QUALITY OF SERVICE INDEX

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2020 AIR SERVICE DATA SEMINAR

AIRLINE DATA INC

ASM GLOBAL ROUTE DEVELOPMENT

MEET US

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ASM GLOBAL ROUTE DEVELOPMENT

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AIRLINE DATA INC

AGENDA

1. Airlines' Approach to Route Forecasting

2. Forecasting Different Traffic Segments: Speaking the Same Language

3. QSI Forecasting Methodology

4. QSI Share Analysis

5. Forecast Calibration & Traffic Stimulation

6. Use of Zip Code Catchment Data in Route Forecasting

QSI
Overview

ROUTE FORECASTING

Why do we do route forecasting?

A detailed forecast can help us answer questions such as:

- Is there sufficient demand for a sustainable route?

- Will the route cannibalize any of our existing traffic?

- Will the route stimulate the market and grow our overall traffic levels?

- How will the new service impact other carriers in the market?

- Will the route increase our market share vs. competitors?

ROUTE FORECASTING

AIRLINE'S PERSPECTIVE

In evaluating a potential destination, they (UA) try to answer two basic questions:
"How many people want to go there, and how much are they willing to pay?" If "enough" is the answer to both, there's a chance United will add the route".

Answering those simple questions gets complicated. Quayle and Gupta wrestle with a Rubik's Cube of factors including economics, demographics, competition, regulation, aircraft availability, and even international relations. Most important, a new route **must fit with United's existing global network.**

ROUTE FORECASTING

- "Forecasting is <u>not</u> an exact science"

- Many different forecasting approaches are available – largely dependent upon data and time available

- Assumptions must be made and clearly stated

- Useful to test methodologies on existing routes (benchmarking)

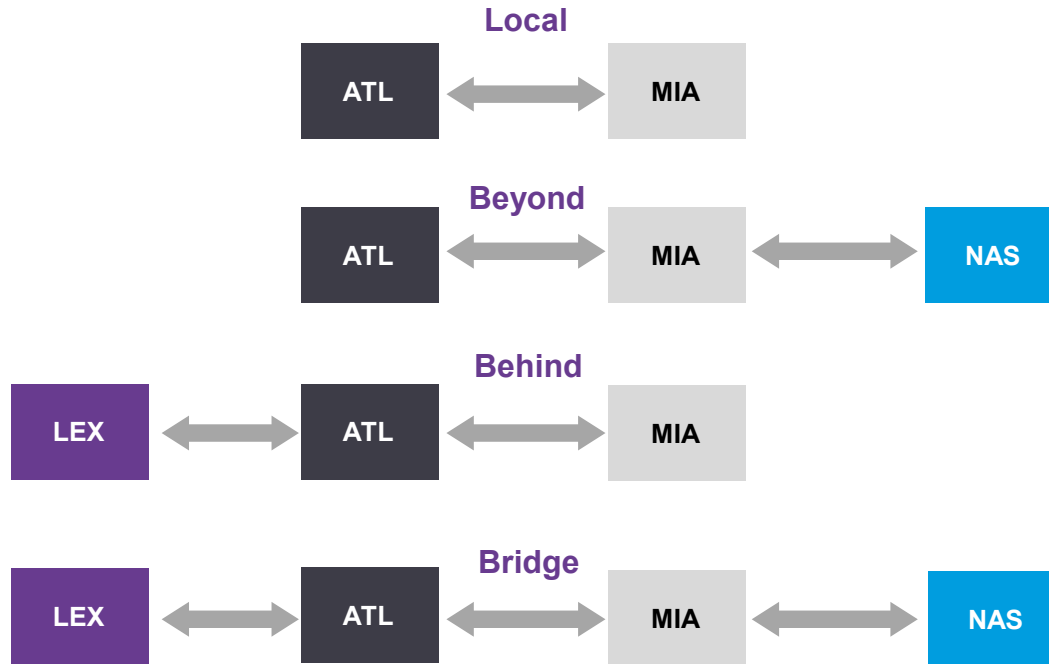- Not a substitute for comprehensive data

ROUTE FORECASTING

"It's more art than science…I'm looking at global GDP, but also what do I think the competition is going to do? It's a lot of game theory."

