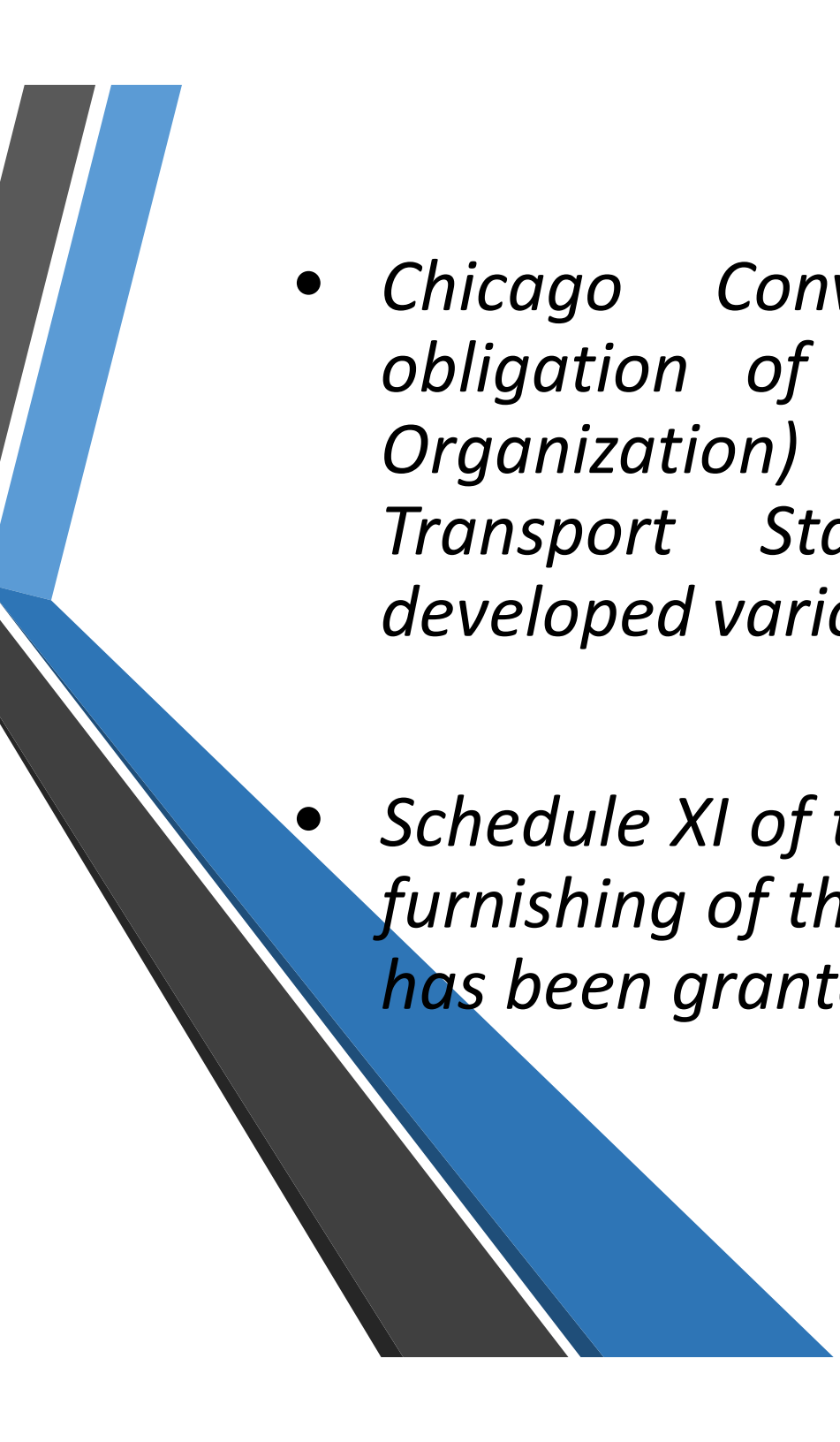




Introduction to Air Transport Statistics

***STATISTICS
IS
THE EYES
OF***

GOVERNMENT ADMINISTRATION

- 
- *Chicago Convention 1944 establishes the obligation of ICAO(International Civil Aviation Organization) contracting States to submit Aeronautical Transport Statistics. Accordingly ICAO has developed various Forms for data collection.*
 - *Schedule XI of the Aircraft Rules,1937 provides for the furnishing of the Traffic Returns to whom a permit has been granted by the DGCA.*

