

MIST™

THE LEADER IN PRECISION AERIAL DELIVERY



A BIT ABOUT MMIST

....our focus

- *Since its inception in 2000, MMIST has been dedicated to the advancement of precision aerial delivery*
- *Our mission is to create a safe and effective transportation system capable of delivering critical supplies when ground based transportation is ineffective or has been disrupted*



MILITARY UAV MARKET DRIVER

...Imagery (so far)

- UAVs (as we know them) found a foothold primarily as a result of the high cost of “payload integration” into existing aircraft
- It became cheaper and quicker to buy a new camera with an entire UAV than to fit a new camera to an existing military aircraft
- Non aviation defence companies were able to displace established aerospace giants to cause a disruption in military aviation



MQ-1 Predator A

MILITARY UAV MARKET DRIVER

...Imagery (so far)

- **Non aviation players were cheaper....often because they lacked system safety process' otherwise typical in aviation**
- **Customers acquired UAVs outside normal aviation practices because UAV's were not always considered "aircraft" and instead risk was reduced by limiting flights to non built up areas**
- **Despite all this...land forces soon became hooked on aerial video imagery taken from runway independent aircraft...under their command**



RQ-7 Shadow

COMMERCIAL UAV MARKET DRIVER

....Imagery (so far)

- The internet, cell phones, PDAs and Cameras have clearly had a significant effect on our world!
- The commercial market for UAVs is following the military application....first exploiting a massive desire for video imagery
- Again we are seeing the conflict between non aviation players and established aviation system safety practices....which will see commercial UAVs limited to use over non built up areas until such time as we comply with existing aviation standards



WHERE'S THE CAMERA?

.....it's a cargo UAV

- **MMIST has yet to sell a system with a camera...because we have been focussed on cargo from the beginning**



- **This might be stupid!....or the cargo market for UAVs might be larger than all other UAV applications put together**
- **Just in case we are wrong....a good cargo hauler makes a great platform for large cameras!**

SOME SIMPLE TRUTHS

- **Aircraft designed to carry cameras do not necessarily make good cargo haulers**
- **UAVs are generally a logistics problem...not a solution to a logistics problem**
- **Most UAVs do not compare well against piloted aircraft on a size per size basis**
- **Any aircraft can be turned into a UAV....so what!**
- **If you take an existing piloted aircraft and turn it into a UAV...it will be more expensive and less reliable**
- **What's required are new more cost effective aircraft**

COST....a very big topic

- Each application has specific challenges that result in different solutions
- Common design drivers (tradeoffs) for an aerial cargo system include:
 - *Runway vs runway independent*
 - *Slow vs Fast*
 - *Large vs small*
 - *Combinations of aircraft vs Single aircraft*
- Main operating cost is crash rate x unit price
- Once system become viable...energy efficiency will be the predominant cost driver