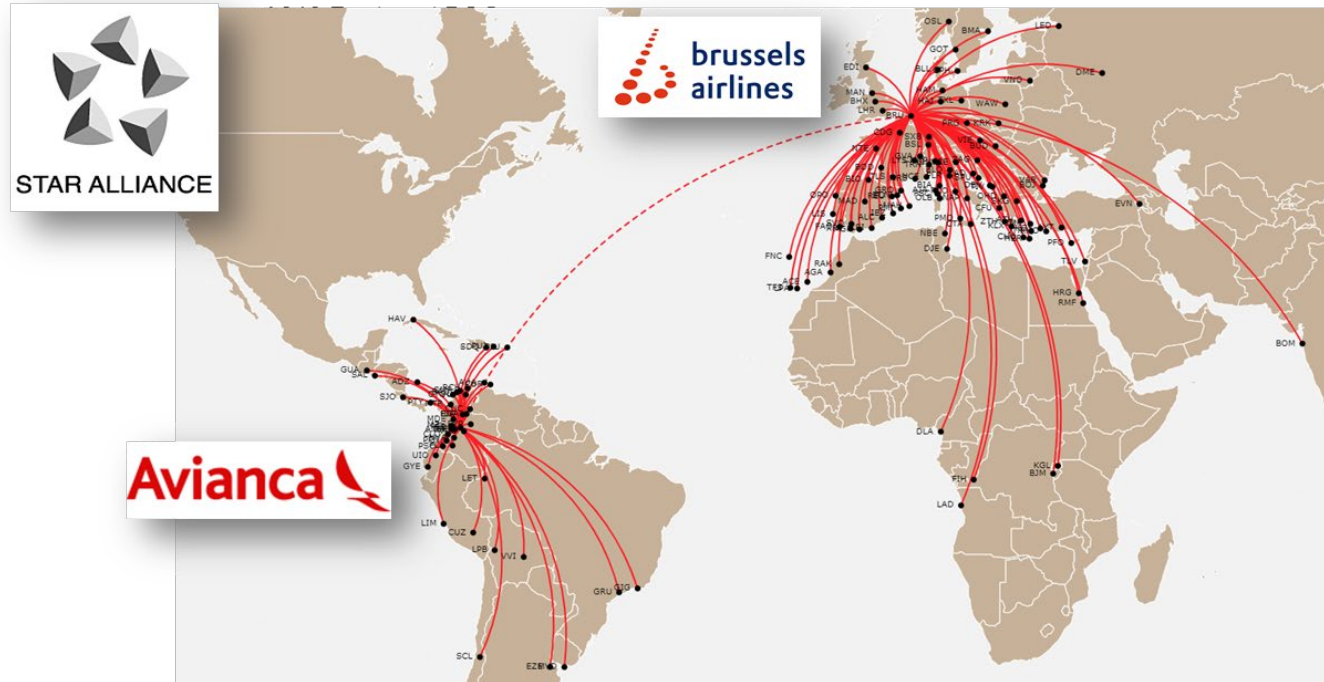Patrick Quale, International Network Planning, United

ROUTE FORECASTING

Potential Market Segments - Terminology

CONNECTING FLOWS – BRIDGE EXAMPLE

Star Alliance: Avianca and Brussels Bridge Proposal

ROUTE FORECASTING

Potential Market Segments

Market segments to be forecasted will vary depending on:

- The **type** of carrier – legacy / alliance / low cost

- Airport **function**: Hub or Spoke?

