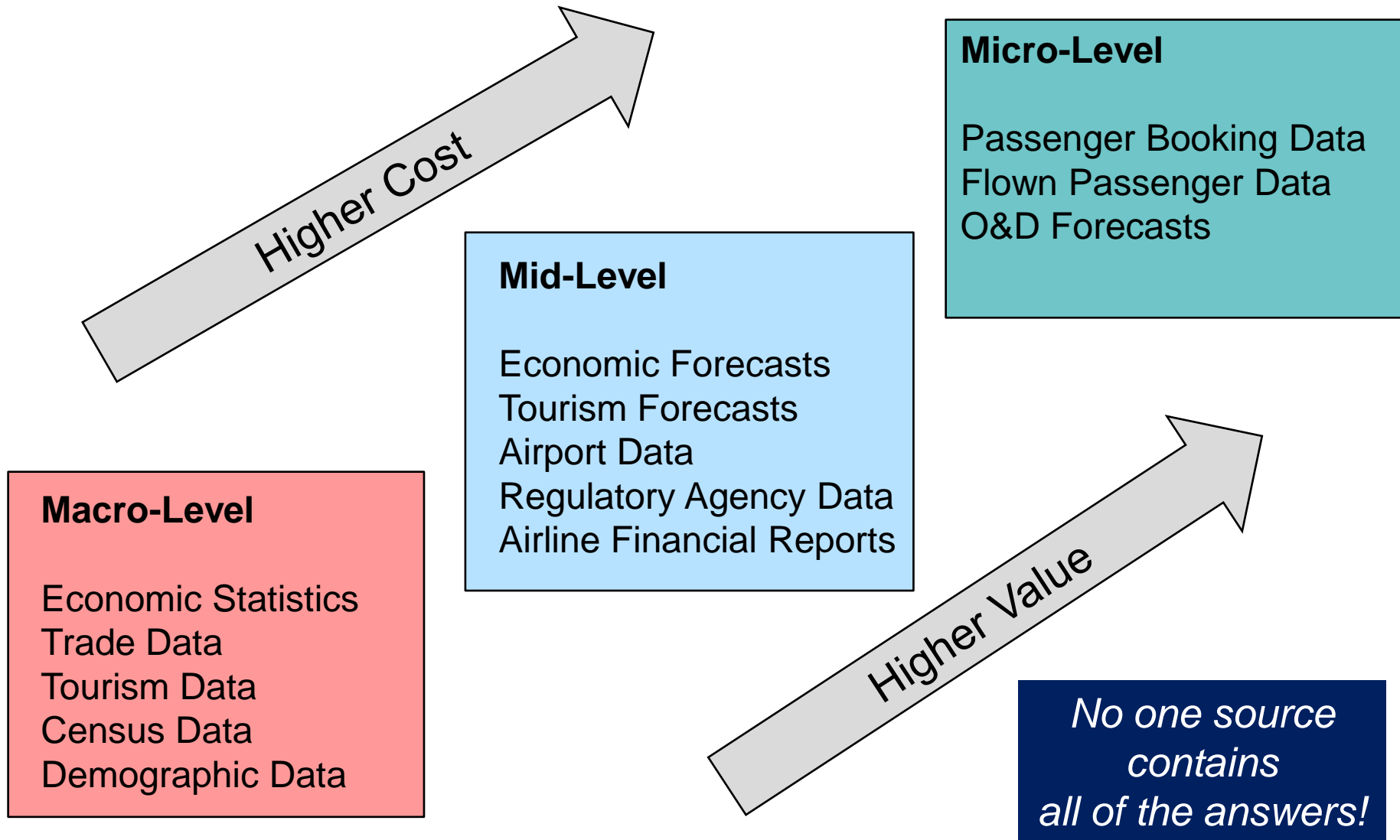*Turkish Passenger Market Analysis*
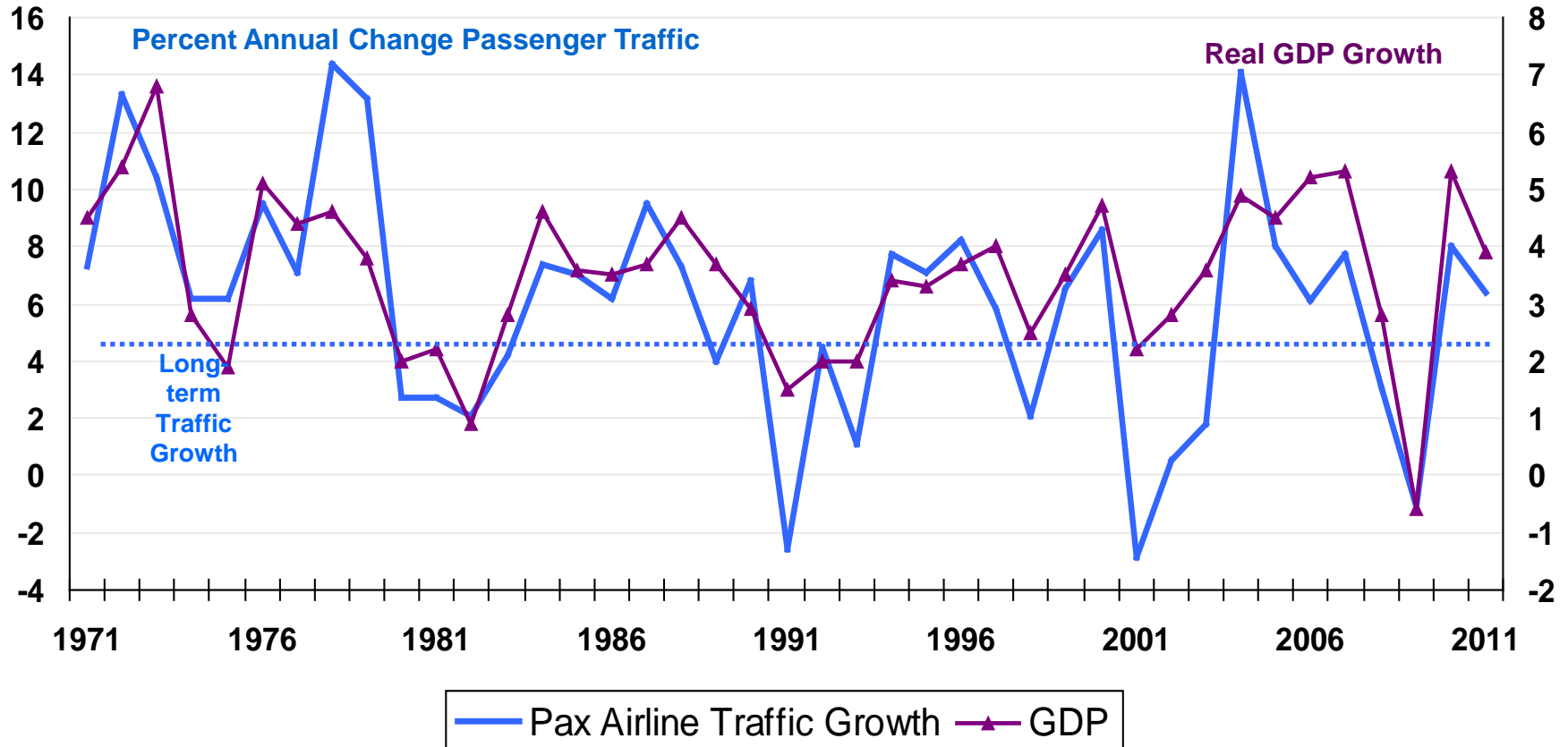***Boeing Commercial Airplanes***

Istanbul Technical University

Air Transportation Management

M.Sc. Program

Network, Fleet and Schedule

Strategic Planning

Module 22 :   14 March 2014

Sources of Passenger Data

Higher Cost

Higher Value

Micro-Level

Passenger Booking Data
Flown Passenger Data
O&D Forecasts

Mid-Level

Economic Forecasts
Tourism Forecasts
Airport Data
Regulatory Agency Data
Airline Financial Reports

Macro-Level

Economic Statistics
Trade Data
Tourism Data
Census Data
Demographic Data

No one source contains all of the answers!

Relationship between Economy and Air Travel

Percent Annual Change Passenger Traffic

Real GDP Growth

Long term Traffic Growth

Legend: Pax Airline Traffic Growth — GDP

Economic drivers of regional traffic growth

Annual growth, 2012 - 2032

Region	RPK	GDP
North America	2.7%	2.5%
Northeast Asia	3.1%	1.6%
Europe	4.2%	1.8%
C.I.S.	4.5%	3.4%
Oceania	4.8%	2.6%
World	5.0%	3.2%
Africa	5.7%	4.4%
Middle East	6.3%	3.8%
Southeast Asia	6.7%	4.7%
Latin America	6.9%	4.0%
China	6.9%	6.4%
South Asia	8.6%	6.6%
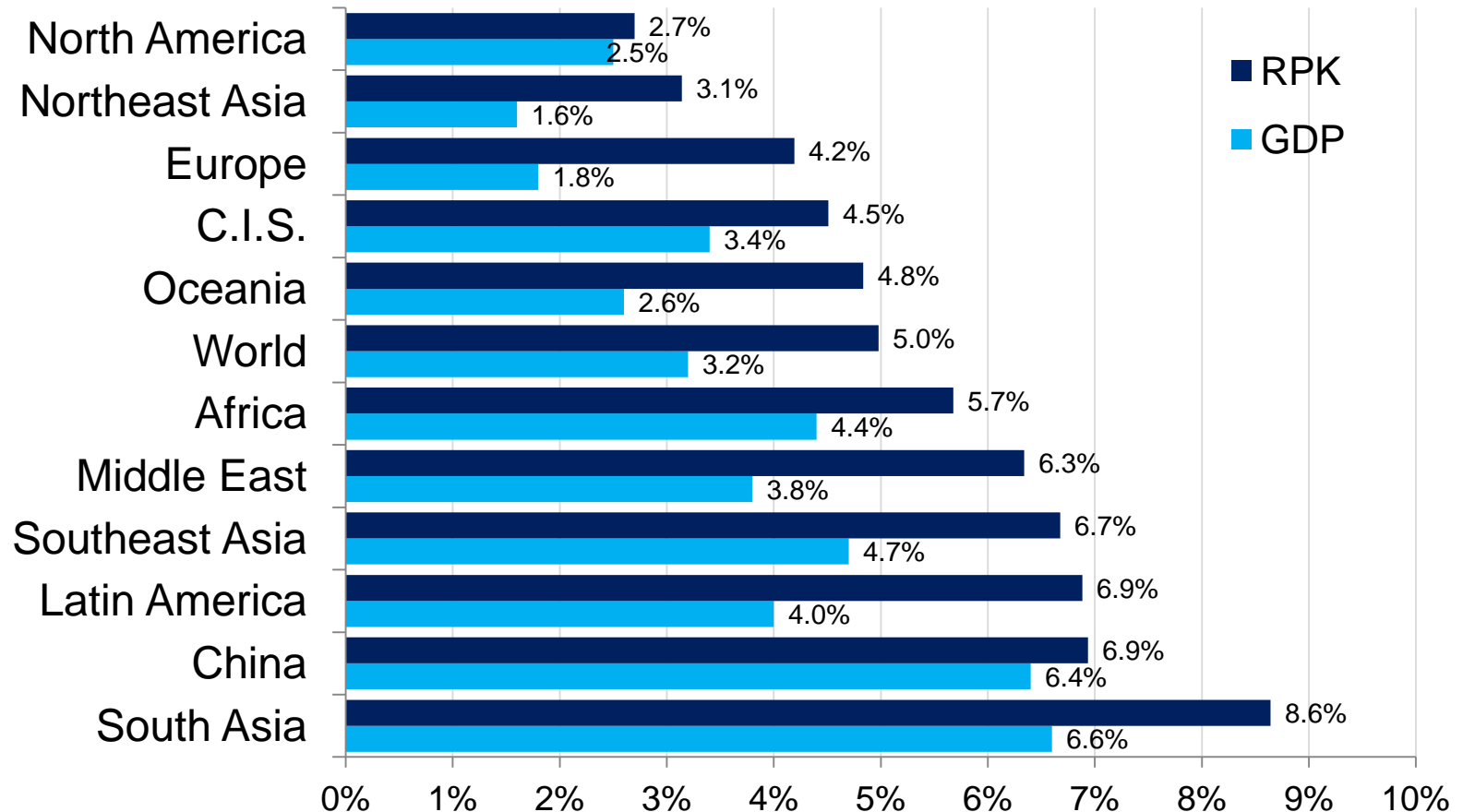
How do these projections impact THY's network development?

