



ICAO

INTERNATIONAL CIVIL AVIATION ORGANIZATION

A UN SPECIALIZED AGENCY

RECONNECTING **THE** WORLD

ICAO Long-term Traffic Forecasts (LTF)

Behzad Taghipour

Associate Aviation Officer
(ATB/ECD/ADA)

Assembly Resolution A41-27

Appendix E : Forecasting, planning and economic analyses

“The Assembly requests the council to ..”

- **Develop and update** forecasts of future trends and developments in civil aviation, and to make these **available to Member States**

- Continue to **update one single set of long-term traffic forecast** For the development of customized or more detailed forecasts such as **air navigation systems planning and environmental analysis**
- keep **improving the accuracy of forecasts** through the **refinement of forecasting methodologies and use of big data**

ADAP – Aviation Data and Analysis Panel

31 States and 6 international organization

Multi-Disciplinary Working Group on Long-Term Traffic Forecasts (MDWG-LTF) established by ADAP

- In collaboration with the Secretariat
- Development and update of a **Single set of long-term traffic forecasts**



Users can produce customized or more detailed forecasts for various purposes

Air navigation
systems planning

Environmental
analysis

Safety
analysis

ASBU
implementation

Recent LTF Updates

2020

- In early 2020 LTF was updated with 2018 baseline extending the forecast period to 2050

Requested by CAEP, A40-9

pre-COVID-19 LTF

2021-2022

- LTF was updated to account for both the estimated traffic decline and recovery paths during the pandemic (presented in ADAP3 and A41)

(ADAP/3-WP/7)
(A41-WP/14-EC/4)

post-COVID-19 LTF
(previous version)

2023

- Additional update of LTF moving the baseline to 2021 and updating scenarios and economic data (completed April 2023)

(ADAP/4-WP/7)

post-COVID-19 LTF
(current version)

Traffic data source

Main source: ICAO Air Transport Statistical forms



Completed with national offices of statistics:



US Department of Transportation (Bureau of Transportation Statistics)



AvStats (UK CAA)



Bureau of Infrastructure, Transport and Regional Economics (Australia)



Official Airline Guide (OAG)

95% of scheduled international passenger and Freight traffic covered by reported traffic

Cleaned OAG and MIDT used to complement the data to arrive at **100%** coverage

ICAO Official LTF Model

Passenger Market: Revenue Passenger Kilometers (RPK)

Freighter market : Freight Ton Kilometers (FTK)

50 Route groups : 40 international and 10 domestic

6 Regions : International and domestic breakdown

Econometric modeling : Panel data model

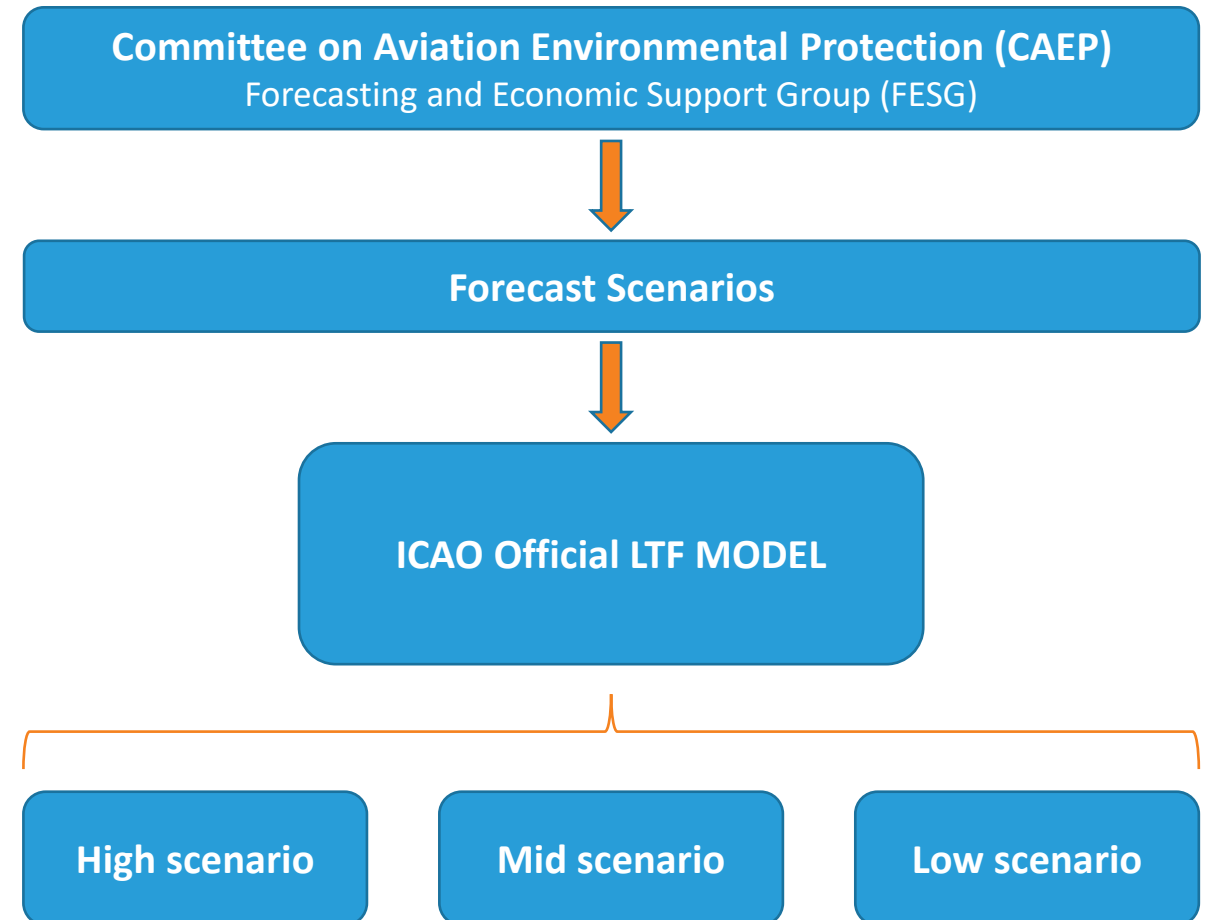
Cross sectional : Individual ordinary least squares (OLS)

