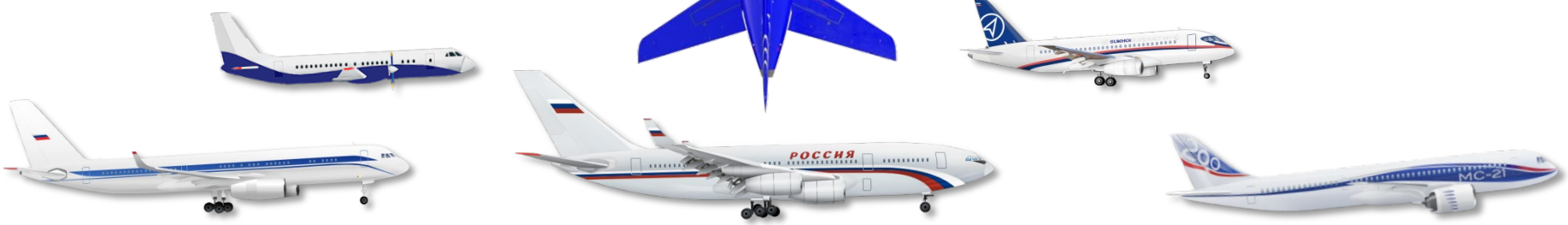
UAC
UNITED AIRCRAFT CORPORATION

Market outlook 2018-2037



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Introduction

The world is changing rapidly! New realities are being created!

The transformation rate of the previously established vision for the international relations, role of globalization, forms and directions of goods, services, financial and human resources movement takes an outstanding role – in terms of its impact to the world.

Complicated modern processes taking place in the world economy create a real threat of "trade wars". Expanding state protectionism in economic matters, non-compliance with WTO rules, refusal to conclude and execute agreements on free trade zones, tariff barriers and differences of views of the world's financial centers on monetary policy form new challenges and obstacles to the development of air transport.

Consistent implementation of "Industry 4.0" principles in the world economy is naturally and actively reflected in the aircraft building industry. Digitalization as a juggernautic force accompanies the aviation in the air and on the ground.

Transition to product life cycle management based on modern digital technologies contributes to radical organizational transformation of aircraft corporations. This business is becoming more thoughtful, dynamic and efficient.

Competition in the air transport market is a continuous search for new ideas and solutions by players in the globalization environment. A significant number of mergers and acquisitions have formed a new corporate structure of the industry in the recent years.

Introduction

Despite the "standard" seven-year cycle of growth in the profitability of air transport, the market shows no signs of a significant decline in profitability. This circumstance contributes to the inflow of long-term capital into the industry, including non-investment class companies.

Optimistic assessment of aircraft leasing is confirmed by extension of capitalization and impact of leasing companies from the Asian region, where companies based on investment from China take on particular importance. In the period up to 2023, a share of the Chinese leasing companies in the value of the operating fleet is projected to grow steadily from current 18% to 22-25%. China's high GDP growth rates sustaining may lead to the future drastic changes in this segment of the world market.

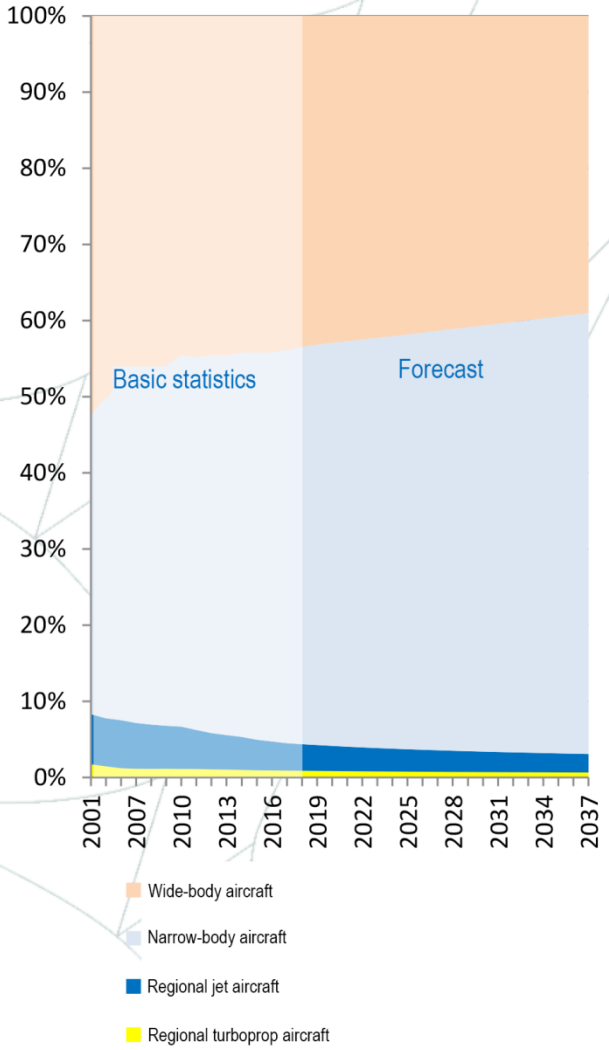
The dynamics of the aircraft industry development in recent decades have contributed to transition to the mega-associations, being the next stage of the global aircraft manufacturers consolidation. Study of the financial stability of the new industrial configuration and its main players competencies sufficiency requires special attention in the current situation. Modern conditions for aircraft creation and future supply of such products to the market cause special risks for air transport that are yet to be revealed by the decisions on aircraft manufacturers unification of their product lines.

Development of an innovative industrial model, increase of the wide-body and long-haul aircraft serial production rates create reasons for new approaches to market segmentation. Changed conditions of the competition will lead to optimization of aircraft fleets, adjustment of air transportation models, and overall change in demand in aeronautical engineering.

World air transportation market

World air transportation market
Current state and development forecast

Transportation distribution by aircraft class



The wide-body aircraft traffic share prevailed over that of narrow-body aircraft by 13 p.p. at the beginning of this century (52% and 39% respectively). But the ratio had been changing rapidly: percentage of narrow-body increased and the stake of wide-body aircraft lowered. The traffic volumes for aircraft of both classes equaled to 46% in 2007, but then the changes continued and a share of narrow-body aircraft increased to 52%, and wide-body aircraft – declined to 44% by 2017. The trend will continue within the forecasted period: narrow-body transportation will reach 58%, and a share of wide-body aircraft will decrease to 39% by 2037. This trend is typical for all regions except Africa and CIS (excluding Russia)

The total share of regional transport is declining (the whole world now is at 4.5% (0.9% for regional turboprops and 3.6% for regional jet aircraft), at this it was equal to 8.3% in 2001) and will continue to decline (to 3.1% in 2037). Exceptions are China (growth from 1.4% to 2.0%) and the CIS (without Russia) - from 11.9% to 12.7%.

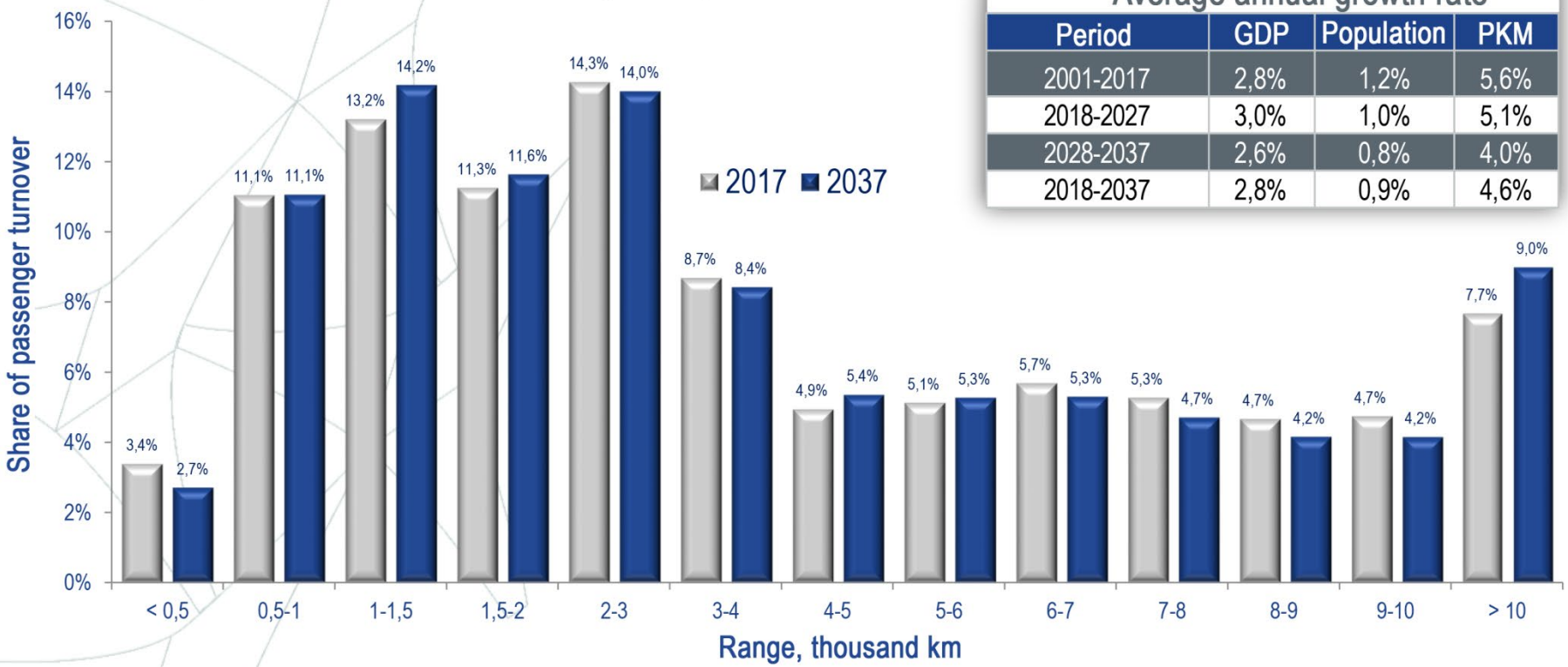
Rise of the GDP is the main transportation growth driver. GDP gain rate was 2.8% within 2000 - 2017 period. It is expected that GDP will grow by 3% (average) during the first decade of the forecasted period and by 2.6% - in the second.

Global population growth rates are decelerating. This indicator was 1.2% in the retrospective period (2001-2017). It will be 1% within the 2018-2027 and 0.8% during 2028-2037 periods. Average growth will be 0.9% for the 20 years.

Passenger turnover is growing at a faster pace compared to GDP. This "outstripping" is reduced as the air transport develops. Thus, the growth rate ratio of the passenger turnover to GDP was 2.02 in the retrospective period, it is expected to be 1.70 in the first decade of the forecast period, and 1.54 in the second. It is expected to be at a level of 1.63 times for the total period. In other words the saturation effect is being witnessed: air travel becomes a routine event and people begin to fly as much as they really need (regardless their income level).

World air transportation market
Actual status and development forecast

Transportation distribution by range



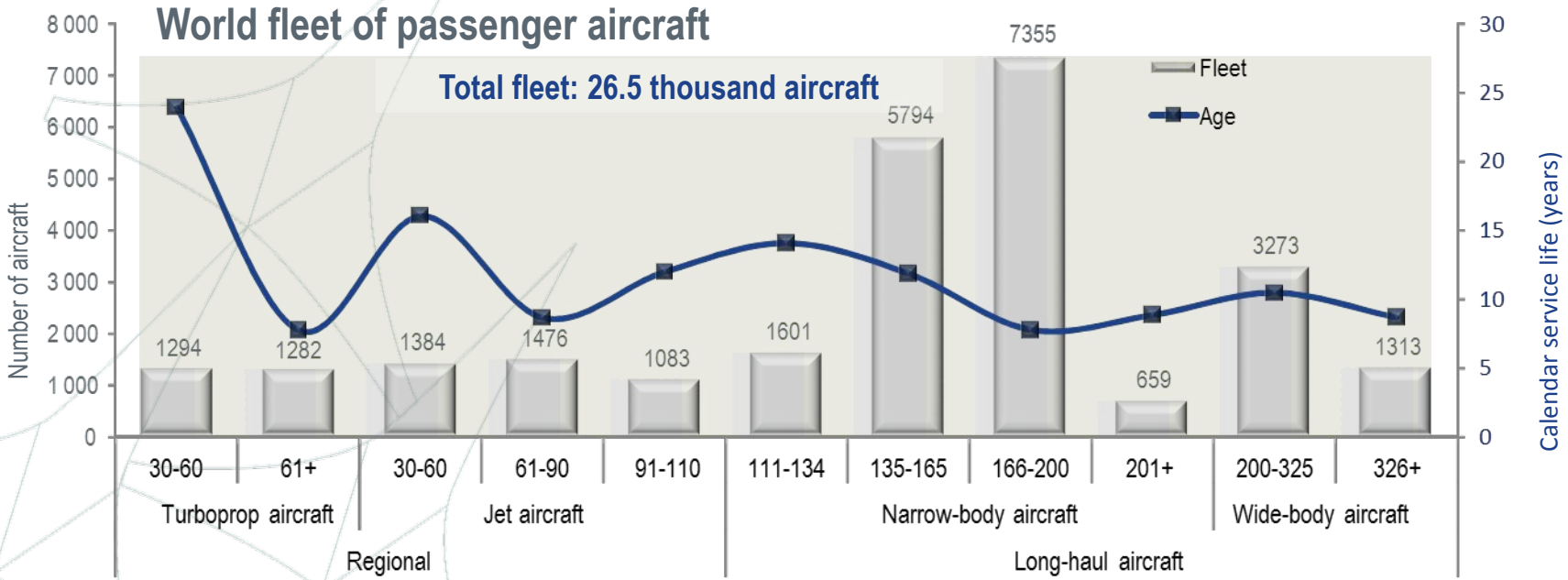
Average annual growth rate

Period	GDP	Population	PKM
2001-2017	2,8%	1,2%	5,6%
2018-2027	3,0%	1,0%	5,1%
2028-2037	2,6%	0,8%	4,0%
2018-2037	2,8%	0,9%	4,6%

No significant changes are expected in the range-wise traffic distribution. Shortest ranges transportation reduction is the only parameter in common for all regions. Also, it should be noted that the median value of world distribution decreased from 2,778 km to 2,742 km, i.e. by 1.3%.

Commercial aircraft market: fleet analysis, trends highliting and demand forecasting

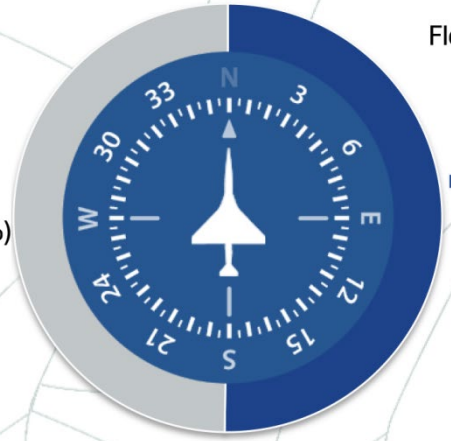
Commercial aircraft market: Modern world fleet



- The narrow-body aircraft with more than 110 seats are the most numerous on the market with a total amount of 15.4 thousand tails (58.1% of the total fleet). They are being followed by wide-body aircraft whose share equals to 4.6 thousand (17.3%). Regional aircraft are calculated at a level of 6.5 thousand tails (24.6%), of which jets are 3.9 thousand (14.9%) and turboprops — 2.6 thousand (9.7%).
- Average aircraft calendar service life of the commercial passenger fleet was 10.8 years at the beginning of 2018.
- The "oldest" one is the regional turboprop aircraft fleet (15.8 years of age), it is followed by the regional jets (12.1 years), narrow-body aircraft (10.0 years), with wide-body aircraft being the "newest“ ones (9.9 years) if the average calendar service life estimation is applied.
- Age-wise distribution of the aircraft fleet shows that in all classes, except the regional turboprop aircraft, the age structure is relatively even, but the long-haul aircraft have the newest (less-then-five-years) share as the most numerous and the regional turboprop segment by contrast has the “elderly" (aged more than 20 years) aircraft share as the most significant.

World commercial aircraft fleet
Regional turboprops: existing fleet

Fleet structure



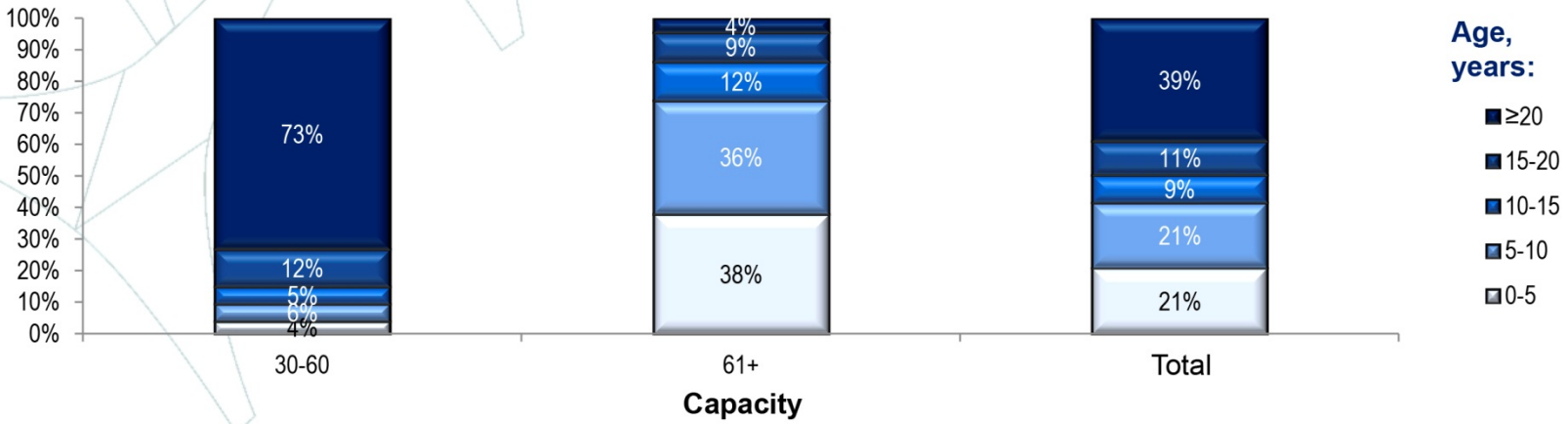
Fleet total 2,576 aircraft

Capacity of 61+ seats; 1 282 aircraft (50%)

Capacity of 30-60 seats; 1,294 aircraft (50%)

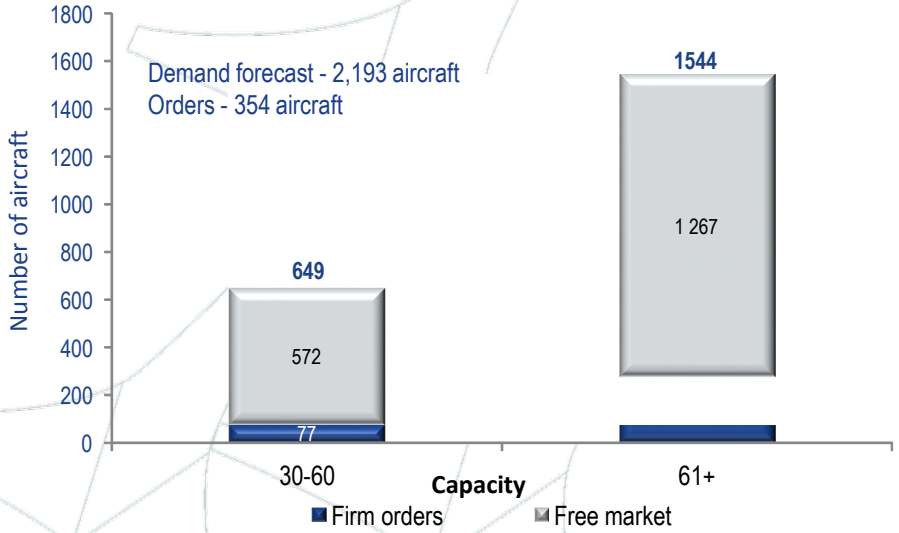
- Average calendar service life of the current fleet of turboprop aircraft is 15.8 years, that is 5 years more than the same indicator for the entire world passenger fleet.
- The oldest are the aircraft of the smallest capacity group (23.9 years), while the average calendar age of aircraft with a capacity of more than 60 seats is significantly lower (7.7 years).
- The share of regional turboprop aircraft in the global passenger fleet is 9.7%, while the share of passenger transportation service provided by these aircraft is less than 1%.
- Numbers of aircraft in both capacity groups of turbo-prop aircraft are approximately equal.
- It is expected that by 2037 ≈910 aircraft of the current fleet will remain "airworthy" out of which the capacity group 61+ seats share will account for about 80% and 20% will go for the 30-60 seats share.