Economic drivers of regional traffic growth

Real GDP Growth in Europe

Legend: 2013, 2014, 2015, 2016, 2017, 2018, 2019

Y-axis: Year over Year Change in Real GDP (2012), scale from (4.0) to 6.0

X-axis categories: France, Germany, Greece, Italy, Spain, United Kingdom, Russia, Turkey
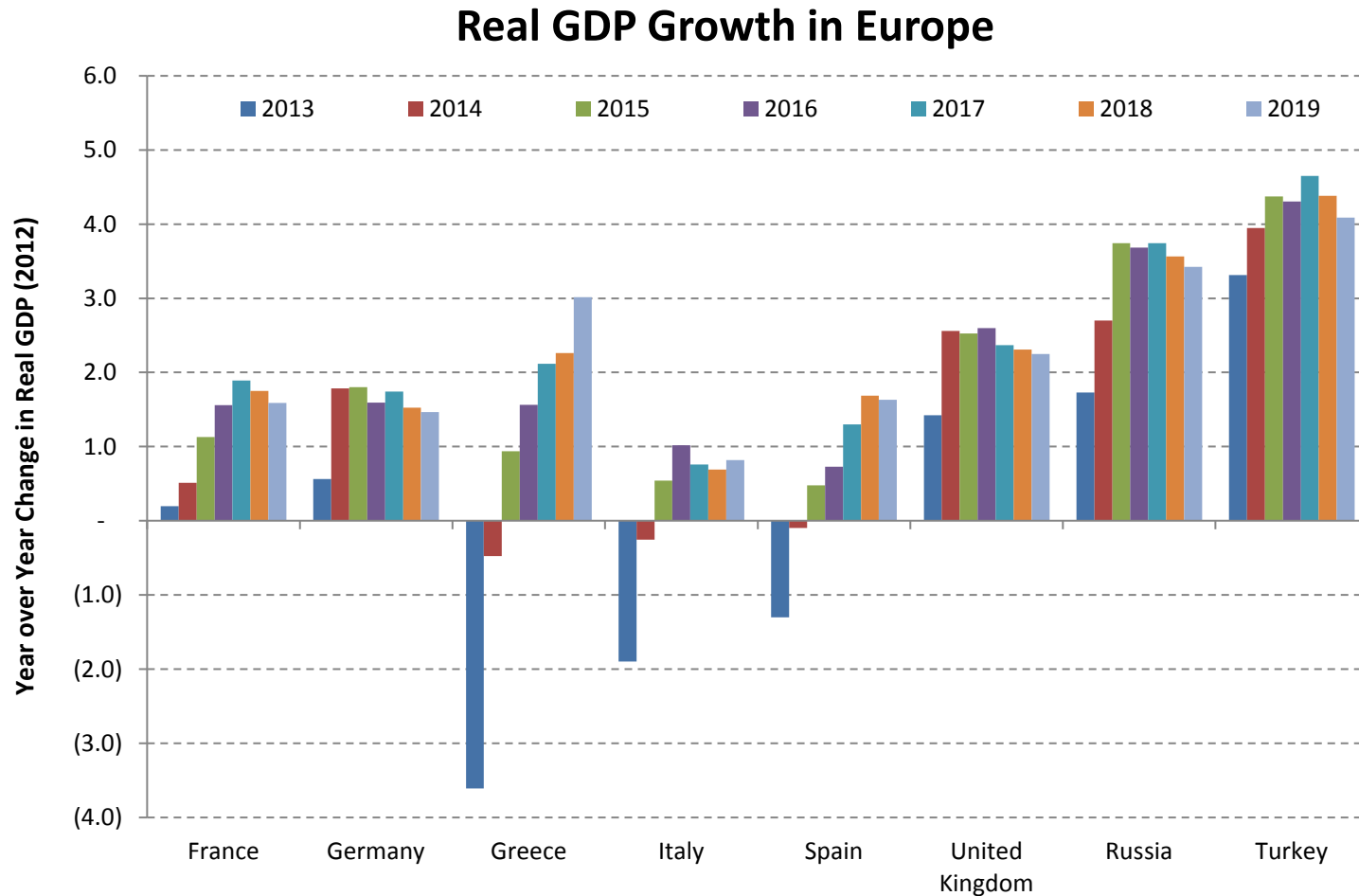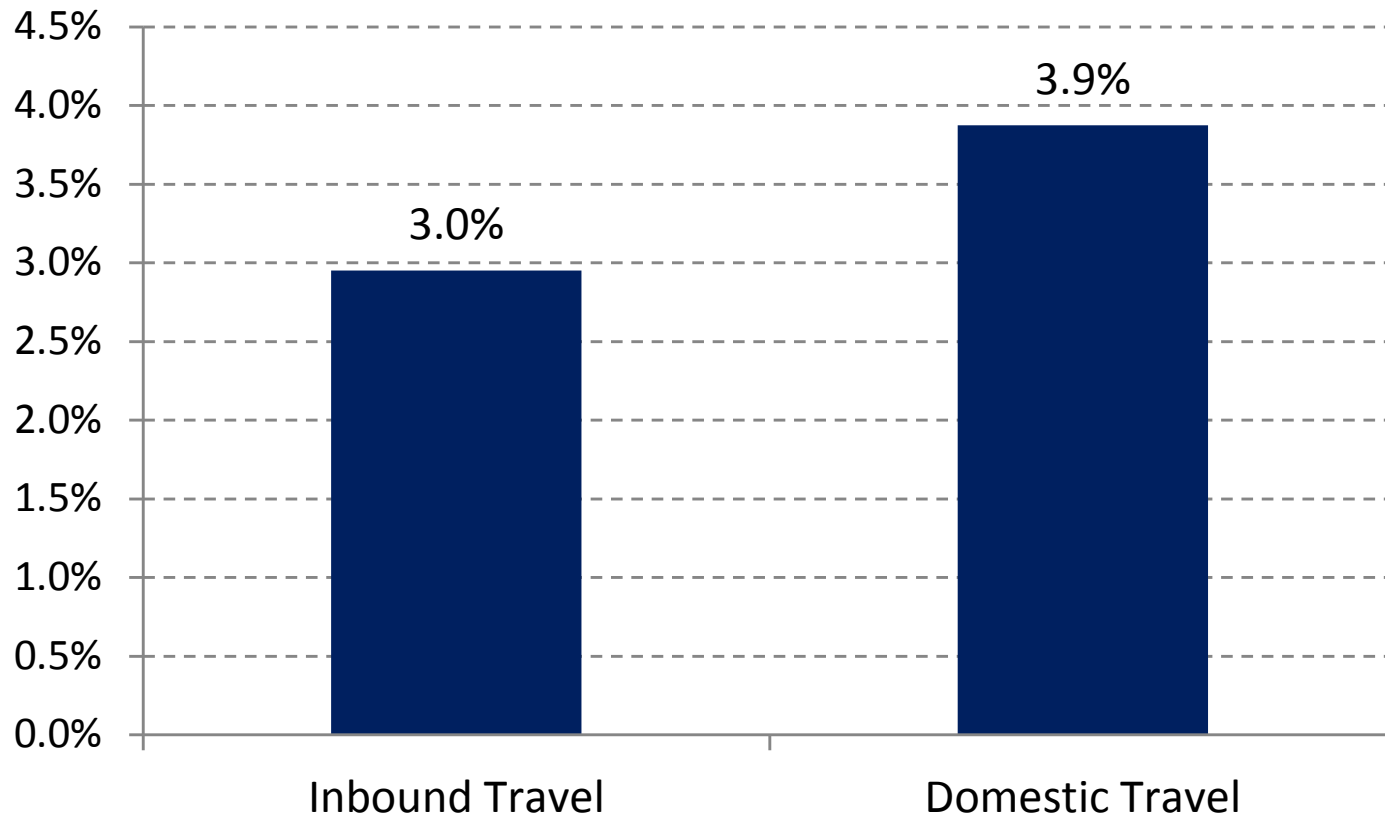
What implications does this data have for Turkish Airlines?

Source: IHS Global Insight

Travel Industry: Powerful economic driver

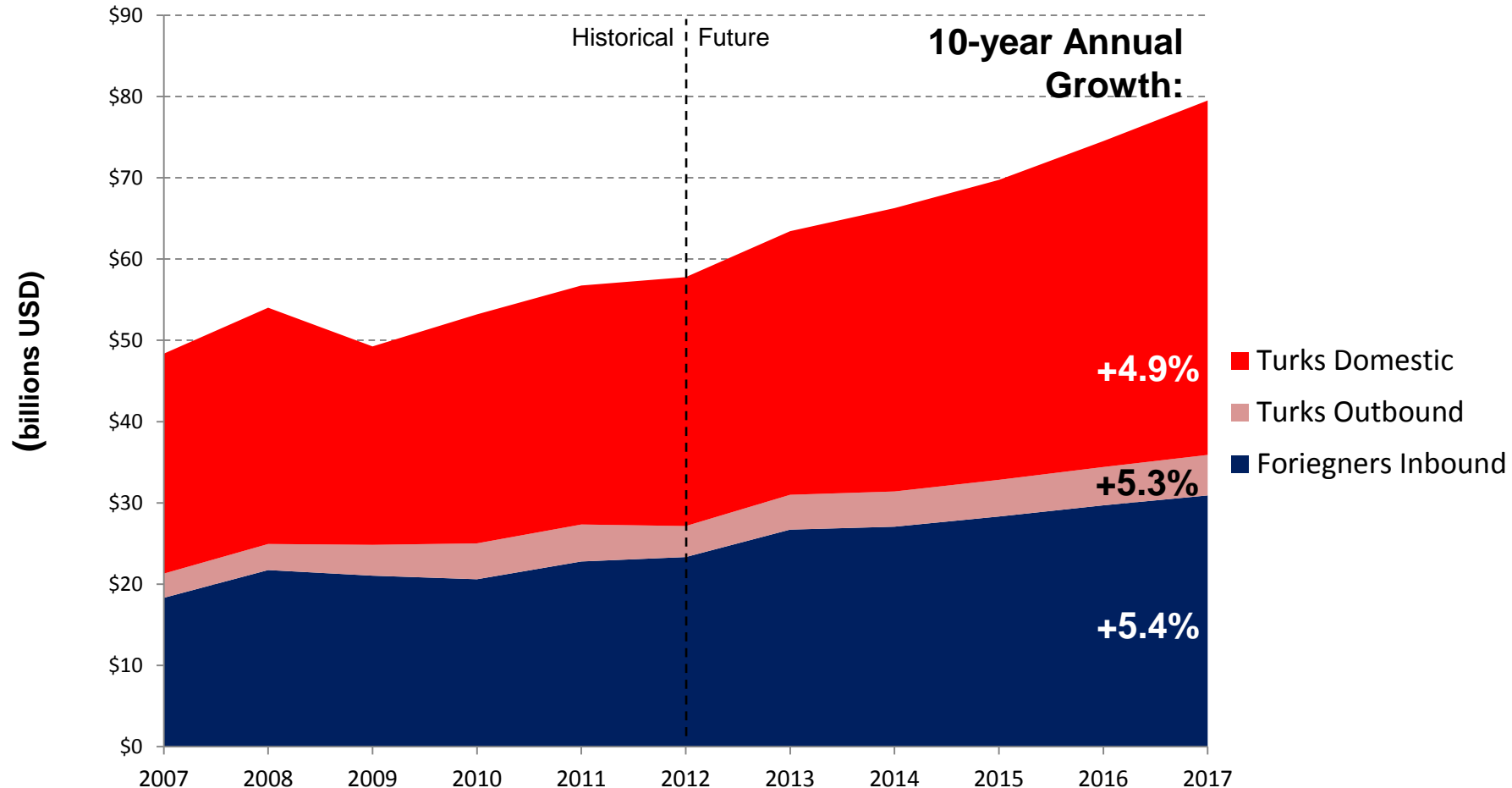## Travel Share of Turkish Gross Domestic Product (GDP)

Foreign and domestic travel both have large contribution

Turkish Travel Expenditure

Chart: y-axis "(billions USD)" from $0 to $90. x-axis years 2007 to 2017. Vertical dashed line at 2012 separating "Historical" and "Future".

10-year Annual Growth:

- **+4.9%** ■ Turks Domestic
- **+5.3%** ■ Turks Outbound
- **+5.4%** ■ Foriegners Inbound

Source: Oxford Economics

Foreign visitation vital for economic development

Turkish Visitor Arrivals by Mode

Historical | Future

10-year Annual Growth:

+4.9%

+8.6%

+5.1%

(thousands)

Legend:
- Sea arrivals
- Road arrivals
- Rail arrivals
- Air arrivals

Y-axis: 0, 10,000, 20,000, 30,000, 40,000, 50,000, 60,000

X-axis: 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017
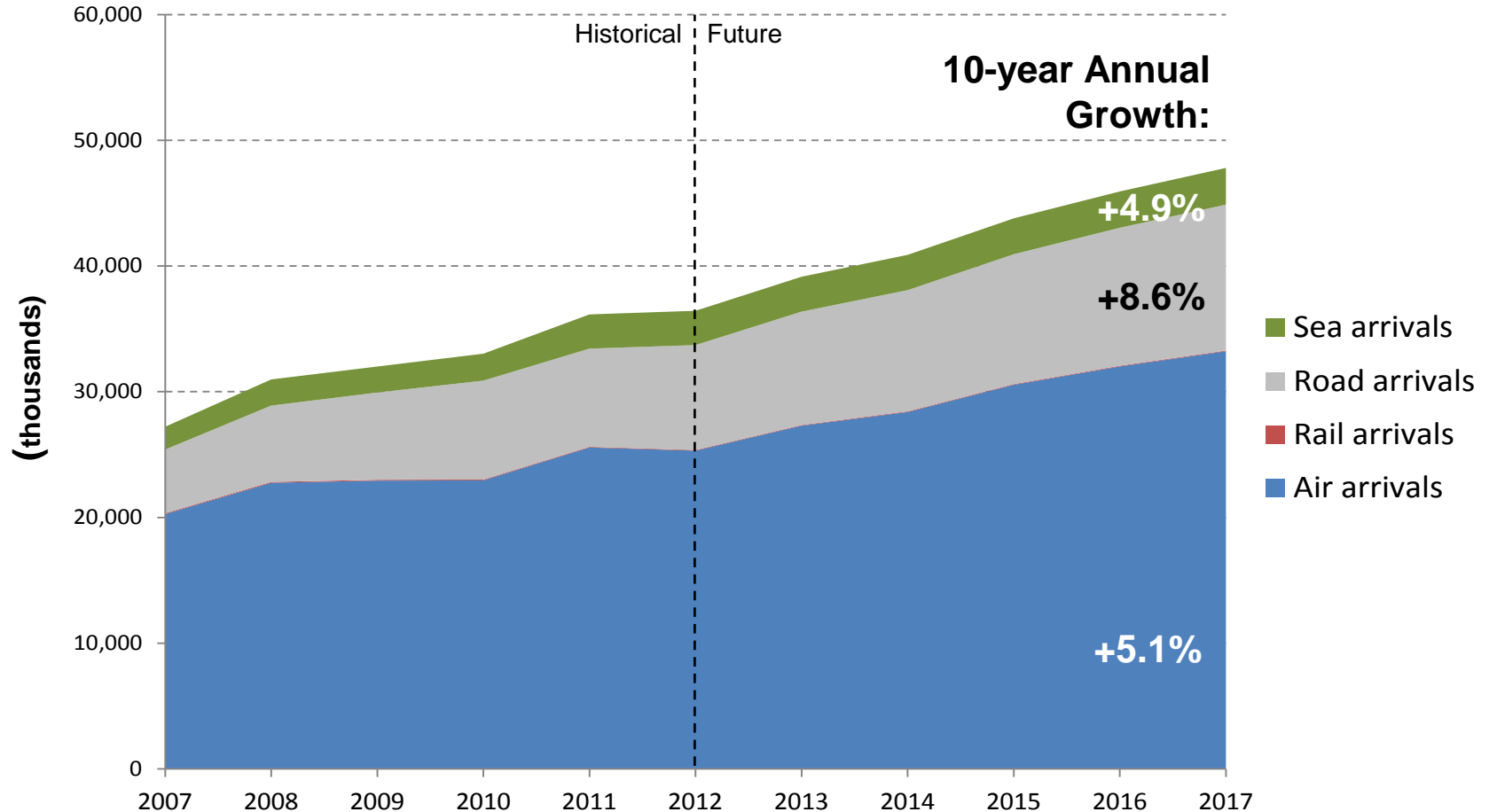
How do modal shifts impact Turkish Airlines business?

Source: Oxford Economics

Passenger needs will vary based on purpose

Turkish Visitor Arrivals by Purpose

10-year Annual Growth:

- +4.0%
- +2.7%
- +6.6%

Legend:
- Other arrivals
- Business arrivals
- Leisure arrivals

Y-axis: (thousands) — 0, 10,000, 20,000, 30,000, 40,000, 50,000, 60,000

X-axis: 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017

Historical | Future
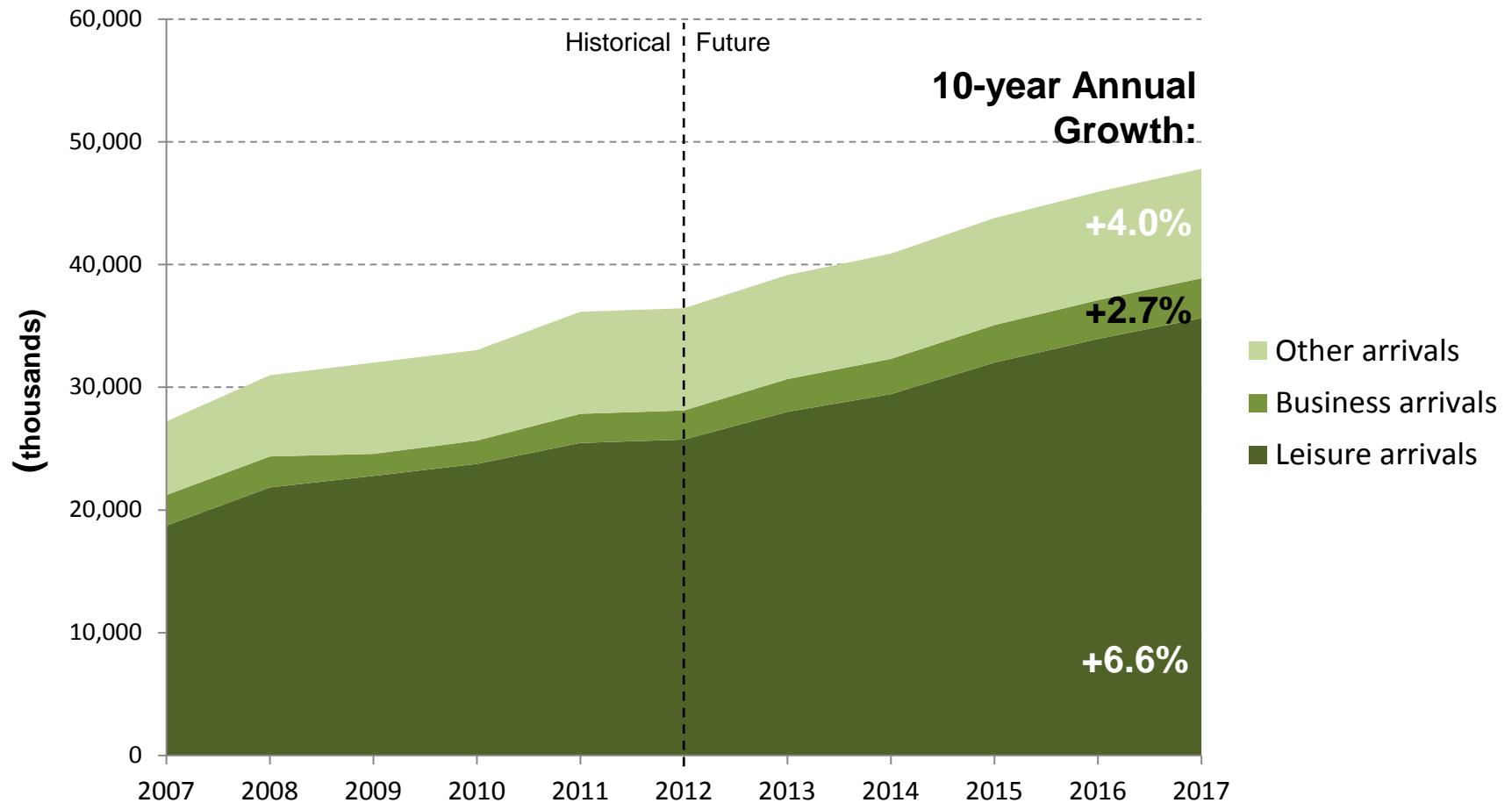
How do airlines respond to passenger needs based on travel purpose?