- **Geography**: certain connecting markets wouldn't make sense due to being "backhauls" (passengers travelling in the wrong 'direction')

Passenger Traffic Market Segments
- **Local**
- **Behind**
- **Beyond**
- **Bridge**

Indirect Passenger Modes of Travel
- **Online**
- **Interline**
- **Self Connection**
- **Surface "Leakage"**

BACKHAUL DISCOUNTS

DTW ⟷ **LAX** ⟷ **DEN**

DTW-DEN: 1,123 mi
DTW-LAX-DEN: 2,841 mi
Circuity factor: 2.5

- Geography would suggest that we ignore any feeder potential from DTW via LAX to DEN

- However, this is subject to the existing flight options available and can be influenced by other factors

DTW

DEN

LAX

ROUTE FORECASTING

Which Airline for Which Market Segment?

Segment	LCC	Point to point carrier	Connecting carrier hub to spoke route	Connecting carrier hub to hub route
Local	Yes	Yes	Yes	Yes
Beyond	No	No	No	Yes
Behind	No	No	Yes	Yes
Bridge	No	No	No	Yes

- Can we think of airline examples that fit each category?
- Do all carriers fit these profiles exactly?

QSI ANALYSIS FORECASTING

- QSI stands for **Quality of Service Index**.
- QSI is best used when exploring the potential demand for scheduled service that **doesn't already operate**, but for which there are identifiable traffic flows via alternate points.
- It can also be used to analyze the markets where direct **service already exists** – additional frequencies / new entrant to the market analysis.
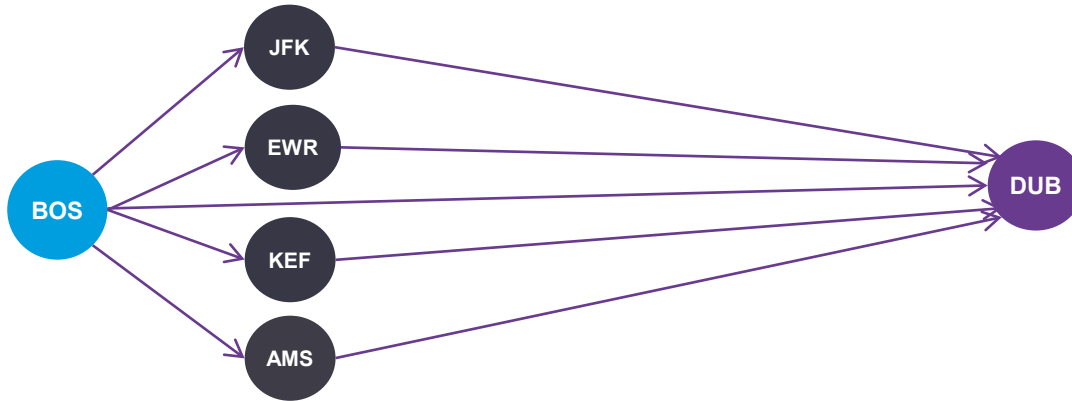
In this case, QSI would be used to determine the potential demand for nonstop service between BOS and DUB.

BOS

JFK

EWR

KEF

AMS

DUB

QSI ANALYSIS FORECASTING

"How many passengers will my flight carry in this market at these times?"

"How much will the market be stimulated with this new service?"

"What percentage of the overall market will I capture?"

"What's the nature of the competitive environment?"

Using QSI = Asking Questions About the Future

- Will we "steal" market share from another airline?

- Do we want to compete with that carrier?

- We will cannibalize traffic off one of our existing flights?

- If yes, is that worth it?

QSI ANALYSIS FORECASTING

QSI Helps Planners Weed Out the Good from the Not-So-Good

- How much money will this flight make?

- If it's going to make money, how profitable will it be?

- How will local and onboard passenger mix impact that revenue?

- Does it contribute positively to my network?

- We have limited resources. How does this flight's performance compare to the other flights that are possible with this aircraft?

- Ultimately, it lets you determine a prospective route's QSI or Fare Share.