The great equalizer for Cargo System

\$/ton-km

CQ-10A



\$ 175,000

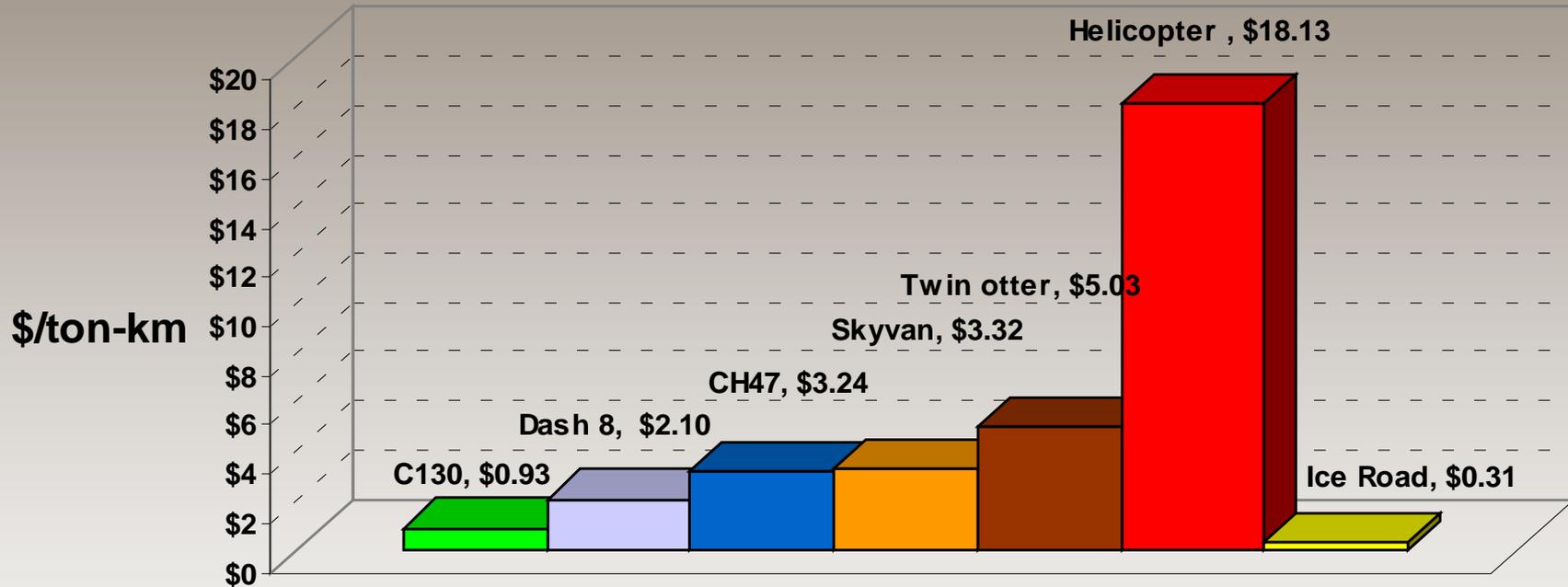
B-2



**\$ 2,000,000,000
1999 dollars**

SAMPLE CARGO COST COMPARISON

Total cost (with fuel)



COMMERCIAL CARGO UAV MARKET FOCUS

.....premium speed delivery service?

