Air Connectivity
Concept and examples
Connectivity Concept

Capacity of the transport value chain to move passengers, mail or cargo from **one point to another**, with

- Shortest possible time
- Maximum user satisfaction
- Adequate price

Supporting regulatory framework to optimize connectivity:
Connectivity Developments

<table>
<thead>
<tr>
<th>Number of Total Passengers</th>
<th>Number of Direct Passengers</th>
<th>Number of Indirect Passengers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 billion</td>
<td>818 million</td>
<td>349 million</td>
</tr>
</tbody>
</table>

68% of all passenger take **direct** flights – while **32%** still take **indirect** flights

- Increased exchanged of traffic rights: approximately **300+ Open Skies Agreements** involving **146 States**
- Shift towards **hub-system** (center of gravity) proves as efficient
- Different **competition strategies** for individual airlines
  - Due to efforts in the field of connectivity and liberalization the **worldwide detour factor** is only **5%**
Direct versus Indirect Cost and Distance

- **TC**: Total cost inclusive of taxes, fees, and charges
- **TFC**: exclusive of fuel surcharge
- **DF**: Detour Factor

![Map of global routes and costs](image)

- USA - Mexico:
  - TC ~ 410 CAD
  - TFC 143 CAD
  - 21,527,251 PAX
  - 44% Connecting
  - DF: 1.09

- Germany - Thailand:
  - TC ~ 819 CAD
  - TFC 155 CAD
  - 72% Connecting
  - DF: 1.06

- Japan - Australia:
  - TC ~ 1398 CAD
  - TFC 140 CAD
  - 1276973 PAX
  - 53% Connecting
  - DF: 1.11

- Additional routes and costs are shown on the map.
The cost of detour and lack of connectivity

Difference in operating costs for Senegal/Morocco to Kenya/Tanzania

- The detour factor to travel from Morocco/Senegal to Kenya/Tanzania is 1.40, meaning that passengers travel on average 40% more distance than a nonstop flight.

- The market size is 25,000 passenger a year and 19,000 of them are flying a connecting flight.

- Based on the average cost structure of air carriers, the flight operations costs\(^1\) are 38,900 $ for the nonstop flight and 54,500 $ for the connecting flight.

- The extra cost of this network inefficiency (economic and environment) is ultimately borne by all the passengers of the network.

\(^1\) flight crew salaries and expenses, aircraft fuel and oil, flight equipment insurance, rental of flight equipment.
Overcoming Connectivity Inefficiencies

- **Market Access**
  - Restrictive exchange of *traffic rights* (Bilateral Agreements)
  - *Unsatisfactory implementation* of regional frameworks/multilateral agreements
  - Restrictions through *aircraft ownership and control* clauses

- **Sub-optimal use of**
  - *Air Navigation Services* (incl. ASBUs)
  - *Aircraft Fleets*
  - *Airport Systems*
  - *Facilitation and Security*

- **Lack of Intermodality**

- **Charges and Taxes**
  - Disregard of *key principles*: cost-relatedness, transparency, consultation with users, non-discrimination
Air Connectivity

Regional outlook
Connectivity of the Middle East in 2015

Number of passengers connecting or flying non-stop to their destination in the Middle East

Source: ICAO
Top State Pairs

Source: ICAO
Top connecting Hubs to/from the Middle East in 2015

Source: ICAO
Connectivity of Iran in 2015

Number of passengers connecting or flying non-stop to their destination to/from Iran

Source: ICAO
Top destinations to/from Iran in 2015

Top 20 Destinations of Traffic Departing From Iran 2015

Top 20 Origins of Traffic Destined to Iran 2015

Source: ICAO
Top International Hubs connecting Traffic to/from Iran in 2015

Source: ICAO
**Top 5 Routes (Unidirectional) with no Direct Flights**

<table>
<thead>
<tr>
<th>Route</th>
<th>Passengers (thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iran &lt;-&gt; United States</td>
<td>400</td>
</tr>
<tr>
<td>Iran &lt;-&gt; Canada</td>
<td>150</td>
</tr>
<tr>
<td>Iran &lt;-&gt; Denmark</td>
<td>60</td>
</tr>
<tr>
<td>Iran &lt;-&gt; Australia</td>
<td>50</td>
</tr>
<tr>
<td>Iran &lt;-&gt; Spain</td>
<td>30</td>
</tr>
</tbody>
</table>

**Proportion of Passengers Connecting via Top Hub**

<table>
<thead>
<tr>
<th>Top Connecting Hub</th>
<th>Proportion of Passengers Connecting via Top Hub</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dubai (DXB)</td>
<td>26%</td>
</tr>
<tr>
<td>Frankfurt (FRA)</td>
<td>37%</td>
</tr>
<tr>
<td>Istanbul (IST)</td>
<td>60%</td>
</tr>
<tr>
<td>Dubai (DXB)</td>
<td>61%</td>
</tr>
<tr>
<td>Istanbul (IST)</td>
<td>70%</td>
</tr>
</tbody>
</table>

*Source: ICAO*
Connectivity map - Iran

Major air traffic originating from Iran in 2015

http://gato.nebula.grid.icm.edu.pl/

Source: ICAO, ICM
Connectivity map - Oman

Major air traffic originating from Oman in 2015

Source: ICAO, ICM
Connectivity map - Turkey

Major air traffic originating from Turkey in 2015

Source: ICAO, ICM