Source: Oxford Economics

Regional differences in travel demand

Turkey Inbound Annual Arrival Growth: 2007-2017

Emerging Europe: 7.7%

Western Europe: 4.3%

North America: 3.7%

Northeast Asia: 7.1%

North Africa: 12.5%

South Asia: 10.2%

Mid East: 9.7%

Southeast Asia: 12.4%

South America: 15.3%

Sub-Saharan Africa: 12.3%

Oceania: 5.0%
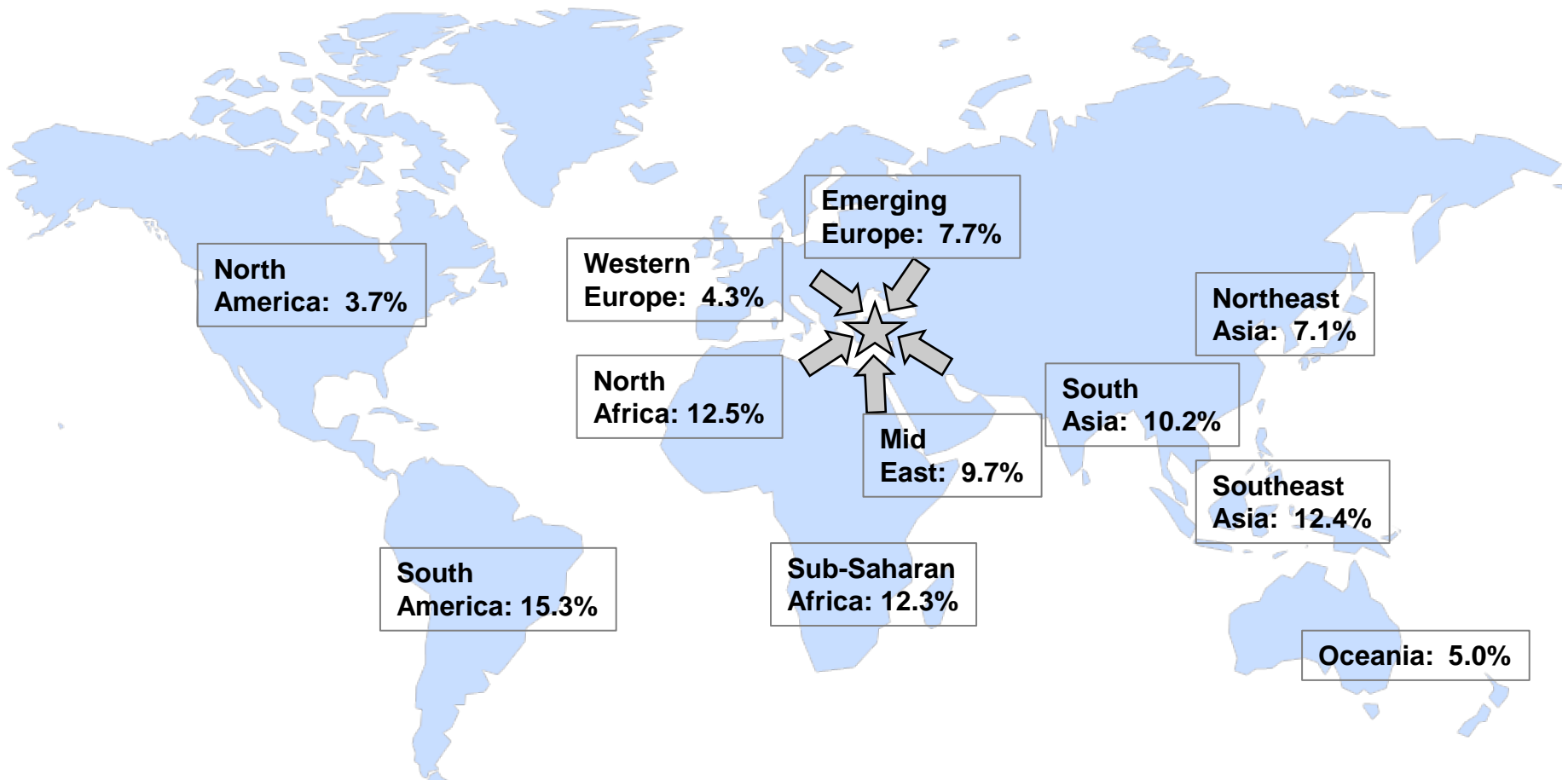
What factors help to explain these regional differences?

Source: Oxford Economics

Turkey air traffic growth by region

Source: Sabre ADI

Average Annual Growth

Russia/C. Asia — 12.8%

Middle East — 19.9%

Africa — 28.1%

N. America — 6.7%

East Asia — 7.7%

SE Asia — 9.4%

South Asia — 9.9%

Turkey Origin/Destination Passengers

400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
-

2008-11, 2009-1, 2009-3, 2009-5, 2009-7, 2009-9, 2009-11, 2010-1, 2010-3, 2010-5, 2010-7, 2010-9, 2010-11, 2011-1, 2011-3, 2011-5, 2011-7, 2011-9, 2011-11, 2012-1, 2012-3, 2012-5, 2012-7, 2012-9, 2012-11, 2013-1, 2013-3, 2013-5, 2013-7, 2013-9, 2013-11

Country Focus: Turkey – U.S.A. air traffic

Total Passengers Arriving at U.S. Gateways

(millions)

Source: U.S. Department of Commerce
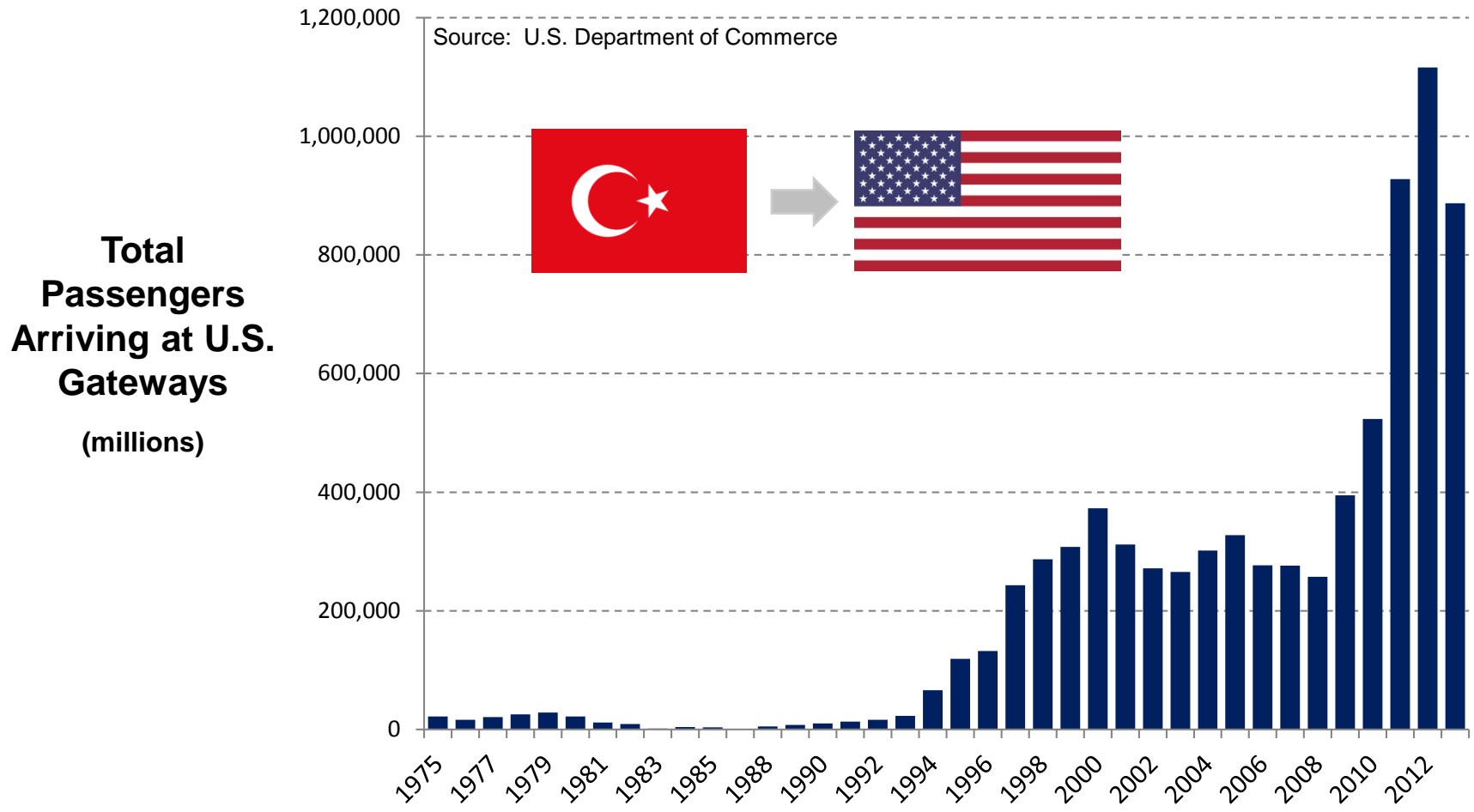
Turkey – U.S.A. passenger traffic by citizenship

Total Passengers Arriving at U.S. Gateways

(millions)

Source: U.S. Department of Commerce

- Non-US Citizens
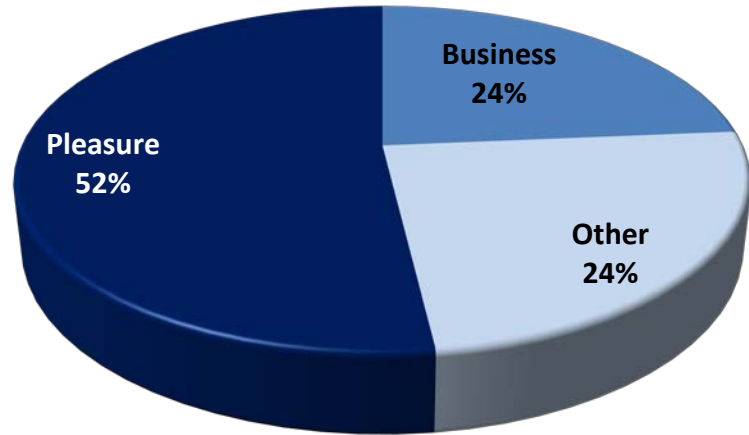- U.S. Citizens
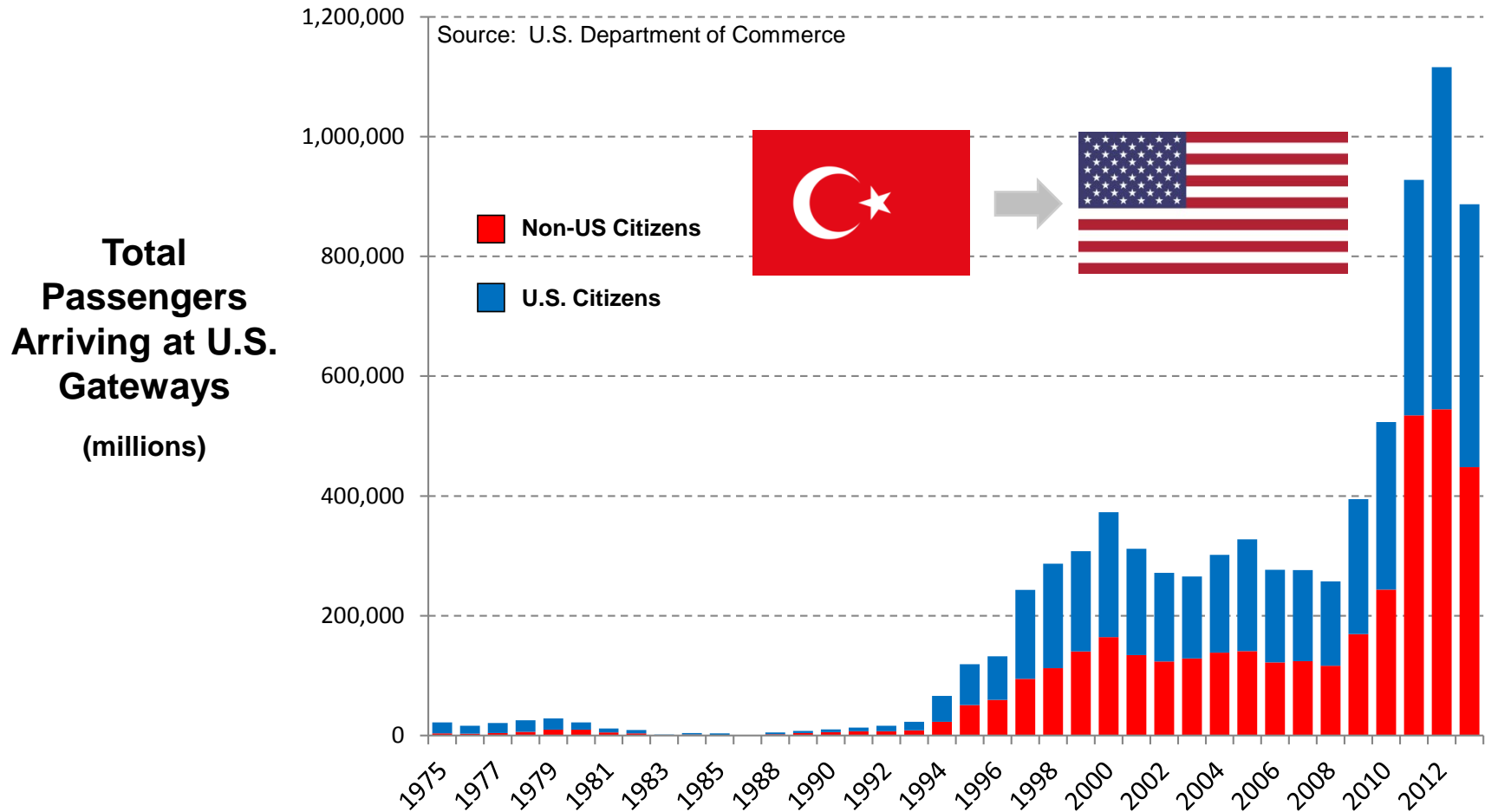
What might cause shifts in nationality over time?