Passenger Demand Model

Basic Specification	Capture Key Economic Drivers
	Traffic demand per capita = f(Income per capita, Cost) $RPKPC_t = f(GDPPC_t, OilPrice_t)$
	Income and Cost – Real GDP Per Capita & Oil Prices
Transportation maturity	As countries income grows demand for air travel increases; transport infrastructure improves to allow for increased activity (Ishutkina and Hansman 2009)
	As economies move from lower to higher income levels air demand growth will increase and then moderate (S-curve)
	Forecast model needs to account for this transition of route groups
Year Specific Event	Effects of 9/11 on air travel in the North America domestic, Intra north America and North Atlantic.
	SARs epidemics in Asia for 2003 , etc.

Development of Scenarios

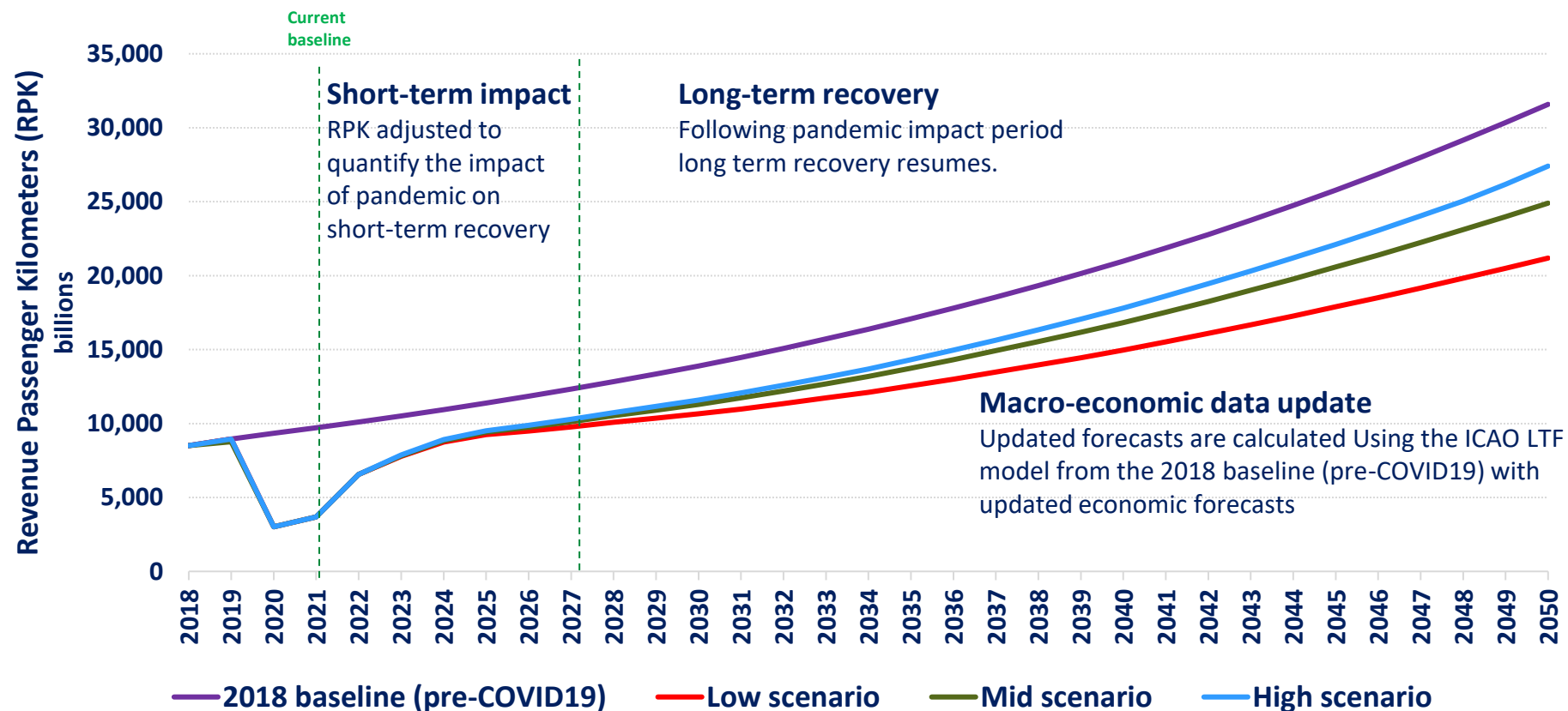
- Given the high uncertainties revolving around the recovery, the Secretariat, working with the MDWG-LTF and members from CAEP, has produced COVID-19 **forecast scenarios**
- These scenarios will allow for incorporating the **expected effect of the pandemic on traffic demand** and **subsequent recovery**
- Last version of these Scenario forecasts was finalized in April 2023 and approved by ADAP in its 4th meeting In September 2023 .