Fleet structure by age (average CSL)



World commercial aircraft fleet
Regional turboprops: demand forecast

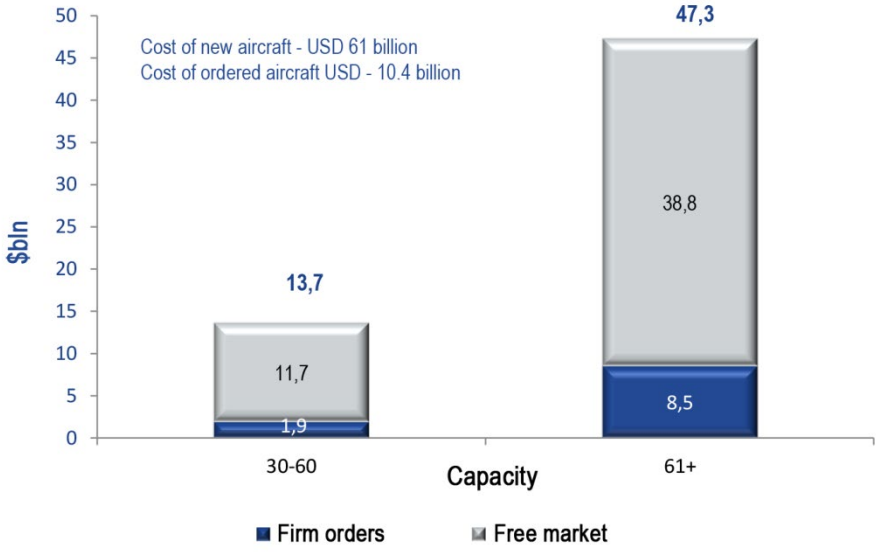
Demand forecast



- The global demand for regional turboprop aircraft for the next twenty years will be ≈2,190 tails, of which 78% will be aircraft with more than 60 seats and 22% — aircraft with 30 to 60 seats. The share of regional turboprop aircraft in the total quantitative demand for new aircraft will be 5%.
- Existing firm orders cover 16% of the expected demand for this class of aircraft.

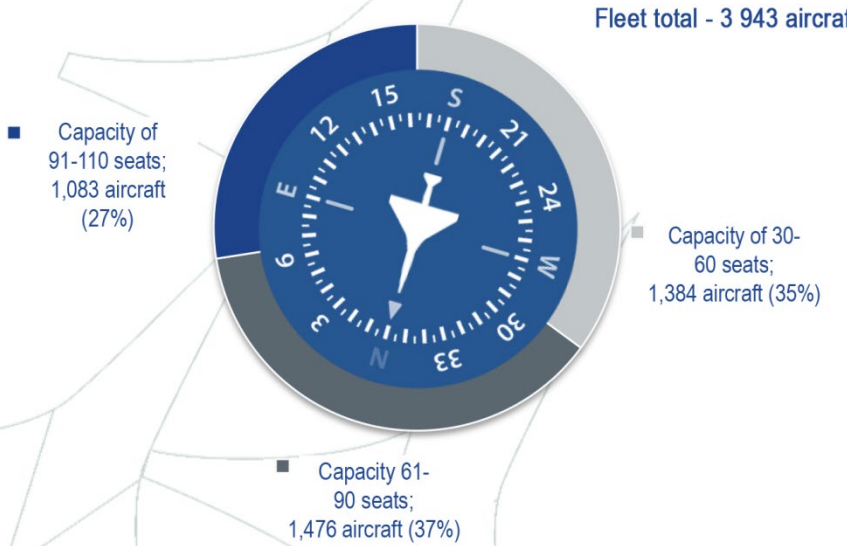
- In general, the sales market for new regional turboprop aircraft is estimated at USD 61 billion (2018 catalog prices), which is 1% of the world market for all new passenger aircraft sales, in value terms.

Forecast of aircraft cost



World commercial aircraft fleet
Regional jets: existing fleet

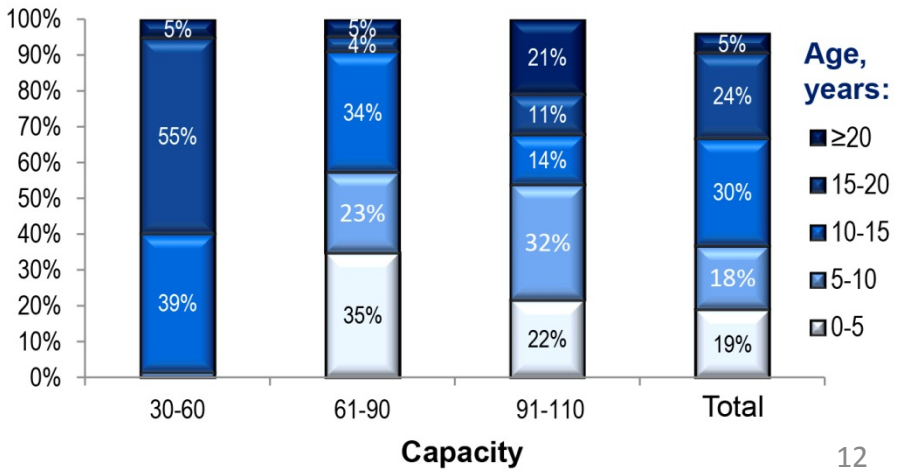
Fleet structure



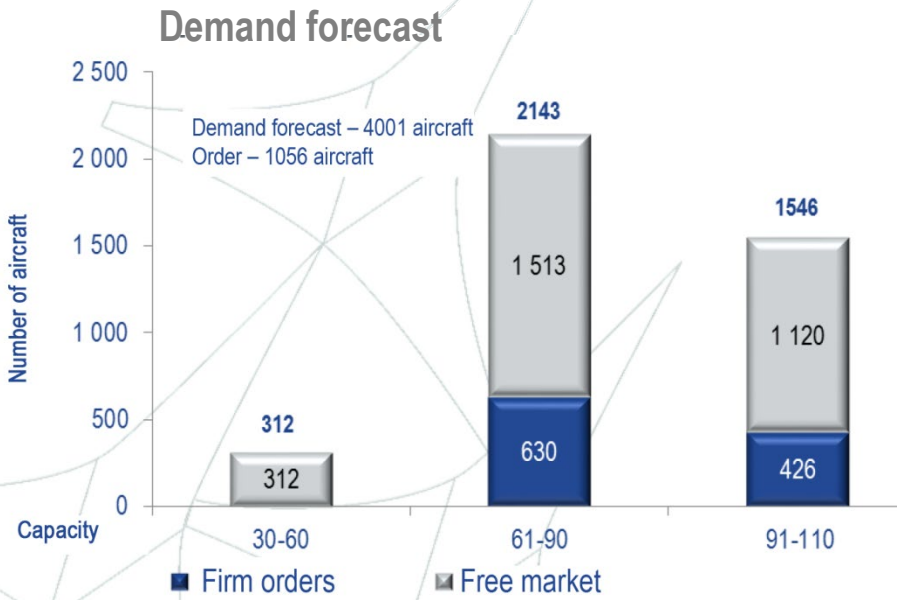
- There are about 4 thousand regional jets in the modern fleet that is 15% of the world fleet. A share of this class of aircraft in the world passenger traffic is 3.6%.
- Most of the regional jets belong to groups of capacity 61-90 seats (1 476) and 30-60 seats (1384).
- 2 200 regional jet aircraft or 56% of their total number in the world are operated by the airlines in North America.

- Similarly to the class of regional turboprop aircraft, the oldest group is the group with 30 to 60 seats. Average calendar service life (average CSL) of this group is 16 years with the average value for the class of 12.1.
- Aircraft of 61-90 seat capacity group are the newest, with average calendar service life of 8.6 years.
- For the 91-110 seat capacity group, the average calendar service life is 11.9 years.
- It is expected that in 2037 ≈770 regional jet aircraft from the fleet existing by the end of 2017 will remain in the world passenger fleet.

Fleet structure by age (average CSL)



World commercial aircraft fleet
Regional jets: demand forecast

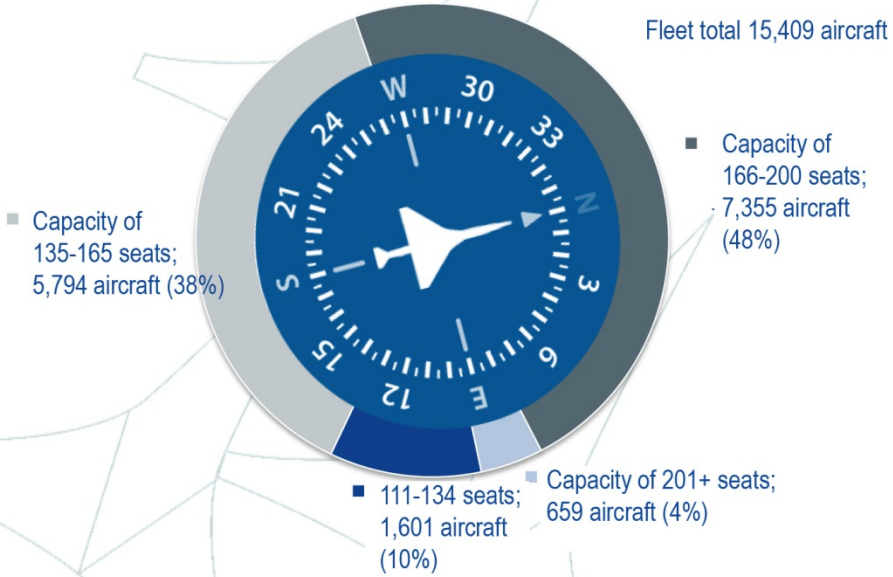


- The total quantitative demand (≈4,000 aircraft) will be distributed mainly between 61-90 (54%) and 91-110 seat (39%) groups. Expected demand for aircraft with a capacity of 30-60 seats is 310 aircraft (6%).
- More than half of all regional jet aircraft (55%) will be purchased by North American airlines, and in the groups of 30-60 seat and 61-90 seat capacity, a share of North American companies will be 69% and 74%, respectively.
- Firm orders cover ≈28% of the demand in the two 'larger' capacity groups. In the group of 30-60 seats, demand for new aircraft is expected only by the end of the forecast period; by now, orders for these aircraft have not been received.

- In general, the market for new regional jet aircraft sales is estimated at USD 191 billion (2018 catalog prices). Volume of sales in 91-110 seats capacity group is expected to be 18% less than in 61-90 seat capacity group.
- In general, regional jet aircraft will take a share of 9.2% in the global demand for new passenger aircraft in quantitative and 3.1% in value terms.

World commercial aircraft fleet
Narrow-body aircraft: existing fleet

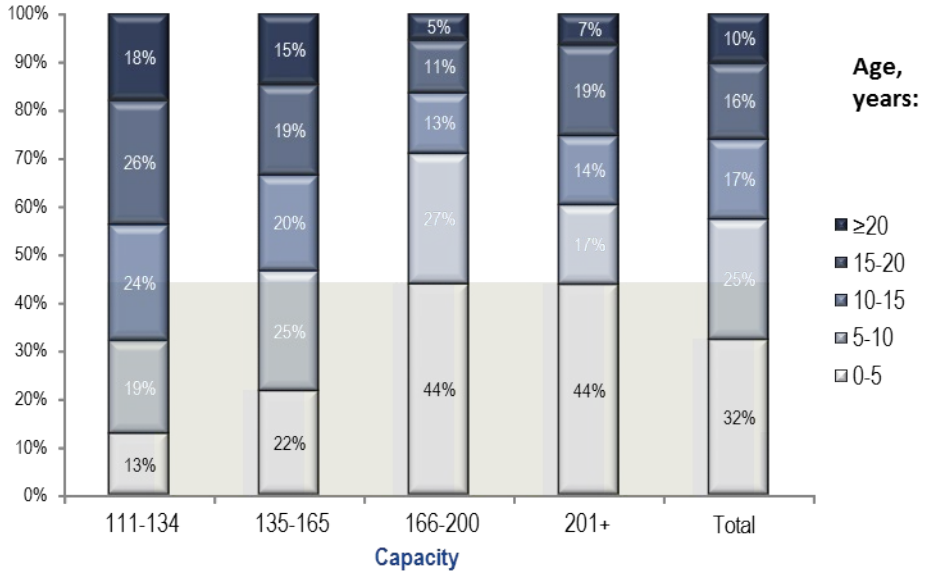
Fleet structure by capacity



- The segment of narrow-body aircraft with a capacity of more than 110 seats is the most numerous (15,410 aircraft), its share in the modern world fleet is 58%. Most narrow-body aircraft belong to capacity groups 166-200 and 135-165 (7 355 and 5 794 aircraft, respectively). In total, 85% of all narrow-body aircraft are concentrated in these groups. In the other groups (capacity of 111-135 and 200+ seats), there are 1,601 and 659 aircraft, respectively.

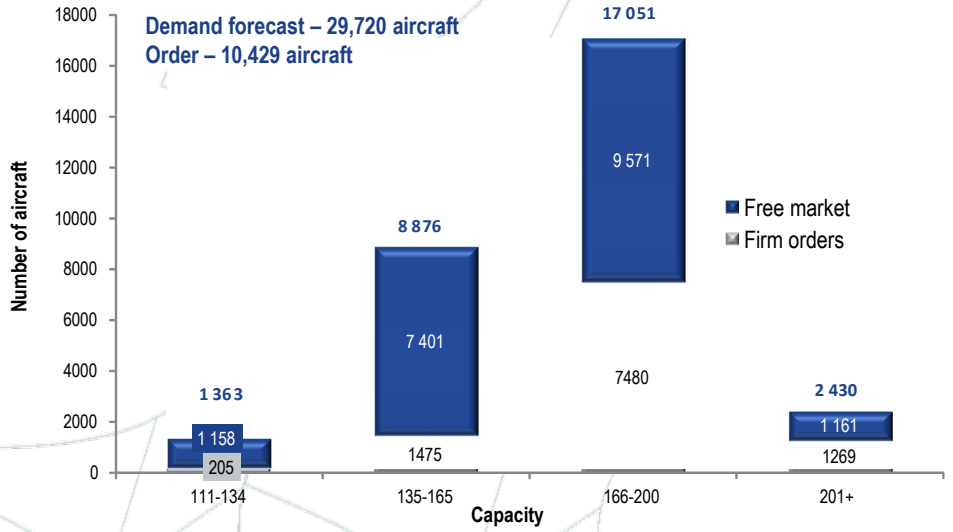
- Average calendar service life of narrow-body aircraft is 10.0 years, which is less than same median value for the fleet as a whole (10.8)
- The largest capacity group (166-200 seats) is at the same time the "newest" in terms of the average calendar service life (7.7 years).
- The groups 201+ (8.8 years), 135-165 (11.8 years) and 111 - 134 seats (14.0 years) were the next by the average calendar service life).
- It is expected that by 2037 ≈ 6,180 aircraft from the world fleet existing at the end of 2017 or 40% of the narrow-body aircraft will remain in the world passenger fleet. 89% of the remaining “airworthy" aircraft will have a capacity in the range of 135-200 seats.

Fleet structure by age (average CSL)



World commercial aircraft fleet
Narrow-body aircraft: demand forecast

Demand forecast



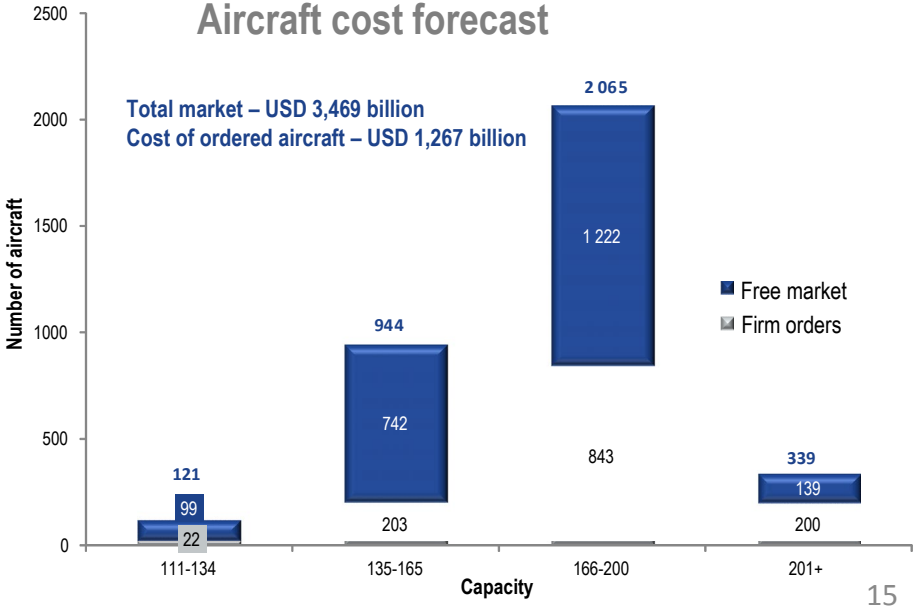
Quantitative demand in the narrow-body segment is estimated at 29,720 aircraft, representing 68% of global demand for new passenger liners. The most popular among buyers will be aircraft for 166-200 and 135-165 seats; the share of these aircraft in the segment of narrow-body aircraft will be 57% and 30%, respectively.

Available firm orders cover the expected demand for new narrow-body aircraft by 35% and in the capacity groups of 166-200 seats and 135-165 seats - by 44% and 17% respectively. The largest coverage with the orders (52%) is recorded in the 201+ capacity group and lowest (15%) - in 111-134 seat capacity group.

Total cost of delivered new aircraft in this segment is estimated at USD 3,469 billion, which is 56% of total market sales of new passenger aircraft. At that, for subgroup of airliners with a capacity of 166-200 seats, the largest sales volume is forecasted at USD 2,064 billion, and in the sub-segment of the aircraft, designed for 135-165 passengers, equals to 944 billion (2018 catalog prices).

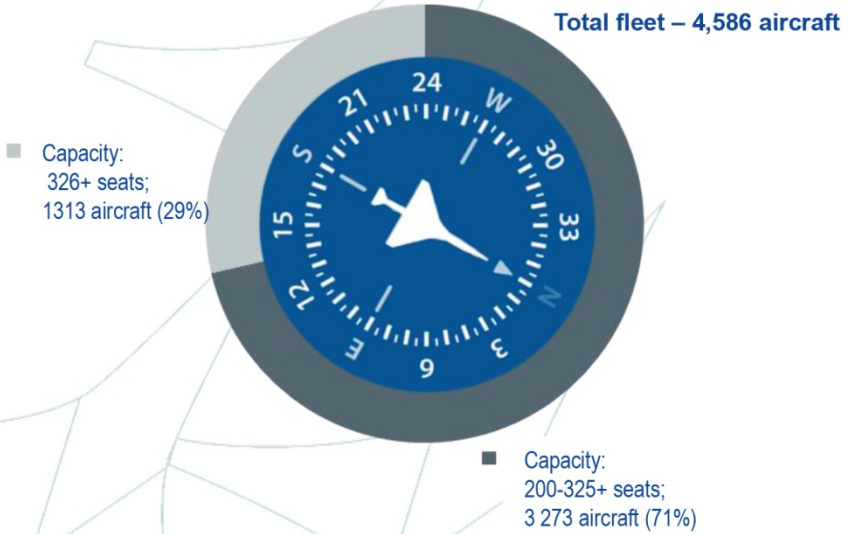
The share of narrow-body aircraft ordered is estimated at 37% of the total cost of deliveries in the segment.