Turkish Nationals: U.S.A. visitor data

Top 10 Destination States for Turkish Citizens

State	
New York	████████████████████████ ~35,000
California	█████████████ ~17,000
Florida	███████████ ~14,000
New Jersey	████████ ~10,000
Massachusetts	███████ ~8,500
Illinois	██████ ~8,000
Texas	█████ ~7,000
Virginia	█████ ~6,500
Pennsylvania	███ ~5,000
District of Columbia	██ ~4,000

Scale: 0   5,000   10,000   15,000   20,000   25,000   30,000   35,000
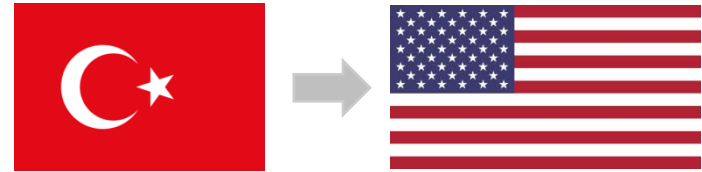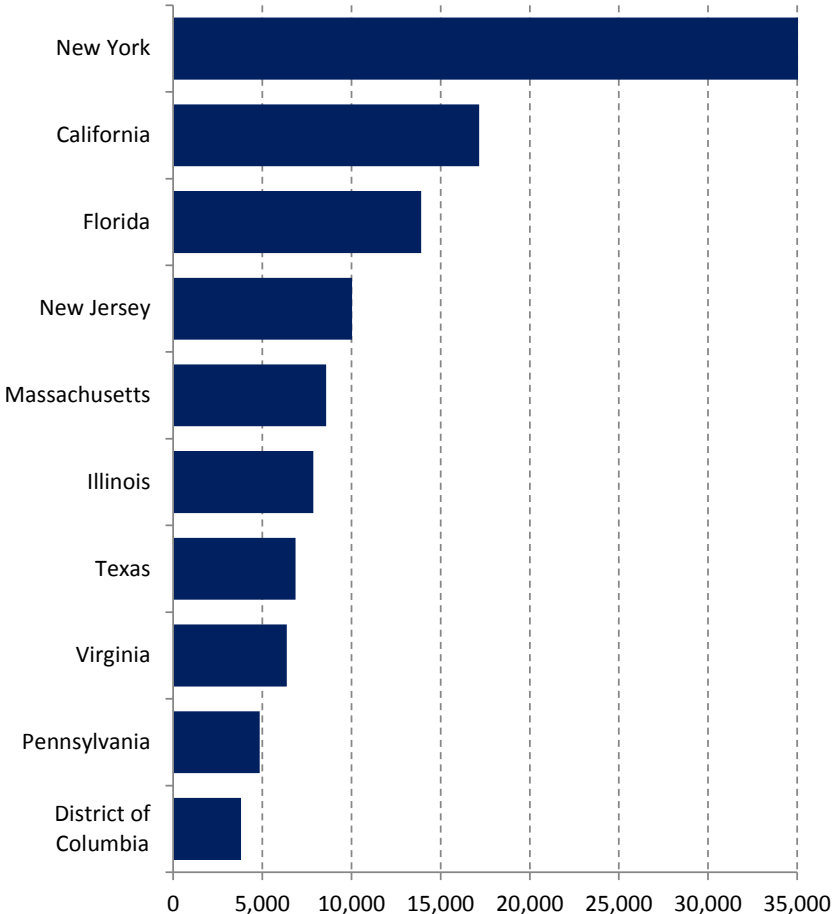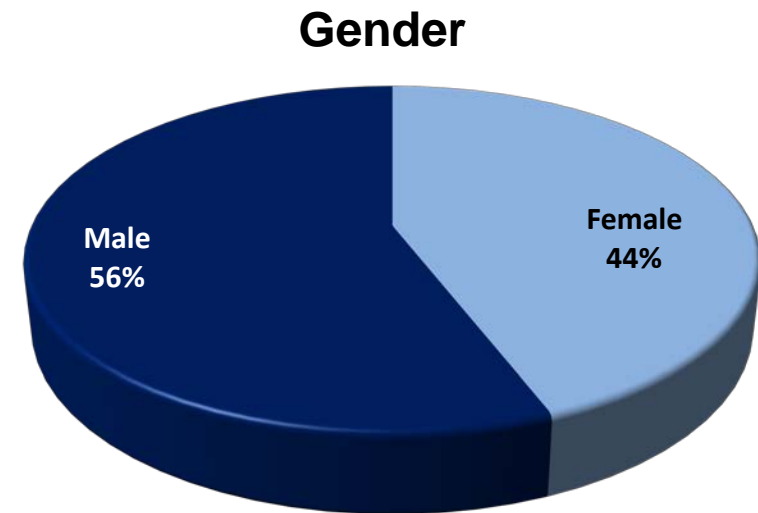
Purpose of Visit to the U.S.A

- Pleasure 52%
- Business 24%
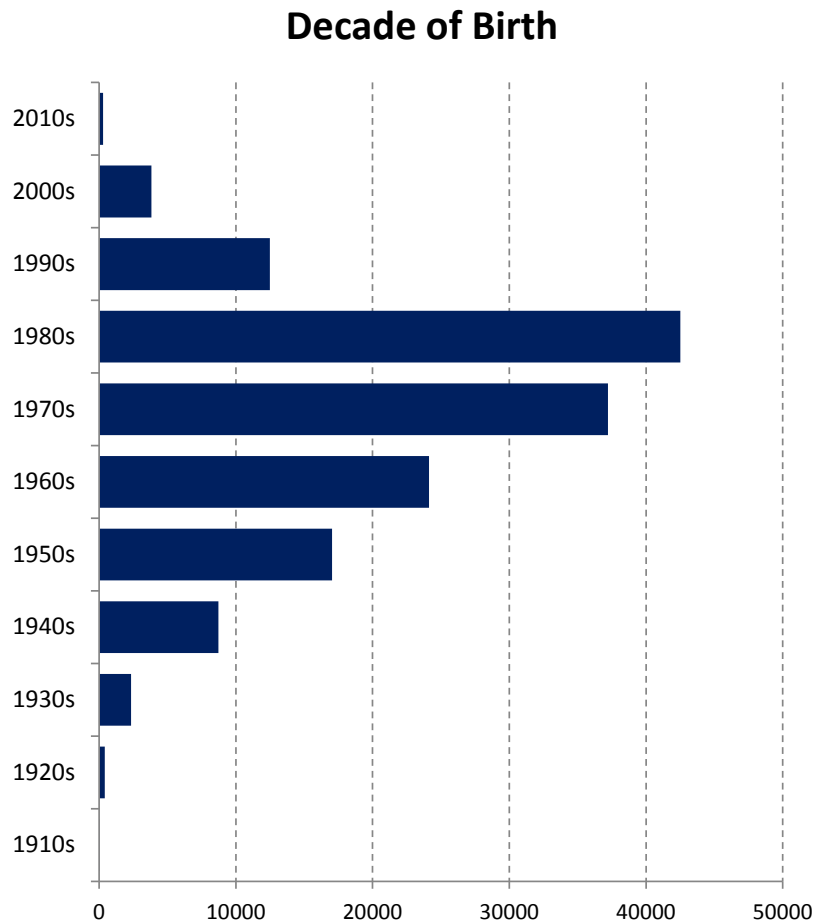- Other 24%

How would a network planner use this type of data?

Source: U.S. Department of Commerce, 2010

Turkish Nationals: U.S.A. visitor data

Decade of Birth
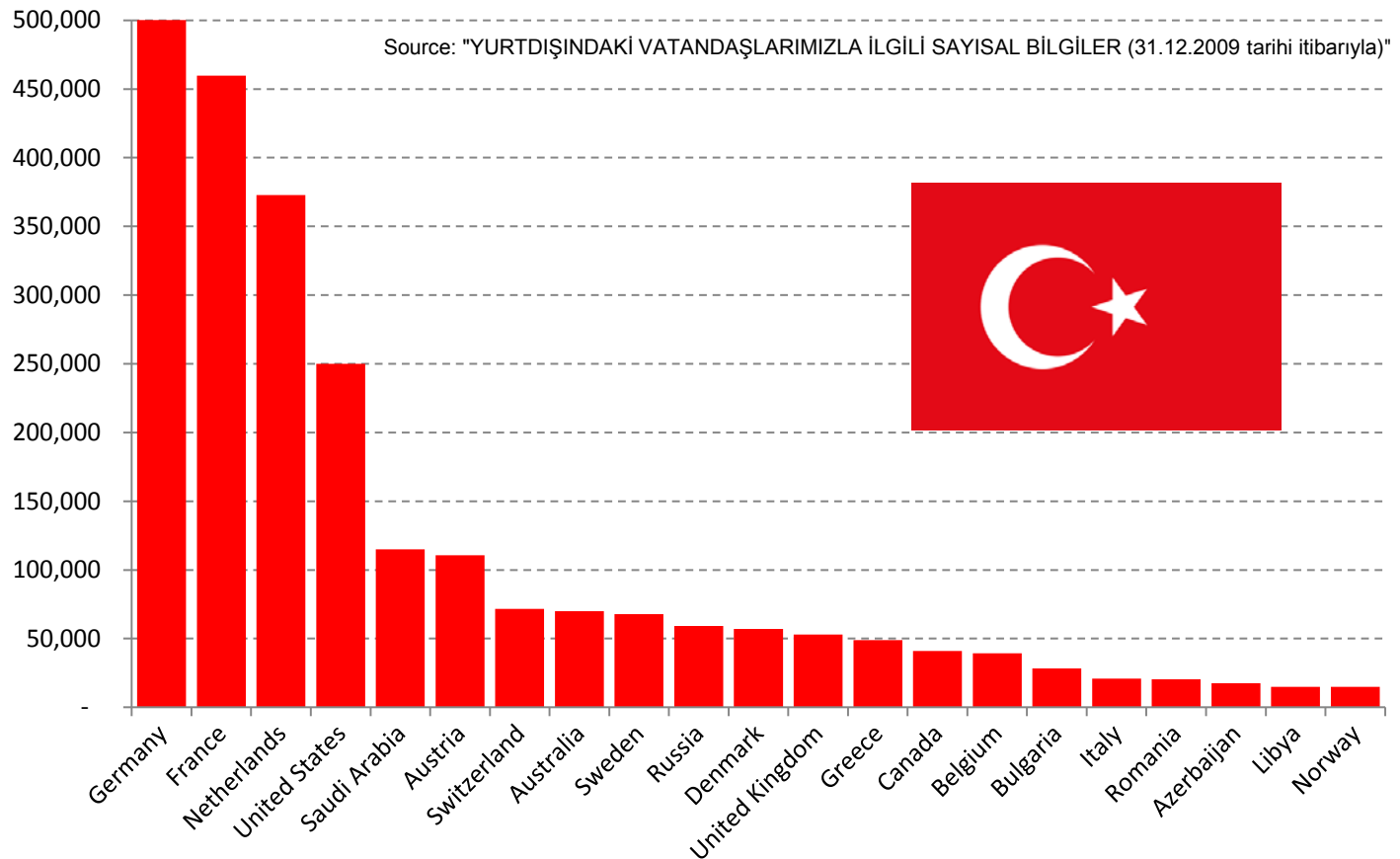

Gender

Male 56%

Female 44%

How would a network planner use this type of data?

Source: U.S. Department of Commerce, 2010

Ethnic settlement may help to guide travel requirements

Turkish Citizens Abroad

Source: "YURTDIŞINDAKİ VATANDAŞLARIMIZLA İLGİLİ SAYISAL BİLGİLER (31.12.2009 tarihi itibarıyla)"

Is this data significant to a network planner? Why or why not?

What is demand and how is it measured?

Air France #049   **Air France #2046**   **Turkish #153**

(SEA) - - - (CDG)(CDG) - - - - (IST)(IST) - - (JNB) - - (CPT)
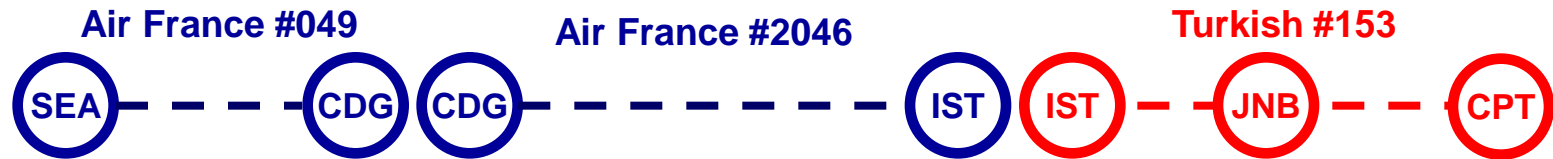
Onboard Loads
- **excellent for dispatchers and caterers**
- **of <u>limited</u> use for airline planners**
- **cannot identify passenger O&D**

SEA-CDG
CDG-IST
IST-JNB
JNB-CPT
} **4 passengers?**

Coupon Origin & Destination (O&D)
- **excellent for revenue accounting**
- **of limited use for airline planners**

SEA-CDG
CDG-IST
IST-CPT
} **Or 3 passengers?**

Online O&D
- **usually available from airlines**
- **not helpful for new route selection**

SEA-IST
IST-CPT
} **Or 2 passengers?**

True O&D
- **useful in evaluating new off-line markets**
- **able to eliminate double-counting**
- **difficult to determine - can be estimated**

SEA-CPT

Best Answer:
1 Passenger!

Load factors and fares vary by airline

Select Airline Load Factor & Fare: Turkey Operations

■ Load Factor △ Average Segment Fare

Load factors by airline: Condor 92%, Tuifly 88%, easyjet 88%, Delta 86%, Sunexpress 83%, Turkish 82%, Emirates 80%, Pegasus 79%, Singapore Airlines 75%, Lufthansa 66%, British Airways 57%
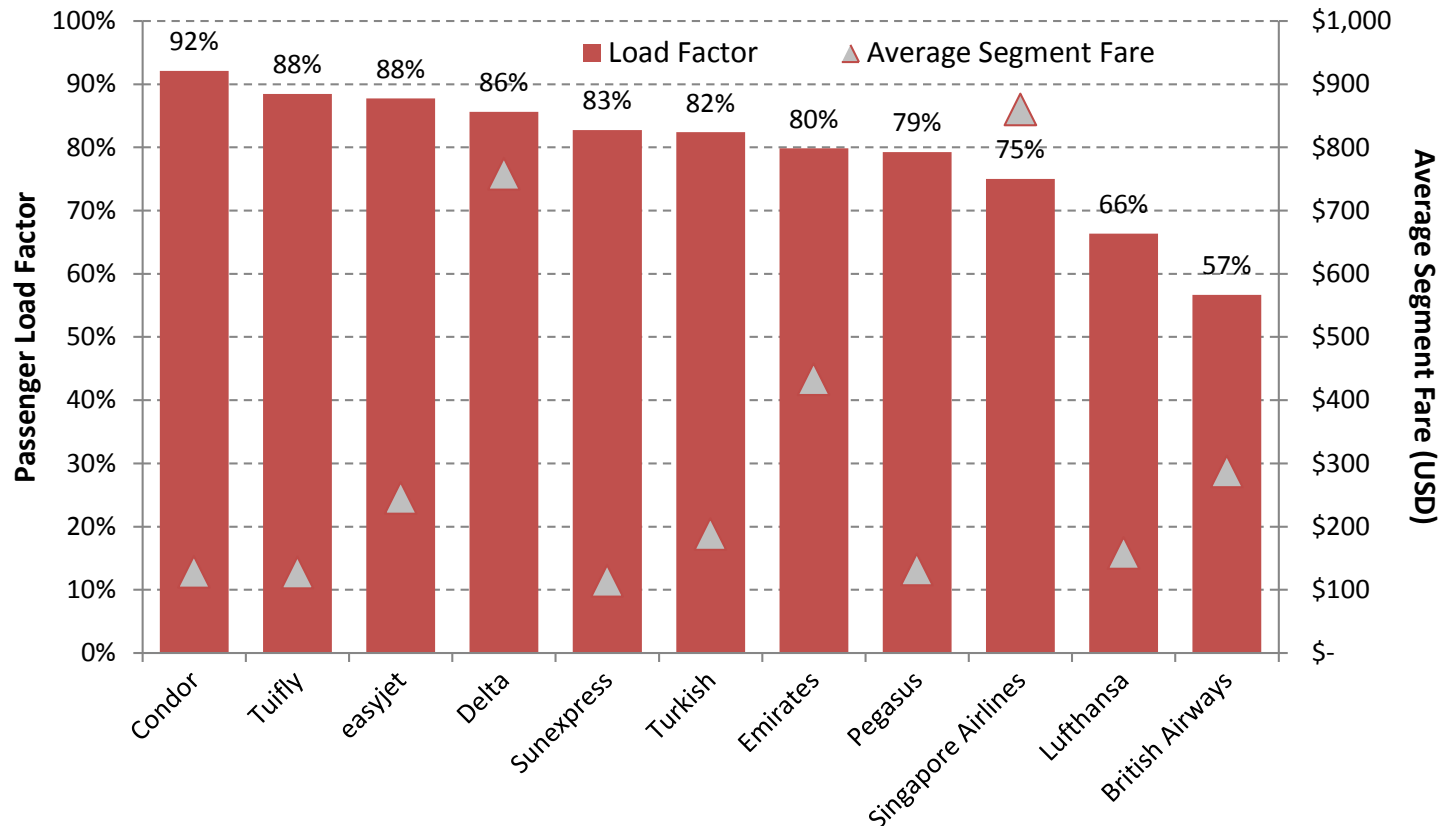
How useful is segment data for network planning?