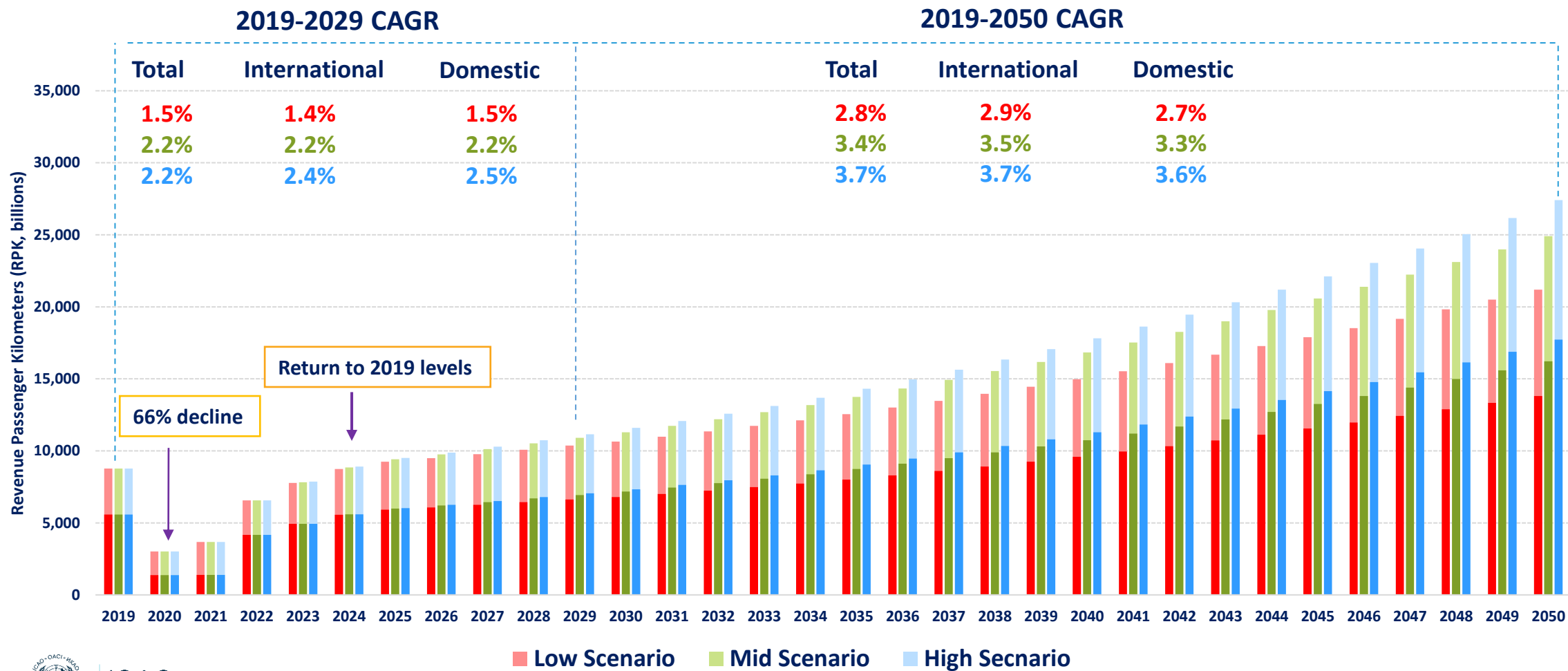
Scenarios Assumptions

Commercial Passenger Market							
Scenario/Assumption	Vaccine	Global Economic Activity	Regional Variation	Route Variation -- Domestic/International	Business Travel Demand	Return to 2019 RPKs	Return to pre-crisis Trend (levels)
High	Announced early 2021 Available/widespread use mid/late 2021	V-shaped recovery -- back to 2019 levels in early 2021	--Solid and sustained global recovery --Asia (China) pick-up quickly in 2021 --Recovery in traffic tracks economic growth (NA/EUR follow Asia)	--Domestic traffic responds quickly particularly in U.S./Europe/Asia (China) --International lags somewhat (2022) --solid income growth drives leisure travel	-- Business Travel growth resumes late 2021 --Returns to normal levels in 2022 -- Drives solid recovery in both markets (B2B and conferences)	2023	Yes -- around 2030
Mid	Announced mid-2021 Available/widespread use early/mid 2022	Return to 2019 levels in late 2021/2022 (running behind the optimistic outlook)	-- Recovery lags economic growth (some behavioral changes/lower incomes) -- Resumption in domestic traffic first -- International lags --China/Asia leads the recovery, followed by NA and EUR	--Domestic traffic growth resumes in 2022 U.S./Europe/Asia (China) --International lags (2023) -- Lower incomes reduce leisure travel	--Business Travel growth resumes in late 2022/2023, but never fully returns to normal levels (i.e., some permanent reduction due to substitutes -- Zoom, etc.)	2024	No -- permanent shift due to substitution of online technologies for business and changes in household vacation/travel patterns
Low	Announced early 2022 Available/widespread use late 2022/early 2023	Return to 2019 levels by 2023/2024	--Recovery lags economic growth -- resumption in domestic traffic slow to gain traction --International lags further behind --China/Asia and developing nations lead recovery. NA and EUR lag.	--Domestic traffic resumes growth in 2024 Asia (China) --International lags (2025) -- Lower incomes reduce leisure travel	--Business travel does not fully recover --Permanent and sustained loss in domestic/international travel as a result.	2027	No -- permanent shift due to substitution of online technologies for business and changes in household vacation/travel patterns