Aircraft cost forecast



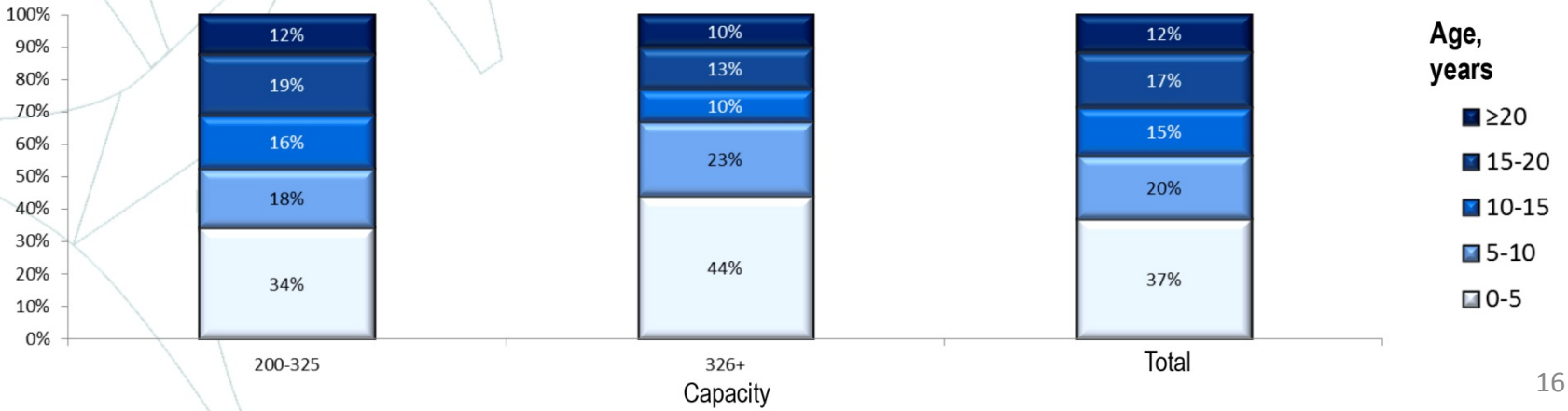
World commercial aircraft fleet
Wide-body aircraft: existing fleet

Fleet structure by capacity

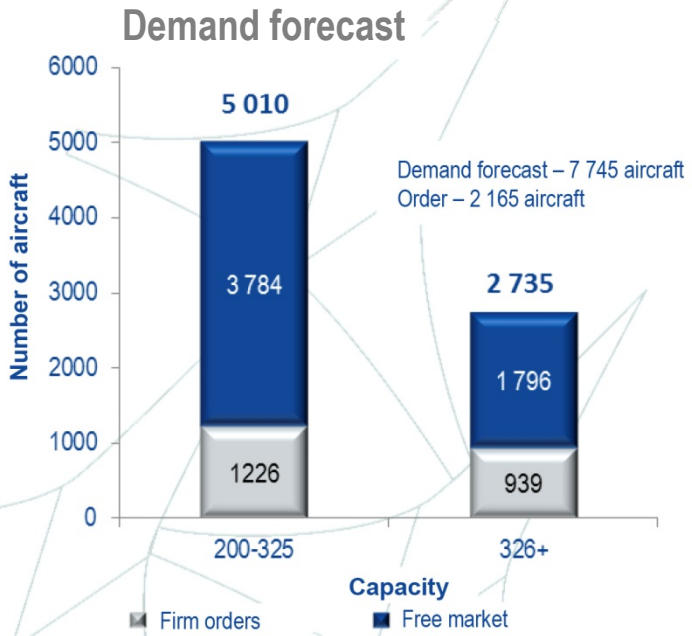


- The modern passenger aircraft fleet consists of 4,586 aircraft; most of them (71%) are airliners with a capacity of up to 325 seats.
- Average calendar service life of the fleet is the smallest among all classes of aircraft and is 9.9 years. At the same time, average age of wide-body aircraft with the capacity of up to 325 seats is more (10.4 years) than for wide-body aircraft with a larger capacity (8.6 years).
- It is expected that 70% of currently operated aircraft will be decommissioned by 2037. The remaining part of the todays fleet will be approximately 1,400 units, of which 930 will be of 200-325 seats capacity and 470 – with capacity of more than 325 seats.

Fleet structure by age (average CSL)



World commercial aircraft fleet
Wide-body aircraft: demand forecast



- Demand for new passenger wide-body aircraft for the twenty-year period is expected to be at 7,745 aircraft or 18% of total sales.
- The ratio of the capacity group"s shares within the segment will change: minding the retirement of existing fleet the 325+ seats subgroup share will increase to 35% by the end of the forecast period.
- Announced firm orders cover 28% of the total forecasted demand, including 24% and 34% in the sub-segments of the "smaller" and "larger" capacity groups, respectively.

- The total cost of new aircraft in the wide-body segment, which are expected to be delivered in the forecast period, is USD 2,439 billion (2018 catalog prices), which is equivalent to 40% of the total market of new passenger aircraft.
- The most profitable will be supplies of the airliners designed for 300, 350 and 250 seats (USD 825, 513 and 481 billion, respectively). Demand for extra-large passenger aircraft with capacity of more than 425 seats is estimated at 615 aircraft, and the cost - at USD 279 billion.

Market of cargo aircraft main trends of the segment

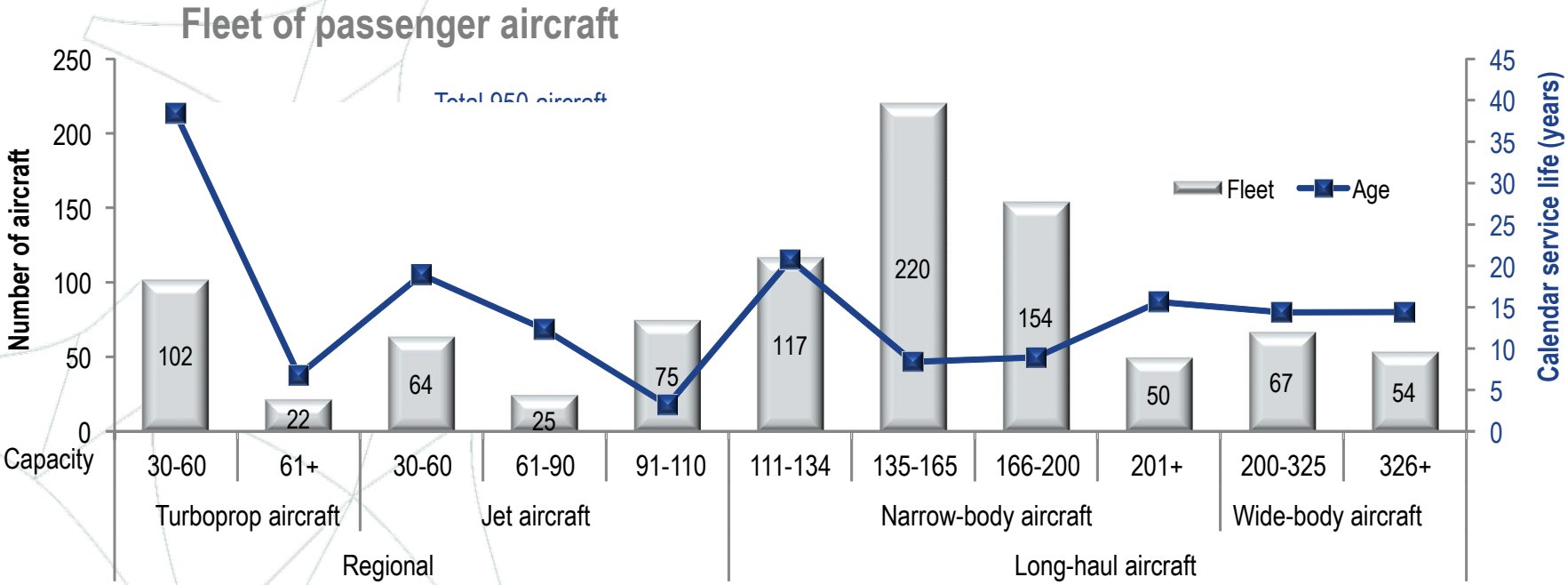
Dynamics of air cargo transportation in 2004-2017 (freight ton kilometers)

- According to UAC's forecast, the demand for non-ramp cargo aircraft in the period 2018-2037 will remain within the range of 2,350 – 2,450 units (new aircraft - 63%, converted - 37%). The main factors affecting freight traffic growth have not changed.
- Cargo turnover growth rate is less than the growth rate of passenger turnover. The share of air cargo transportation using passenger aircraft is slowly declining and will decrease to about 50% freight-ton-kilometers (FTK) for all segments by 2037.
- In the medium term, air cargo growth rate may be significantly affected by infrastructure constraints, including ability of airports to handle cargo. USA's policy to return the center of world production of goods and services to its territory forms risks of reduction of air cargo traffic on USA-Asian and Asian-European routes. At the same time, emergence of new destinations with relatively high traffic intensity is predicted: China-Central Africa and China-Latin America.
- The desire of the leading countries to execute a new stage of the resource base development in Africa creates conditions for subsequent growth of trade turnover and expansion of its directions. Conditions for increasing demand for cargo transport to/from Africa are emerging.
- It is predicted that wide participation of American airlines in the Program of mobilization readiness of the USA Department of Defense (CRAF) will sustain. This factor will contribute to preservation of the dominant share of American airlines in the quantitive structure of the world cargo aircraft fleet.

Review of regional fleet of passenger aircraft: fleet, traffic dynamics and demand for aircraft (Regional review)

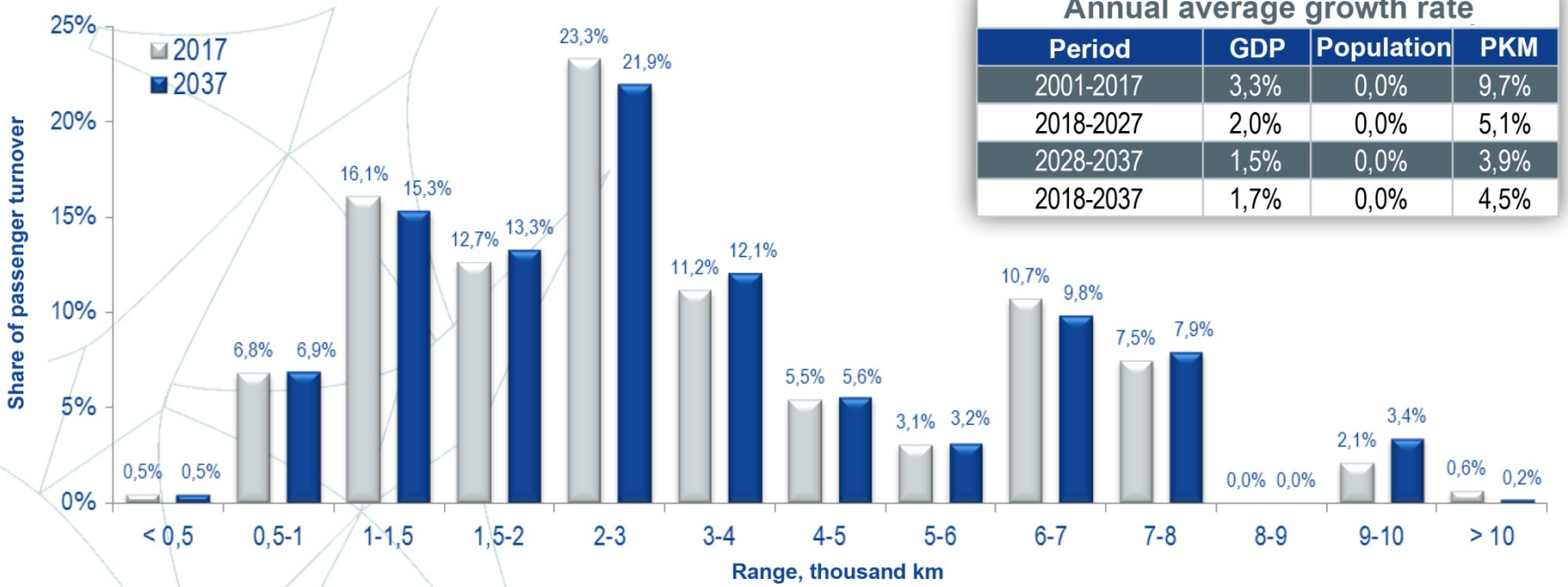
FORECAST 2018-2037

Regional review
Russia: regional fleet of passenger aircraft



- By the end of 2017, the aircraft fleet included 950 aircraft. By 2037, approximately 270 aircraft (28%) will remain in the fleet.
- Average calendar service life of the aircraft was 14.7 years at the end of 2017 that is significantly more than the world average (10.8 years). The "oldest" is the class of turboprop aircraft (32,7) and, in particular, its subgroup with a capacity of 30-60 seats (102 aircraft, whose average age is 38,4 years).

Transportation distribution by range



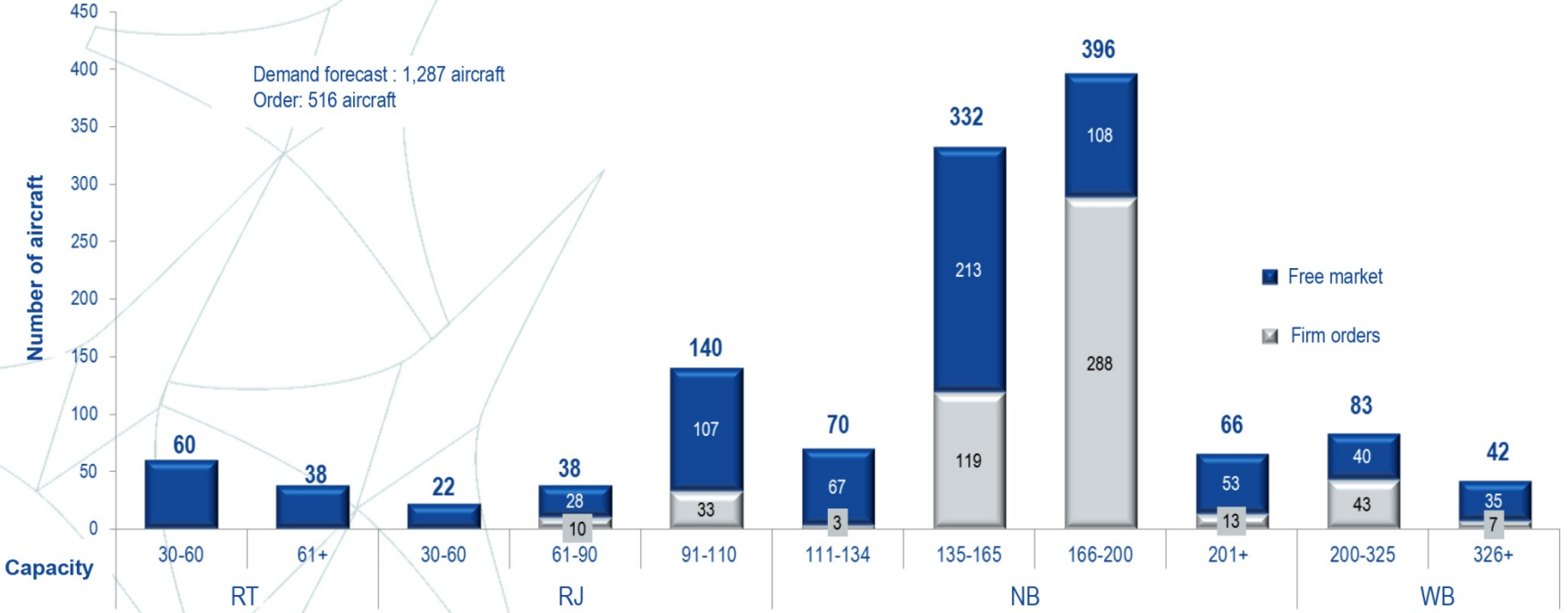
Annual average growth rate

Period	GDP	Population	PKM
2001-2017	3,3%	0,0%	9,7%
2018-2027	2,0%	0,0%	5,1%
2028-2037	1,5%	0,0%	3,9%
2018-2037	1,7%	0,0%	4,5%

- Average annual growth rate of passenger traffic in the forecasted period will be 4.5%, which is 0.1 percentage points less than the world average.
- Relatively short flights prevail in the traffic distribution by range. At this Russian airlines generate 75,5% of the turnover at ranges less then four thousand km, which is considerably higher than the world average (61.9%). This trend will generally sustain in the forecasted period even though the Russian airlines share at these distances may reduce to 69.9% by 2037, unlike the world average that is expected to increase to 62.0%.

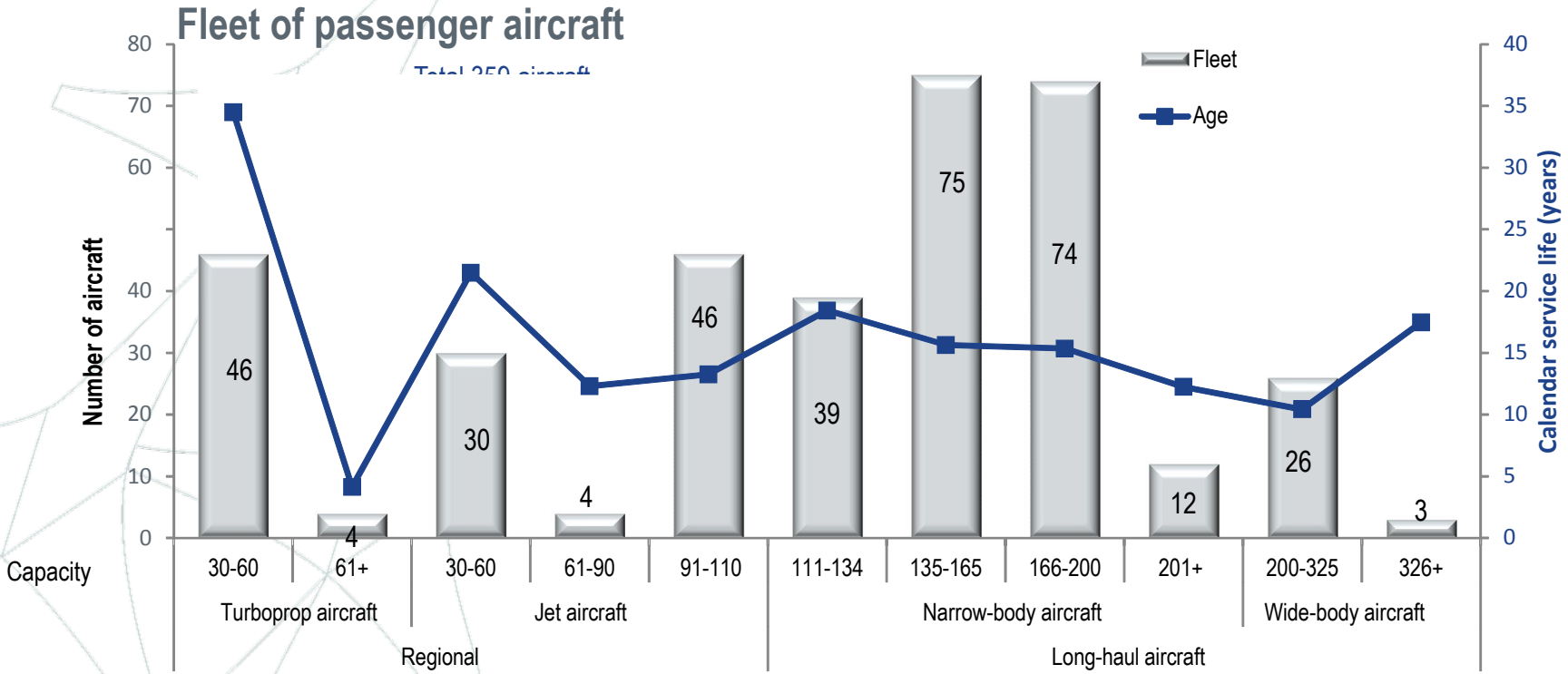
Regional review
Russia: passenger aircraft demand forecast till 2037

New aircraft demand forecast



- Total demand for new aircraft is estimated at 1,290 aircraft, of which 860 (67%) are narrow-body ones, 125 (10%) –wide-body, 200 (16%) are regional jets and 100 (8%) are regional turboprop aircraft. Catalog value of the new aircraft will be USD152 billion.
- Available firm orders cover 40% of expected demand in quantitative and 45% in value terms.
- Global share of Russian airlines in purchasing of new passenger aircraft within the next 20 years will be 2.9% in quantitative terms and 2.5% in value terms.