Source: Sabre ADI, YE 7/2013

Turkish Origin & Destination Markets

Largest Turkish OD Markets
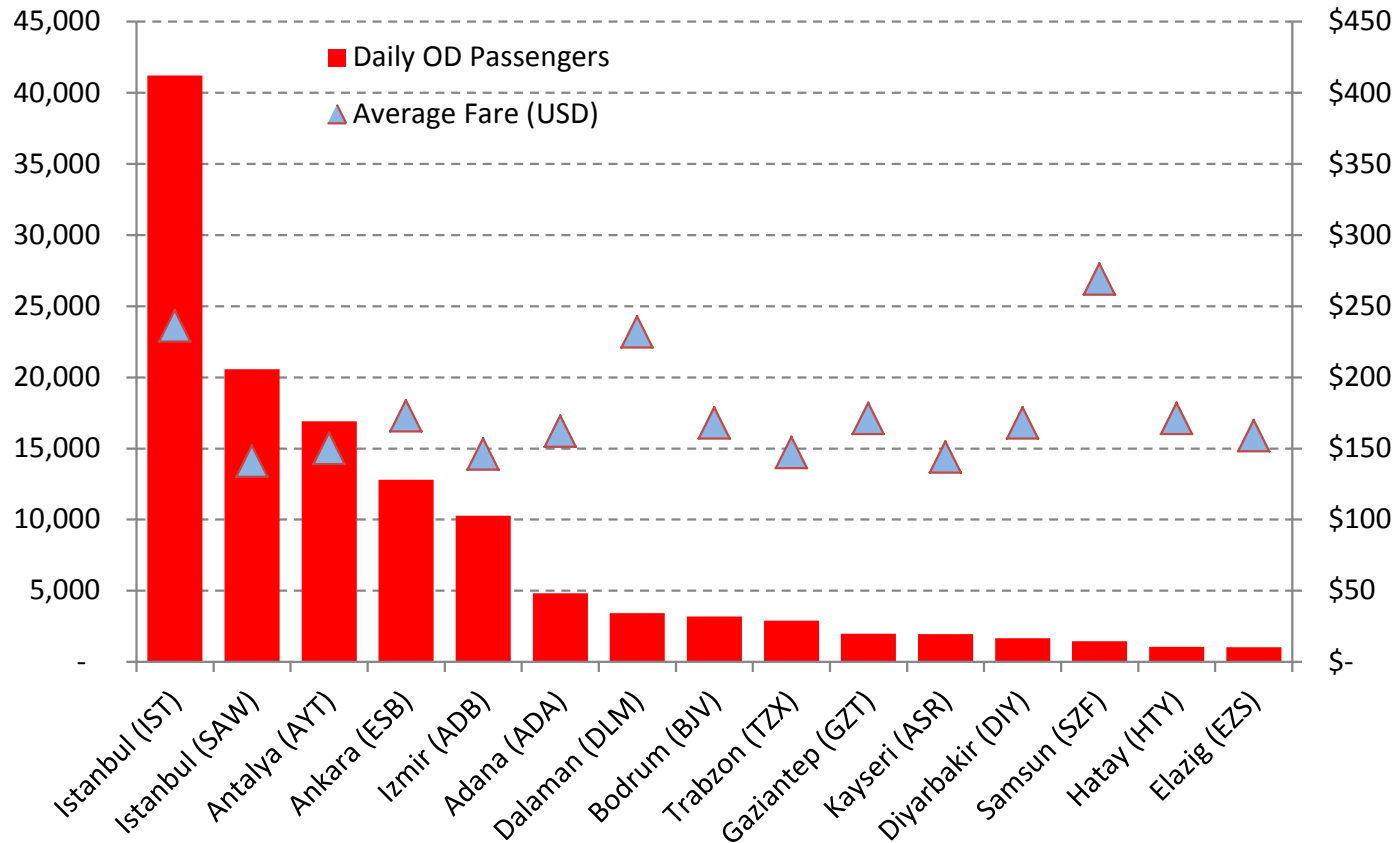
Why do these market sizes and fares differ?

Turkey Origin & Destination demand/fares

Leading Turkish Origin & Destination Pairs- AFRICA

Source: Sabre ADI, YE 7/2013

Legend:
- Non-stop THY service
- Daily Passengers
- Yield (USD/km)

Left axis: Daily Origin & Destination Passengers (Each Direction)
Right axis: Average Passenger Yield (USD per kilometer)

Data values (Daily Passengers):
- Istanbul-Algiers: 347
- Istanbul-Tripoli: 316
- Istanbul-Tunis: 293
- Istanbul-Benghazi: 175
- Istanbul-Casablanca: 140
- Istanbul-Misurata: 68
- Sabiha Gokcen-Casablanca: 59
- Istanbul-Johannesburg: 50
- Sabiha Gokcen-Sfax: 41
- Istanbul-Lagos: 40
- Istanbul-Khartoum: 28
- Istanbul-Nairobi: 28
- Istanbul-Cape Town: 26
- Istanbul-Accra: 18
- Istanbul-Addis Ababa: 16
- Istanbul-Dakar: 16
- Istanbul-Dar Es Salaam: 16
- Istanbul-Entebbe/Kampala: 11
- Istanbul-Kinshasa: 11
- Istanbul-Kigali: 11
- Istanbul-Douala: 10
- Istanbul-Abuja: 9
- Istanbul-Libreville: 9
- Istanbul-Abidjan: 9
- Istanbul-Nouakchott: 7

Turkish Regional Market Share

TURKEY <=> AFRICA

Passenger Share
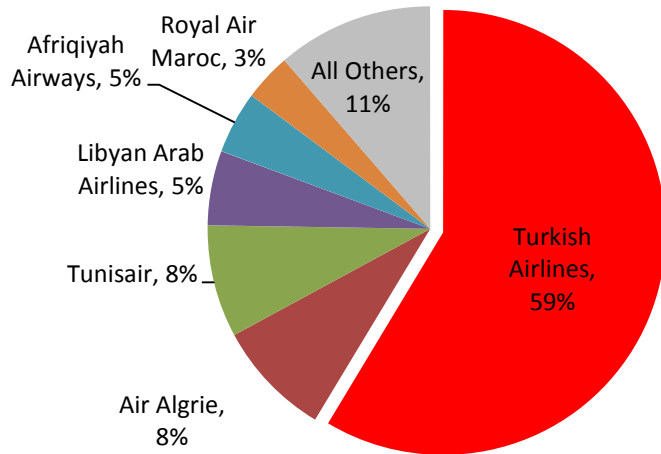
Royal Air Maroc, 3%
Afriqiyah Airways, 5%
All Others, 11%
Libyan Arab Airlines, 5%
Tunisair, 8%
Turkish Airlines, 59%
Air Algrie, 8%

Revenue Share "Gap"

	Passengers	Revenue
Turkish Airlines	59%	62%
Air Algrie	8%	8%
Tunisair	8%	3%
Libyan Arab Airlines	5%	3%
Afriqiyah Airways	5%	3%
Royal Air Maroc	3%	4%
All Others	11%	17%

Source: Sabre ADI, YE 7/2013

Turkey Origin & Destination demand/fares

Leading Turkish Origin & Destination Pairs- EAST ASIA

Source: Sabre ADI, YE 7/2013
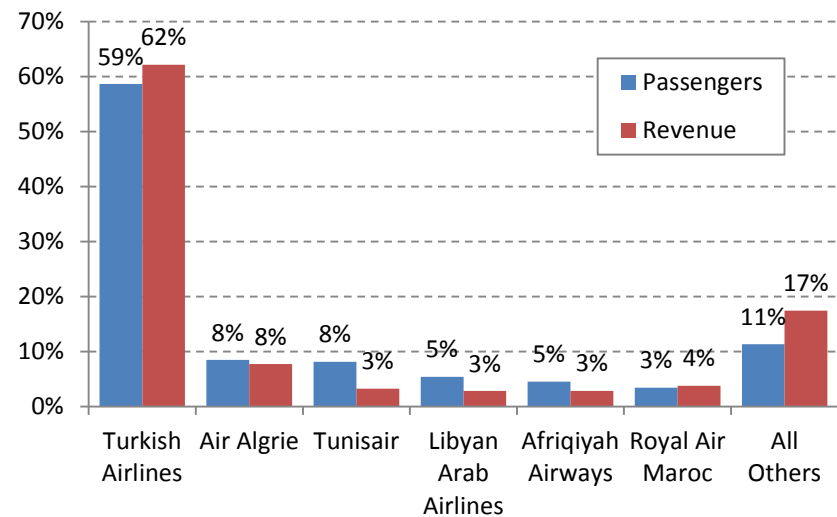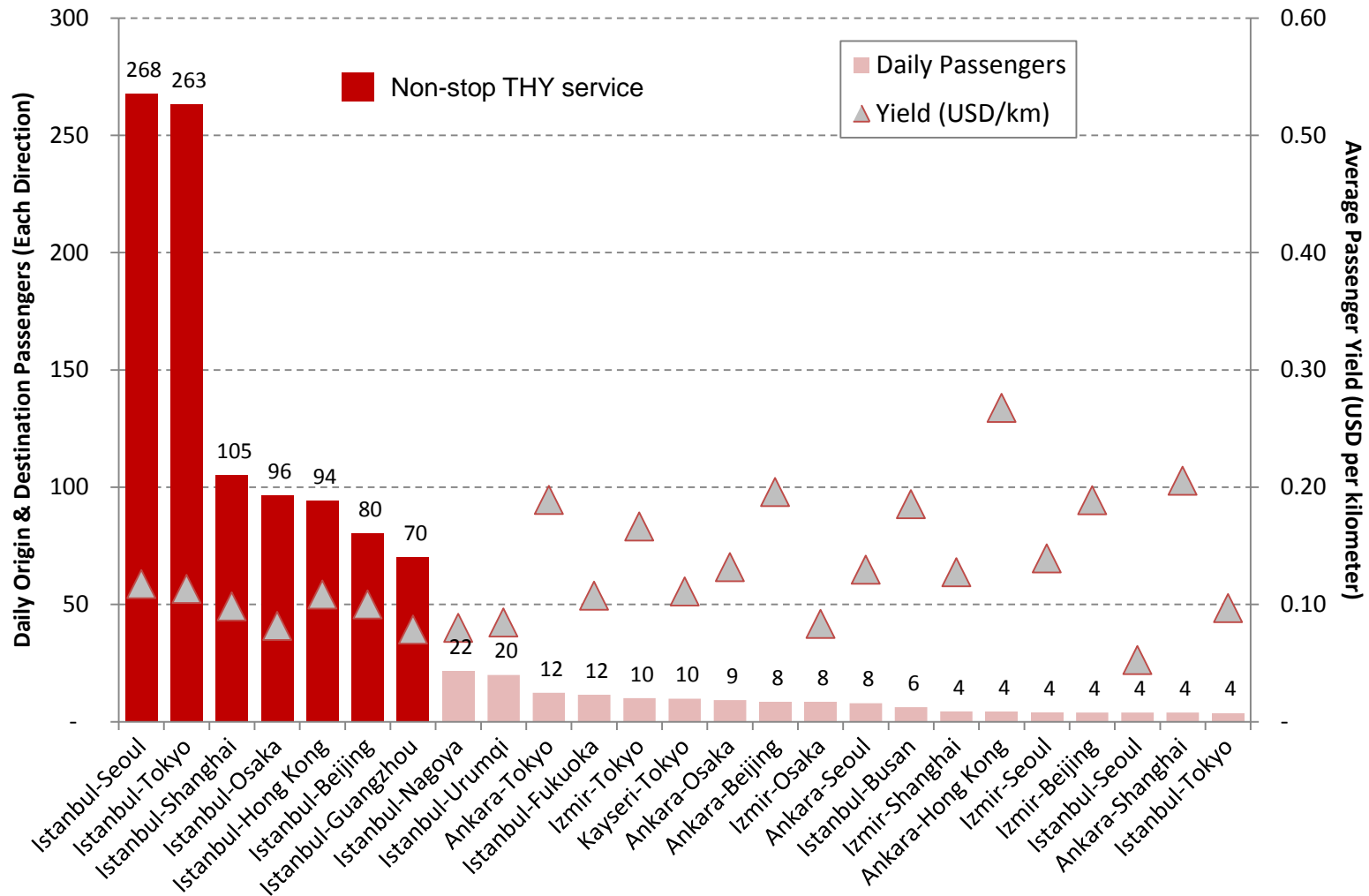

Legend:
- ■ Non-stop THY service
- ■ Daily Passengers
- △ Yield (USD/km)

Left axis: Daily Origin & Destination Passengers (Each Direction) — 0 to 300
Right axis: Average Passenger Yield (USD per kilometer) — 0 to 0.60

Data values (Daily Passengers):
- Istanbul-Seoul: 268
- Istanbul-Tokyo: 263
- Istanbul-Shanghai: 105
- Istanbul-Osaka: 96
- Istanbul-Hong Kong: 94
- Istanbul-Beijing: 80
- Istanbul-Guangzhou: 70
- Istanbul-Nagoya: 22
- Istanbul-Urumqi: 20
- Ankara-Tokyo: 12
- Istanbul-Fukuoka: 12
- Izmir-Tokyo: 10
- Kayseri-Tokyo: 10
- Ankara-Osaka: 9
- Ankara-Beijing: 8
- Izmir-Osaka: 8
- Ankara-Seoul: 8
- Istanbul-Busan: 6
- Izmir-Shanghai: 4
- Ankara-Hong Kong: 4
- Izmir-Seoul: 4
- Izmir-Beijing: 4
- Istanbul-Seoul: 4
- Ankara-Shanghai: 4
- Istanbul-Tokyo: 4

Turkish Regional Market Share

TURKEY <=> EAST ASIA

Passenger Share

- Emirates, 3%
- Etihad, 3%
- Qatar, 4%
- Asiana, 7%
- Korean Air, 7%
- All Others, 9%
- Turkish Airlines, 67%

Revenue Share "Gap"

	Passengers	Revenue
Turkish Airlines	67%	68%
Korean Air	7%	9%
Asiana	7%	8%
Qatar	4%	3%
Etihad	3%	2%
Emirates	3%	4%
All Others	9%	6%