CIVIL AVIATION REQUIREMENTS

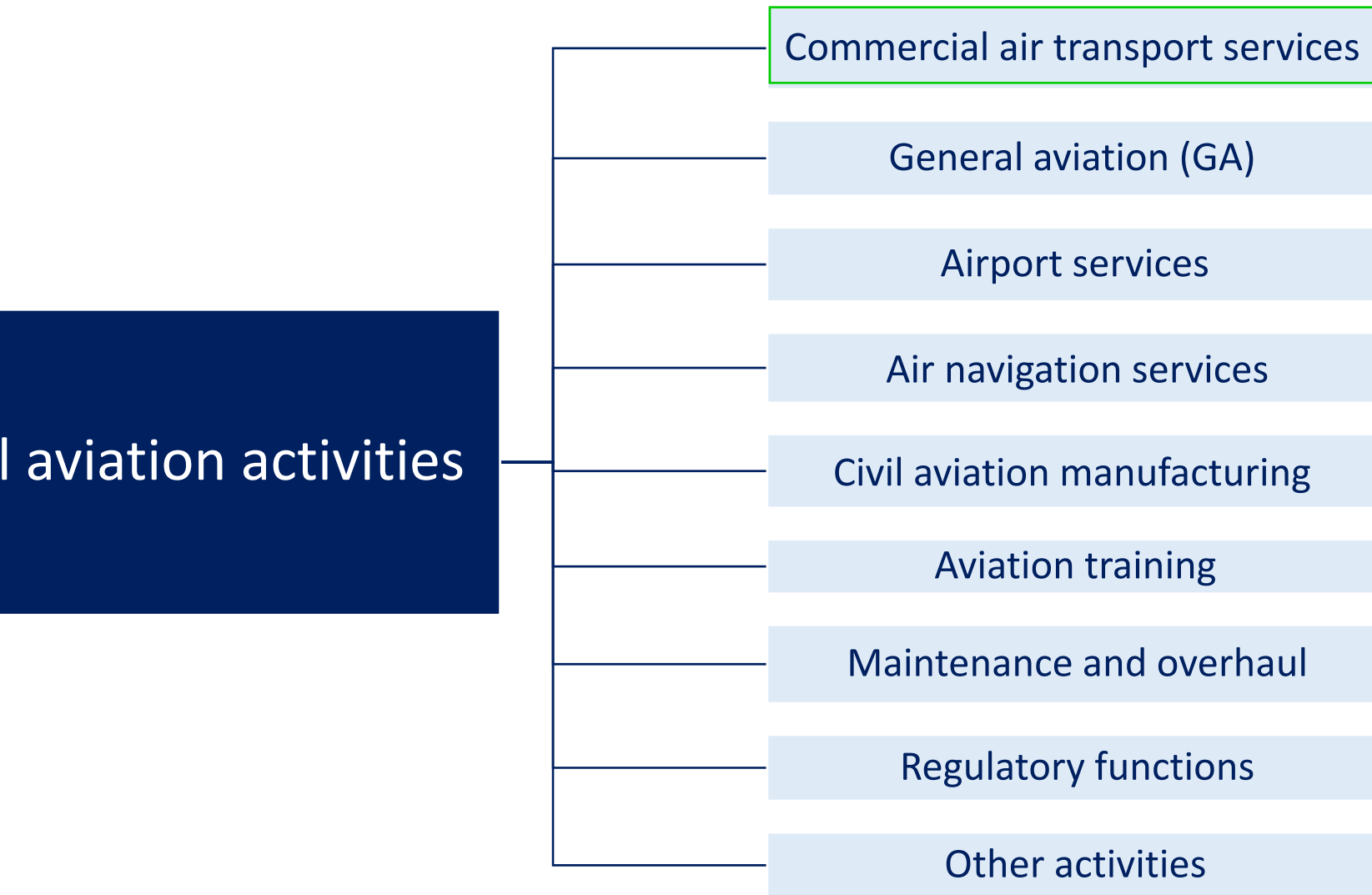
Instructions 10.9 of CAR SERIES “C” PART I
SECTION 3 –AIR TRANSPORT dated 1st MARCH
1994, *The operator shall regularly submit to DGCA
information relating to their operational
engineering, and commercial and financial
performance*

INDIAN AVIATION ON GLOBE (55 COUNTRIES)