Regional review
CIS*: regional passenger aircraft fleet

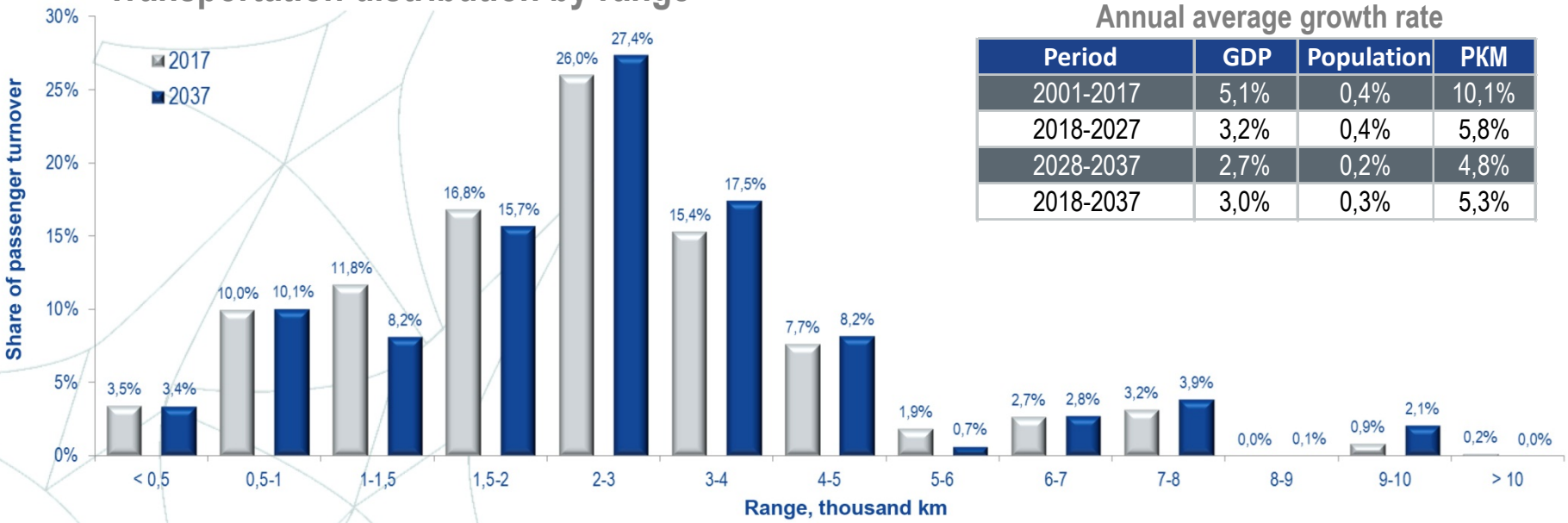


- The modern passenger fleet consists of 359 aircraft, average age of the aircraft is 17.8 years. Of these, only 74 units (21%) will remain airworthy in the world fleet by 2037.
- CIS countries have the oldest aircraft fleet. Similarly to Russia, the "oldest" is the class of regional turboprops (32.3) and 30-60 seats group (34.5).
- Narrow-body aircraft - 200 (56%) and regional — 130 aircraft (36%, in the world — 25%) dominate in the fleet structure. This explains a significantly larger share for transportation ranges of less then five thousand km (91%) than the world average (67%).

** Russian statistics not considered*

Regional review
CIS*: air transportation

Transportation distribution by range



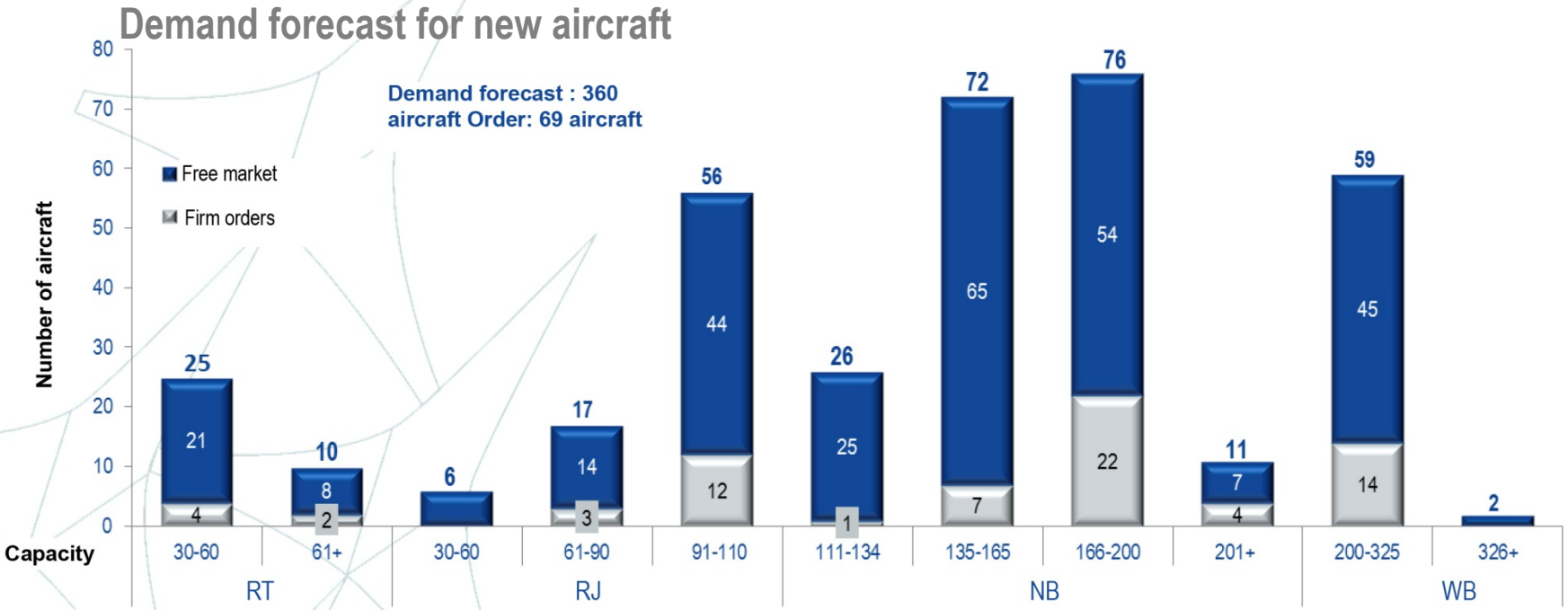
Annual average growth rate

Period	GDP	Population	PKM
2001-2017	5,1%	0,4%	10,1%
2018-2027	3,2%	0,4%	5,8%
2028-2037	2,7%	0,2%	4,8%
2018-2037	3,0%	0,3%	5,3%

- Unlike Russia, CIS countries have non-zero population growth rates (retrospective - 0.4%, forecast - 0.3%; for comparison, the world average values are 1.2%, 0.9%). Forecasted GDP growth rate for the region is more than the world average. But incomes per capita are behind the world average level (2017 — 0.39 p. p.; 2037 — 0.46 p. p.).
- Air mobility of the population is also less than the world average (in 2017 — 0.42), but higher rates of traffic growth (5.3%) and lower rates of population growth will cause the growth of air mobility to the level of 0.54 of the world average. The region's share in world passenger traffic will increase in 20 years from 0.8% to 0.9%, but it will still be less than the region's share in the population (1.8% and 1.7% in 2017 and 2037, respectively), which indicates a lagging in the development of air transport relative to the world average.
- Airlines in the region serve mainly short-and medium-range flights. Thus, in 2017, 91% of passenger traffic was carried out on flights with a range of up to 5 thousand km (the world-average value for such ranges is 67%).

** Russian statistics not considered*

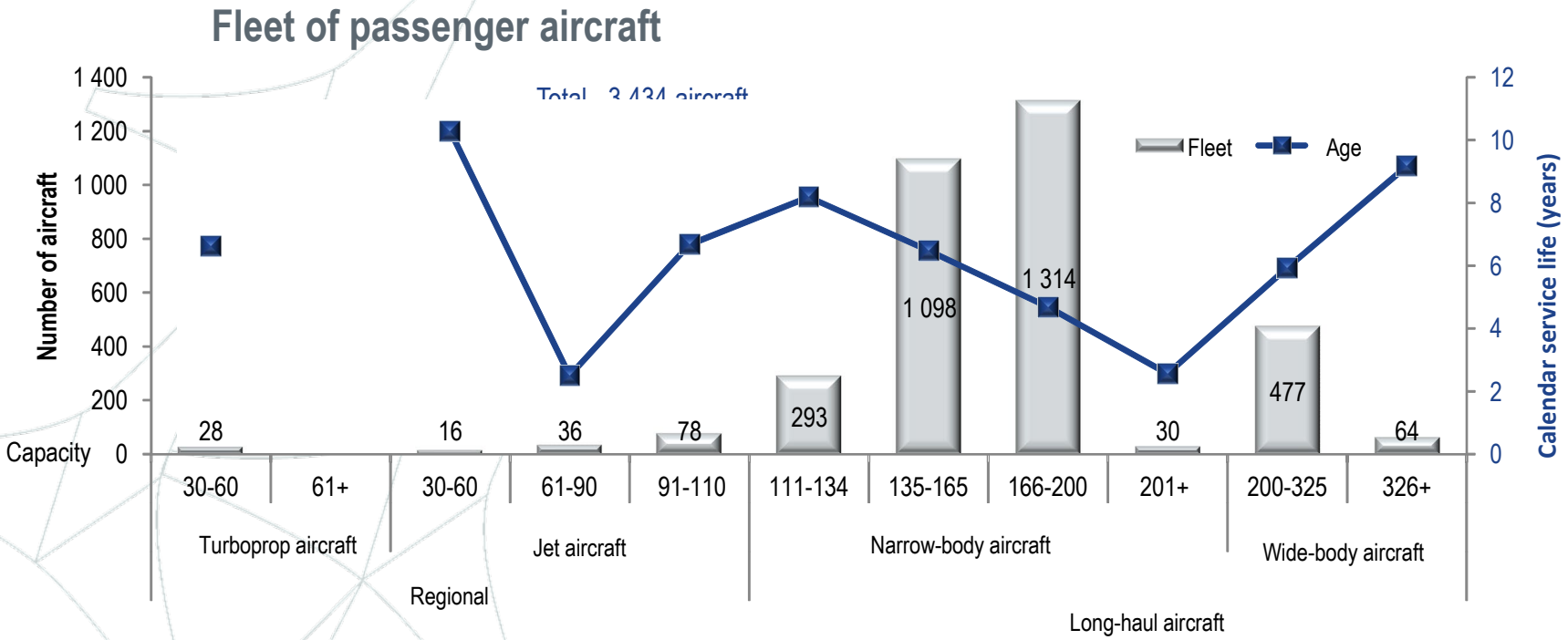
Regional review
CIS*: passenger aircraft demand forecast till 2037



- The CIS is one of the two exception regions in which the narrow-body and wide-body transportation share is inverse to the global trend (the share of narrow-body transportation will decrease from 67.5% to 61% and the share of wide-body transportation will increase from 20.6% to 26.3%). Also a fairly high proportion of traffic generated by the regional jet aircraft is being highlighted: 11.2% in 2017 and 11.9% in 2037 with an average world level of 3.6% in 2017 and 2.4% in 2037.
- Total demand for new aircraft is estimated at 360 aircraft, including 185 regional narrow-body, 80 regional jet, 35 regional turboprop and 60 wide-body aircraft. Catalog price of the new aircraft will be USD 41.2 billion. Share of the region in the world's sales is 0.8% in quantitative terms and 0.7% in value terms. The largest demand is forecasted for narrow-body aircraft with a capacity of 135-200 seats and wide-body aircraft with a capacity of up to 325 seats, which can become the most profitable (USD 14.9 billion).
- Available firm orders cover 19% of expected demand in quantitative terms and 21% in value terms.

** Russian statistics not considered*

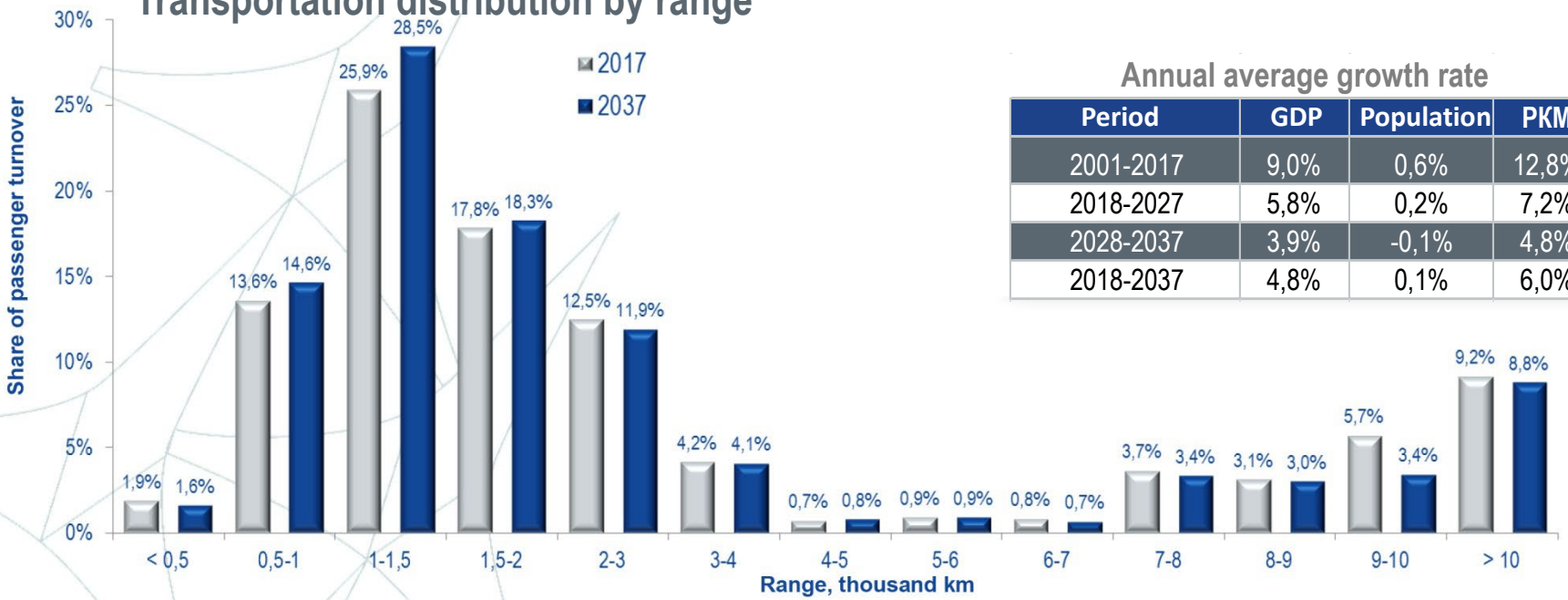
Regional review
China: regional fleet of passenger aircraft



- The aircraft fleet of Chinese airlines includes 3,434 aircraft, of which 80% belong to the narrow-body aircraft class, 16% — to wide-body aircraft class. The fleets are record "young". Average aircraft age is 5.9 years (world average is 10.8). It is expected that ≈ 1 900 aircraft of the current Chinese fleet or 55% thereof will remain in the world fleet by 2037.
- Relatively short up to four thousand km flights (maximum range for Chinese domestic lines) generating 76% of passenger turnover (world average — 62%) dominate the transportation distribution by range as per the structure of the current fleet. In the structure of the wide-body aircraft traffic, on the contrary, flights of the longest range (more than 10 thousand km) prevail. The 1,742 km value of the traffic range distribution median in 2017 is the lowest of all regions considered it will further decrease to 1,645 km by 2037. The distribution character will not change significantly.

Regional review
China: air transportation

Transportation distribution by range



Annual average growth rate

Period	GDP	Population	PKM
2001-2017	9,0%	0,6%	12,8%
2018-2027	5,8%	0,2%	7,2%
2028-2037	3,9%	-0,1%	4,8%
2018-2037	4,8%	0,1%	6,0%

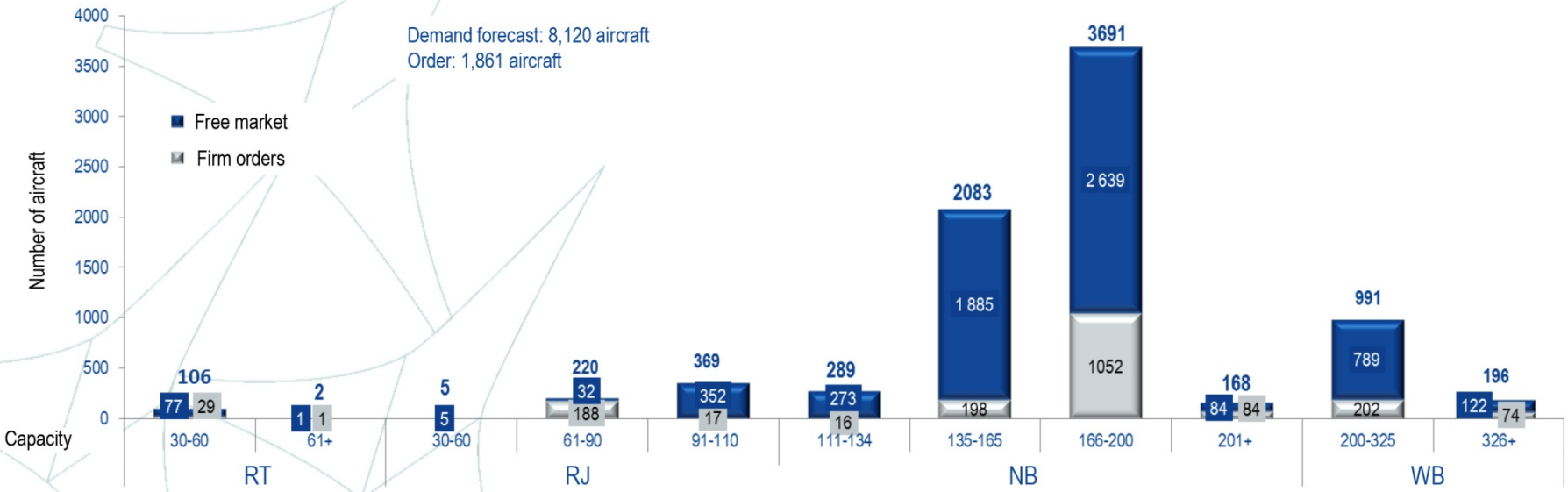
Average annual growth rate of traffic in the forecasted period will be 6.0%, against the background of 4.8% of GDP growth, significantly more than the world's average (4.6% and 2.8%, respectively). At that, air mobility of the population, which was 77% of the world average in 2017, will exceed this median value by 18% by the end of the forecast period. It is expected that in about 2025 China will become the leader of the world ranking of air traffic among the countries.

China's share of world GDP, population and passenger turnover has changed. If in 2017 the largest of them was a share in the population - 18.8% with a share in world passenger traffic - 14.4% and in world GDP - 13.1%, by 2037 the share in the world population will decrease to 15.9%, while the share in passenger traffic and GDP will grow to 18.8% and 19.3%, respectively.

Since 2003, the share of narrow-body aircraft transportation has prevailed over that of wide-body. In 2017, the share of transportation by narrow-body aircraft was 62.6%, and for wide-body aircraft - 36.0%. By 2037, the share of narrow-body transportation will increase to 68.5%, while that of wide-body transportation will decrease to 29.5%. During the same period, the share of regional aircraft transportation will increase from 1.4% to 2%, mainly due to the regional jet aircraft as the share of turboprop aircraft transportation in the entire forecast period will not exceed 0.1%.