Turkey Origin & Destination demand/fares

Leading Turkish Origin & Destination Pairs- LATIN AMERICA

Source: Sabre ADI, YE 7/2013
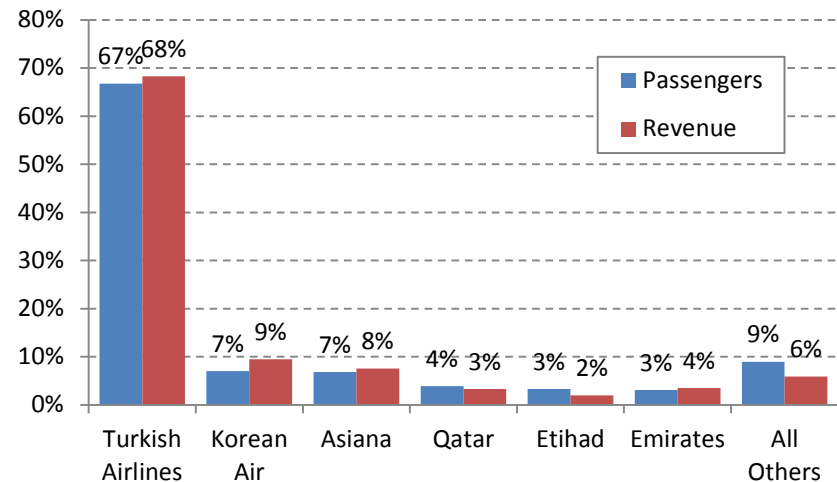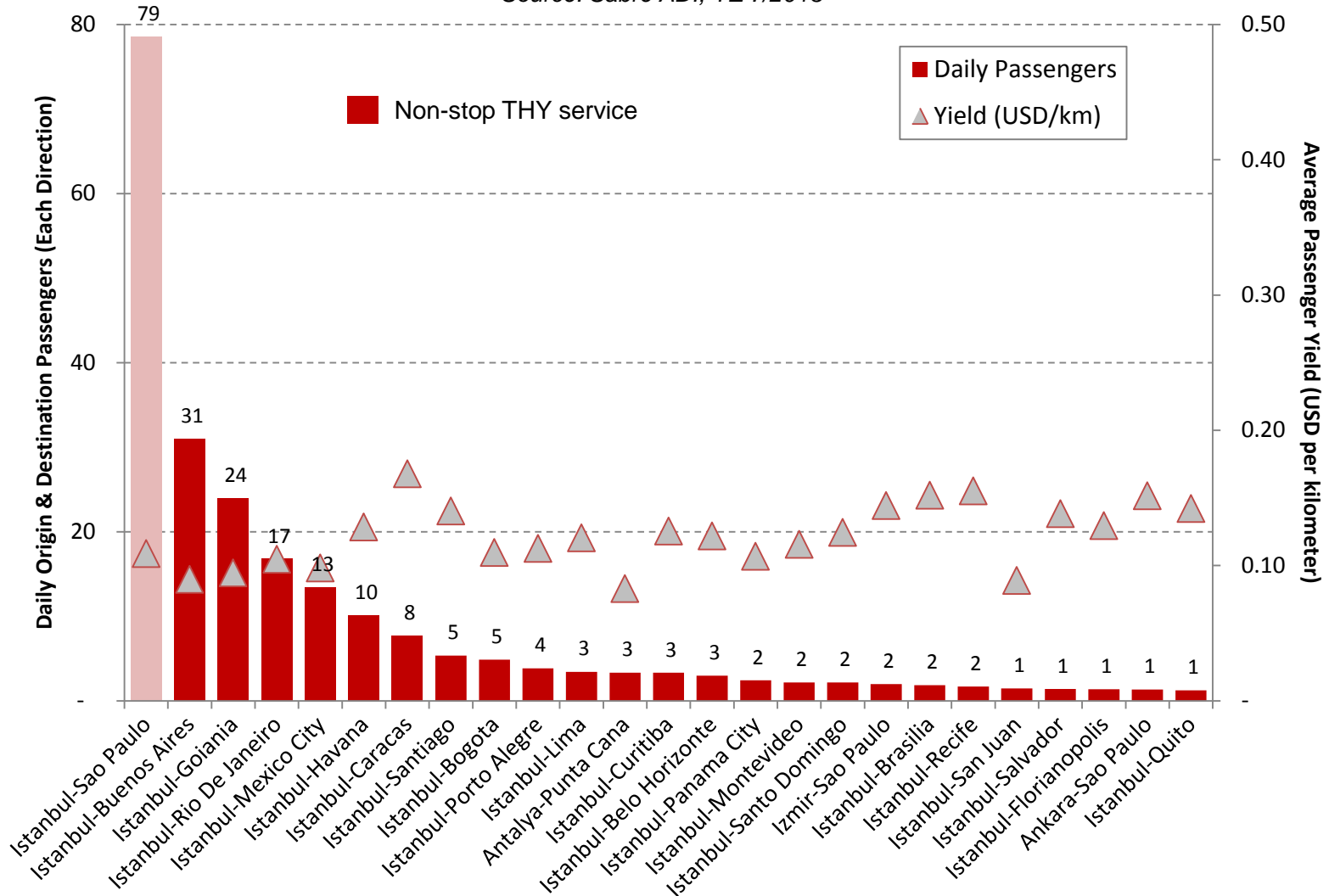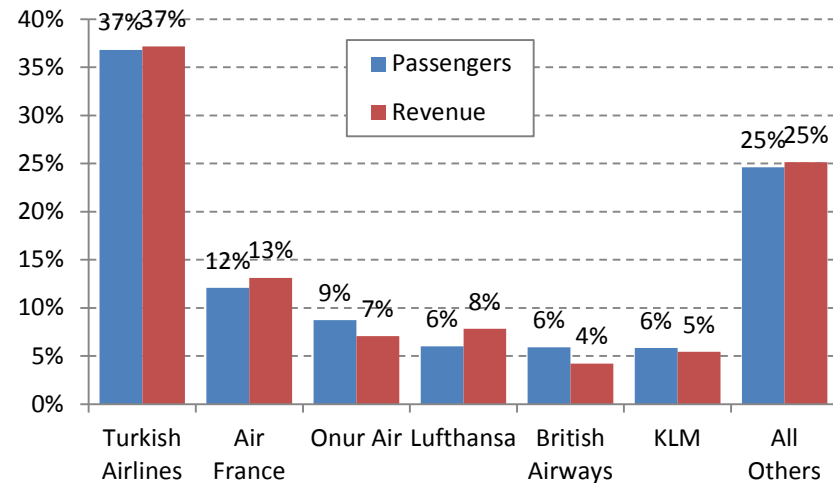

Legend: Non-stop THY service ■ | Daily Passengers ■ | Yield (USD/km) △

Data values (Daily Origin & Destination Passengers, Each Direction):
- Istanbul-Sao Paulo: 79
- Istanbul-Buenos Aires: 31
- Istanbul-Goiania: 24
- Istanbul-Rio De Janeiro: 17
- Istanbul-Mexico City: 13
- Istanbul-Havana: 10
- Istanbul-Caracas: 8
- Istanbul-Santiago: 5
- Istanbul-Bogota: 5
- Istanbul-Porto Alegre: 4
- Istanbul-Lima: 3
- Antalya-Punta Cana: 3
- Istanbul-Curitiba: 3
- Istanbul-Belo Horizonte: 3
- Istanbul-Panama City: 2
- Istanbul-Montevideo: 2
- Istanbul-Santo Domingo: 2
- Izmir-Sao Paulo: 2
- Istanbul-Brasilia: 2
- Istanbul-Recife: 2
- Istanbul-San Juan: 1
- Istanbul-Salvador: 1
- Istanbul-Florianopolis: 1
- Ankara-Sao Paulo: 1
- Istanbul-Quito: 1

Turkish Regional Market Share

TURKEY <=> LATIN AMERICA

Passenger Share

- Turkish Airlines, 37%
- Air France, 12%
- Onur Air, 9%
- Lufthansa, 6%
- British Airways, 6%
- KLM, 6%
- All Others, 25%

Revenue Share "Gap"

Legend: Passengers, Revenue

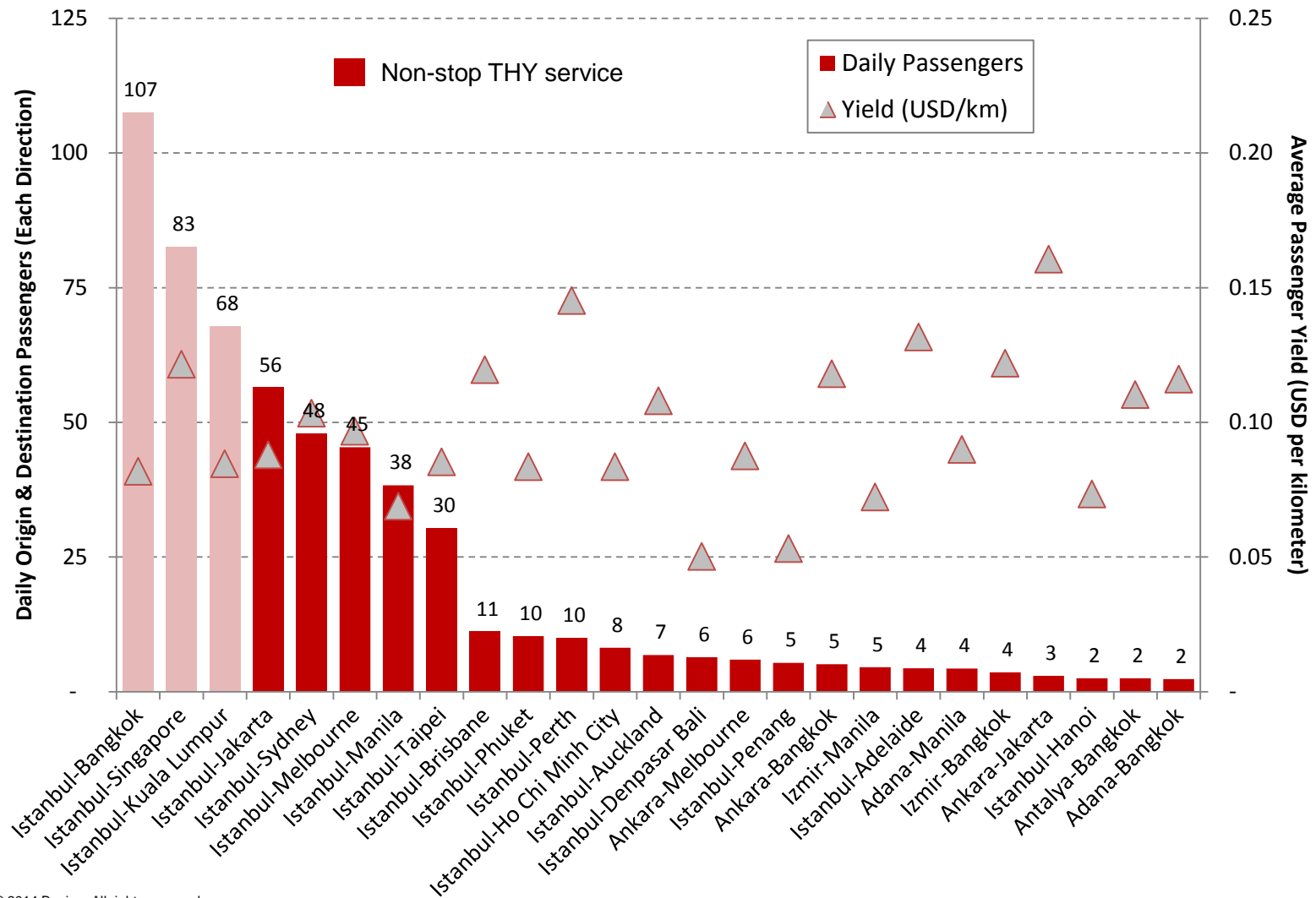|	Passengers	Revenue
Turkish Airlines	37%	37%
Air France	12%	13%
Onur Air	9%	7%
Lufthansa	6%	8%
British Airways	6%	4%
KLM	6%	5%
All Others	25%	25%

Turkey Origin & Destination demand/fares

Leading Turkish Origin & Destination Pairs- SOUTHEAST ASIA

Source: Sabre ADI, YE 7/2013

Legend:
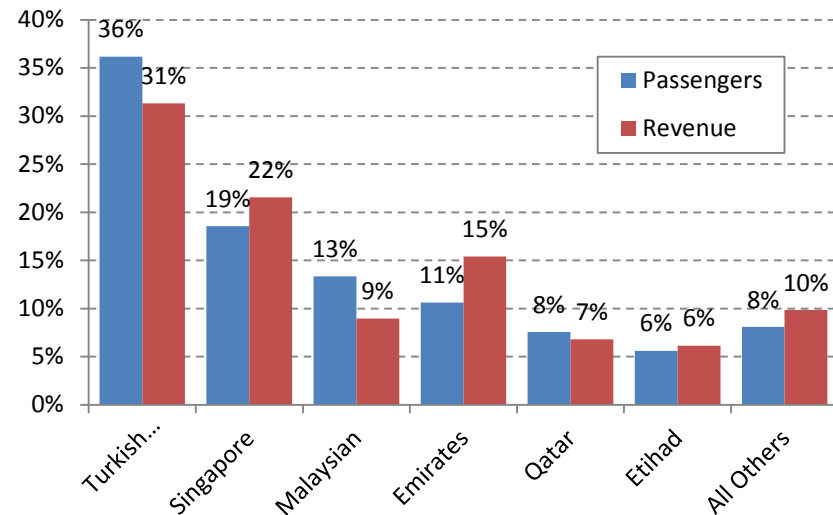- Non-stop THY service
- Daily Passengers
- Yield (USD/km)

Y-axis (left): Daily Origin & Destination Passengers (Each Direction), scale 0–125
Y-axis (right): Average Passenger Yield (USD per kilometer), scale 0–0.25

Daily Passenger values by origin-destination pair:
- Istanbul-Bangkok: 107
- Istanbul-Singapore: 83
- Istanbul-Kuala Lumpur: 68
- Istanbul-Jakarta: 56
- Istanbul-Sydney: 48
- Istanbul-Melbourne: 45
- Istanbul-Manila: 38
- Istanbul-Taipei: 30
- Istanbul-Brisbane: 11
- Istanbul-Phuket: 10
- Istanbul-Perth: 10
- Istanbul-Ho Chi Minh City: 8
- Istanbul-Auckland: 7
- Istanbul-Denpasar Bali: 6
- Ankara-Melbourne: 6
- Istanbul-Penang: 5
- Ankara-Bangkok: 5
- Izmir-Manila: 5
- Istanbul-Adelaide: 4
- Adana-Manila: 4
- Izmir-Bangkok: 4
- Ankara-Jakarta: 3
- Istanbul-Hanoi: 2
- Antalya-Bangkok: 2
- Adana-Bangkok: 2

Turkish Regional Market Share

TURKEY <=> SE ASIA

Passenger Share
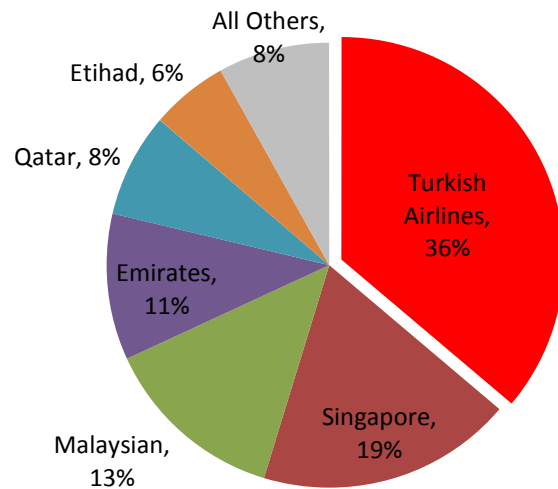
- All Others, 8%
- Etihad, 6%
- Qatar, 8%
- Emirates, 11%
- Malaysian, 13%
- Singapore, 19%
- Turkish Airlines, 36%

Revenue Share "Gap"

	Passengers	Revenue
Turkish…	36%	31%
Singapore	19%	22%
Malaysian	13%	9%
Emirates	11%	15%
Qatar	8%	7%
Etihad	6%	6%
All Others	8%	10%

Turkey Origin & Destination Demand/fares

Leading Turkish Origin & Destination Pairs- N. AMERICA

Source: Sabre ADI, YE 7/2013
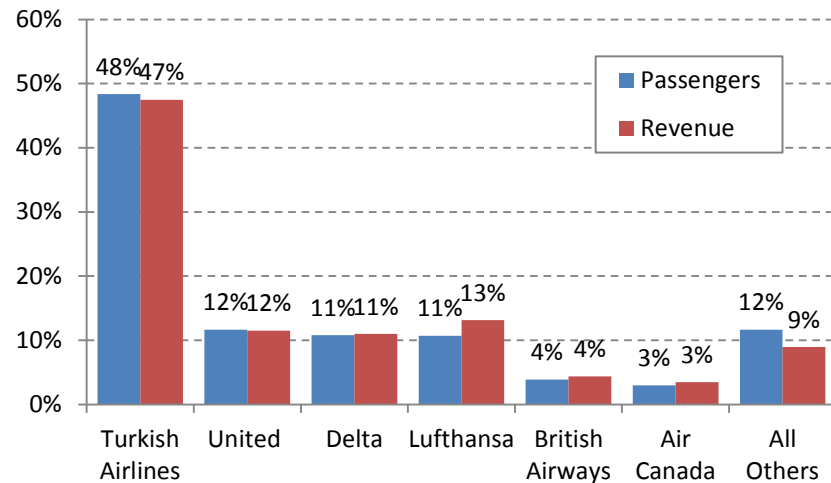

Legend:
- Non-stop THY service
- Daily Passengers
- Yield (USD/km)

Y-axis (left): Daily Origin & Destination Passengers (Each Direction) — 0 to 300
Y-axis (right): Average Passenger Yield (USD per kilometer) — 0 to 0.30

Data values (Daily Passengers):
- Istanbul-New York: 288
- Istanbul-Los Angeles: 96
- Istanbul-Washington: 76
- Istanbul-Toronto: 73
- Istanbul-Chicago: 62
- Istanbul-Newark: 55
- Istanbul-San Francisco: 39
- Istanbul-Boston: 37
- Istanbul-Houston: 32
- Istanbul-Miami: 31
- Istanbul-Montreal: 31
- Ankara-New York: 20
- Istanbul-Atlanta: 20
- Istanbul-Seattle: 16
- Istanbul-Vancouver: 15
- Izmir-New York: 14
- Istanbul-Dallas/Fort Worth: 14
- Istanbul-Detroit: 12
- Ankara-Washington: 12
- Istanbul-Orlando: 11
- Ankara-Los Angeles: 9
- Istanbul-Denver: 8
- Istanbul-Minneapolis: 8
- Istanbul-Las Vegas: 7
- Istanbul-Calgary: 7

Turkish Regional Market Share

TURKEY <=> NORTH AMERICA

Passenger Share

- Air Canada, 3%
- British Airways, 4%
- All Others, 12%
- Lufthansa, 11%
- Delta, 11%
- United, 12%
- Turkish Airlines, 48%

Revenue Share "Gap"

Legend: Passengers, Revenue

	Passengers	Revenue
Turkish Airlines	48%	47%
United	12%	12%
Delta	11%	11%
Lufthansa	11%	13%
British Airways	4%	4%
Air Canada	3%	3%
All Others	12%	9%

North America: Passenger Traffic Growth Trend

Average Annual Growth

- Newark — **28.9%**
- San Francisco — **7.5%**
- Miami — **3.4%**
- Atlanta — **6.7%**
- Seattle — **9.3%**
- Vancouver — **11.4%**
- Dallas — **6.8%**
- Detroit — **9.2%**
- Denver — **7.7%**

Y-axis: Turkey O&D Passengers per Month (0 to 3,500)

X-axis: 2002-12 to 2013-9

How would a network planner use this information?