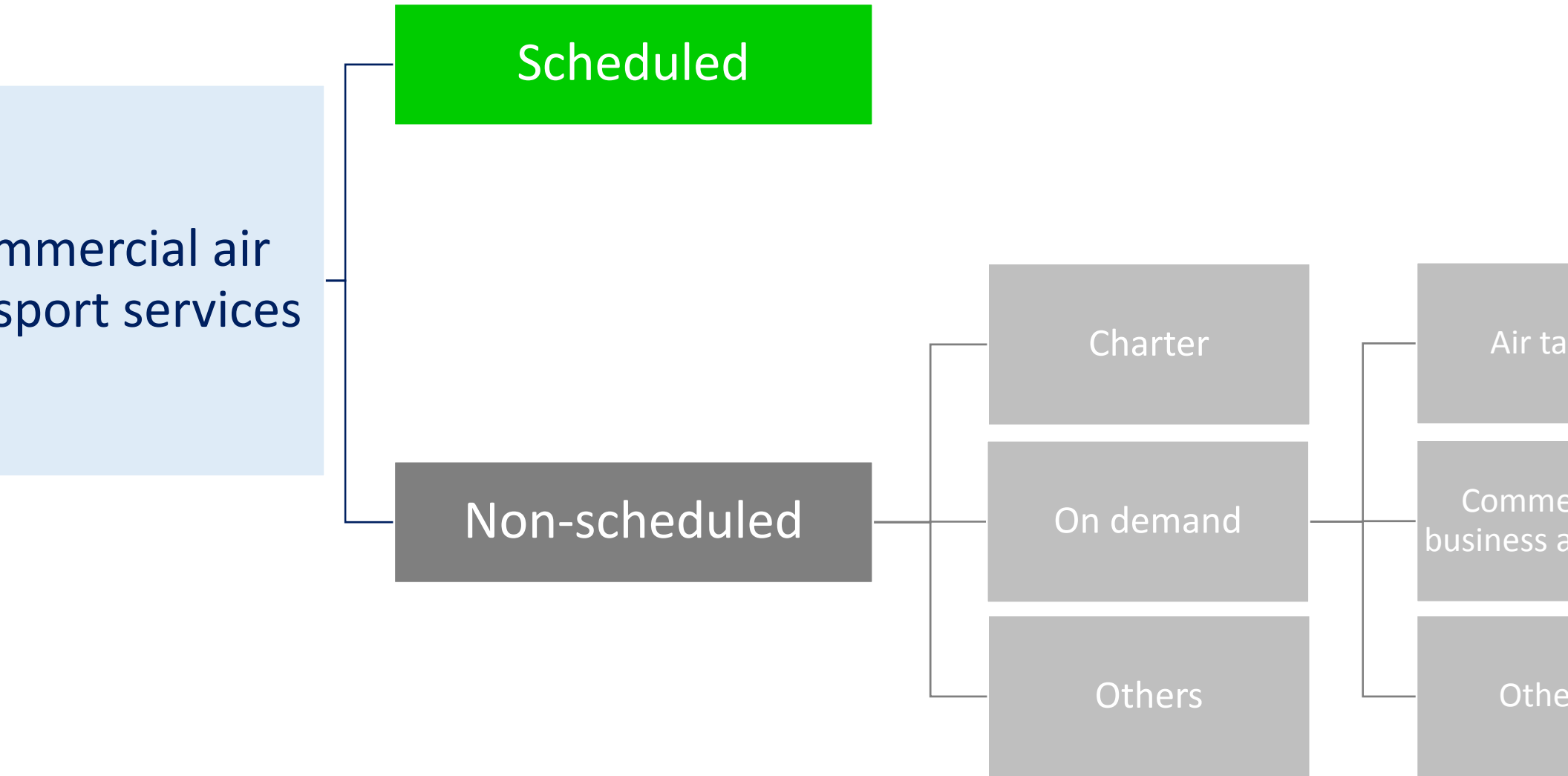
- *Currently India has air connectivity covering more than 300 routes in 55 countries through 87 Scheduled international carriers out of them 5 are Indian carriers (Air India, Air India Express, Jet Airways, Indigo, Spicejet) and 83 Foreign Carriers.*

Civil Aviation Activities Classification



Civil Aviation Activities

Commercial Air Transport Services



*Statistics Division Collect THE FOLLOWING
Air Transport Statistics*

<i>Form</i>	<i>Aviation Parameters</i>
<p><i>FORM-A</i> <i>(MONTHLY)</i></p>	<p><i>A/c km. Flown</i> A/c hours A/c departures Passengers carried ASKM (Available Seats in Kilometre) RPKM (Revenue Passenger in Kilometre) Passenger load factor</p> <p><i>Freight carried</i> ATKM (Available ton km) RTKM (Revenue ton km)</p> <p><i>Weight Load Factor</i></p>

.....Continued

City Pair- wise revenue traffic

Passengers carried,

Freight carried

Mail

FORM-B
(Quarterly)

..... Continued

Station- wise traffic data on no. of fights/type of A

Capacity Available

Revenue Traffic Carried

FORM- C

.....Continu

FORM-D
(Annually)

Fleet Statistics

No of Aircrafts

Size of Aircrafts

Utilization of Aircrafts

Personnel Statistics

Category-wise No. of Personnel

Annual Expenditure on each category

.....continue

FORM-EF
(Annually)

Profit & Loss Statement

Operating Revenue

Operating Expenditure

Operating Results

Balance Sheet

Assets & Liabilities

PUBLICATION OF DGCA (STATISTICS DIVISION)

- ***Monthly Data-Air Traffic Statistics***
- ***Annual Publication –Air Traffic Statistics & Financial performance of Domestic Air Lines.***
- ***International Traffic Data –Quarterly***
- ***Hand Book on Civil Aviation Statistics***

Availability of Data at web-site

- **Monthly Data- Operator-wise/month-wise Air Traffic Statistics (from 2009 on wards)**
- **Air Transport Statistics from 1997-98 on ward**
- **Domestic City Pair- wise Traffic from Aug,2015 on ward**
- **Quarterly international traffic statistics from 2015**
- **Hand Book on Civil Aviation-2014-15 & 2015-16**

Number of Air Lines(Domestic)-2015-16

Sl.No.	Name of Airline	Services
	<u>NATIONAL CARRIERS</u>	
1	Air India	International, Domestic, Cargo
2	Air India Express	International, Domestic, Cargo
3	Alliance Air	Domestic, Cargo
	<u>PRIVATE CARRIERS</u>	
4	Go Air	Domestic, Cargo
5	Indigo	International, Domestic, Cargo
6	Jet Airways	International, Domestic, Cargo
7	Jetlite	Domestic, Cargo
8	Spicejet	International, Domestic, Cargo
9	Air Costa	Domestic, Cargo
10	Air Asia	Domestic, Cargo
11	Vistara	Domestic, Cargo
12	AIR PEGASUS	Domestic, Cargo
13	Trujet	Domestic, Cargo
14	Bluedart	Cargo
15	Quickjet	Cargo