Regional review
China: passenger aircraft demand forecast till 2037

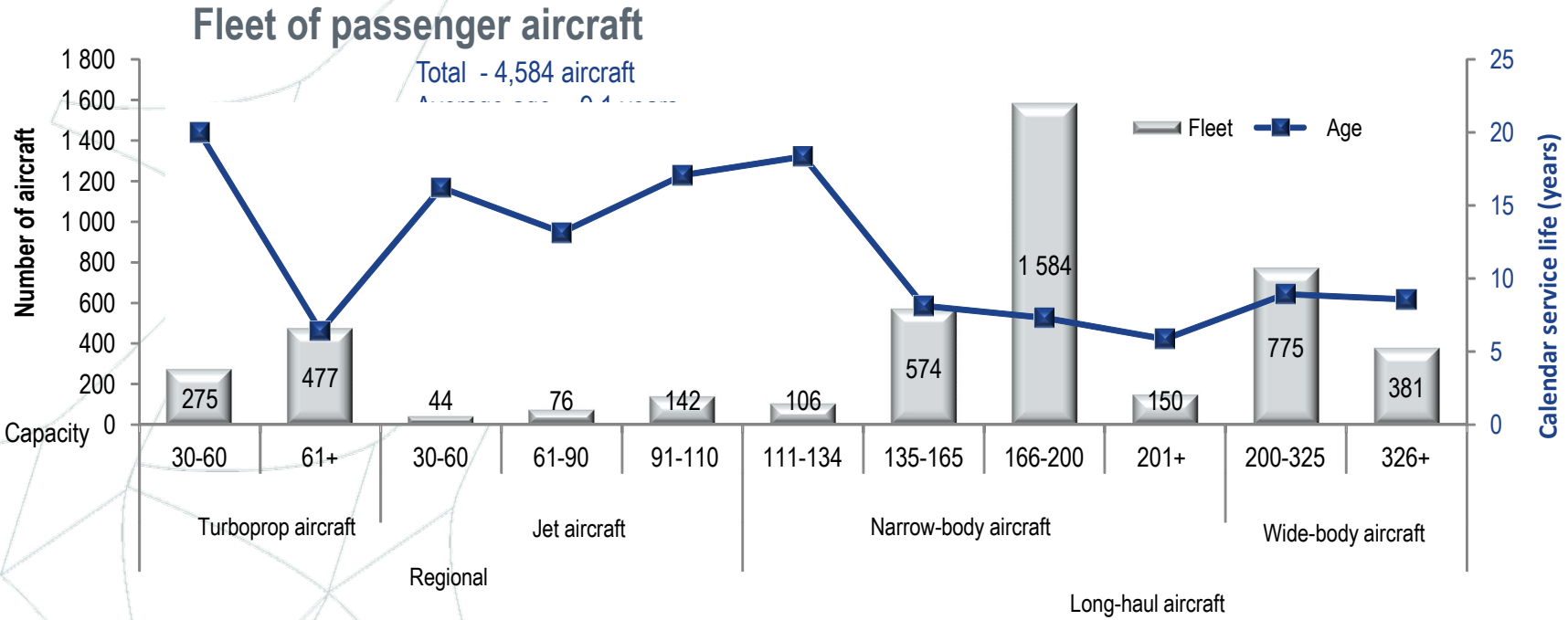
Demand forecast for new aircraft



- Expected total demand for new aircraft is 8,120 units, which is only the fourth result if divided by regions (following the rest of the Asia-Pacific region — 9 125, Europe — 8 720 and North America — 8 540). In value terms, the demand of Chinese airlines is estimated at USD 1,097 billion and this is the third result as North America is ahead of China in quantitative demand for cheaper regional aircraft, but is inferior in demand for more expensive narrow-body and wide-body aircraft.
- China is almost neutral and often acts as a donor at the used aircraft market.
- Most of the demand is made up of narrow-body aircraft ≈6,230 (77% of the total and 65% in value terms). The next most demanded will be wide-body aircraft - ≈1,190 (15% and 32%, respectively), then regional jets ≈590 (7.3% and 2.7%) and regional turboprops ≈110 (1.3% and 0.2%).
- 23% of expected demand in quantitative terms and 24% in value terms are covered by existing orders.

Regional review. Asia-Pacific region

APR*: regional fleet of passenger aircraft



The modern aircraft fleet consists of 4,584 aircraft. Average calendar life of the aircraft is 9.1 years, which is less than the world average (10.8). More than half (53%) of the fleet are narrow-body aircraft, 25% — wide-body aircraft. The share of regional turboprop aircraft is relatively large - 16.4% (world average 9.7%) and the share of regional jets is small — 5.7% (world average — 14.9%). Regional jets aircraft are the oldest (15.8).

Unlike China, the distribution of transportation in the region by range is more uniform (China has high emphasis on flights of up to 4 thousand km with a dump in flights ranging from 4 to 7 thousand km) and is characterized by a significantly higher median value of 2,882 in 2017 and 2,787 in 2037.

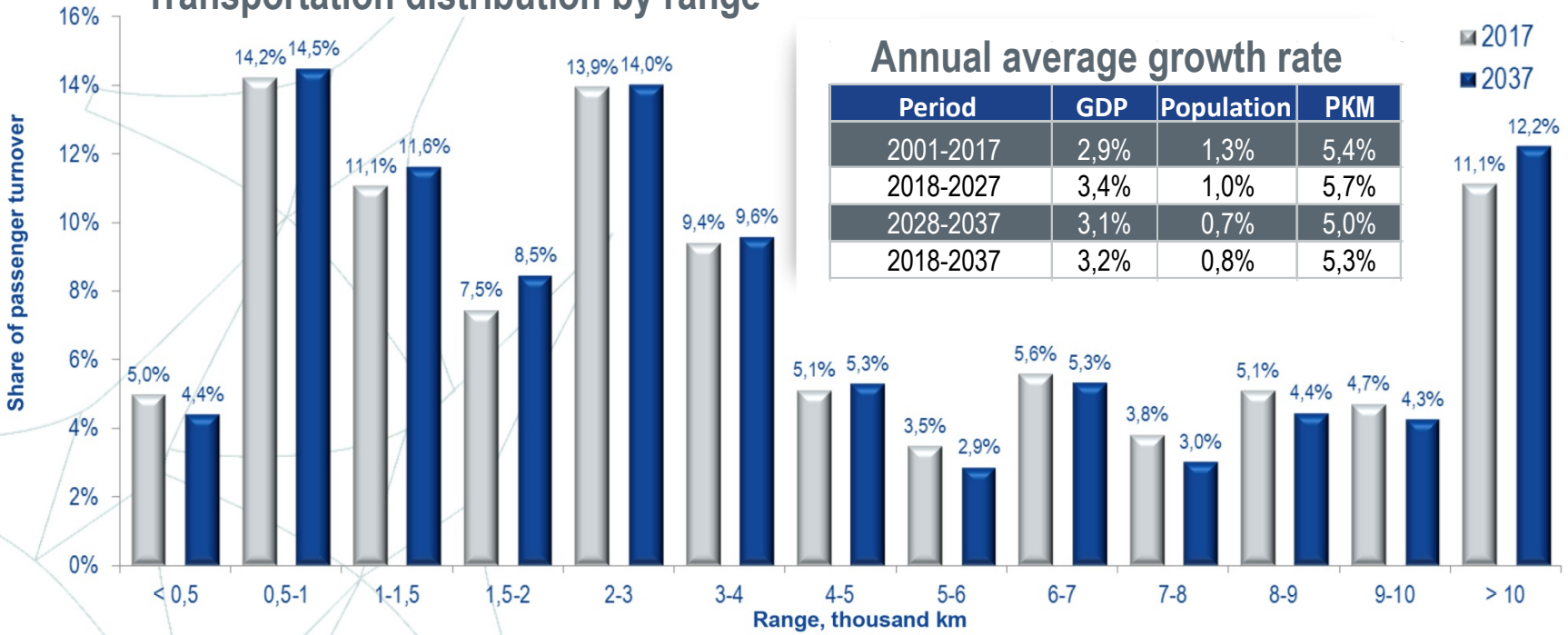
Despite the smaller number in the modern fleet, 54.5% of the passenger turnover of the region's airlines is being executed with wide-body aircraft and only 43.2% — with narrow-body ones. However, the global trend of increasing share of narrow-body transport and reducing similar share of wide-body aircraft is also relevant for the region. As a result the shares of narrow-body and wide-body traffic will be equal by 2026, and by 2037 share of transportation by narrow-body aircraft will increase to 55.3%, while the same share on wide-body aircraft will reduce to 43.0%.

** PRC statistics not considered*

Regional review. Asia-Pacific region

APR*: air transportation

Transportation distribution by range



Annual average growth rate

Period	GDP	Population	PKM
2001-2017	2,9%	1,3%	5,4%
2018-2027	3,4%	1,0%	5,7%
2028-2037	3,1%	0,7%	5,0%
2018-2037	3,2%	0,8%	5,3%

- Population of the Asia-Pacific region (without China) was 2,707 million people in 2017, which is 35.9% of the total world population (with China +1,418 million = 4,125 million or 54.7%), and this is the region with the largest population in the world. Average annual population growth rate during the forecast period (0.8%) is 0.1 percentage points lower than the world's average. At the same time, GDP growth rate (3.2%) will exceed the world indicator (2.8%). This will lead to increase in the region GDP share during 20 years from 19.7% to 21.3% of global GDP but will be significantly less than the share of the region in the world population (35.4%). Per capita income will increase from 0.55 to 0.60 of the world's average indicator.

- The Asia-Pacific region (excl. China) ranked third in the world in terms of 2017 passenger traffic. It is expected that due to faster traffic growth rates the region will leave North America as well as Europe behind (in 2025 and 2032, respectively), and become the rating leader. The region world share will increase from the current 18.6% to 21.6% in 20 years.

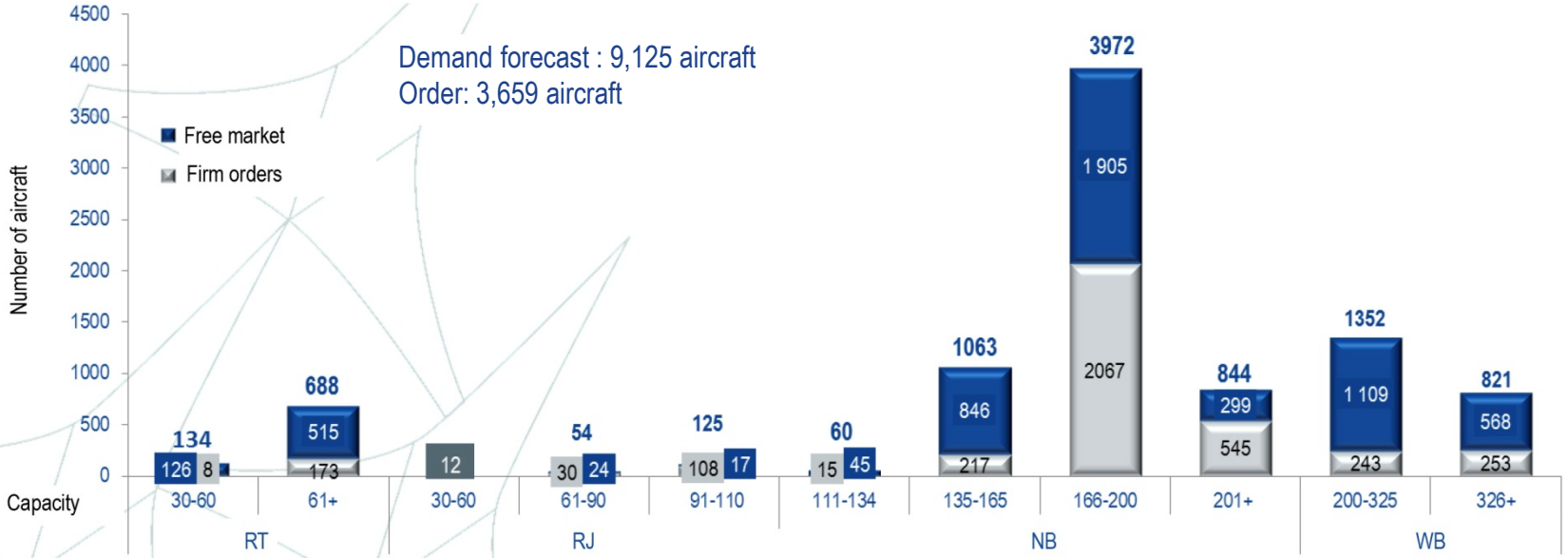
- Due to the lagging of per capita income and high number of population, air mobility will remain significantly below the world's average (0.52 in 2017 and 0.61 in 2037).

** PRC statistics not considered*

Regional review. Asia-Pacific region

APR*: passenger aircraft demand forecast till 2037

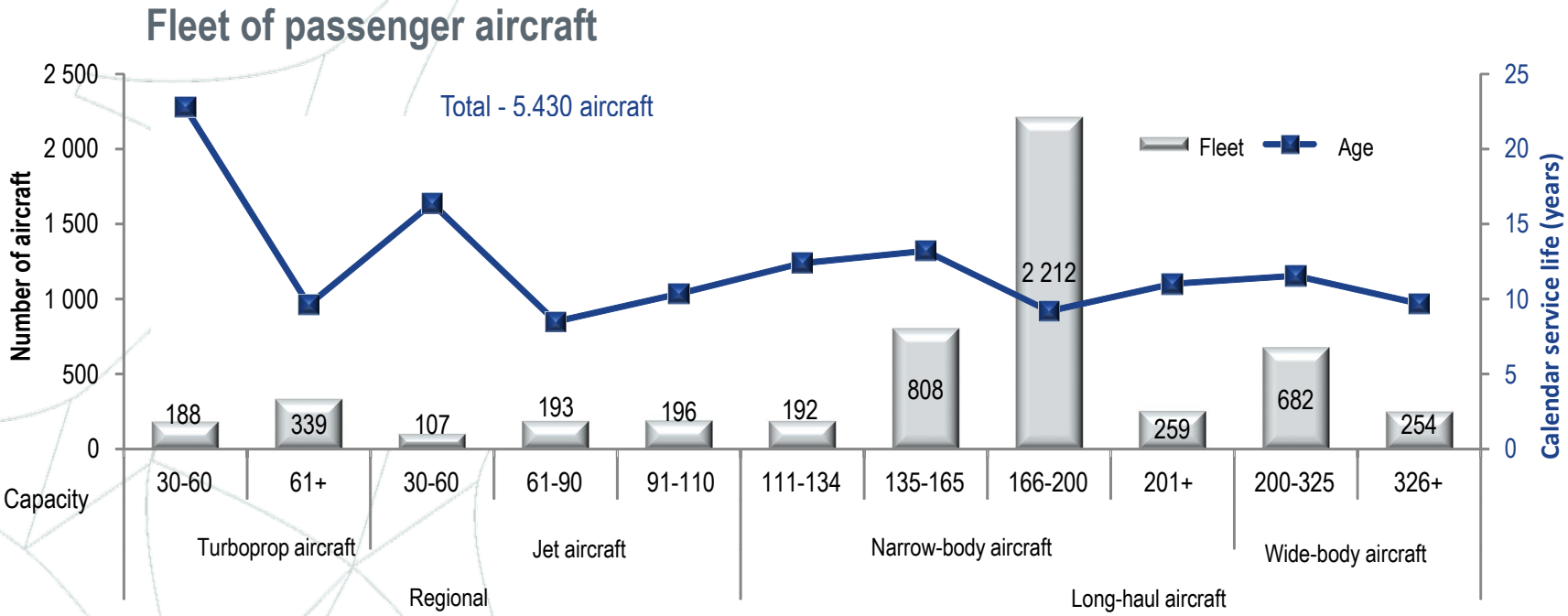
Demand forecast for new aircraft



- The region airlines will purchase 9,125 new aircraft within 20 years, which is more than in other regions. The new aircraft sales market is estimated at USD 1,430 billion, in 2018 catalog prices. 40% of demand in quantitative terms and 37% in value terms will be covered with existing firm orders.
- Most sales are expected for the narrow-body group of aircraft with 166-200 seats, that will be purchased in quantity of 3,970 units for USD 479 billion. Firm orders already exist for 52% of these aircraft. Larger scale sales of this capacity of aircraft are expected only in Europe (4,280 units).
- The 200-325 seat capacity group will be the second in new aircraft demand in terms of quantity and cost. It is expected that the region's airlines will purchase ≈1,350 of such aircraft for USD 367 billion.
- The defining characteristic of this region is its high demand for wide-body aircraft with a capacity of more than 325 seats and regional turboprop aircraft with a capacity of more than 60 seats. At that, the region will become a leader in acquisitions of 201+ narrow-body group aircraft ≈840 units (35% of world demand).
- Existing orders and deliveries of new aircraft in 2018 cover 48% of the quantitative demand in narrow-body, 23% in wide-body aircraft class, 22% — in regional turboprops and 72% — in the class of regional jets. In general, 40% of the estimated number of new passenger aircraft for airlines in the region has been ordered already.

** PRC statistics not considered*

Regional review
Europe*: regional fleet of passenger aircraft

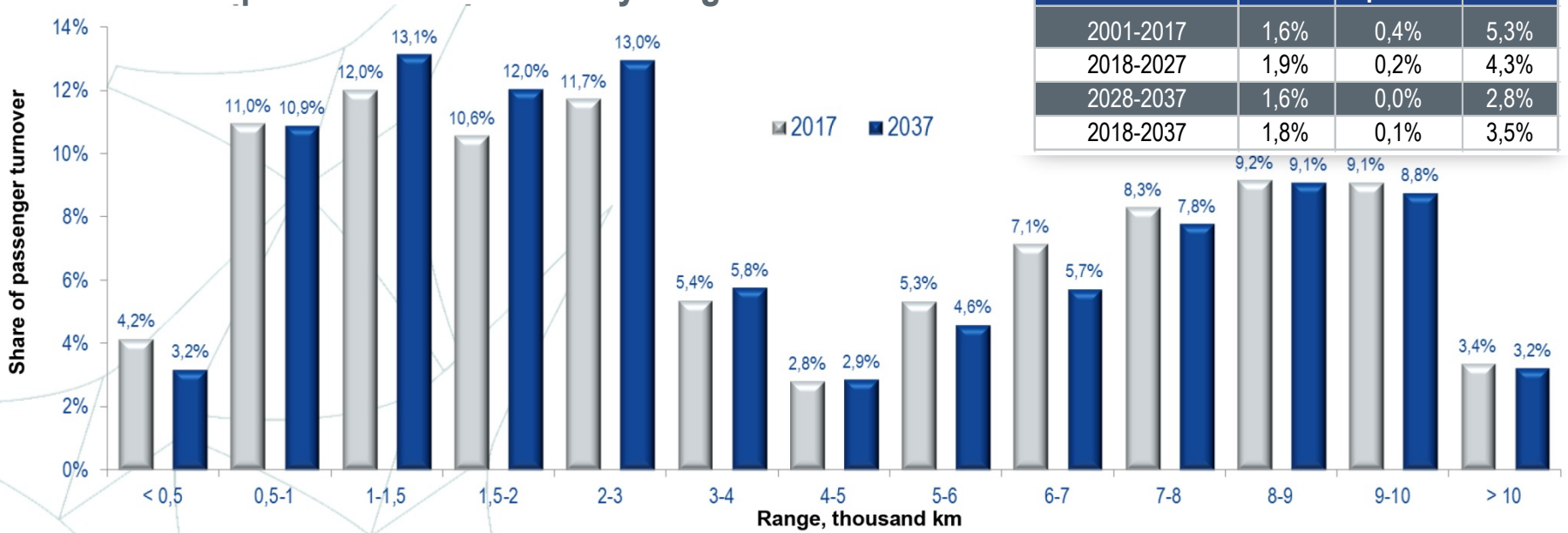


- The existing fleet of the region consists of 5,430 aircraft (second place in the world after North America), of which 64% belongs to the class of narrow-body aircraft, 17% — wide-body aircraft, 9.7% — regional turboprops and 9.1% — regional jets. Average calendar service life of the aircraft fleet of European companies is 11.0 years, which is slightly more than the world average (10.8).
- The biggest part of the fleet are narrow-body aircraft with 166-200 and 135-165 seats and wide-body aircraft with 200-325 seats.
- The share of regional traffic of the European companies is decreasing all the time: in 2001 it was 9.2% (regional jets - 7.1% and regional turboprops - 2.1%), by 2017 it decreased to 3.3% (regional jets 2.3% and regional turboprops 1.0%). In the forecast period, reduction in the share of regional transportation will continue, but its pace will decrease: in 2037, share of regional jet transport will account for 1.3%, and share of regional turboprop — 0.6%. The effect of the reduced share of regional air transport in Europe is partly due to the replacement of short-haul air transportation by alternative modes of transport.