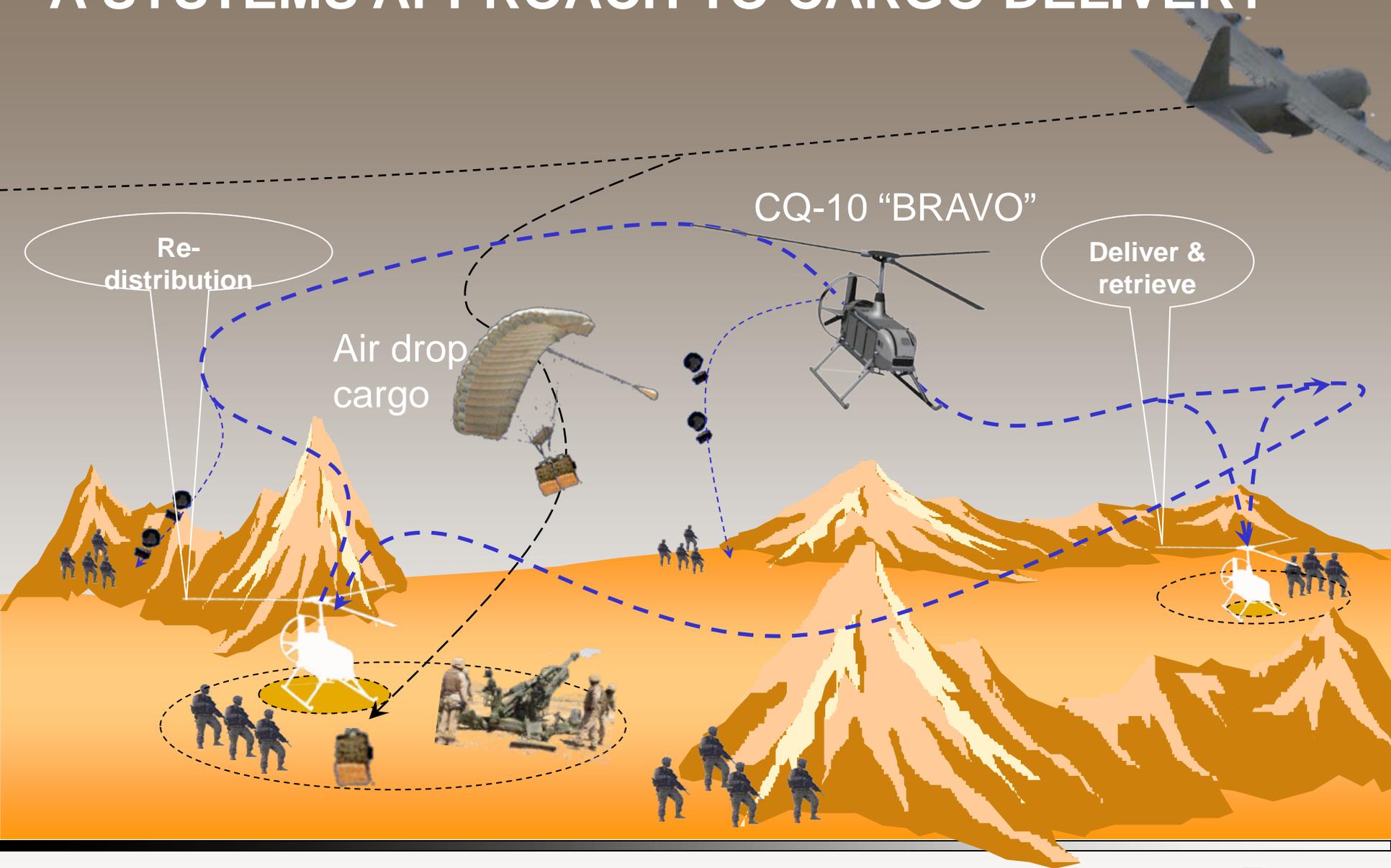
.....cost savings?

.....publicity stunt?



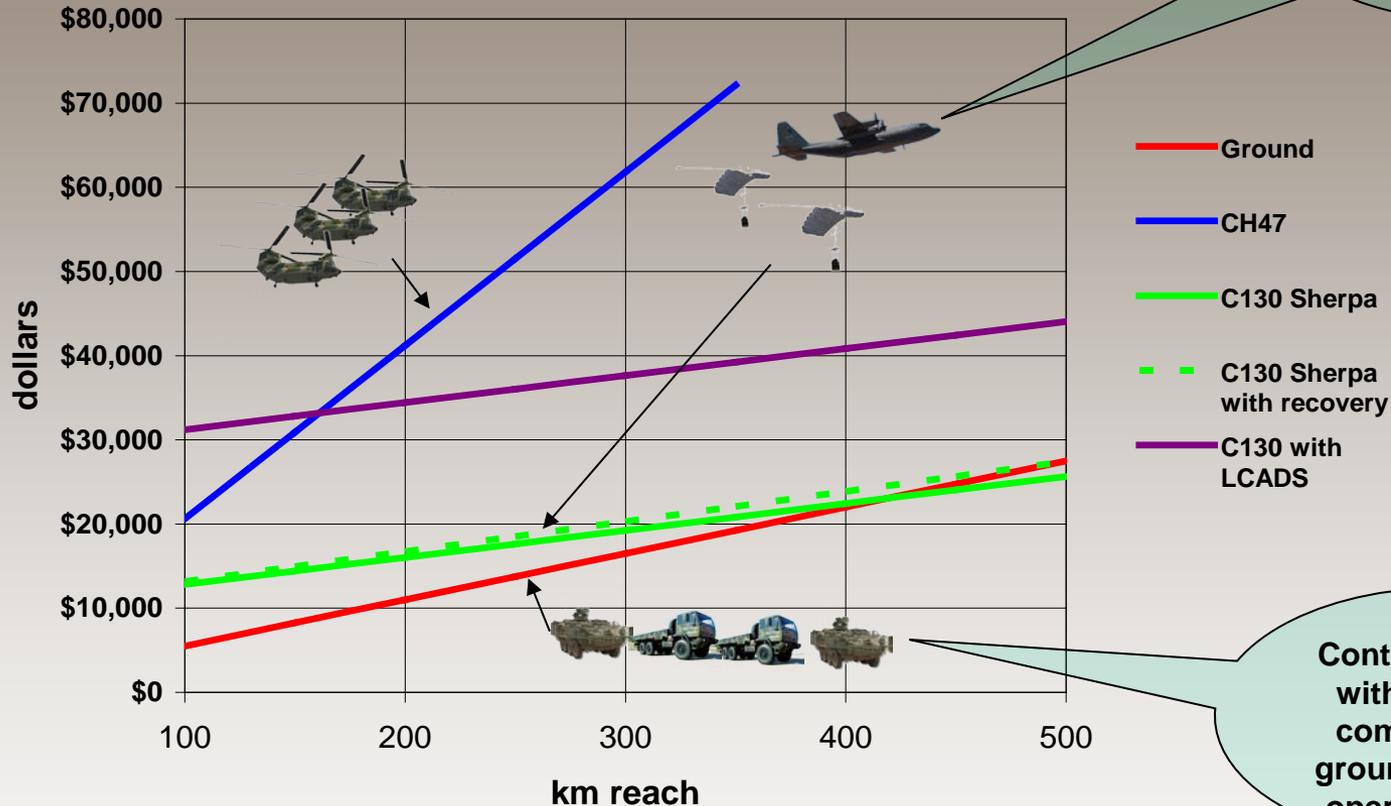
- **Not so fast.....making a significant improvement in delivery time or transportation cost is extremely complex**