PASSENGER TRAFFIC	UNIT	2015-16	2014-15
Domestic Passengers	Departing Passengers	85.20 million (21.58)	70.08 million (15.51)
Domestic Airline Demand	Revenue Passenger Kilometers (RPK)	80.96 billion (20.80)	67.02 billion (13.32)
Domestic Airline Capacity	Available Seat Kilometers (ASK)	97.71 billion (15.21)	84.81 billion (5.07)
International Passengers	Departing and Arriving Passengers	49.83 million (8.94)	45.74 million (5.85)
Total Passengers (Domestic & International)		135.03 (16.59)	115.82 (11.63)

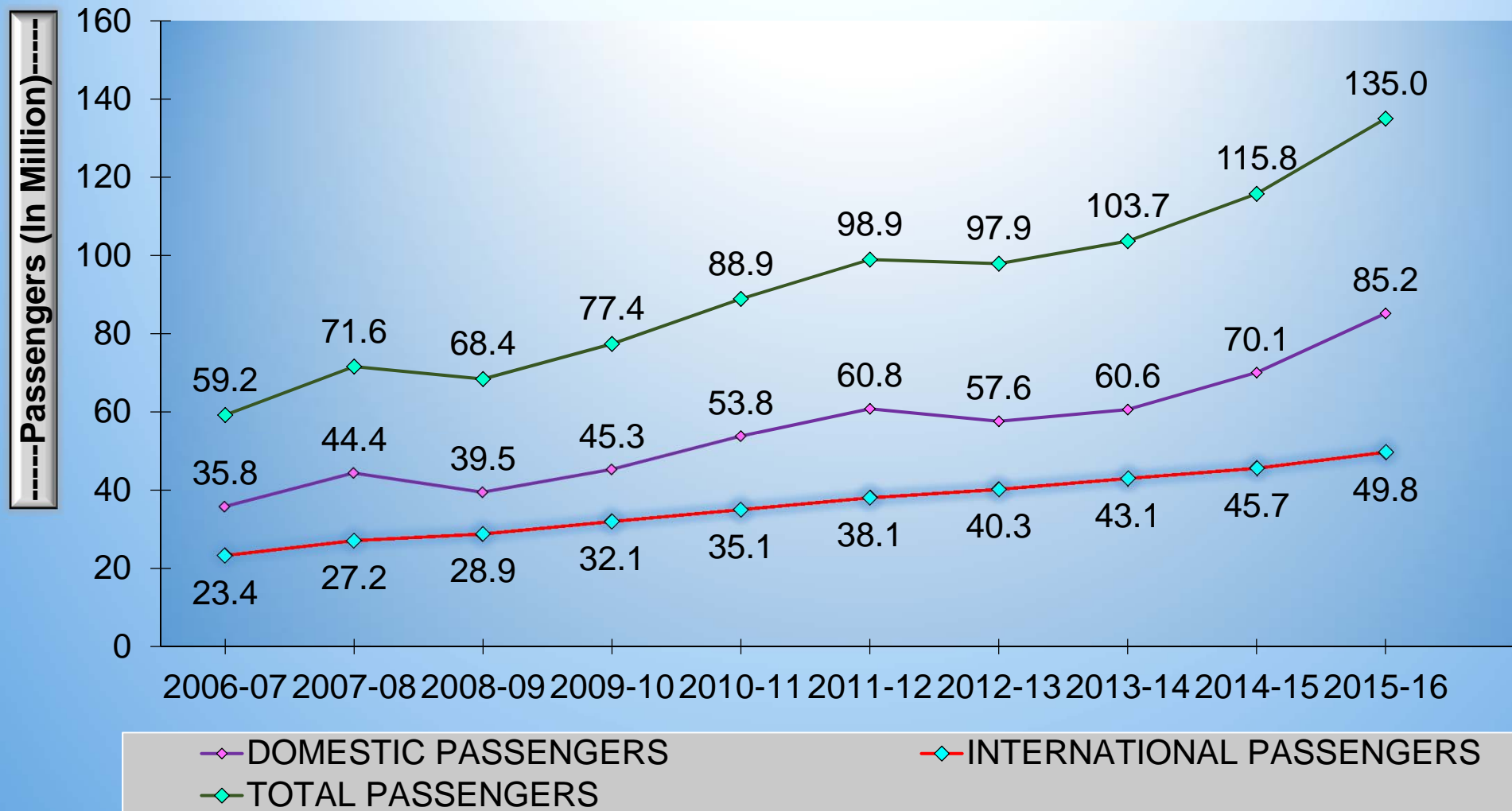
YEAR ON YEAR GROWTH IN PASSENGERS AND PASSENGER LOAD FACTOR (PLF)

NAME OF THE AIRLINE	PASSENGERS (2014-15) (In Number)	PASSENGERS (2015-16) (In Number)	YoY GROWTH IN PASSENGERS (%)	PLF (2014-15) (%)	PLF (2015-16) (%)	YoY GROWTH IN PLF (%)
AIR INDIA	11727171	12742163	8.7	77.2	79.2	2.8
AIR INDIA EXPRESS	191095	149217	-21.9	73.5	80.1	9.1
ALLIANCE AIR	310492	400340	28.9	68.3	66.5	-2.8
SPICEJET	10716089	10670866	-0.4	81.8	92.0	12.2
JET ARWAYS	12473808	15961308	28.0	78.4	80.6	2.8
INDIGO	23727080	31453451	32.6	79.4	84.1	5.7
GO AIR	6529936	7160189	9.7	79.1	83.7	5.7
JETLITE	3030638	2439721	-19.5	80.1	79.3	-0.8
AIR ASIA	553106	1705808	208.4	76.1	80.2	5.3
AIR COSTA	723627	711836	-1.6	74.1	80.7	9.1
VISTARA	100919	1422611	1309.7	53.7	69.4	29.1
TRUJET	0	204588	-	-	80.1	-
AIR PEGASUS	0	175577	-	-	78.5	-