Source: Sabre ADI, 12 month moving average

Market Share in Non-stop O&D Pairs

Turkey-North America O&D Revenue Share
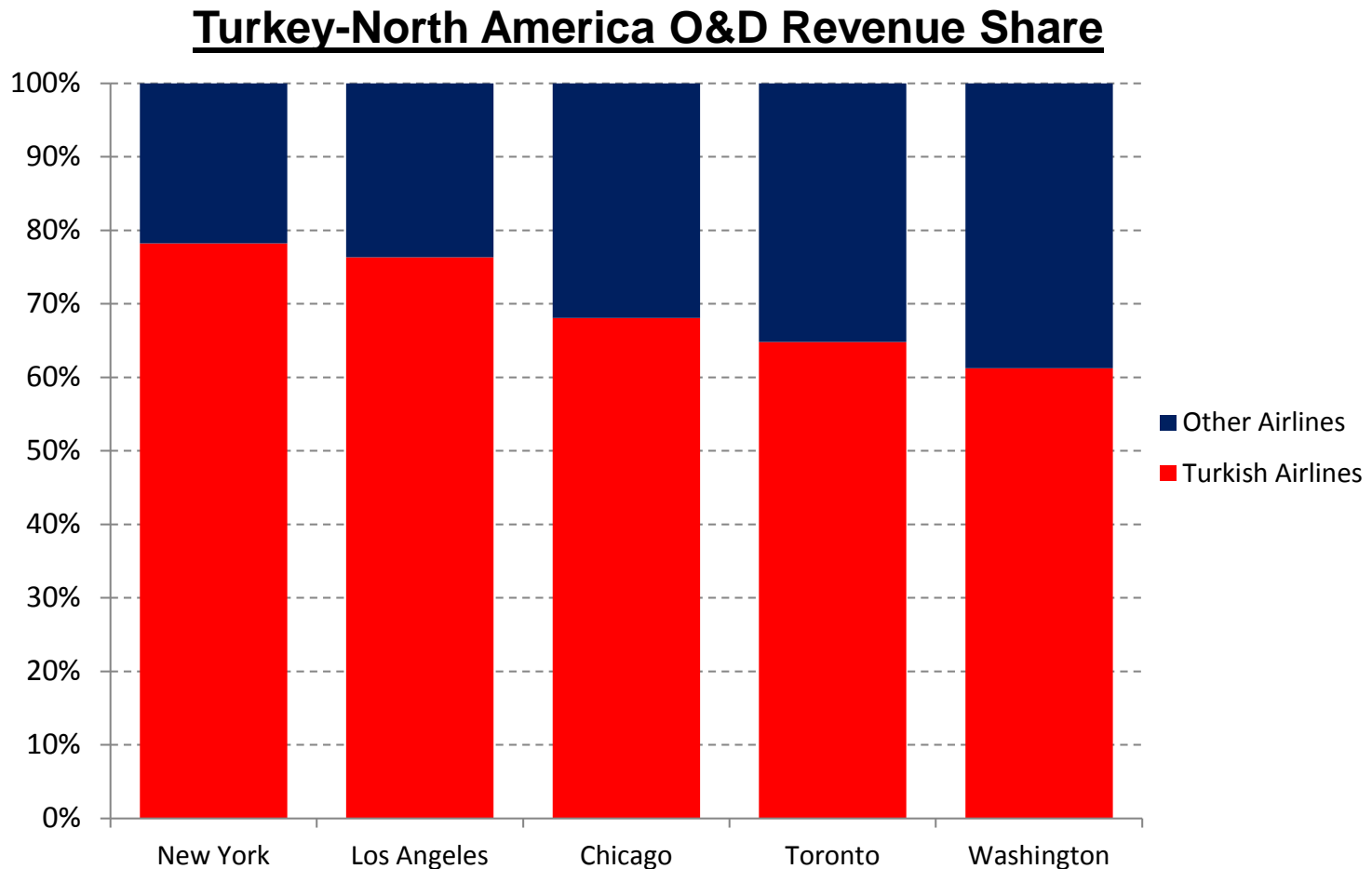
How does THY maintain such high market shares?

Yield differences between markets

Turkey-North America O&D Revenue by Class

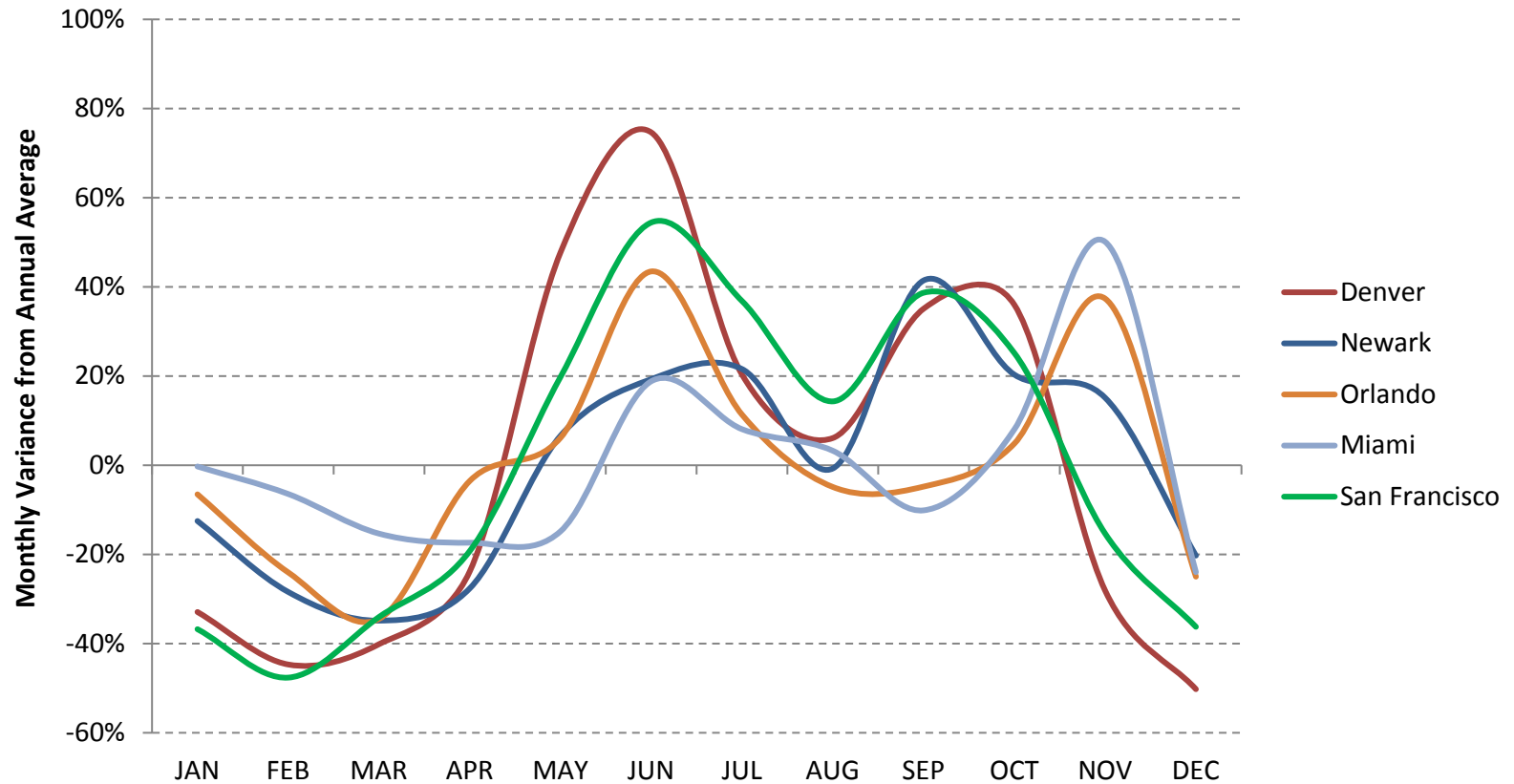*How would a network planner use this information?*

Source: Sabre ADI, YE 7/2013
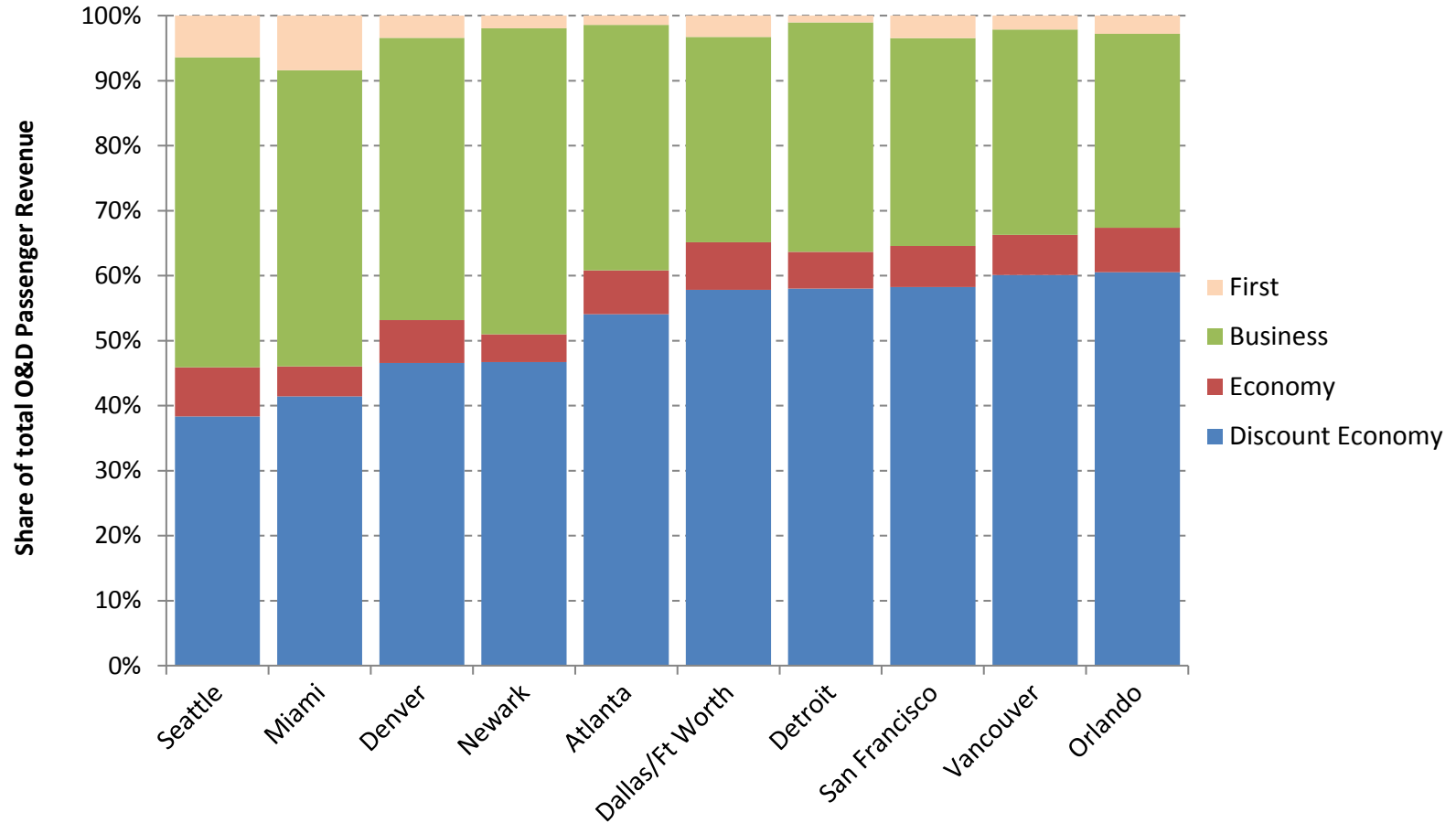
Point of Origin impacts market planning

Turkey-North America O&D Point of Origin

Legend: U.S.A. (blue), Turkey (red)
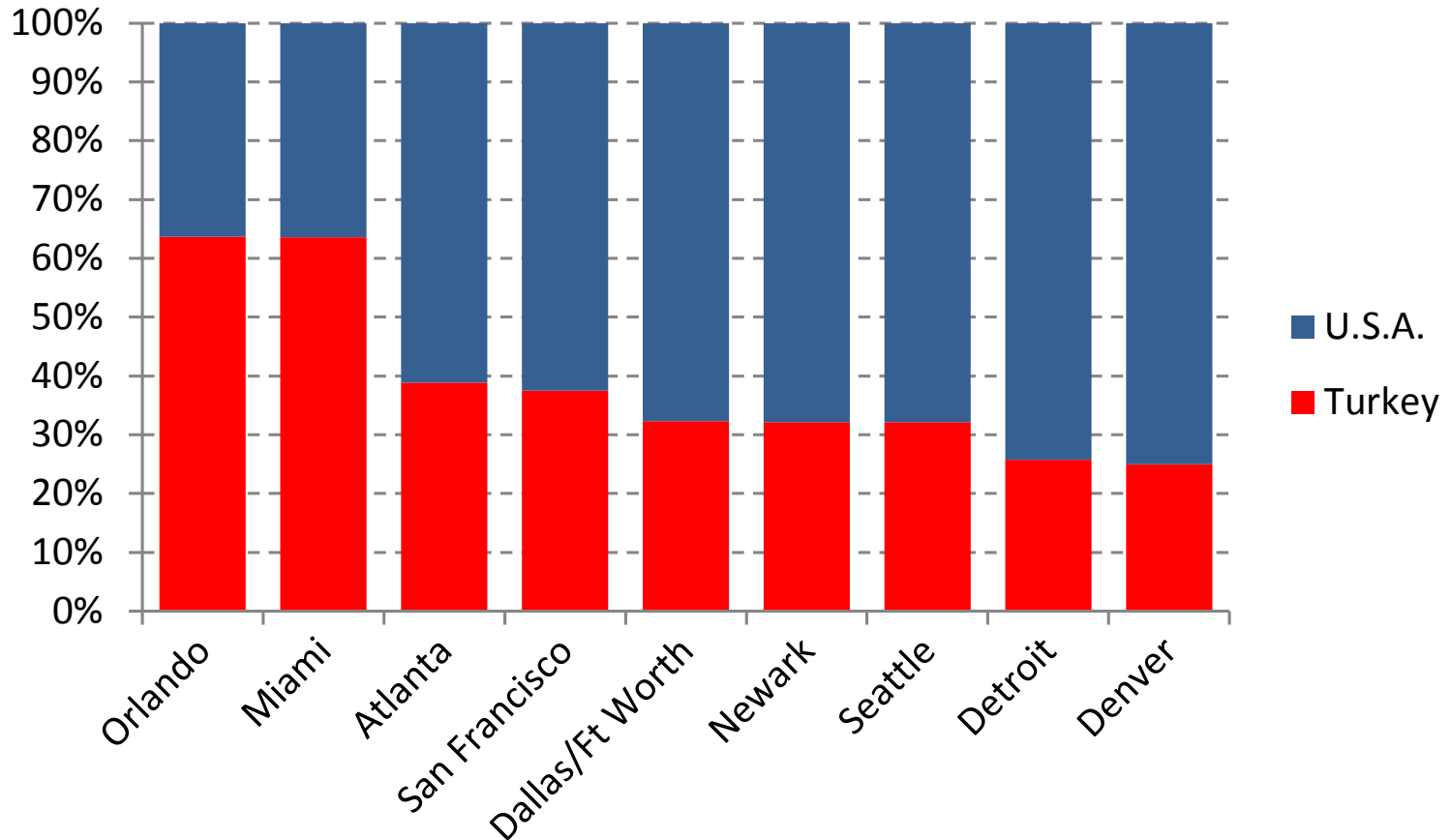
What implications might this data have for planning?