A SYSTEMS APPROACH TO CARGO DELIVERY



EXAMPLE TRANSPORTATION COSTS

Transportation cost per Qty 20 - 1,000 lb A22 pallets



Note 1 : CH47 and C130 commercial rates used here – DOD may use different operating costs

Note 2: Ground vehicle cost estimates include only maintenance and fuel costs...real costs are higher

CQ-10 "BRAVO"



NOBODY WANTS TO PAY FOR INVENTORY

....the real driver for cargo UAVs

- **Bricks and mortar retailers have learned to make money from inventory they don't own by selling faster than they pay**
- **Manufacturers have driven production costs down with “Build to order” and “Just in time” delivery of input material**
- **Inventory reduction has freed up vast amounts of working capital and is limited only by the performance of our transportation system...and the consumers demand for speed**

NOBODY WANTS TO PAY FOR INVENTORYthe real driver for cargo UAVs

- **“Since when did we get so poor we can’t afford inventory?”** Brian McMahon, MMIST production specialist
- **Consumer demand for quick service is ever increasing...and competition is fierce**
- **Delivery times can be shortened by getting away from “lean” and “just in time” manufacturing or by warehousing inventory.... but not if there is another way!**

E-COMMERCE

- **Business continues to change at an incredible pace**
- **While manufacturer/retailers are innovating to eliminate inventory.... e-commerce is vying to replace the retailer....all by delivering quickly**
- **So it's down to the cost of HIGH SPEED DELIVERY vs the cost of LOCAL INVENTORY**