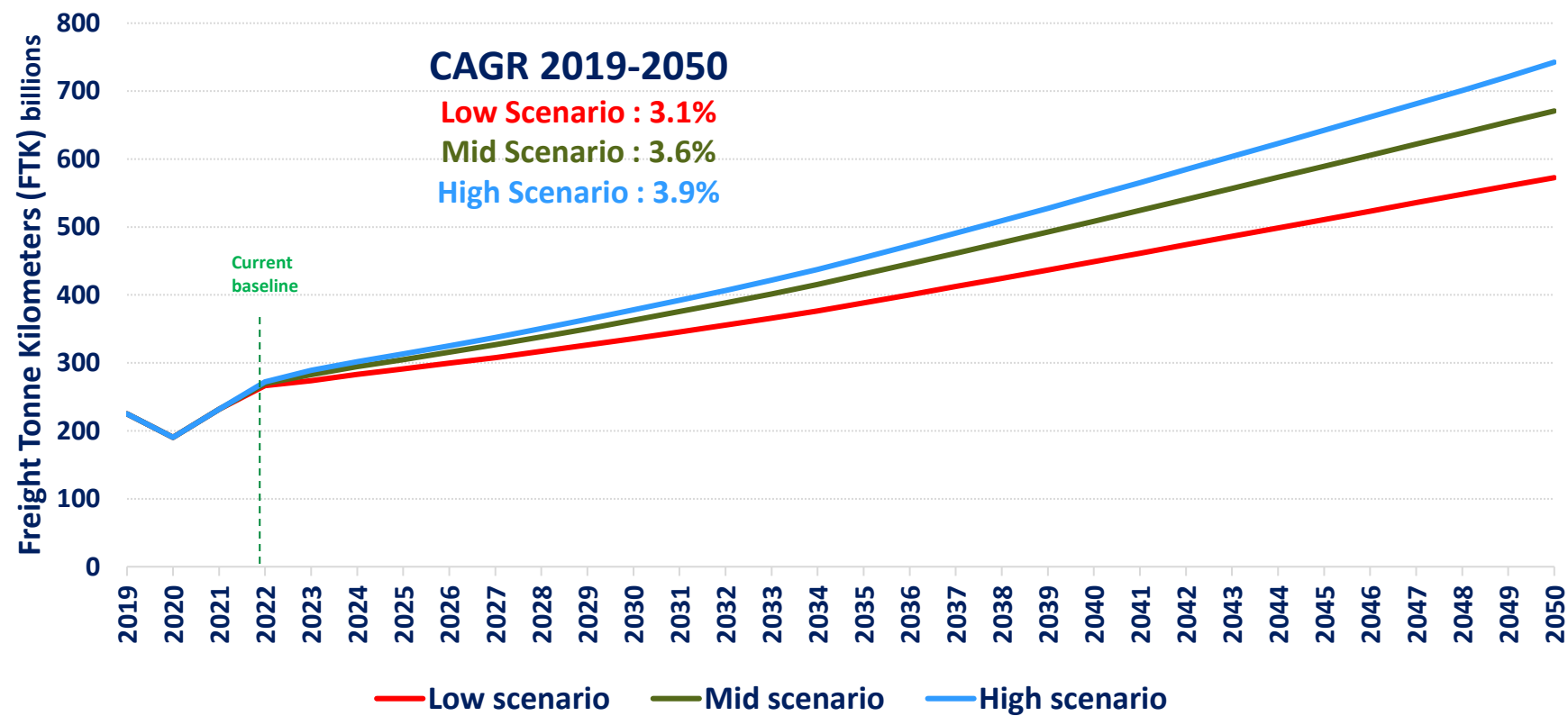
LTF Forecast Scenarios (Passenger)