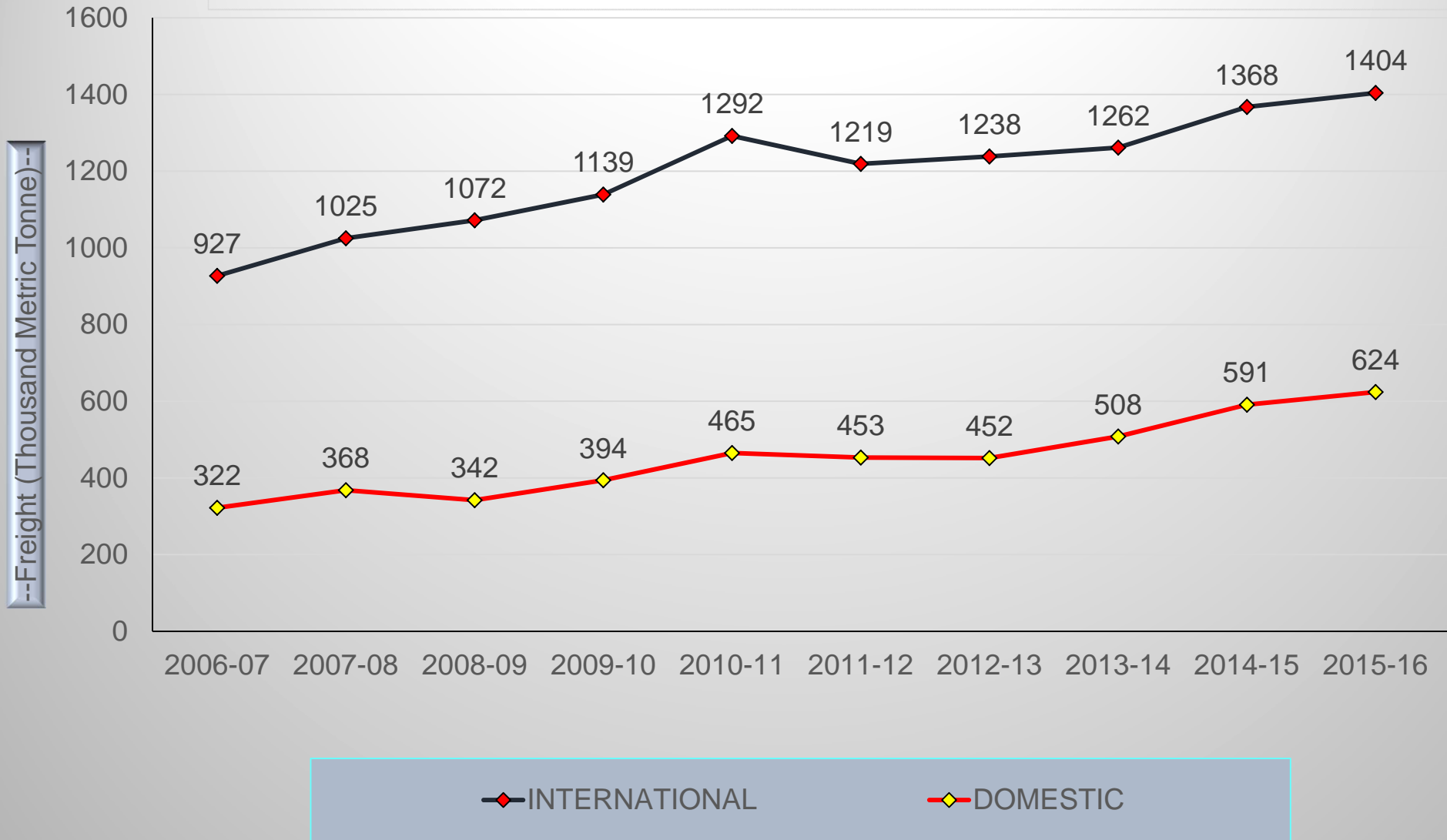
Note: VISTARA OPERATED FOR ONLY THREE MONTHS i.e. JANUARY-MARCH DURING THE YEAR 2014-15.

AIR PEGASUS STARTED ITS OPERATIONS IN JULY 2015 AND TRUJET IN MAY 2015.