** Russia and CIS statistics not considered*

Regional review
Europe*: air transportation

Transportation distribution by range



Annual average growth rate

Period	GDP	Population	PKM
2001-2017	1,6%	0,4%	5,3%
2018-2027	1,9%	0,2%	4,3%
2028-2037	1,6%	0,0%	2,8%
2018-2037	1,8%	0,1%	3,5%

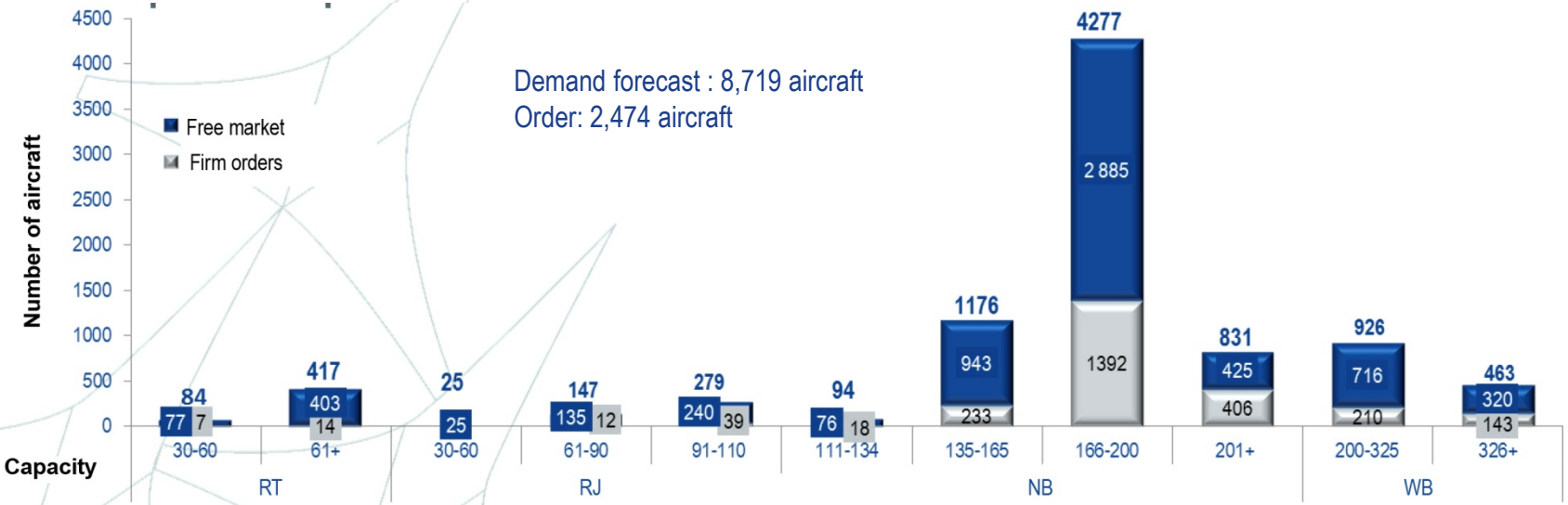
- Europe's share of the world population was 8.3% in 2017. Expected rate of population growth in Europe (0.1%) is small compared to the world average (0.9%) and in this regard, Europe's share will be reduced to 7.1% by 2037.
- The GDP passenger traffic growth rates (1.8% and 3.5% respectively) in the region are smaller than the world's average (2.8% and 4.6%, respectively), which is quite typical for regions with developed economy and air transportation.
- Europe is the region with one of the highest levels of income per capita (2.85 times the world average in 2017). This allows Europeans to significantly exceed the world average by 3.3 times, which, along with per capita income, is the second indicator in the world after North America.
- Traffic distribution by range has a distinctive bimodal form: value of the first mode in the forecast period will grow, and second – will decline. As a result, median of the distribution will significantly reduce from 3,108 to 2,830 km. Comparing the European distribution by range for with the world average, large shares of traffic for range of 6-10 thousand km and relatively small shares of traffic for the longest ranges (>10 thousand km) can be seen.
- Europe overtook North America and became the leader of the world ranking in passenger turnover in 2017. It is expected that the region will hold this position until 2032, when Asia-Pacific region (excl China) will move to the first place.

** Russia and CIS statistics not considered*

Regional review

Europe*: passenger aircraft demand forecast till 2037

Demand forecast for new aircraft



- At the beginning of the century, the share of the wide-body transportation was almost twice as large as the share of narrow-body traffic (59% and 32%). But the transportation shares ratio was rapidly changing: the narrow-body increased and wide-body decreased. In the period from 2010 till 2013, the share of traffic with aircraft of these classes was approximately equal to 47%, but then changes continued and, by 2017, the share of narrow-body traffic increased to 51%, and the share of wide-body traffic decreased to 45.7%. In the forecast period, the trend will continue and, by 2037, the share of transportation by narrow-body aircraft will grow to 59.9%, and the share of wide-body aircraft will decrease to 38.1%.

- A large volume of transportation work and more frequent fleet replacement will cause high demand of 8,720 new aircraft in the region for the total cost of USD 1,256 billion. The most demanded will be narrow-body aircraft ≈6,380 (73% of the total quantity and 62% of total demand's cost value). At that, the region will become the leader of the world ranking in new narrow-body aircraft sales. The most demanded will be narrow-bodies of 166-200 seats (4,280 aircraft, a third of which has already been ordered). The second in demand will be the narrow-body group with 135-165 seats: ≈1,180 aircraft will be purchased. And third in popularity are wide-body aircraft with 200-325 seats (≈930 aircraft). There is also high demand in the region for narrow-body aircraft with 201+ seats at ≈830 aircraft (34% of world demand).

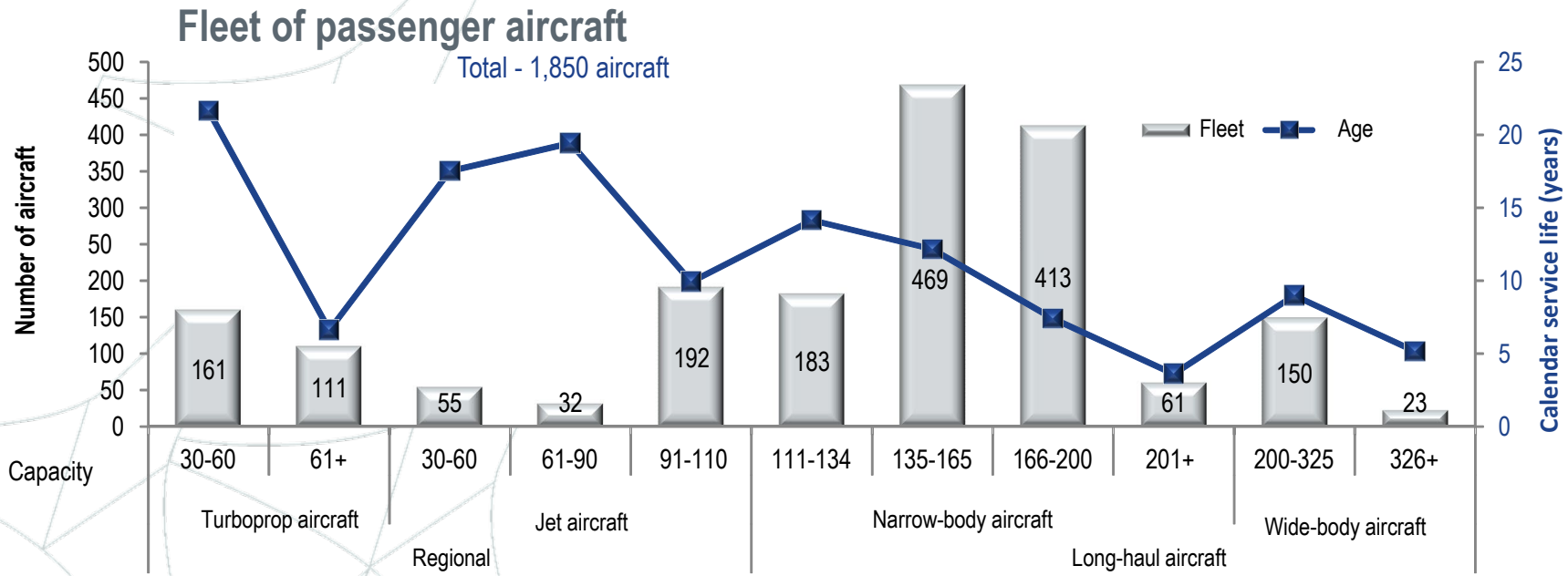
- Available firm orders cover 28% of the quantitative demand, but share of orders in the classes of regional aircraft is relatively small (4% for regional turboprops and 11% for regional jets), and share of orders in the classes of long-haul aircraft is larger (narrow-body - 32% and wide-body - 25%).

- Europe is the leader among the donor regions at the used aircraft market and this is applicable for all aircraft classes.

** Russia and CIS statistics not considered*

Regional review. Latin America

LA: regional fleet of passenger aircraft



- The total aircraft fleet in the region includes 1,850 aircraft (7% of the world fleet). Average calendar service life is 11.2 years. The "oldest" are regional turboprops (15.5), the "newest" — wide-body aircraft (8.5).

- One of the features of the region is a relatively high share in the existing fleet of regional turboprop aircraft (14,7%) and a small share of wide-body aircraft (9.4%) compared with the world average (9.7% and 17.3%, respectively). This is due to higher than the world average share in the traffic distribution of ranges up to 1 thousand km (21.6% and 14.4%, respectively) and a smaller share of traffic in the range of more than five thousand km (22.5% and 33.2%).

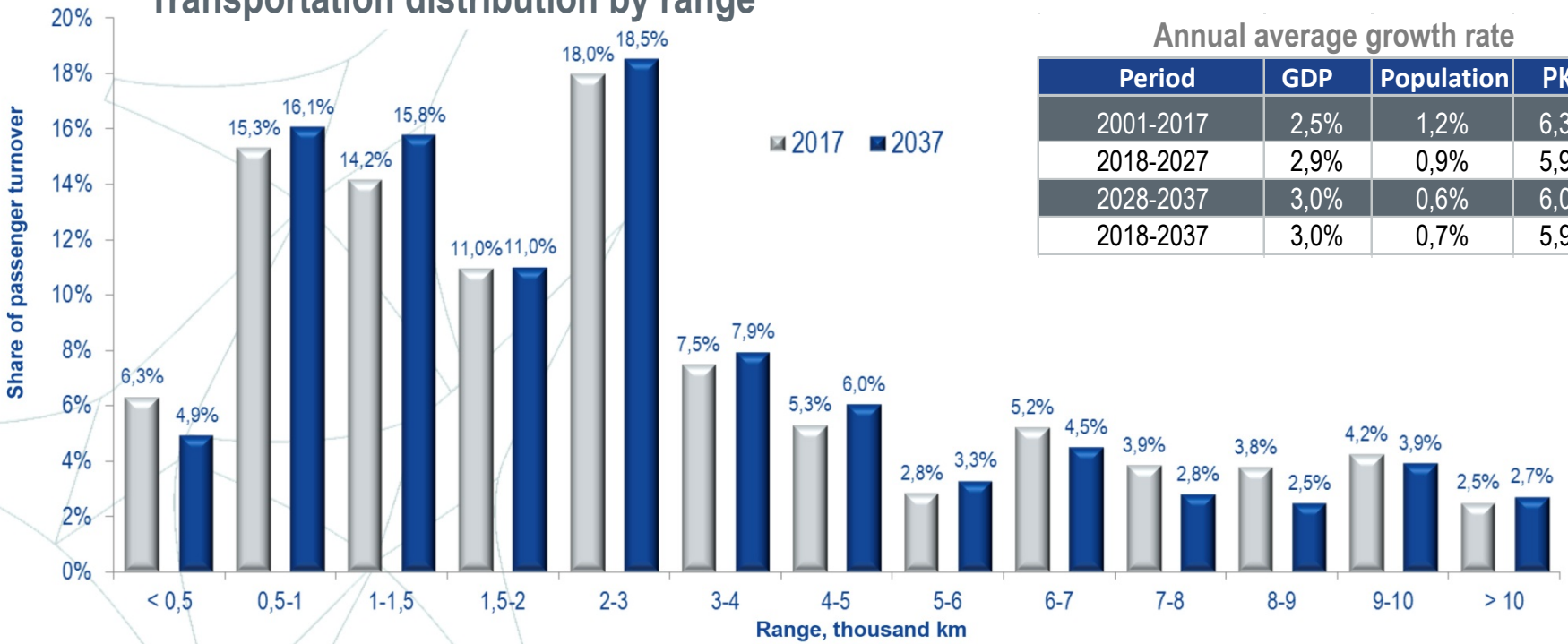
- 67.7% of the passenger turnover was executed with narrow-body and 25.7% with wide-body aircraft in 2017. By the end of the forecast period, the share of narrow-body aircraft transportation will increase to 78%, and the share of wide-body aircraft transportation will decrease to 18.4%. Total share of regional aircraft traffic will be reduced from 6.6% to 3.6%.

- The region acts more often as a buyer at the used aircraft market, purchasing up to 15% of its aircraft fleet thereat.

Regional review. Latin America

LA: air transportation

Transportation distribution by range



Annual average growth rate

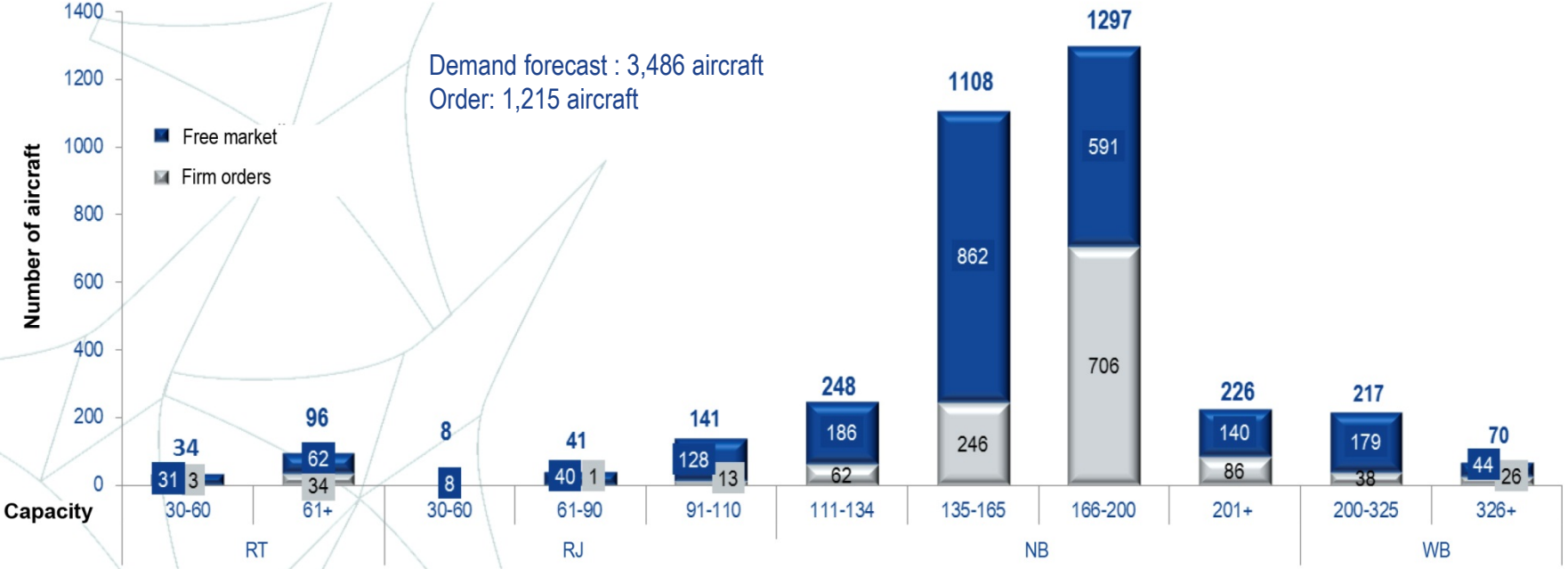
Period	GDP	Population	PKM
2001-2017	2,5%	1,2%	6,3%
2018-2027	2,9%	0,9%	5,9%
2028-2037	3,0%	0,6%	6,0%
2018-2037	3,0%	0,7%	5,9%

- The region does not belong to the leaders, neither on the achieved GDP nor on passenger traffic. Its world share in population is larger than that of world GDP and world transport, which is true for relatively underdeveloped regions. But GDP growth rate of (3.0%) and passenger turnover (5.9%) in the region exceeds the world average (2.8% and 4.6%, respectively), which gives reason to treat the region as developing.
- Per capita income and air mobility will increase during 20 years from 0.86 and 0.6 to 0.9 and 0.8 of the world average, respectively.
- 2,181 km median value of traffic distribution by range was rather low (2,778 world-average) in 2017 . Only China has a lower median value. It is expected that the distribution median will reduce to 2,120 km, i.e. by 2.8% by the end of the forecast period.

Regional review. Latin America

LA: passenger aircraft demand forecast till 2037

Demand forecast for new aircraft



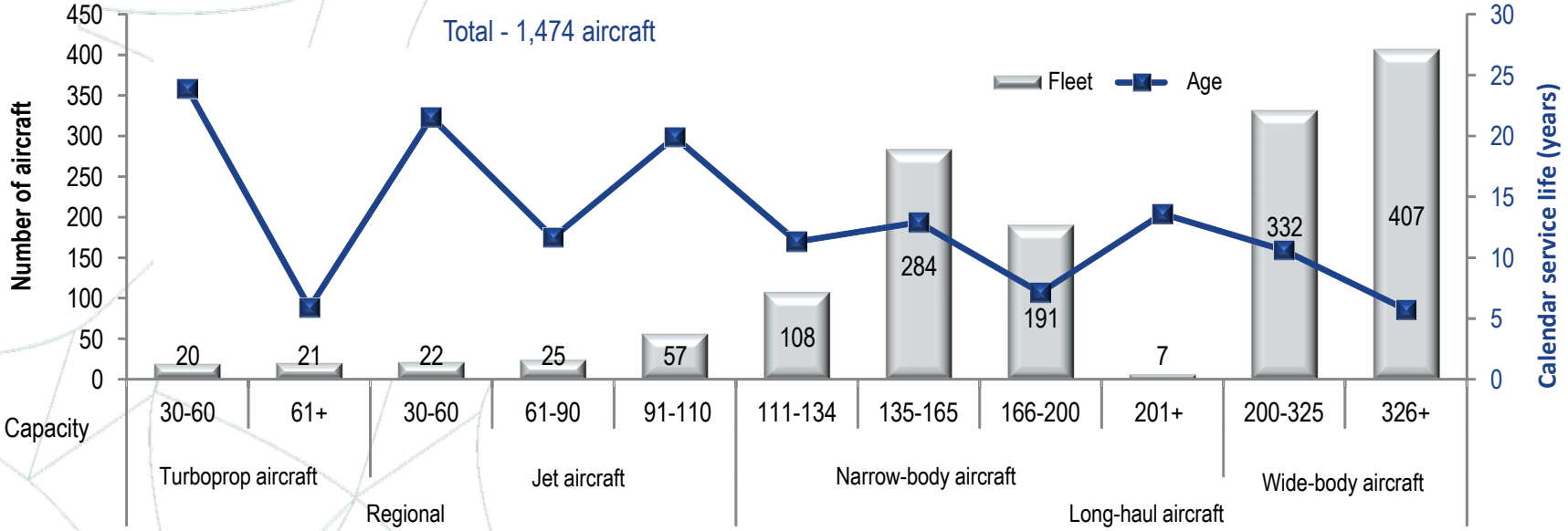
- It is expected that during the forecast period, the region's airlines will purchase 3,490 new passenger aircraft, of which 83% will be of narrow-body aircraft class, 8% — wide-body, 5% — regional turboprops and 4% — regional jets. Despite the fact that the share of the region in the world quantitative demand is only 4.7%, the stake of the region in the world's demand for narrow-body aircraft is noticeably larger — 9.7%. 35% of the expected overall demand has already been covered by firm orders, i.e. 38% of the narrow-body class and only 7% of regional jet class demand is covered with firm orders.

- The most wanted capacity groups will be 135-165 and 166-200 seats narrow-body aircraft (≈1,300 and ≈1 110 units respectively). Coverage of the demand by firm orders in these capacity groups is 54% and 22% respectively.

Regional review. Middle East

Mideast: regional fleet of passenger aircraft

Fleet of passenger aircraft



Half of the total fleet is formed by wide-body aircraft, 40% - narrow-body aircraft, 7% - regional jets and 3% — regional turboprop aircraft. The "newest" in the current aircraft fleet are wide-body aircraft of biggest capacity (5.7 years); the same seating group is the most numerous in the entire fleet.

Passenger traffic of wide-body aircraft is 4.5 times higher than the passenger traffic of narrow-body aircraft. Trends in the transportation ratio change between narrow-body and wide-body aircraft coincide with the global trend: reduction in the wide-body aircraft share (from 81.2% to 79.1% and increase in the narrow-body aircraft stake from 18.0% to 20.6%). The share of regional aircraft passenger traffic will reduce from 0.8% to 0.4%, mainly due to regional jets, as a share of regional turboprop transport is ≈0.1% for all forecast period.

