Managing a MMSC – Cost implications for mode selection

By the end of this session, you will be able to:

- Understand the cost implications when drones are used as a channel for health supply chain distribution.
- Consider the importance of SOPs to balance speed of delivery and associated costs when managing a MMSC.

Refer to page 58 in your Team Member Workbook

A **Pre-Read**: The Essential Guide to Implementing Drone Delivery in Healthcare and STEP Training on Supply Chain Optimization

Context:

Zipline's publications on cost considerations for operating drones in a healthcare supply chain setting.

Your Task:

- Read the article *The Essential Guide to Implementing Drone Delivery in Healthcare*, and the *STEP Training on Supply Chain Optimization*, paying close attention to the tips it provides for logistics cost savings and related benefits and/or challenges.
- Consider which of the tips provided in the article you will try to incorporate into your transportation mode selection SOPs.

Refer to pages 39-53 in your Team Member Workbook

B **Theory**: Two Focus Areas

OUR SHARED GOAL:
Reduce the operating cost of the multimodal health supply chain network

OUR GUIDING SUPPLY CHAIN PRINCIPLE:
Unused space in our network represents a missed opportunity and, unnecessarily, increases the cost to operate the network

This module will review two cost areas of focus with the Zipline implementation in each state

Drone network costs

Non-drone network costs

B **Theory**: Drone Network Costs are Fixed

In each state, the respective **state government pays a fixed monthly fee for Zipline** to deliver commodities against a predetermined set of use cases. This currently includes essential medicines, vaccines, HIV commodities, and could include malaria, nutrition, blood products, etc. in the future.

Fixed fee means that the price does not change with:

- the number of deliveries completed in a month
- the number of facilities within the state onboarded or served in a month

This is different than payments for traditional logistics, where:

- you pay for fuel for every trip made to pick up commodities
- you pay for a logistics partner's time and labor for every trip made to pick up commodities
- you pay for more cold storage capabilities when you onboard or serve a new health facility

B **Theory**: Drone Network Costs are Fixed

- Zipline's network in Nigeria offers **unlimited deliveries of commodities for pre-determined use cases** (e.g., vaccines, essential medicines, and potentially blood products, program medicines like ARVs, etc.).
- Therefore, the addition of greater utilization does not add to the price of the system – **the price remains fixed, even as the volume of commodities distributed increases.**
- Higher capacity utilization reduces cost by spreading fixed costs across a larger number of units and deliveries. **Therefore, the system becomes more cost-effective for the government the more it is used.**

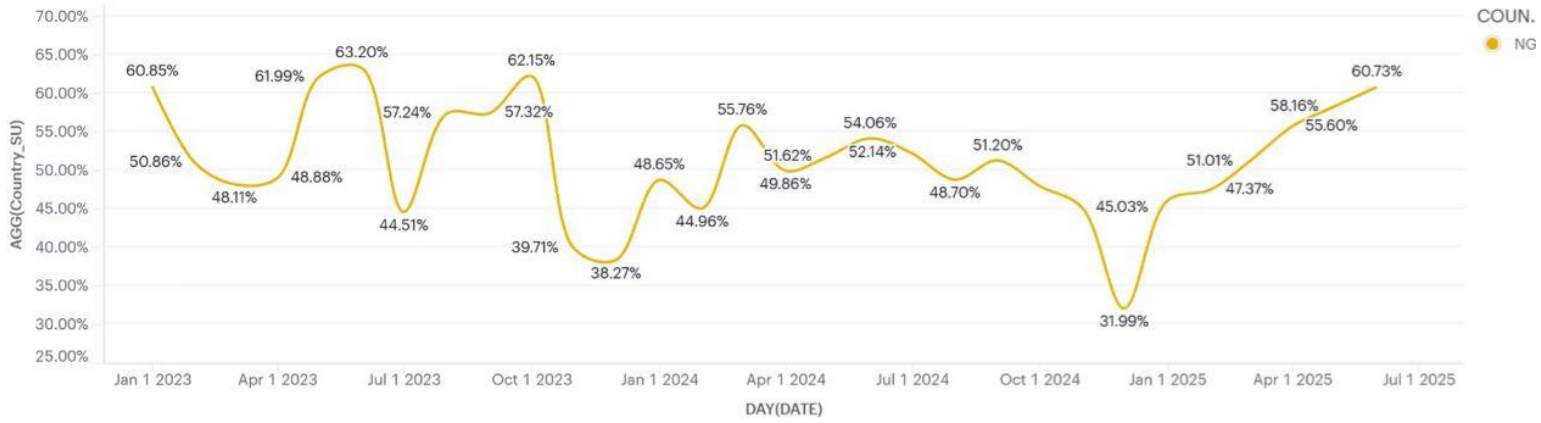
B **Theory**: Drone Network Costs are Fixed