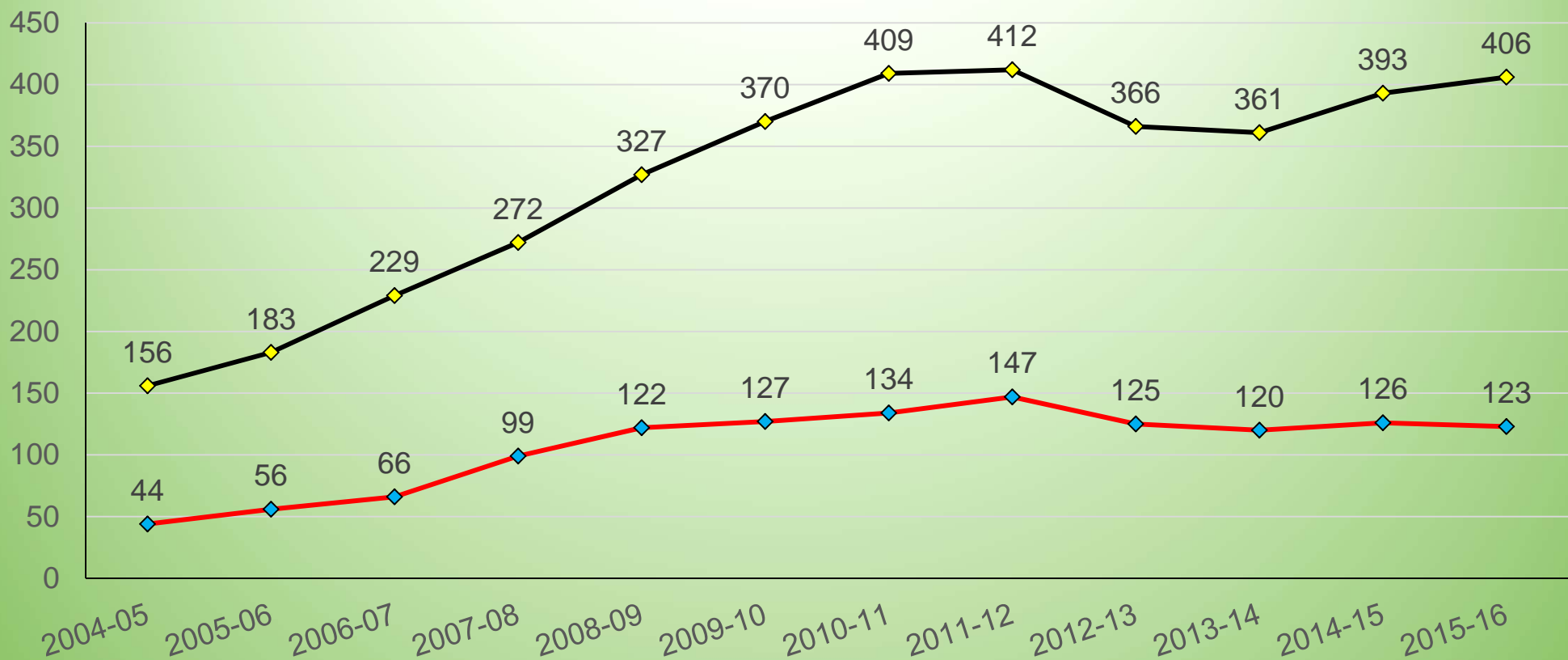
PASSENGER TRAFFIC CARRIED BY SCHEDULED CARRIERS OF THE PAST DECADE



FREIGHT TRAFFIC CARRIED BY SCHEDULED CARRIERS OVER THE PAST DECADE



NON-SCHEDULED OPERATORS



on 31st March, 2016

—◆— Number of aircrafts (including helicopters)

—◆— Number of Operators

Definition of Revenue Passenger-Kilometres

Revenue passenger kilometres (RPK) – also called Passenger kilometres performed (PKP):

Revenue passenger-kilometre means that one passenger is carried on one kilometre.

For an airline:

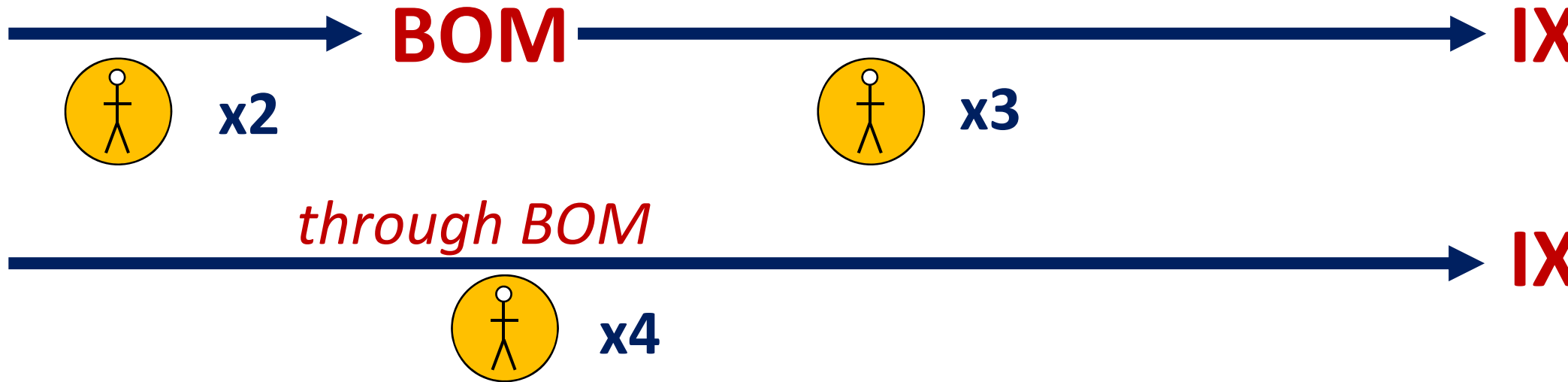
of the products obtained by multiplying the number of revenue passengers carried on each flight by the corresponding stage distance. The resultant figure is equal to the number of kilometres travelled by all passengers.