QSI ANALYSIS FORECASTING

- Very few routes only have nonstop options, most have connecting options as well. To establish/assign value to all available itineraries on a specific route, a QSI analysis is performed.

- QSI analysis works by **assigning a weighting factor to different flight options** available to a passenger when flying between Origin & Destination, **to reflect the passenger's preference** for one flight option over another.

- Various inputs go into a QSI model, like:
  - Schedules
  - MCT (minimum connecting time)
  - Demand
  - Interline & Codeshare partners
  - Airport locations (lat & lon)
  - Route distances (elapsed time)

- Variables that could be considered for scoring include:
  - Frequency of service
  - Duration of connecting time   What about air fare? (response prediction)
  - Aircraft type
  - Distance / routing circuity
  - Nonstop/connection/number of connections

QSI-SHARE ANALYSIS

In order to forecast what market share it might capture, an airline weights itself against other airlines based on these factors.

QSI Example Calculation, Frequency / Aircraft Type

Airline 1 : 3 flights per day on Small RJs = 3*0.5 = 1.5
Airline 2 : 2 flights per day on 737s = 2*1= 2
Airline 3 (new entrant): 2 flights on E170s = 2*0.7= 1.4

Airline 3 Share: 1.4/4.9 = 29%

Aircraft Type	Score
Narrow body	1
Large RJ (E170)	0.7
Small RJ (CRJ200)	0.5
Turboprop	0.2

ROUTE FORECASTING

QSI Example Calculation, Schedule Quality

Let us model the desirability (D) of a service by its departure time:

Time of Departure	Desirability Factor (D)
07:00	0.90
08:00	1.10
09:00	1.00
10:00	0.95
11:00	0.90
12:00	0.80
13:00	0.70
14:00	0.60

Time of Departure	Desirability Factor (D)
15:00	0.60
16:00	0.75
17:00	0.90
18:00	1.00
19:00	0.90
20:00	0.80
21:00	0.70
22:00	0.50

QSI ANALYSIS FORECASTING

Calibration

- Airline preference (e.g. hub dominance, loyalty programs, low or high fares).

- Airport preference (primary versus secondary).

- Time-of-day.

- Fewer seats for local passengers due to RM algorithms giving preference to more valuable connecting passengers.

- Demand "spill" due to high load factors.

- Inferior connections unduly influencing QSI share, even after accounting for variables like circuity and elapsed time.

- Traffic Stimulation

TRAFFIC

Stimulation

QSI & EXPECTED TRAFFIC STIMULATION

- The QSI methodology measures changes in the <u>quantity</u> and <u>quality</u> of service; **it does not directly estimate traffic changes.**

- Separate analyses within a route forecast can quantify and/or account for the stimulation in traffic due to changes in service.

  - ✓Average annual stimulation rates.
  - ✓Fare and service stimulation rates.

- The first new nonstop service in a market is often poorly predicted by QSI, so analyses based on a comparable market approach is always recommended.

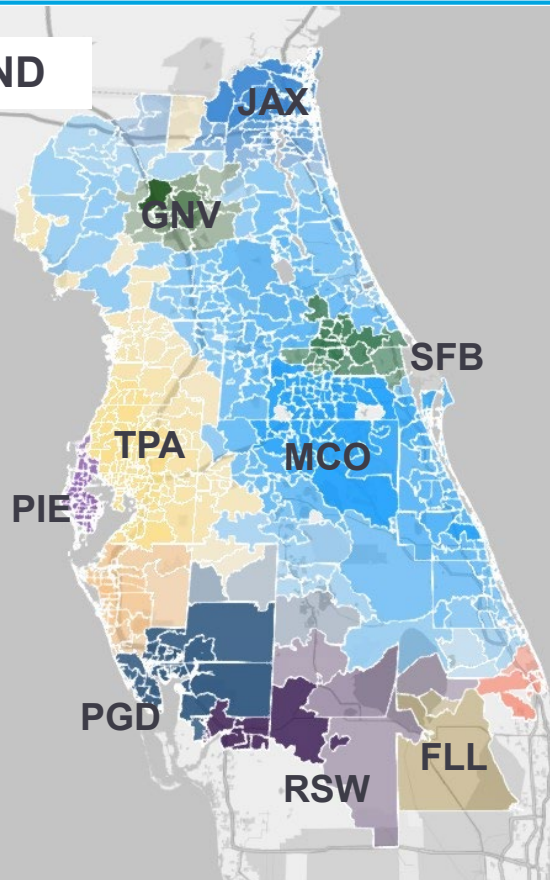 **<u>Always start with the science, and then apply the art.</u>**