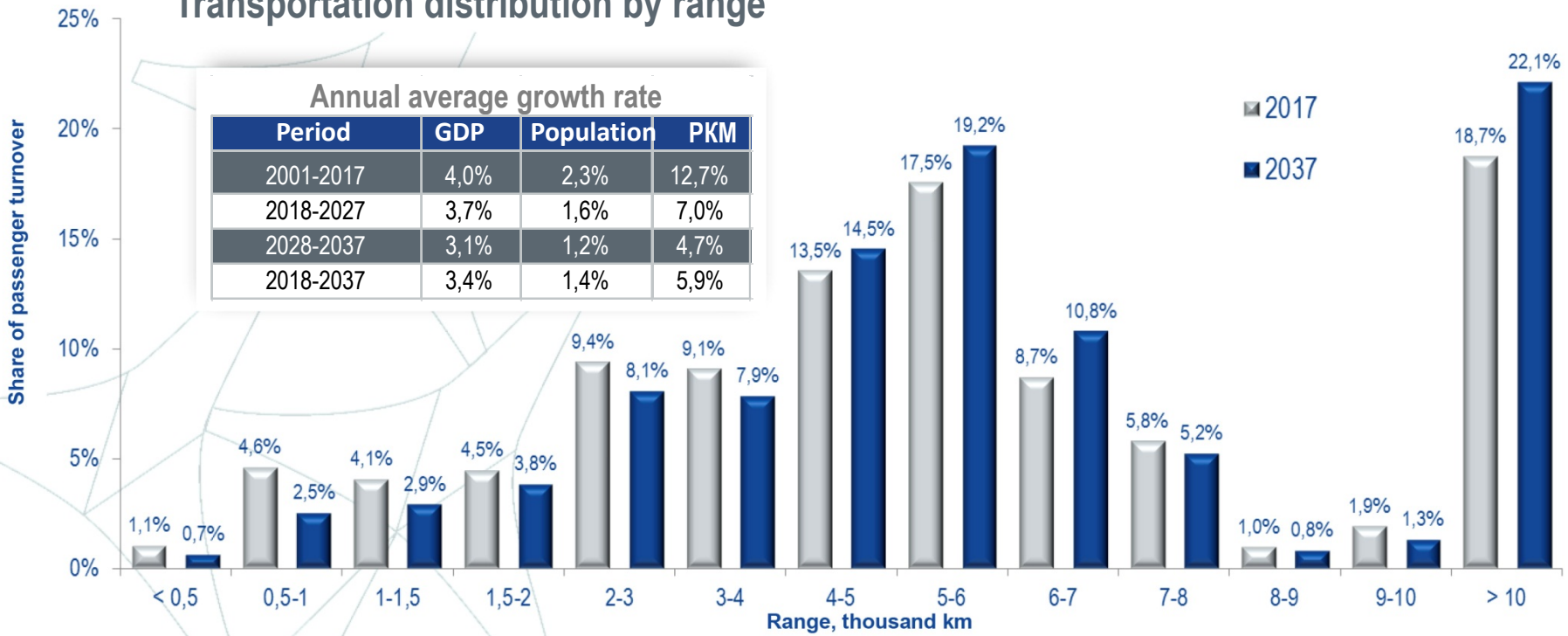
Regional review. Middle East

Mideast: air transportation

Transportation distribution by range

Annual average growth rate

Period	GDP	Population	PKM
2001-2017	4,0%	2,3%	12,7%
2018-2027	3,7%	1,6%	7,0%
2028-2037	3,1%	1,2%	4,7%
2018-2037	3,4%	1,4%	5,9%



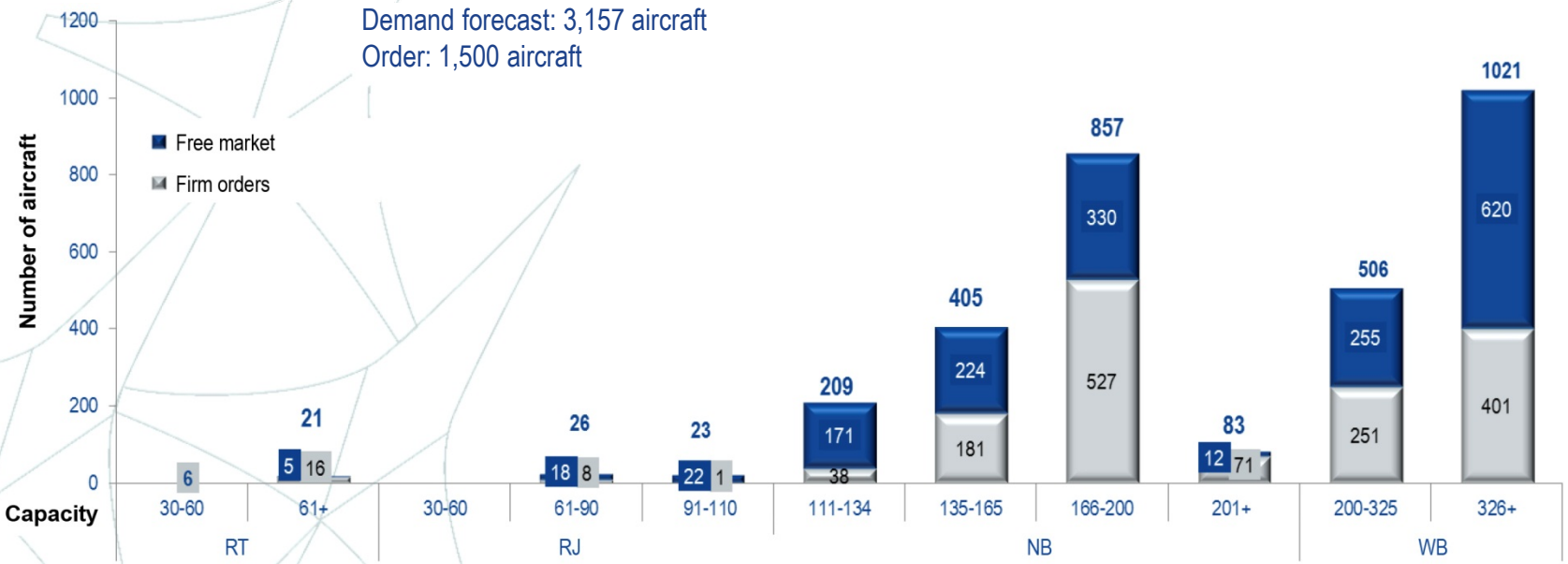
The shares of the region in world's population and GDP are approximately the same (3.3%), which characterizes medium level of economy development. Population (1.4%) and GDP (3.4%) growth rates are larger than the world average (0.9% and 2.8%, respectively). As a result, by 2037, the region's share in world GDP and world population will increase to 3.7%.

The Middle East region differs from other regions due to specific demand for transportation. Thus, the region successfully embodies a hub principle of transportation organized via its own largest airports located advantageously between Europe and Asia. The region's share in the global passenger traffic is abnormally high (9.3% in 2017 and 11.8% in 2037). In 2017, in terms of air mobility, the region was the third in the world - 2.8 of the world average (after North America - 4.76 and Europe - 2.84); in 2037, the region will move to the second place (3.22, North America will decline to 3.37). At that, in 2037, maximum passenger traffic will be achieved for flights with a range of more than 10 thousand km.

Regional review. Middle East

Mideast: passenger aircraft demand forecast till 2037

Demand forecast for new aircraft

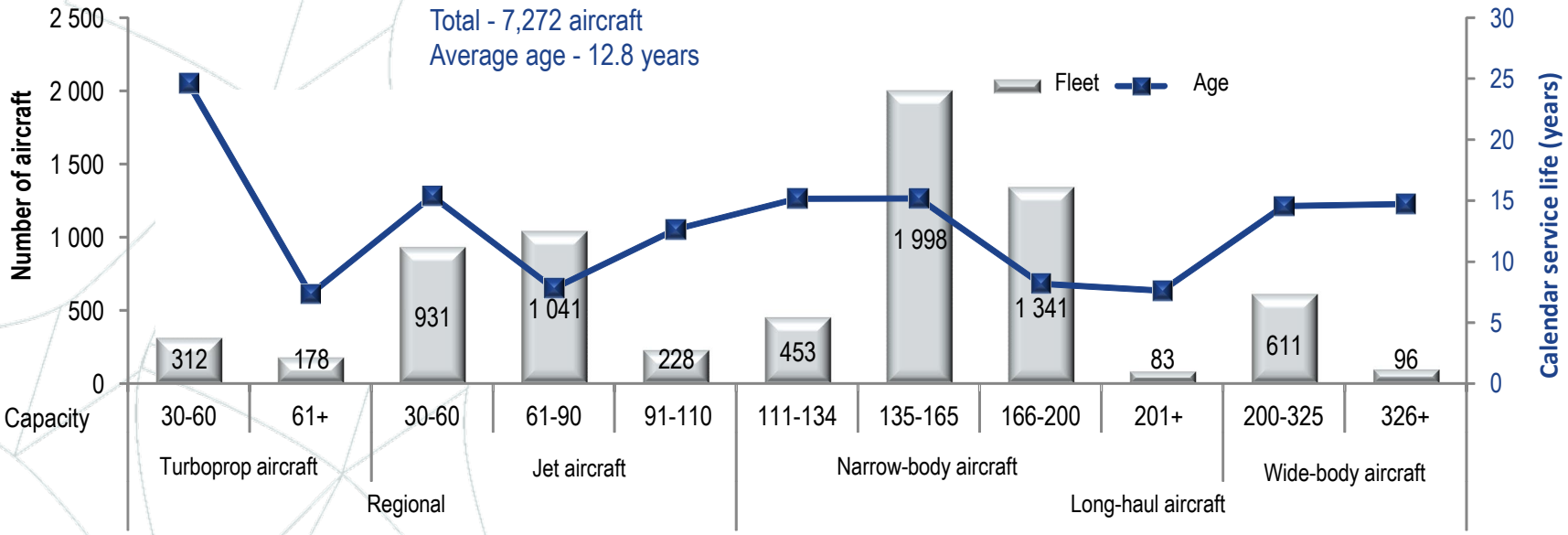


- The total demand for new passenger aircraft is estimated at ≈3,160 aircraft or USD 725 billion. It is expected that, during the forecast period, 48% of the quantitative demand will be covered by wide-body aircraft.
- Quantitative demand for new narrow-body aircraft (≈1,550 aircraft) will slightly exceed the demand for wide-body aircraft (≈1,530 aircraft). At that, 75% of the sales market in the region, in value terms, will be made up of wide-body aircraft. At that, demand for new regional aircraft is low and is estimated at ≈30 aircraft.
- Wide-body aircraft of 326+ class and narrow-body aircraft of 166-200 class (1,020 and 860 aircraft, respectively) will be the most demanded capacity groups among airlines in the region. Sales of wide-body 326+ aircraft will provide more than half of the total sales in value terms in the region.
- The region's airlines will provide 56% of the world's quantitative demand in the group of ultra-large aircraft (≈350 aircraft with a capacity >425 seats).
- Existing firm orders cover 48% of quantitative and 44% of value demand for new passenger aircraft in the region.

Regional review. North America

N.America: regional fleet of passenger aircraft

Fleet of passenger aircraft

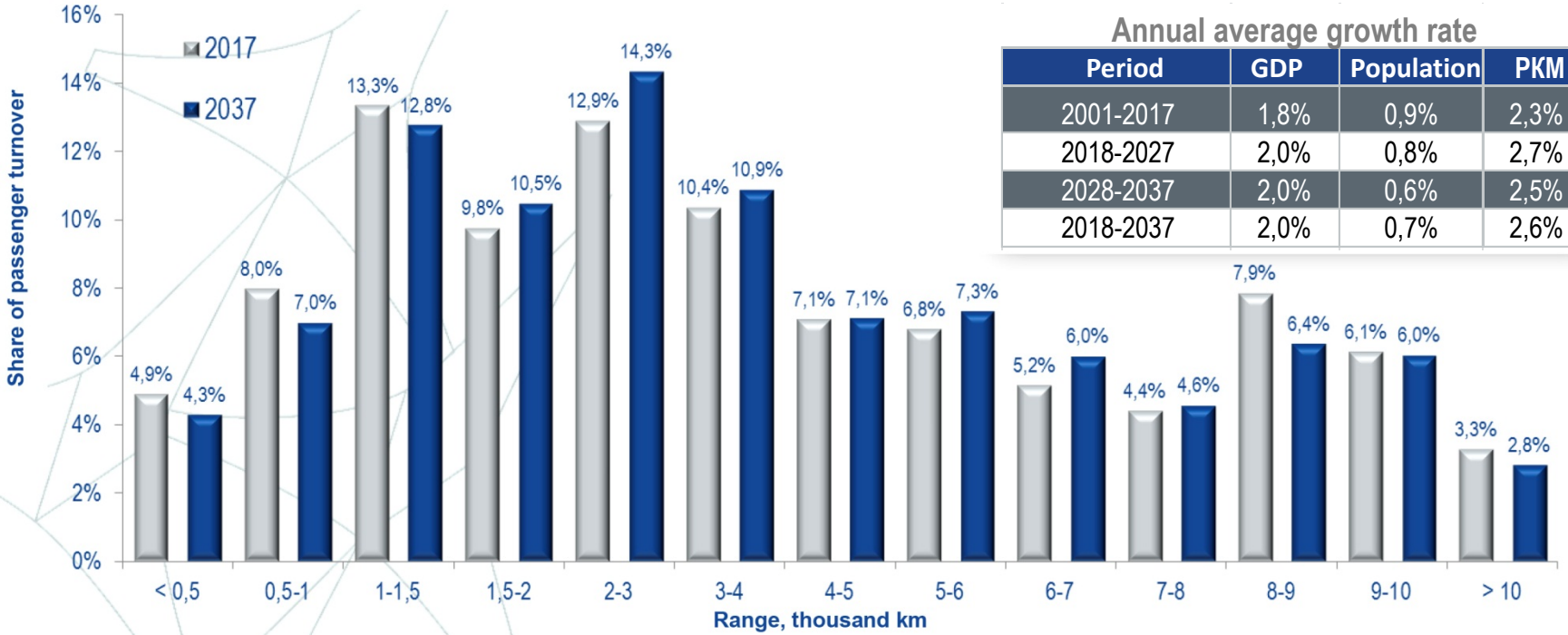


- The 2017 aircraft fleet consist of 7,272 units, the largest in the world. However, the average calendar service life of the fleet (12.8 years) was two years more than the world average. A distinctive feature of the region is the large share of regional jet traffic equaling to 9.3% in 2017 (with an average world level of 3.6%). By the end of the forecast period, the share of regional jet transport will be reduced to 8% (2.4% of the world's average).
- 56% of the world's fleet of regional jet aircraft is concentrated in this region, and 67% and 71% of the smaller capacity groups of aircraft (30-60 and 61-90 seats), respectively.
- Approx. 1,730 aircraft, i.e. 24% of the current region's fleet will remain "airworthy" by the end of the forecast period.

Regional review. North America

N.America: air transportation

Transportation distribution by range



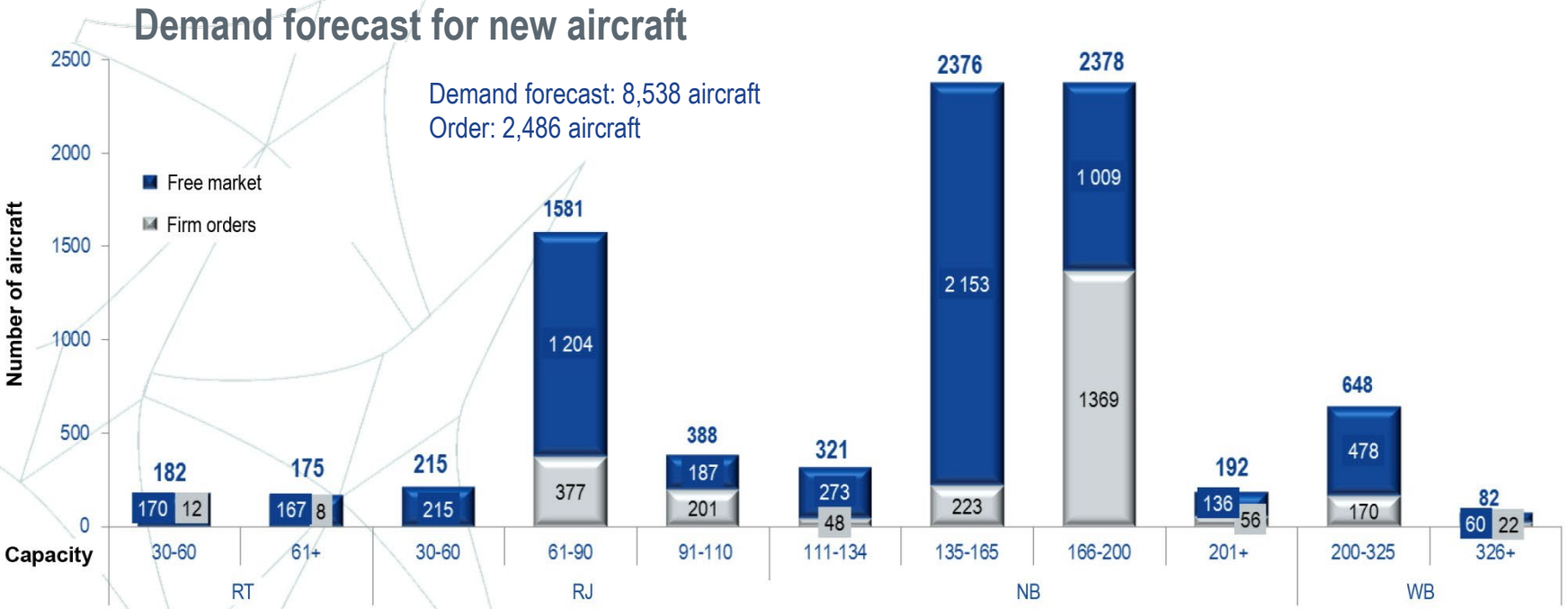
Annual average growth rate

Period	GDP	Population	PKM
2001-2017	1,8%	0,9%	2,3%
2018-2027	2,0%	0,8%	2,7%
2028-2037	2,0%	0,6%	2,5%
2018-2037	2,0%	0,7%	2,6%

- North America was the second after Europe in terms of the world's 2017 GDP share. The region's GDP growth rate is lesser than the world average and the fast-growing Asia-Pacific region (excluding China) will surpass this region by the end of the forecast period. But in terms of per capita income, North America remains the undisputed leader in the world ranking: by the end of the forecast period, Europe (2nd place in the ranking) will not even reach the North America's 2017 level .
- The region lost its world leadership in passenger traffic in 2017 (Europe is the current leader), but in terms of air mobility of the population it will remain the first in the world during the entire forecast period.
- Median value of the traffic distribution by range (2,642 km) is close to the world average (2,778 km) and it will increase during 20 years by 5.2%, to the current average value (the world average itself will decrease by 1.3% to 2,742 km).

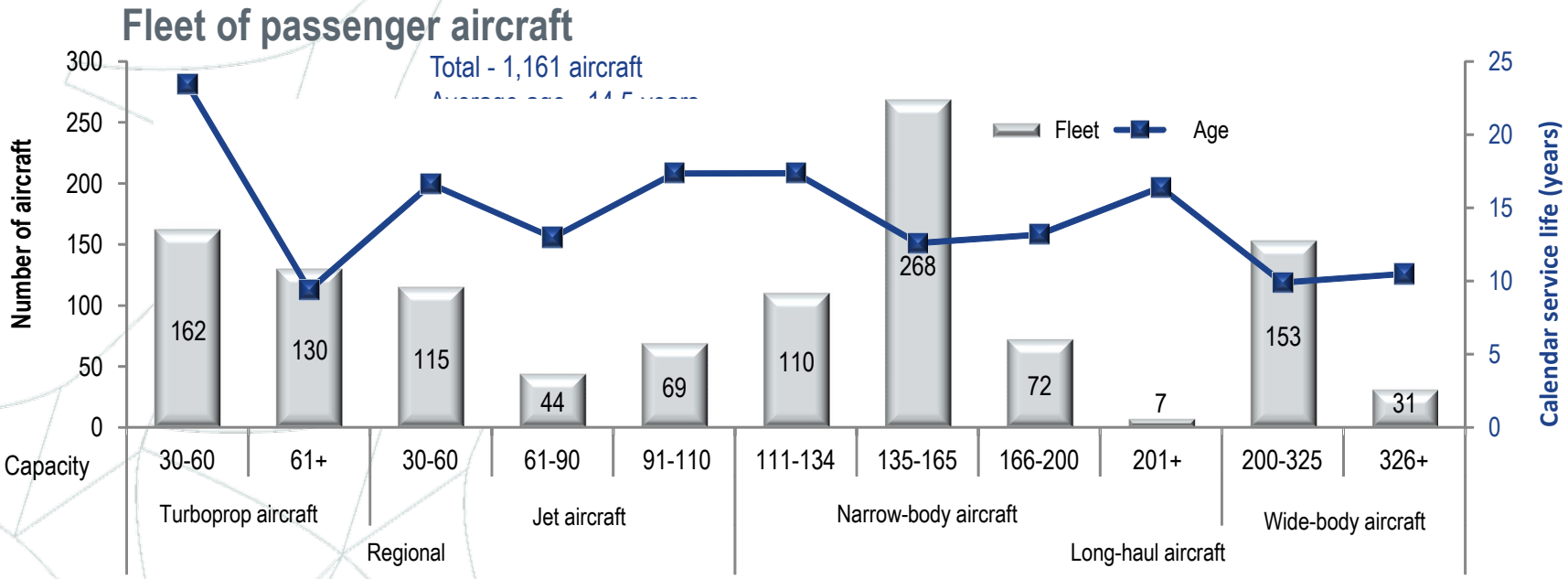
Regional review. North America

N.America: passenger aircraft demand forecast till 2037



- The total demand for new aircraft in the region is estimated at ≈8,540 aircraft or USD 909 billion, which corresponds to a global share of 19.6% (3rd place in the ranking) in quantitative terms and 14.7% (4th place in the ranking) in value terms. Available firm orders cover 29% of the regional demand in quantitative terms and 32% in value terms. The most popular will be narrow-body aircraft with 135-165 and 166-200 seats (≈2,380 in each of these segments).
- A distinguishing feature of the region is the abnormally high demand for 61-90 seat regional jet aircraft of 1,580 units, which is 74% of this capacity group's total world requirement.
- 89% of the total wide-body demand of 730 units will be covered by the smaller aircraft capacity group (up to 325 seats).