$$\sum_{\text{at stage } i} (\text{passengers carried on flight stage } i) \times (\text{distance of flight stage } i)$$

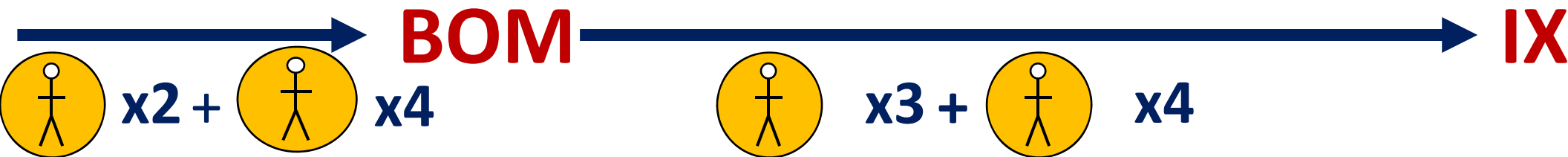


It requires data by flight stage

Revenue Passenger-Kilometres (Illustration)

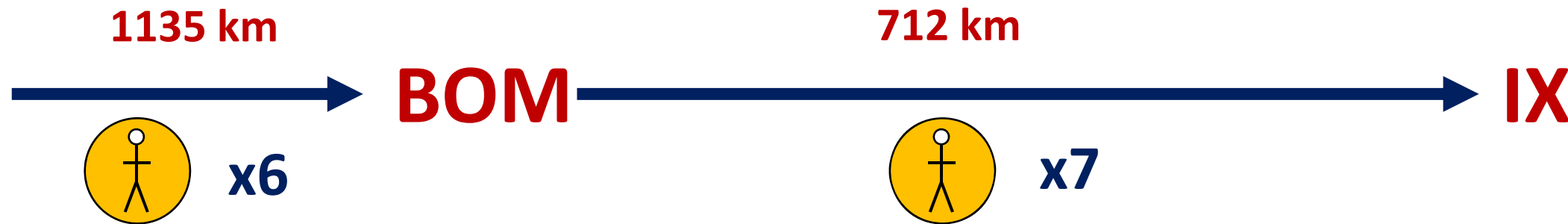


Computation of the RPK: the 1st step is to break down the data by flight stage



Revenue Passenger-Kilometres Illustration

(broken down by flight stage)



Computation of the RPK: the 2nd step is to multiply the number of passengers by distance on each flight stage

$$\text{Revenue Passenger - Kilometres} = 6 \times 1135 + 7 \times 712 = 11794$$

Definition of Available Seat-Kilometres

Available seat-kilometres (ASK):

Available seat-kilometre means that one seat is flown on one kilometre.

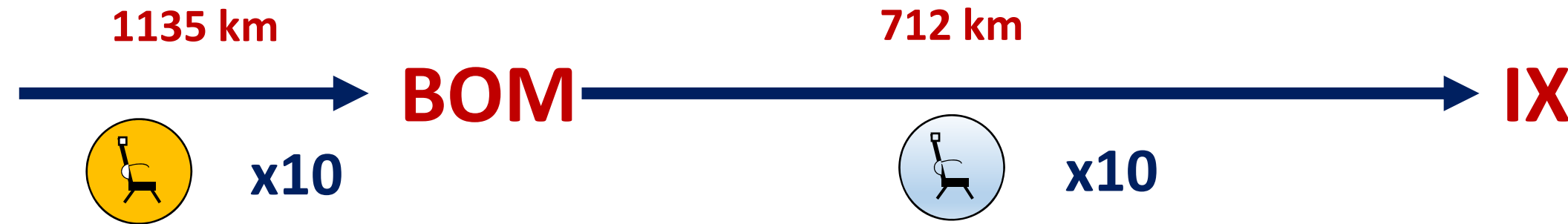
For an airline:

Sum of the products obtained by multiplying the number of seats available for sale on each flight stage by the corresponding stage distance. Seats not actually available for the carriage of passengers because of higher amount of fuel required or other payload/operational restrictions should be excluded from the calculations.

$$\sum_{\text{flight stage } i} (\text{seats available on flight stage } i) \times (\text{distance of flight stage } i)$$

Available Seat-Kilometres Illustration

AA959



Computation of the ASK: multiply the number of seats by the distance on each flight stage