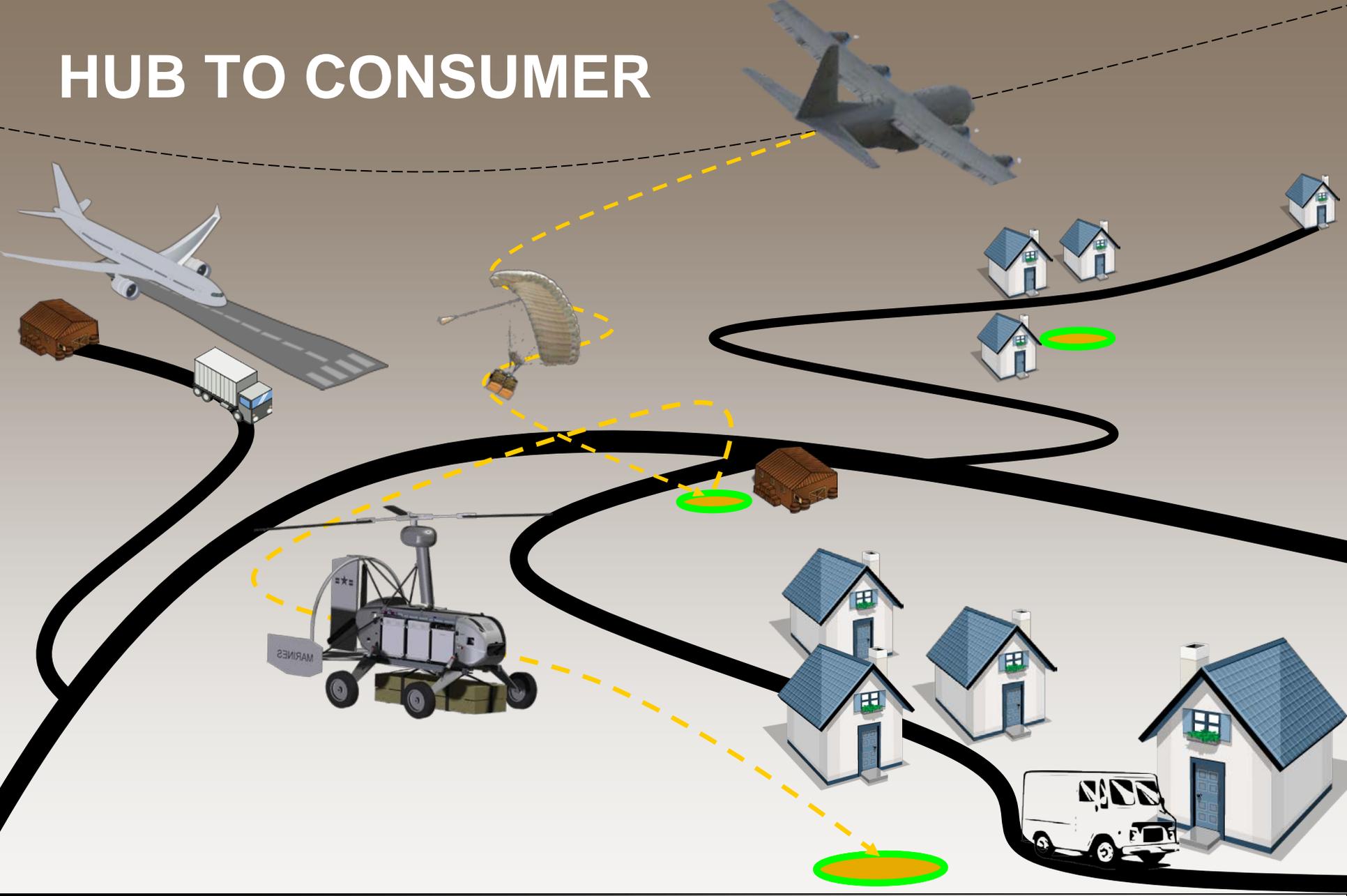
HOW CAN UAV'S BE TRANSFORMATIONAL?

