How COVID-19 is impacting the Aerospace sector

Webinar

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The Roland Berger Aerospace COVID-19 task force Europe

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COVID-19 has caused a major drop in travel demand and is significantly impacting the aviation and aerospace sectors

COVID-19's impact on aerospace

1) Death rates also vary between countries due to variations in the breadth of testing efforts; 2) Revenue Passenger Kilometers; 3) Maintenance, Repair & Overhaul

Source: Roland Berger
Global commercial aircraft groundings have now begun a very moderate recovery, with Europe and China having bottomed-out in mid- to late-April.

Development of global aircraft groundings¹), Jan-Jun 2020²) [grounded % of in-service fleet]

1) Considering narrowbodies, widebodies and regional jets only; 2) Based on reported groundings data, adjusted based on press research from 4th March

Source: China MoT, Cirium, Roland Berger
The two key indicators for the industry's future – level of the 'New Normal' and the growth thereafter – are influenced by a system of 11 drivers.

Level of the 'New Normal'
Level to which aviation RPKs recover once travel demand reaches stability post-crisis

1. Economic growth
2. Yield/ticket price
3. Government influences
4. Consumer spending on aviation
5. Globalisation
6. Environmental concerns
7. Remote business practices
8. Consumer health concerns
9. Government travel restrictions
10. Airline operations
11. Airport experience

Growth rate after reaching the 'New Normal'
Ongoing annual growth rate once travel demand reaches stability post-crisis

- Traditional drivers
- Long-term trends modified by COVID-19
- New COVID-19 specific drivers
- Some link
- Significant link

Source: Primary and secondary research, Roland Berger
Global air traffic is expected to be hit hard by the COVID-19 crisis; our three scenarios span the range from Rebound to Recession.

Potential scenarios for how global travel demand will recover post COVID-19

**Revenue passenger kilometer, 2018-30 [RPK tn]**

![Graph showing scenarios]

**Assumptions for scenarios**

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>Scenario 1: Rebound</th>
<th>Scenario 2: Delayed cure</th>
<th>Scenario 3: Recession</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration of air travel restrictions</td>
<td>–</td>
<td>2 months</td>
<td>4 months</td>
<td>6 months</td>
</tr>
<tr>
<td>Fleet retirements during crisis</td>
<td>–</td>
<td>Per usual ret. curves</td>
<td>Accelerated for older a/c</td>
<td>3A: Adjusted retirements¹</td>
</tr>
<tr>
<td>&quot;New normal&quot;² reached by:</td>
<td>Winter 2020</td>
<td>Summer 2021</td>
<td>Summer 2022</td>
<td></td>
</tr>
<tr>
<td>Level of the &quot;new normal&quot;</td>
<td>100%</td>
<td>100%</td>
<td>90%</td>
<td>80%</td>
</tr>
<tr>
<td>Year of recovery to 2019 RPKs</td>
<td>–</td>
<td>2020</td>
<td>2022</td>
<td>2024</td>
</tr>
<tr>
<td>CAGR after reaching the &quot;new normal&quot;</td>
<td>4.6%</td>
<td>4.6%</td>
<td>4.1%</td>
<td>3.6%</td>
</tr>
<tr>
<td>Indicative likelihood of occurring</td>
<td>–</td>
<td>Likely</td>
<td>Most likely</td>
<td></td>
</tr>
</tbody>
</table>

1) Assumes accelerated retirements of old, widebody aircraft and delayed retirement of narrowbody aircraft; 2) Reference case in which retirements follow standard pre-crisis patterns; 3) "New normal" defined here as the status of global travel demand once aviation RPKs stabilize following the COVID-19 crisis.

Source: Primary and secondary research, Roland Berger Aircraft Production Model.
Due to reduction in air travel new aircraft demand is expected to be significantly lower forcing the industry to shrink.

New aircraft deliveries 2020-2028 [# of a/c]

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>Scenario 2</th>
<th>Scenario 3a</th>
<th>Scenario 3b</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shut down period</td>
<td></td>
<td>3 months</td>
<td>6 months</td>
<td>6 months</td>
</tr>
<tr>
<td>Time to recovery</td>
<td></td>
<td>Summer 2021</td>
<td>Summer 2022</td>
<td>Summer 2022</td>
</tr>
<tr>
<td>'New Normal' traffic volume</td>
<td></td>
<td>90%</td>
<td>80%</td>
<td>80%</td>
</tr>
<tr>
<td>Future growth CAGR</td>
<td></td>
<td>4.1%</td>
<td>3.6%</td>
<td>3.6%</td>
</tr>
</tbody>
</table>

New A/C deliveries

2020-2028

Source: Airbus and Boeing Global Market Forecast; Roland Berger (projection)
Global MRO spending by airlines on large commercial aircraft could fall by 50-70% in 2020

Global Large Commercial Aircraft MRO market size development, 2019-20 [USD bn]

Key assumptions

> Decline of global flying hours in 2020 by:
  - 40-45% under Scenario 2
  - 60-65% under Scenario 3

> Airlines ground older aircraft first when traffic declines due to:
  - Higher operating costs of older aircraft (primarily maintenance and fuel)
  - Cash costs of maintenance events (e.g. heavy airframe checks, engine overhauls)

> Share of global fleet over 10 years old:
  - c. 45% at the end of 2019
  - Drops to c. 40% under Scenarios 2 and 3A due to early retirement during and following the crisis
  - Stays at the same level in scenario 3B, as older aircraft are parked during the crisis

Source: Boeing, Aircraft Commerce, Cirium, IATA, RAND, Roland Berger
A clear playbook to master the crisis has emerged – Preparing for the 'New Normal' is the next priority

I. Crisis management
Immediate future

- Establish a crisis mgmt. taskforce to manage/monitor crisis response
- Implement hygiene measures, ramp down operations, secure continuity of critical functions
- Secure and monitor ongoing liquidity position
- Monitor health of critical suppliers, and provide necessary support
- Compress spend without destroying the basis to recover
- Ensure commercial continuity and link with the customer

LARGELY DONE

II. Transition
Rest of 2020 & 2021

- Revisit and revise corporate strategy to fit with the 'New Normal'
- Realign production and supply chain planning in line with revised demand signal
- Begin shifting operations and resources back to new normal mode
- Secure operational ramp-up in a timely and cost-controlled manner in both MAKE and BUY
- Implement "No Regret" resizing and efficiency measures

Prepare efficient restart after crisis

III. 'New Normal'
2021+

- Review supply chain strategy and configuration to fit with the defined corporate strategy
- Assess and revise operating model in line with changes in strategy
- Monitor health and longevity of business & supply chain operations
- Optmise existing footprint in line with changes in industry demand/landscape
- Implement restructuring and operations efficiency programmes

Emerge stronger out of the crisis

Source: Roland Berger
COVID-19 will have varying degrees of impact on key industry trends which need to be considered when defining 'New Normal' strategy for companies.

- Launch of the next generation aircraft
- Globalization of footprint
- Race to capture the aftermarket
- Consolidation within aerospace
- Emergence of Chinese OEMs
- Drive towards sustainability
- Automation

Source: Roland Berger