$$\text{Available Seat - Kilometres} = 10 \times 1135 + 10 \times 712 = 18470$$

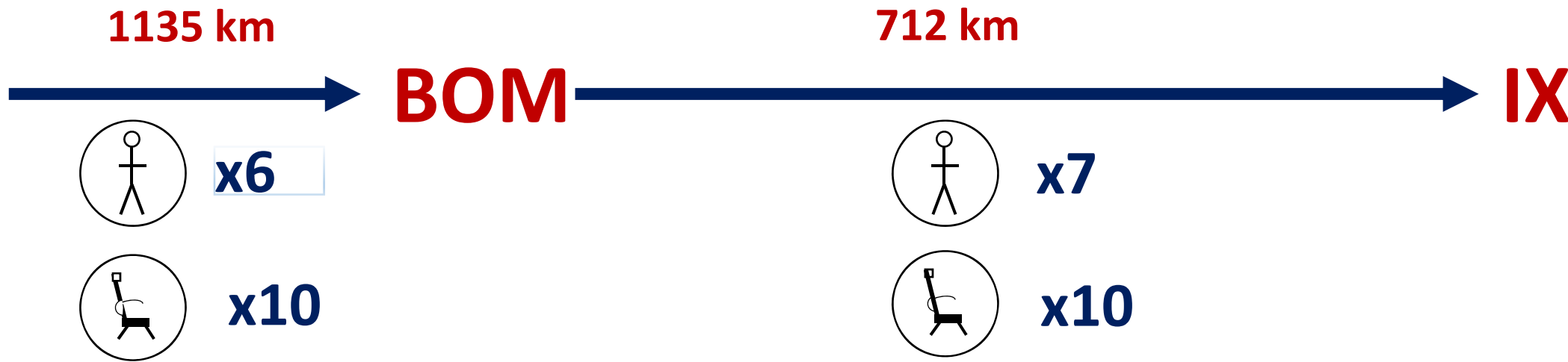
Definition of Passenger Load Factor

Passenger Load Factor (PLF):

Revenue passenger-kilometres as a percentage of the available seat-kilometres

$$PLF = \frac{RPK}{ASK}$$

Passenger Load Factor (PLF) Illustration



$$PLF = \frac{RPK}{ASK} = \frac{11794}{18470} = 0.64 = 64\%$$

Definition of Passenger Tonne-Kilometre

Revenue tonne-kilometres for an airline:

The products obtained by multiplying the number of tonnes of passenger revenue load carried on each flight stage by the corresponding stage distance.

$$\sum_{\text{stage } i} (\text{passenger revenue load on flight stage } i) \times (\text{distance of flight stage } i)$$

Example for the calculation of the revenue load for 1 revenue passenger:

$$\begin{aligned} \text{Passenger revenue load} &= \text{weight of the Passenger} + \text{weight of its checked baggage} \\ &= 70 \text{ kg} + 30 \text{ kg} \\ &= 100 \text{ kg} \\ &= 0.1 \text{ tonne} \end{aligned}$$

When no data is available, **0.1 tonne is the standard weight** suggested by ICAO for a **passenger plus its baggage**

Definition of Passenger Tonne-Kilometre

for the calculation of the Passenger Tonne-Kilometre:



$$\text{passenger tonne – kilometres} = 6 \times 0.1 \times 1135 + 7 \times 0.1 \times 712 = 1179$$

It is also equal to:

$$\text{passenger tonne – kilometres} = \text{average revenue load} \times \text{RPK} = 0.1 \times 1179 =$$

Definition of Freight Tonne-Kilometre

Freight tonne-kilometres:

$$\sum_{\text{stage } i} (\text{freight tonnes carried on flight stage } i) \times (\text{distance of flight stage } i)$$

Example for the calculation of the Freight Tonne-Kilometre:



⇒ $\text{Freight tonne – kilometres} = 0.5 \times 1135 + 0.7 \times 712 = 1065.9$

Definition of Available Tonne-Kilometre

Available Tonne-Kilometre:

$$\sum_{\text{flight stage } i} (\text{total capacity on flight stage } i) \times (\text{distance of flight stage } i)$$

for the calculation of the Available tonne-kilometre:



➡ $\text{Available tonne - kilometres} = 2 \times 1135 + 2 \times 712 = 3694$

Definition of Weight Load Factor

Weight Load Factor (WLF):

total revenue tonne-kilometres as a percentage of the available tonne-kilometres

$$F = \frac{\text{passenger tonne kilometres} + \text{freight tonne kilometres} + \text{mail tonne kilometres}}{\text{available tonne kilometres}}$$

$$WLF = \frac{\text{total tonne kilometres}}{\text{available tonne kilometres}}$$

Weight Load Factor Illustration

AA959

1135 km

712 km

BOM

IX

0.6 tonnes of passenger revenue load

0.7 tonnes of passenger revenue load

0.5 tonnes of freight

0.7 tonnes of freight

Total Payload Capacity = 2 tonnes

Total Payload Capacity = 2 tonnes

$$= \frac{(0.6 + 0.5) \times 1135 + (0.7 + 0.7) \times 712}{2 \times 1135 + 2 \times 712} = \frac{2245.3}{3694} = 0.67 = 60\%$$

Aircraft Kilometres Illustration

Kilometres:

$$\sum_{\text{flight stage } i} (\text{departures for flight stage } i) \times (\text{distance of flight stage } i)$$

for the calculation of the aircraft kilometres:



$$\text{aircraft kilometres} = 2 \times 1135 + 2 \times 712 = 3694$$

Some definitions used in air carriers statistics

Speed flown:



$$\text{speed flown} = \frac{\text{aircraft kilometres}}{\text{airborne hours}}$$



$$\text{average block speed} = \frac{\text{aircraft kilometres}}{\text{block hours}}$$

Average distance flown per aircraft:

$$\text{average stage distance flown per aircraft} = \frac{\text{aircraft kilometres}}{\text{number of departures}}$$

THANK YOU