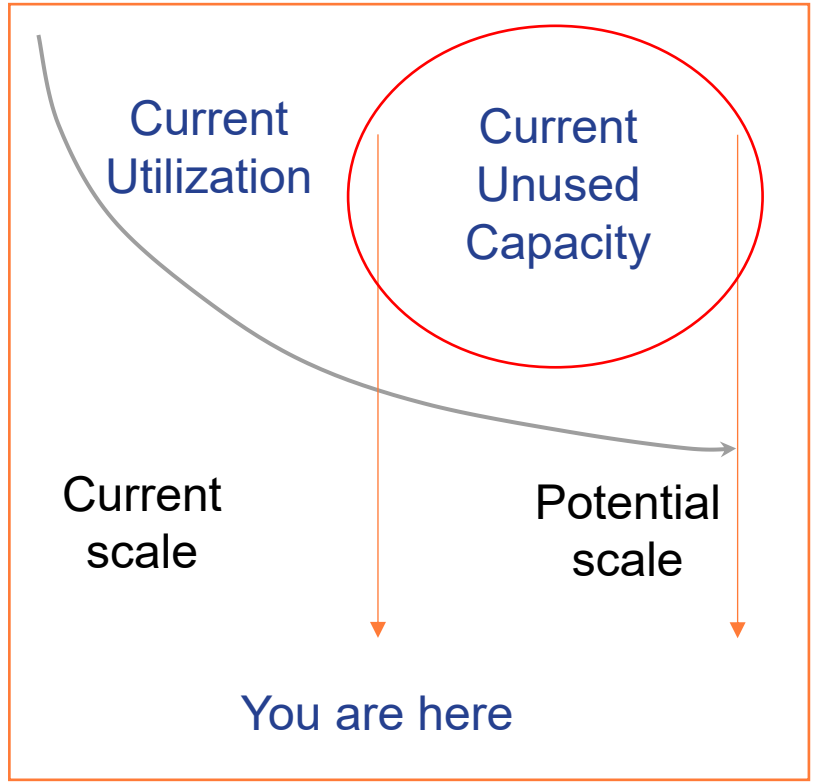
There is usable capacity in the current Zipline network in each state!

Service Utilization is defined as the **percentage of facilities that had an order fulfilled within a selected period** relative to the **total number of active facilities** during that same period.

Active facilities include those classified as **operationalised or partially suspended** in the **Fulfillment System (F.S.)**, as determined by relevant stakeholders. This metric provides insights into operational engagement and demand trends across facilities.

Country Service Utilization





B Job 1: Maximize the use of the drone network

01

Determine the targeted drone utilization rate

Is surge capacity required or can the network be fully utilized?

Goal – to use as much of the drone capacity as possible each month

02

Determine the products that are:

- Compatible with the drone network
- Identify those that require drone delivery (emergency response)

03

Determine delivery points that:

- Require drone delivery due to geographic barriers
- Benefit from drone delivery due to access challenges

04

Once the mandatory delivery points (Step 3) are planned, use the remaining available flights for other less challenging delivery points

Closing thought: Every delivery made with a drone is one less needing a truck, motorbike, boat or other mode

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B **Theory**: Non-drone Network Costs are Variable

The second half of this module looks at the requirements for maximizing the use of a multimodal health supply chain network once the fixed cost drone network is optimized.

This section covers three areas:

- Baseline information
- Strategies and considerations
- Design for optimization and operational efficiencies

B **Job 2:** Baseline information - Determine your non-drone network capacity

01

Document your fleet by asking the question "How many of each do I have?" (these are the "modes" in your Multi-modal supply chain network design)

- Trucks (list by size)
- Motorbikes
- Boats
- Drones
- Private sector providers
- Other

02

Assign cargo (payload) capacity for each mode

- Cubic feet
- Volume (number of packages)

03

Calculate the "mode specific" capacity of your transportation network

- Number of vehicles multiplied by the capacity of each
- Example: 3 pickup trucks, each can carry 50 cubic feet of cargo – the total capacity for your pickup truck fleet is 150 cubic feet of cargo

04

Calculate the total capacity of your transportation network

Sum the results from Step 3

Record results in your SOP

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B

Job 3: Baseline information – Determine your non-drone network operating cost (per mode)

01

In calculating the mode specific operating cost, you must first know the following:

- For each mode identified in the first exercise (Know Your Network Capacity) **derive the operation cost per mile** including:
  - Average miles driven per day
  - Average number of gallons of fuel consumed per day
  - Average fuel costs per gallon
  - Average labour cost per day
  - Routine maintenance cost per day
  - Average miles/Average number of gallons of fuel

02

Calculate the miles per gallon for each mode

- Average miles / Average number of gallons
- Example: If 100 miles uses 10 gallons of fuel, the miles per gallon is 10

03

Calculate the "on-road" cost per mile for each mode

- (Average gallons/Average miles) * Cost per gallon
- Example: If 10 gallons of fuel goes for 100 miles, and the cost per gallon is $5.00, then the cost per mile is calculated as: (10 / 100) * 5.00 = $0.50 cost per mile

04

Calculate the total cost per mile for each mode

Now you add in the average cost for daily routing maintenance and average labour cost

Record results in your SOP

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Job 4: Baseline Information – Determine your daily delivery point requirements

01

Develop a daily delivery schedule with assigned delivery points

02

Calculate the average volume per delivery point

03

Define any special circumstances associated with the delivery point

Ability to access or difficulty in accessing:

- Seasonal considerations
- Road conditions
- Conflict zone

Frequency of delivery

- Weekly/bi-weekly/monthly

04

Post this information on a map

Record results in your SOP

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B **Theory**: Non-drone Network Costs are Variable

Strategies and considerations: Fewer and fuller delivery vehicles reduce operating cost

The goal is to put as few vehicles on the road as possible while maintaining required service standards

Strategies and considerations: Design multi-delivery point routes in a circular pattern, avoid backtracking

The goal is to service as many delivery points as possible with the fewest miles driven possible

Strategies and considerations: Consider replacing the longer delivery legs with a drone flight

The goal is to service as many delivery points as possible with the fewest miles driven possible

B

Job 5: Design for non-drone network for operational efficiencies

01

Using the map from the previous assignment, determine delivery point clusters that can be serviced by one vehicle

02

Match the volume expected for each cluster to the appropriate vehicle

03

Account for any special circumstances associated with the delivery point

Ability to access or difficulty in accessing:

- Seasonal considerations
- Road conditions
- Conflict zone

Frequency of delivery

- Weekly/bi-weekly/monthly

NOTE: These conditions will change with each delivery frequency, so expect plans and modes to change periodically

GOAL: Standardization of the delivery process

Record results in your SOP

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