MARKET STIMULATION

- Airports can develop their own stimulation curve based upon their experience in their own market.

- This graph illustrates the impact of new services to Kuala Lumpur by AirAsia, AirAsia X and Malindo Airways.

Stimulation Impact of New Routes at KUL

$y = 8835.8x^{-0.751}$

Stimulation Impact (y-axis): 0% to 7000%

Market Size Prior to Route Launch (x-axis): 0 to 18,000
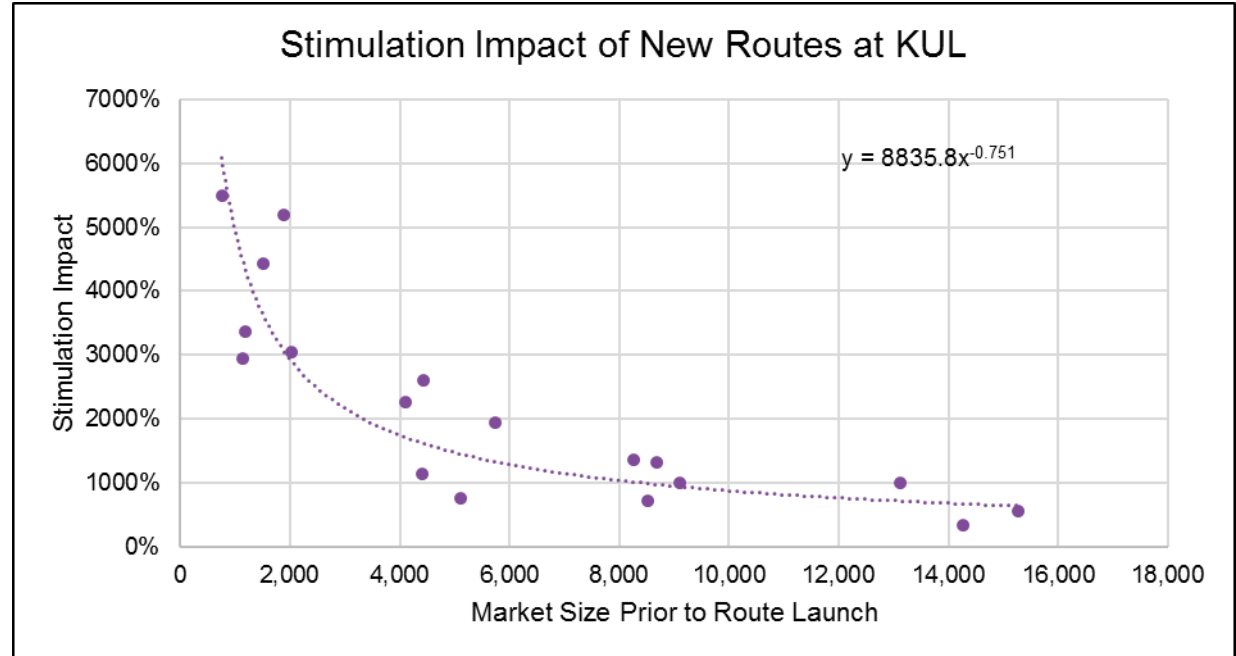
USING POSTAL CODE CATCHMENT DATA FOR QSI

Top Airports to IND

To justify new service there are two avenues to prove the market to an airline:

- Stimulation (fare, frequency)
- **Share shift from a nearby airport with existing traffic**.