- **By enabling the creative development of new types of aircraft....that established companies would otherwise never have explored**
- **From this creative explosion could come breakthroughs in cost effectiveness of air transportation**

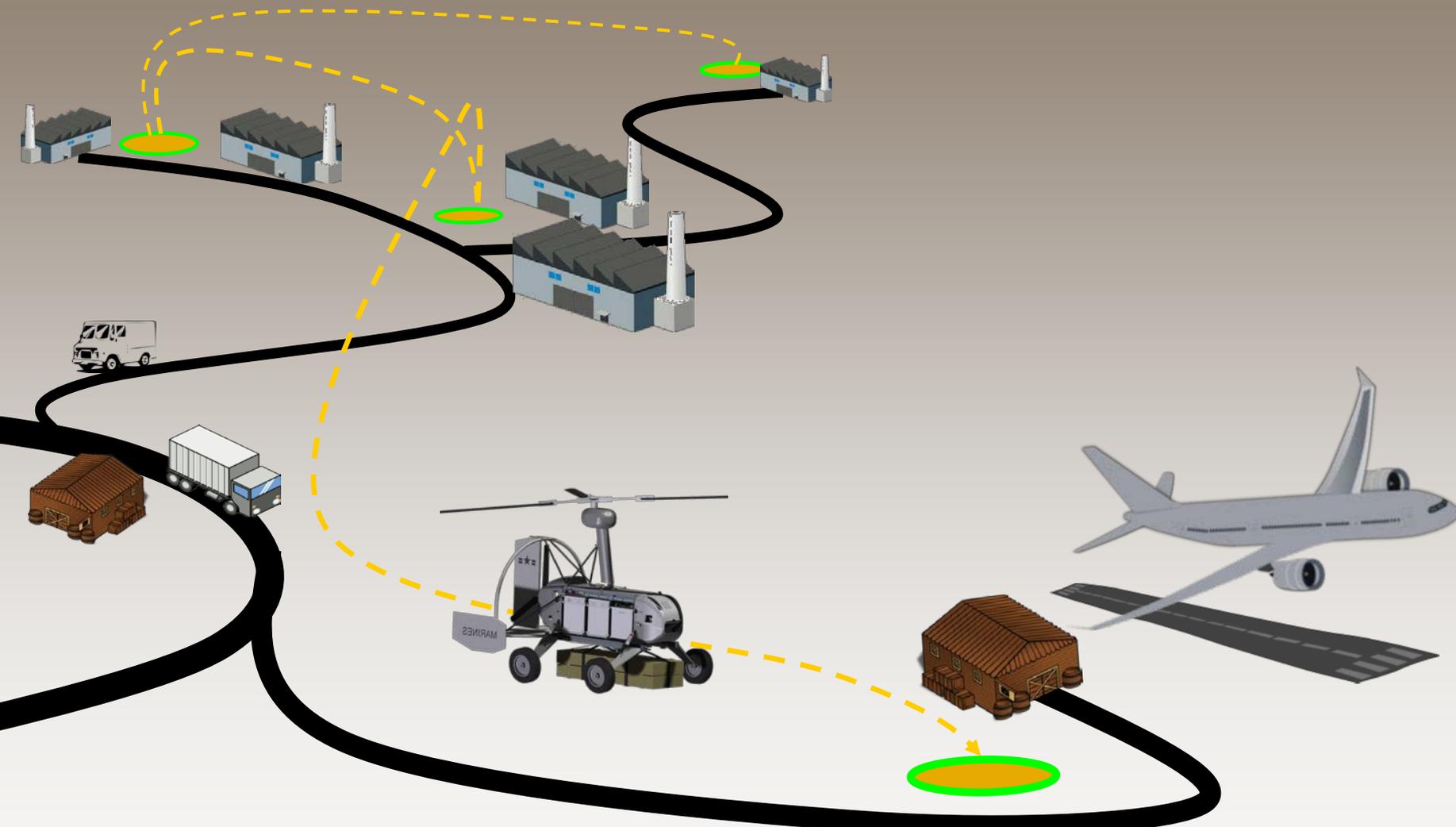
HOW CAN UAV'S BE TRANSFORMATIONAL?

