translation

CEILINGS AND VISIBILITY

Sub-grid microclimates (difficult to detect for BVLOS routes)

- Think SFO or NYC, coastal cities
- Icing in northern climates in cloud

TEMPERATURE

Temperature (non-ambient measurements difficult)

- Heat island effect (major urban cities and desert locations)
- Take-off/Landing largest risk--affects density altitude

CONSIDERATIONS

CARGO AND PEOPLE CARRIERS

Client Experience

- Go/No Decision Leadtime—5 Hours or More
- Client “Weather” Tolerance Versus Airframe Tolerance
- City versus Airport METAR Temperatures and Weight Planning

MANNED OR UNMANNED

No Human Pilot

- Replicating human inferences requires better micro-climate measurements

DATA LATENCY: SENSOR TO DECISION

Time of Year and Hazard ID Lead-times

Pop-up showers/thunderstorms or snow squalls

Outflow boundaries entering city canyons

Localized ceiling and fog creation/dissipation

RESEARCH TOPICS

SENSORS

Ground level and above ground level (invisible wind threats, ceiling and visibility)

- Point Versus Area Coverage—Density of Measurements
- Routes Versus Vertiport Locations—What Parameters Are Key?
- What is Good Enough? Mix of IoT and Legacy Weather Sensors?
- Building obstructions to remote sensing systems
- UAS as a sensor? How and what…in-situ, derived or both? Policy?
- Business Models (P3) – Innovation and Greater Measurement Density
- Safety Versus Client Experience
- Validation and Calibration for performance-based standards vice instrument certification
- How validate performance standards are being met by PSUs? Who?

PREDICTIONS

Best Approaches and Resolutions to Generate Useful Outputs

- Physical and Dynamical Models, Coupled CFD, Machine Learning
- Same Basic Questions as Sensors

LATENCY

Sensor—Fusion—Analytics—Decision Insight: Processed Where? Delivered How and to Whom?