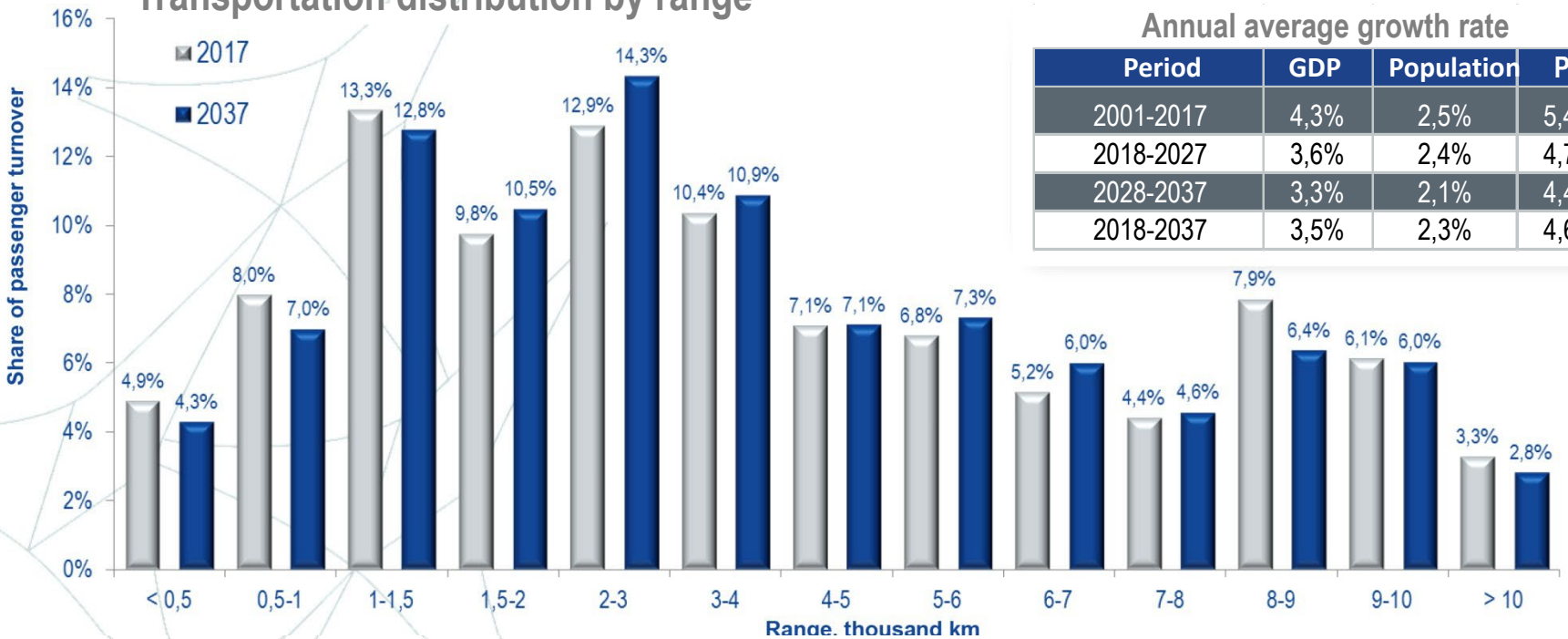
Regional review
Africa: regional fleet of passenger aircraft



- Africa's share of in the modern world fleet is 4.4%
- The region's fleet consists of 1,161 aircraft, of which only 39% belong to narrow-body class (58% world average).
- A share of regional aircraft in the modern fleet is relatively high (25% of regional turboprops and 20% of regional jets at world's average of 10% and 15%, respectively).
- Africa is one of the two exception regions, where the share of wide-body aircraft traffic will increase in the forecast period (from 50.5% to 53.4% against the narrow-body air traffic share stagnation ≈41.3%). It should be noted that absolute value of the wide-body aircraft transportation share exceeds the same share of the narrow-body traffic in common with the Middle East airlines.
- Another distinctive feature of the region is high share of regional jet aircraft transportation (2.5%, with the world average level of 0.9).

Regional review
Africa: air transportation

Transportation distribution by range



Annual average growth rate

Period	GDP	Population	PKM
2001-2017	4,3%	2,5%	5,4%
2018-2027	3,6%	2,4%	4,7%
2028-2037	3,3%	2,1%	4,4%
2018-2037	3,5%	2,3%	4,6%

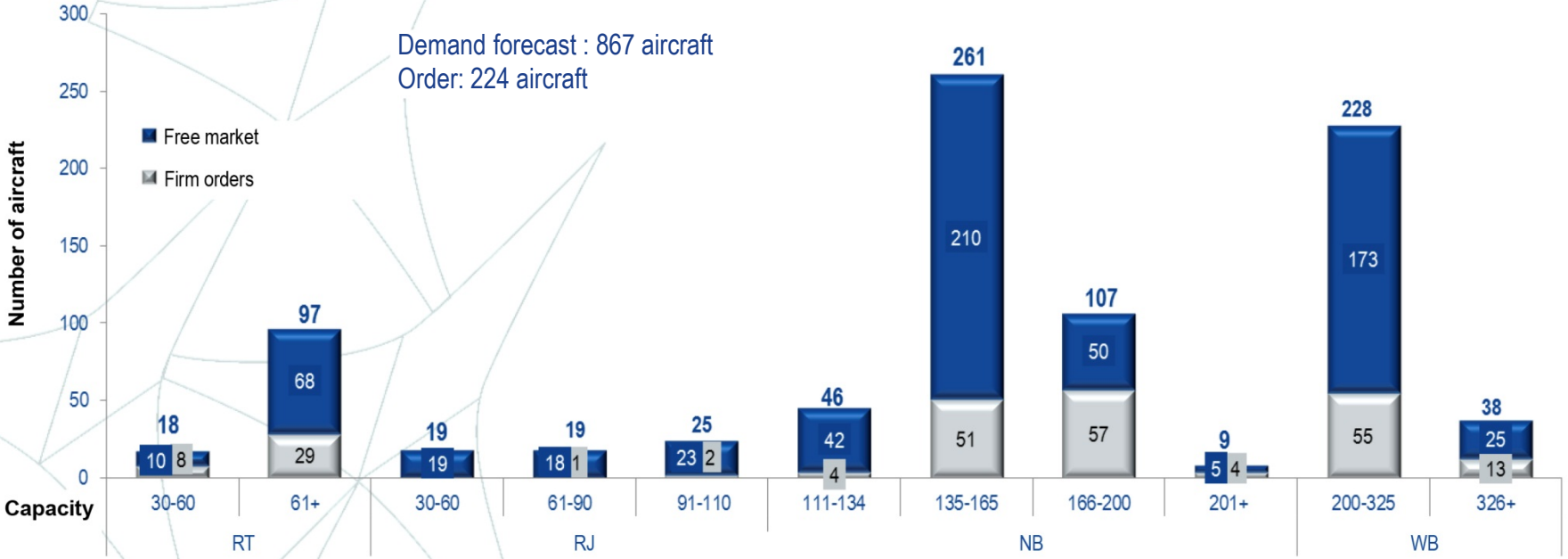
- The population is one of the few areas in which the region is among the leaders taking the third position after APR (excl. China) and PRC. 16.6% of the world's population lived in Africa in 2017. The region's population growth rate will be the highest in the world (2.3% at the world average of 0.9%), so that the region will overtake China in 2023. The region's world share will increase to 21.7% by 2037.

- In terms of per capita income and air mobility, the region ranks last (18% and 13% of the world average levels in 2017, respectively). Despite the fact that GDP growth rate is higher than the world average, and growth rate of passenger traffic coincides with the world average, per capita income and air mobility will decrease to 16% and 10% of the world average, respectively, mainly due to growth of population.

- The passenger traffic distribution by range is characterized by a sufficiently high median value: 3,107 km in 2017 and 3,103 km in 2037 (only Middle East and Europe air companies reached higher level).

Regional review
Africa: passenger aircraft demand forecast till 2037

Demand forecast for new aircraft



- The region is characterized by high activity in the secondary market, where 41% of all aircraft are purchased. Demand for new aircraft in the region is estimated at 870 aircraft or USD 130 billion, which corresponds to a world share of 2.0% in quantitative terms and 2.1% in value terms. Available firm orders cover 26% of regional demand in quantitative terms and 28% in value terms. The most popular will be narrow-body aircraft with 135-165 seats and wide-body aircraft with 200-325 seats (≈260 and 230 aircraft, respectively).

- Most of sold aircraft will be narrow-body ≈420, which is 49% of total demand (the world's average share for narrow-body aircraft is 68%). Demand for wide-body aircraft is estimated at 270 aircraft (31%, with the world's average of 18%). The specificity of the region is a large share of demand for regional turboprops — 115 aircraft or 13% (in the world - 5%). Demand for regional jet aircraft is forecasted in the amount of ≈60 aircraft (7%, with the world average level of 9%).

Supplementary materials

World aircraft fleet by the end of 2017 (AC)

Capacity / aircraft class	World as a whole	Africa	APR without China	CIS without RF	Europe	Lat. America	Middle East	North America	China	Russia
30-60 RT	1,294	162	275	46	188	161	20	312	28	102
61+ RT	1,282	130	477	4	339	111	21	178	0	22
30-60 RJ	1,384	115	44	30	107	55	22	931	16	64
61-90 RJ	1,476	44	76	4	193	32	25	1,041	36	25
91-110 RJ	1,083	69	142	46	196	192	57	228	78	75
111-134 NB	1,601,	110	106	39	192	183	108	453	293	117
135-165 NB	5,794	268	574	75	808	469	284	1,998	1,098	220
166-200 NB	7,355	72	1,584	74	2,212	413	191	1,341	1,314	154
201+ NB	659	7	150	12	259	61	7	83	30	50
200-325WB	3,273	153	775	26	682	150	332	611	477	67
326+WB	1,313	31	381	3	254	23	407	96	64	54
Total	**26,514**	**1,161**	**4,584**	**359**	**5,430**	**1,850**	**1,474**	**7,272**	**3,434**	**950**

Supplementary materials

Demand for new passenger aircraft in 2018-2037

Capacity / aircraft class	World as a whole	Africa	APR without China	CIS without Russia	Europe	Lat. America	Middle East	North America	China	Russia
30-60 RT	649	18	134	25	84	34	6	182	106	60
61+ RT	1,544	97	688	10	417	96	21	175	2	38
30-60 RJ	312	19	12	6	25	8	0	215	5	22
61-90 RJ	2,143	19	54	17	147	41	26	1,581	220	38
91-110 RJ	1,546	25	125	56	279	141	23	388	369	140
111-134 NB	1,363	46	60	26	94	248	209	321	289	70
135-165 NB	8,876	261	1,063	72	1,176	1,108	405	2,376	2,083	332
166-200 NB	17,051	107	3,972	76	4,277	1,297	857	2,378	3,691	396
201+ NB	2,430	9	844	11	831	226	83	192	168	66
200-325WB	5,010	228	1,352	59	926	217	506	648	991	83
326+WB	2,735	38	821	2	463	70	1,021	82	196	42
Total	**43,659**	**867**	**9,125**	**360**	**8,719**	**3,486**	**3,157**	**8,538**	**8,120**	**1,287**

Catalog cost of new passenger aircraft to be delivered to the market in 2018–2037, USD billion

Capacity / aircraft class	World as a whole	Africa	APR without China	CIS without Russia.	Europe	Lat. America	Middle East	North America	China	Russia
30-60 RT	14	0.4	2.7	0.5	1.8	0.7	0.1	3.8	2.4	1.2
61+ RT	47	3.0	21.1	0.3	12.8	2.9	0.6	5.4	0.0	1.2
30-60 RJ	11	0.6	0.4	0.2	0.8	0.3	0.0	7.6	0.2	0.8
61-90 RJ	99	0.9	2.6	0.8	7.0	2.0	1.2	72.1	10.4	1.9
91-110 RJ	81	1.3	6.6	2.9	14.7	7.4	1.2	20.4	19.4	7.3
111-134 NB	121	4.1	5.2	2.3	7.9	22.4	19.1	28.5	25.7	6.1
135-165 NB	944	27.3	115.4	7.6	125.9	117.1	43.1	250.7	222.1	34.9
166-200 NB	2,065	13.4	479.1	9.3	529.3	155.3	102.9	286.3	439.6	49.5
201+ NB	339	1.3	118.1	1.6	115.6	31.6	11.6	26.6	23.4	9.2
200-325WB	1,388	63.2	366.5	14.9	264.1	56.4	140.4	177.2	281.8	23.7
326+WB	1,051	14.2	311.9	0.8	175.7	25.8	404.8	30.0	72.1	16.0
Total	**6,161**	**129.7**	**1 429.6**	**41.2**	**1,255.6**	**422.0**	**725.1**	**908.7**	**1,097.0**	**151.8**

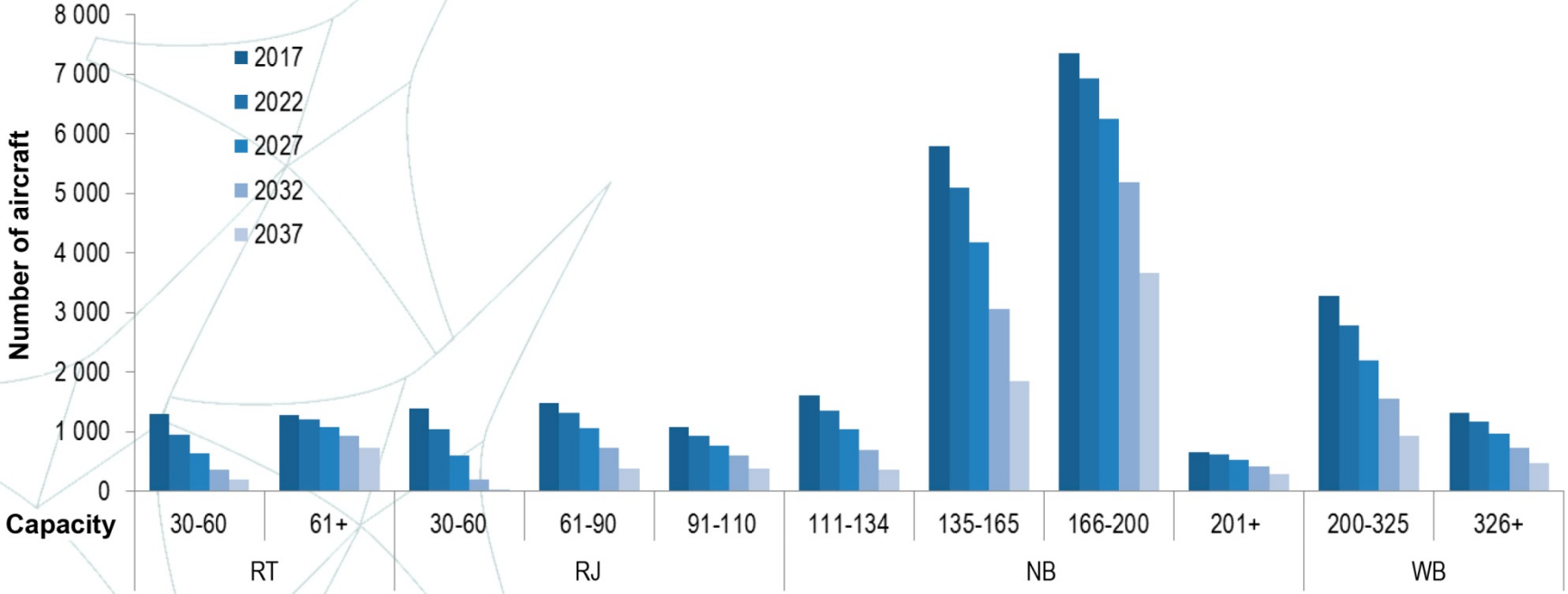
Supplementary materials

Region shares in world demand

Regions of world	All groups		Regional				Long-haul			
	All classes		Turboprops		Jets		Narrow-body		Wide-body	
	Aircraft	USD	Aircraft	USD	Aircraft	USD	Aircraft	USD	Aircraft	USD
APR without China	20.9%	23.2%	37.5%	39.1%	54.6%	52.4%	21.5%	22.4%	28.1%	27.8%
Europe	20.0%	20.4%	22.8%	23.9%	14.8%	15.7%	21.0%	20.5%	19.7%	22.3%
North America	19.6%	14.7%	16.3%	15.0%	11.3%	11.7%	20.0%	20.7%	17.9%	18.0%
China	18.6%	17.8%	5.9%	5.9%	5.0%	5.2%	17.7%	17.1%	15.3%	14.5%
Lat. America	8.0%	6.9%	5.2%	5.5%	4.8%	5.0%	9.7%	9.4%	9.4%	8.5%
Middle East	7.2%	11.8%	4.9%	4.0%	4.7%	5.1%	5.2%	5.1%	3.7%	3.4%
Russia	2.9%	2.5%	4.5%	3.8%	2.0%	2.1%	2.9%	2.9%	3.4%	3.2%
Africa	2.0%	2.1%	1.6%	1.4%	1.6%	1.5%	1.4%	1.3%	1.6%	1.6%
CIS without RF	0.8%	0.7%	1.2%	1.3%	1.2%	1.3%	0.6%	0.6%	0.8%	0.6%
World	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
(for reference)	(43 659 AC)	(USD 6 161 bln)	(2 190 AC)	(USD 61 bln)	(3 994 AC)	(USD 191 bln)	(29 700 AC)	(USD 3 467 bln)	(7 742 AC)	(USD 2 438 bln)

Supplementary materials

Schedule of decommission of existing fleet of commercial aircraft



The rest of the current fleet, by year of forecast period

Forecast year	Total	RT		RJ			NB				WB	
		30-60	61+	30-60	61-90	91-110	111-134	135-165	166-200	201+	200-325	326+
2017	26,514	1,294	1,282	1,384	1,476	1,083	1,601	5,794	7,355	659	3,273	1,313
2022	23,373	947	1,202	1,043	1,309	925	1,354	5,101	6,932	611	2,788	1,161
2027	19,282	630	1,084	591	1,055	764	1,046	4,180	6,247	529	2,196	960
2032	14,419	368	926	187	718	595	686	3,057	5,178	416	1,555	733
2037	9 260	188	724	21	374	379	361	1,851	3,669	296	929	468

Supplementary materials

Abbreviation	Interpretation
CRAF	Civil reserve air fleet
M&A	Mergers and acquisitions
APR	Asia-Pacific region
Mideast	Middle east
GDP	Gross domestic product
AC	Aircraft
WTO	World Trade Organization
km	kilometers
PRC	People's Republic of China
CSL	Calendar service life
LA	Latin America
bln	billion
UAC	United Aircraft Corporation
PKM	Passenger-kilometer
RJ	Regional jet aircraft
N. America	North America
CIS	Commonwealth of Independent States
USA	The United States of America
TKM	Ton-kilometers
thou	Thousand
NB	Narrow-body aircraft
WB	Wide-body aircraft

Following information was used for this Review preparation: FlighGlobal Fleets Analyzer, ICAO Data Plus, IATA, IHS Markit, OOH, Transport Clearing House, state committees of individual countries and other sources.