- **A breakthrough in cost effectiveness of air cargo will:**
 - ***Continue the steady progress towards more efficient commerce, freeing up capital otherwise locked up in inventory and bricks and mortar***
 - ***Improve operational efficiency in all types of industries by helping minimizing down-time due to part availability***
 - ***Provide a powerful capability to respond to disasters and humanitarian crisis***
 - ***Provide spinoff advancements in personal air transport***

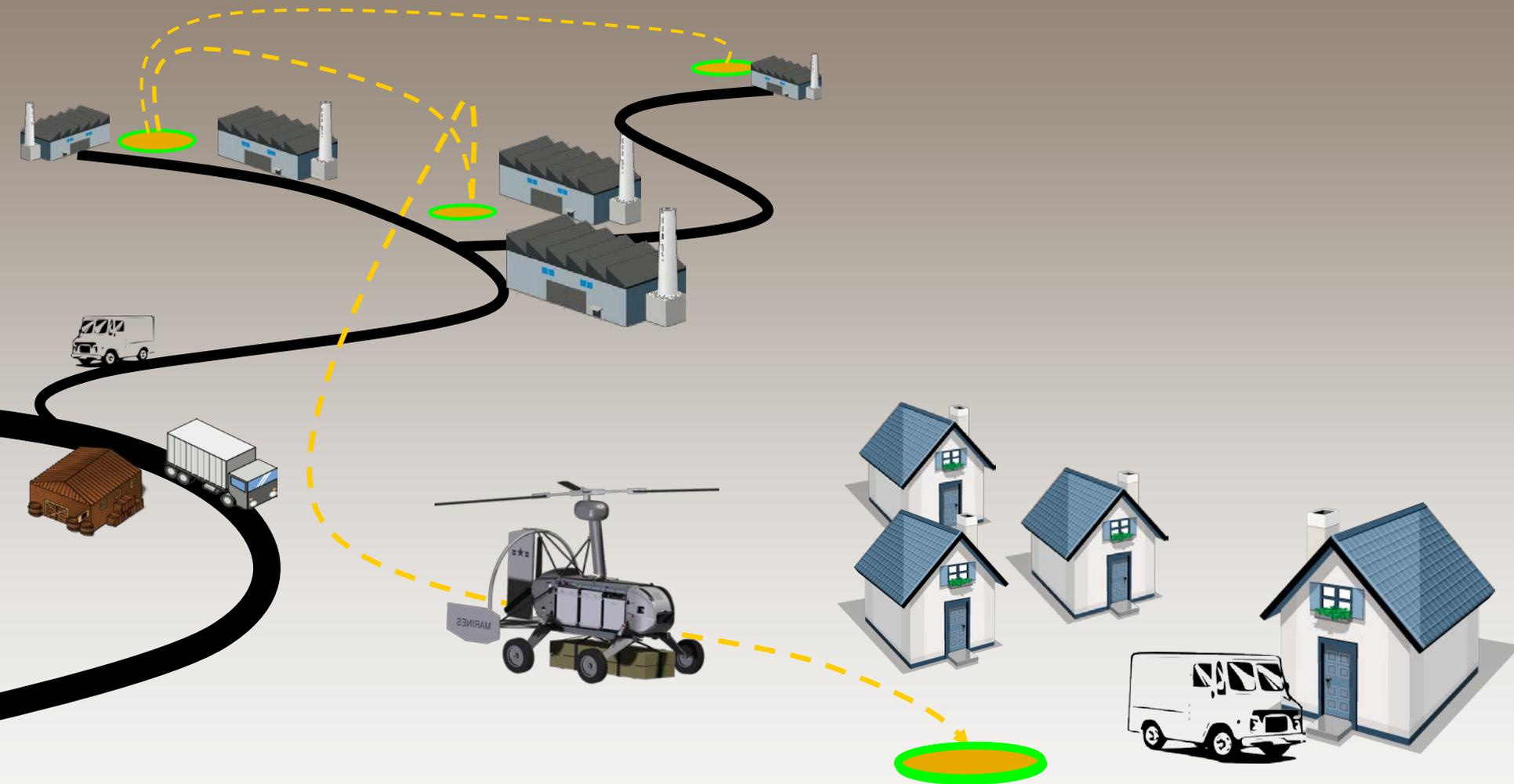
HUB TO CONSUMER



FACTORY TO HUB



FACTORY TO CONSUMER





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MMIST™