LTF Global Results (Passenger)



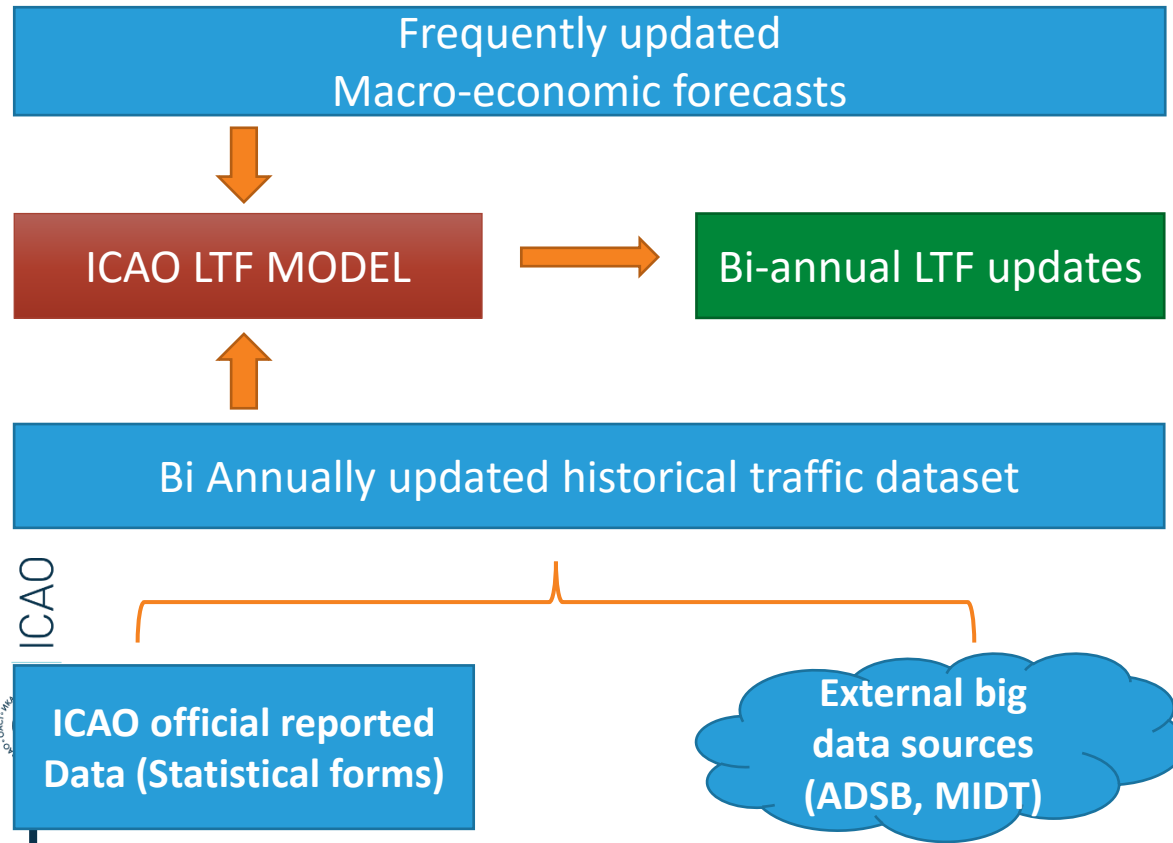
LTF Global Results (Cargo)