The latter requires an analysis of your catchment and how much traffic is leaking between airports. Both of these traffic justifications represent risk for an airline in terms of determining what passengers will do. Anything that makes that analysis more rigorous and less of a guess improves your pitch.

USING POSTAL CODE CATCHMENT DATA FOR QSI

Top Airports to LEX
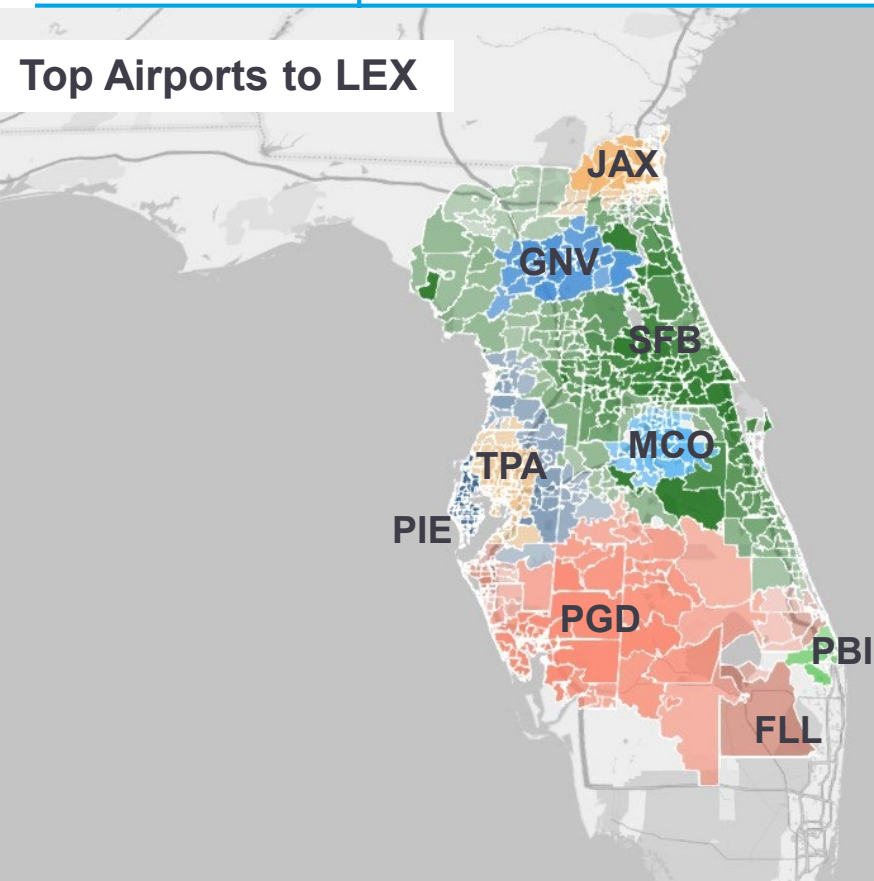
Note SFB's share shift and catchment expansion where SFB has nonstop service not offered from the nearby competitors. A similar phenomenon took place when Norwegian added SWF to unique European cities.

SUMMARY

- The QSI analysis works by assigning a weighting factor to different flight options available to a passenger, to reflect the passenger's preference for one flight option over another.

- The QSI methodology measures changes in the quantity and quality of service; **it does not directly estimate traffic changes**

- It is not an exact science!

- State your assumptions clearly.

- Develop a stimulation curve / determine stimulation rates for your market or a set of reliable proxy markets. This will help quantify and/or account for the stimulation in traffic due to changes in service through:

✓ Fare and frequency stimulation rates;

✓ Redistribution of traffic within your catchment from a nearby competitor with existing traffic.

THANK YOU