Future Work

- The Secretariat should continue to work with the MDWG-LTF to improve the econometric model specifications to capture impact of key variables such as Sustainable Aviation Fuels (SAF) and lasting effects of the COVID-19 pandemic on long-term traffic forecasts;
- The Secretariat should continue work with the MDWG-LTF for bi-annual updates and customization of forecast; and
- the Secretariat should promote capacity building in the area of forecasting and econometric modelling to meet the needs of Member States.

Future Work - Frequent LTF Updates



- Given the aviation market volatility resulting from the pandemic the need for more frequent forecasts for effective planning and implementation is felt more than ever before
- ICAO continues to utilize officially reported data in conjunction with big data sources (ADS-B, MIDT) and frequently updated macro-economic data to produce LTF updates at bi-annual intervals.
- The 4th session of the Aviation Data Analysis Panel (ADAP) supported more frequent updates of LTF through the integration of official reported data and big data to enable the timeline of such update with a shorter duration to facilitate planning and implementation needs of States.

Dissemination

- ICAO, using ADS-B Flight aware data and the ICAO Enterprise Data Management (EDM), has worked to develop interactive dashboards to monitor different aspects of the impact of COVID-19 on civil aviation.
- In July 2022 through state letter 67, The secretariat asked the states to provide a focal point to receive a license to access these dashboards free of charge.
- ICAO will disseminate access to the more frequent LTF updates of passenger and cargo traffic through these dashboards



Operational impact



Aircraft utilization



Country-pair traffic



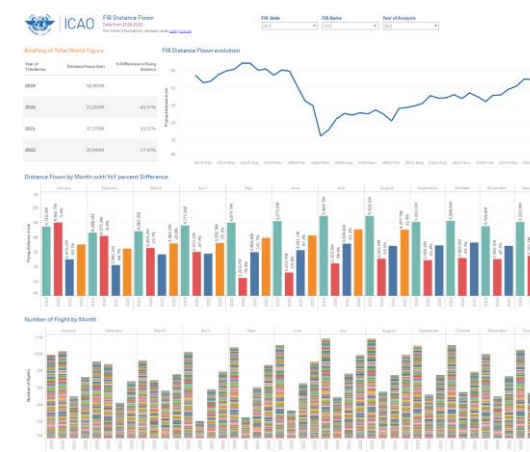
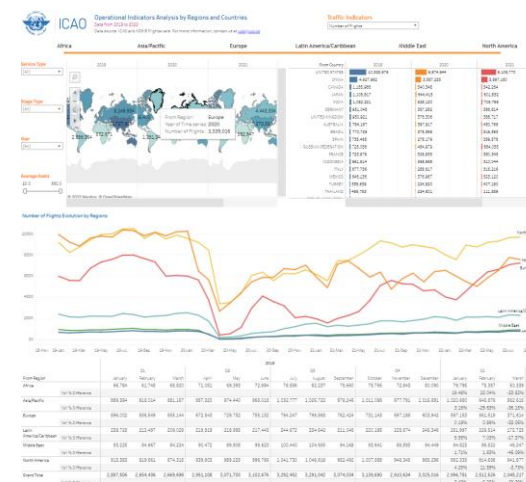
Economic impact - Air carriers



ECONOMIC IMPACT - AIRPORTS



ECONOMIC IMPACT - ANSPs





Thank You