Seasonality varies by region and/or market

Turkey-North America O&D Demand by Month
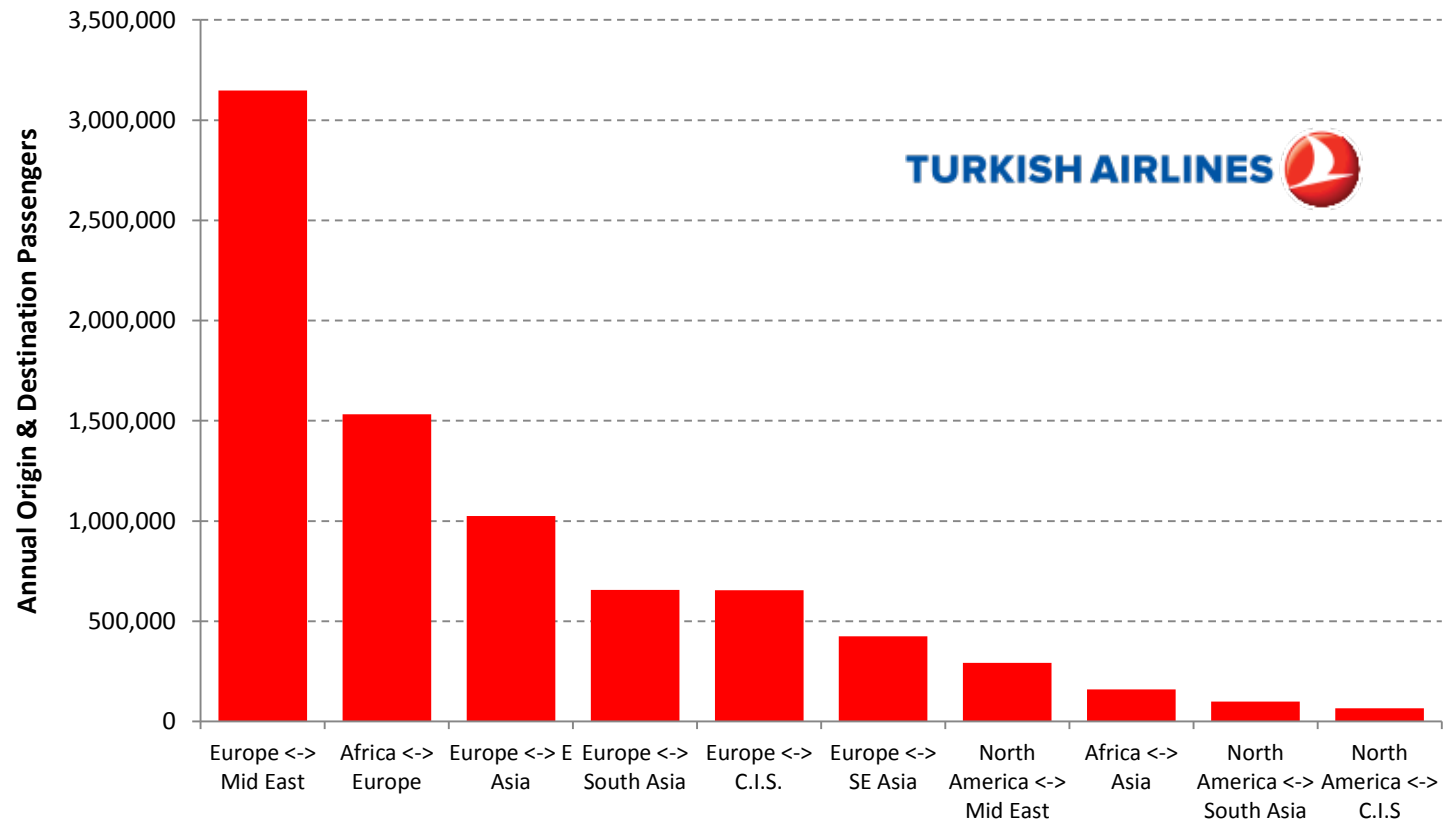

How would a network planner use this information?

Source: Sabre ADI, YE 7/2013

Connecting Traffic Flows

What regions are connected via the Istanbul hub?

Istanbul as a crossroads of regions
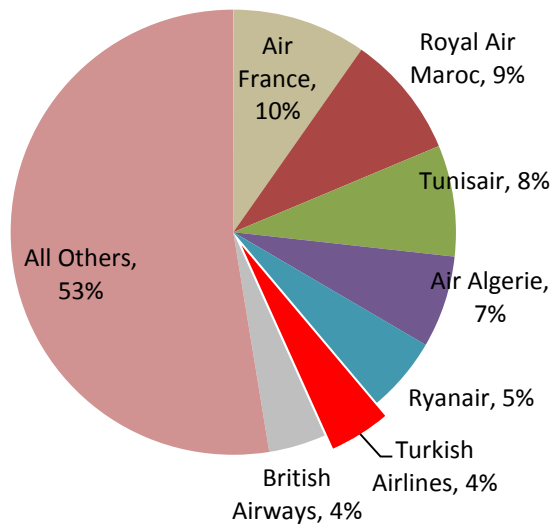
Turkish Airlines Passenger Flow Traffic

Source: Sabre ADI YE 7/2013

Regional Flow Market Share

AFRICA <=> EUROPE

Passenger Share

Air France, 10%
Royal Air Maroc, 9%
Tunisair, 8%
Air Algerie, 7%
Ryanair, 5%
Turkish Airlines, 4%
British Airways, 4%
All Others, 53%

Revenue Share "Gap"

	Passengers	Revenue
Air France	10%	18%
Royal Air Maroc	9%	4%
Tunisair	8%	2%
Air Algerie	7%	3%
Ryanair	5%	2%
Turkish Airlines	4%	4%
British Airways	4%	11%
All Others	53%	57%
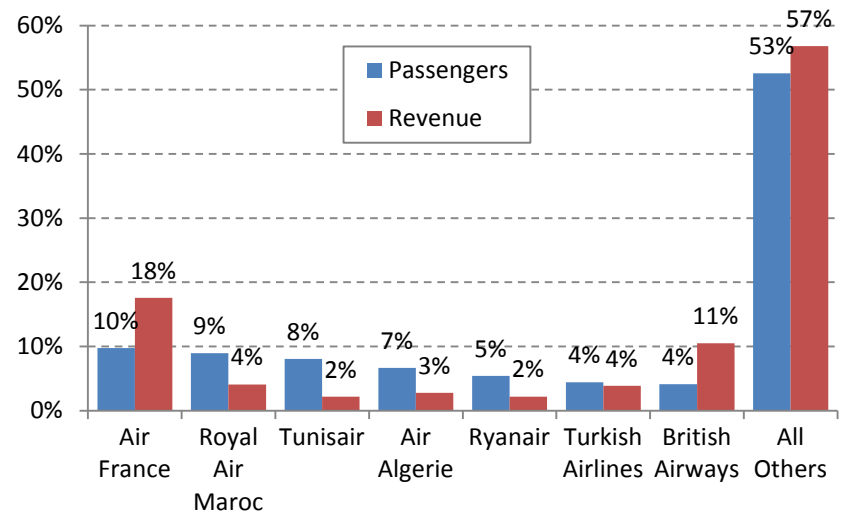
Regional Flow Market Share

EUROPE <=> EAST ASIA

Passenger Share

Lufthansa, 10%
Air China, 9%
Air France, 8%
KLM, 7%
Cathay Pacific, 6%
Turkish Airlines, 5%
Finnair, 5%
All Others, 49%

Revenue Share "Gap"

Airline	Passengers	Revenue
Lufthansa	10%	13%
Air China	9%	6%
Air France	8%	9%
KLM	7%	6%
Cathay Pacific	6%	8%
Turkish Airlines	5%	4%
Finnair	5%	4%
All Others	49%	49%
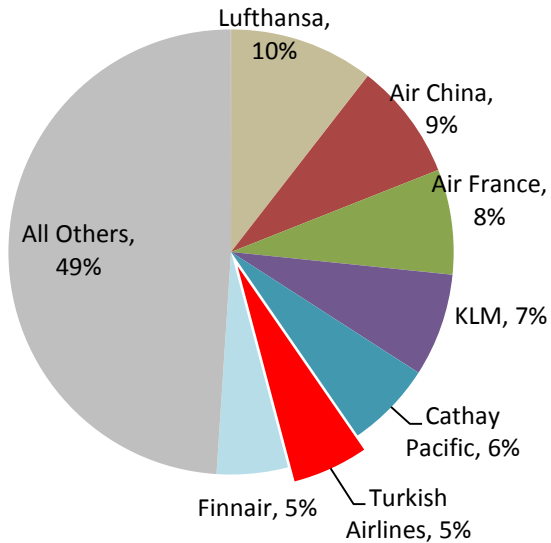
Source: Sabre ADI YE 7/2013
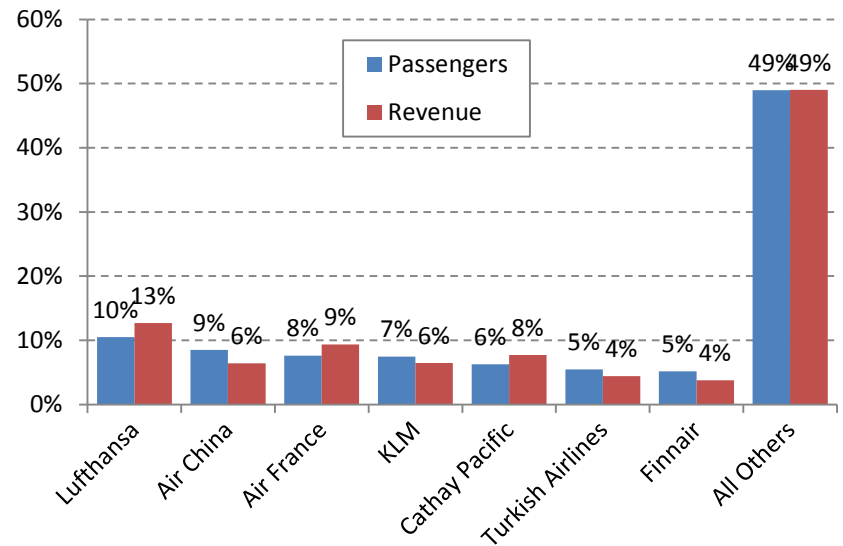
Regional Flow Market Share

EUROPE <=> SOUTH ASIA

Passenger Share

- Emirates, 23%
- Qatar, 11%
- Jet Airways, 7%
- Pakistan Int'l, 7%
- Air India, 7%
- Turkish Airlines, 6%
- Lufthansa, 5%
- British Airways, 4%
- All Others, 30%

Revenue Share "Gap"

Legend: Passengers (blue), Revenue (red)

Airline	Passengers	Revenue
Emirates	23%	28%
Qatar	11%	9%
Jet Airways	7%	6%
Pakistan Int'l	7%	6%
Air India	7%	3%
Turkish Airlines	6%	5%
Lufthansa	5%	8%
British Airways	4%	8%
All Others	30%	27%
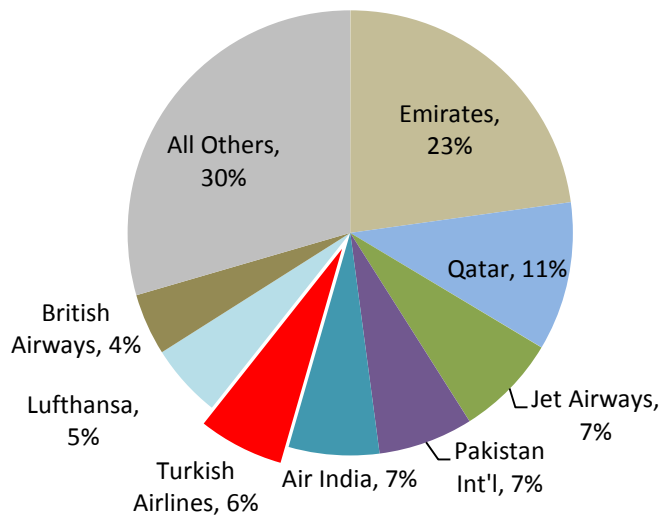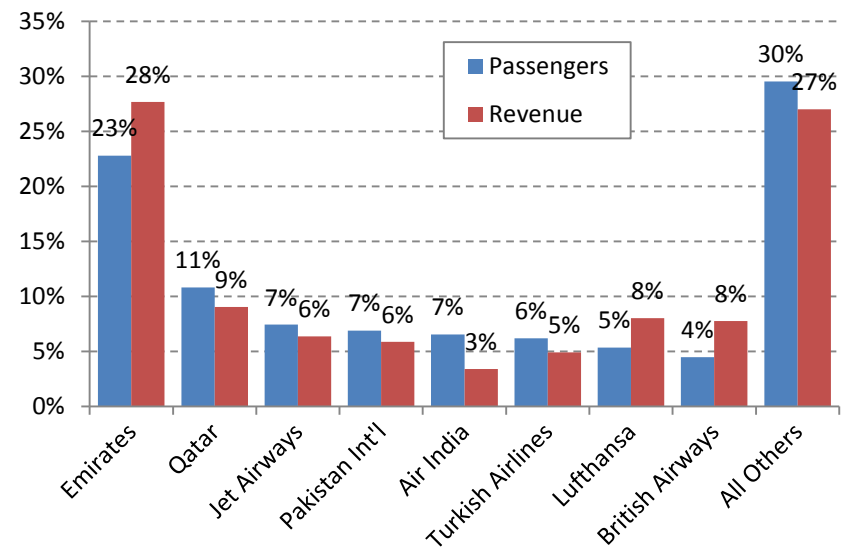
Source: Sabre ADI YE 7/2013

Regional Flow Market Share

NORTH AMERICA <=> MIDDLE EAST

Passenger Share

United, 12%
El Al, 12%
Delta, 9%
Emirates, 9%
British Airways, 6%
Lufthansa, 6%
Turkish, 5%
Air Canada, 5%
All Others, 35%

Revenue Share "Gap"

	Passengers	Revenue
United	12%	13%
El Al	12%	12%
Delta	9%	9%
Emirates	9%	16%
British Airways	6%	5%
Lufthansa	6%	6%
Turkish	5%	4%
Air Canada	5%	4%
All Others	35%	31%
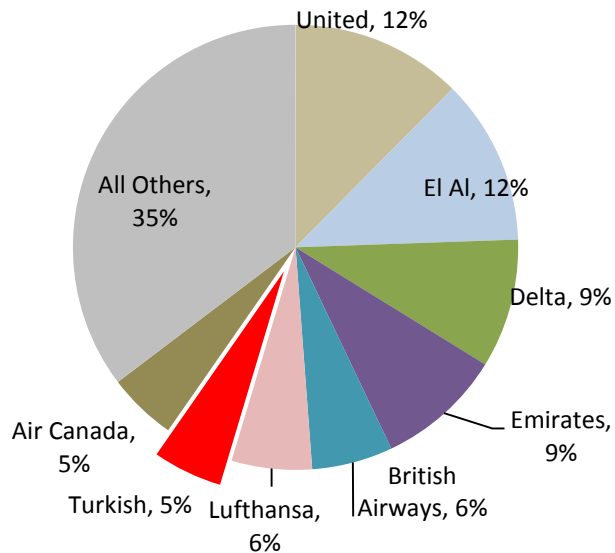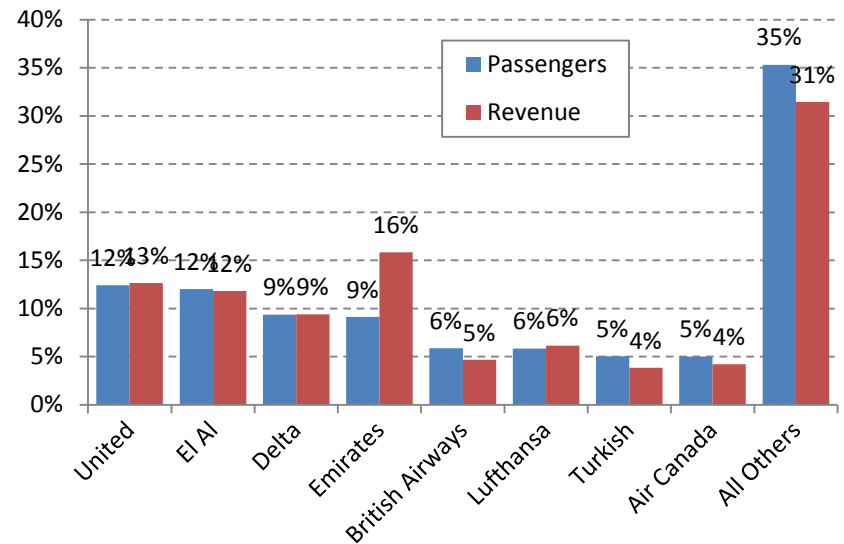
Importance of connecting traffic flows

O&D Size Potential: Turkey + Other THY Flows

Chart legend: Other Flow (dark blue), Turkey (red). Y-axis: Passengers Daily in Each Direction (0 to 1,200). X-axis cities: San Francisco, New York, Dallas/Ft Worth, Vancouver, Miami, Atlanta, Seattle, Detroit, Orlando, Denver.
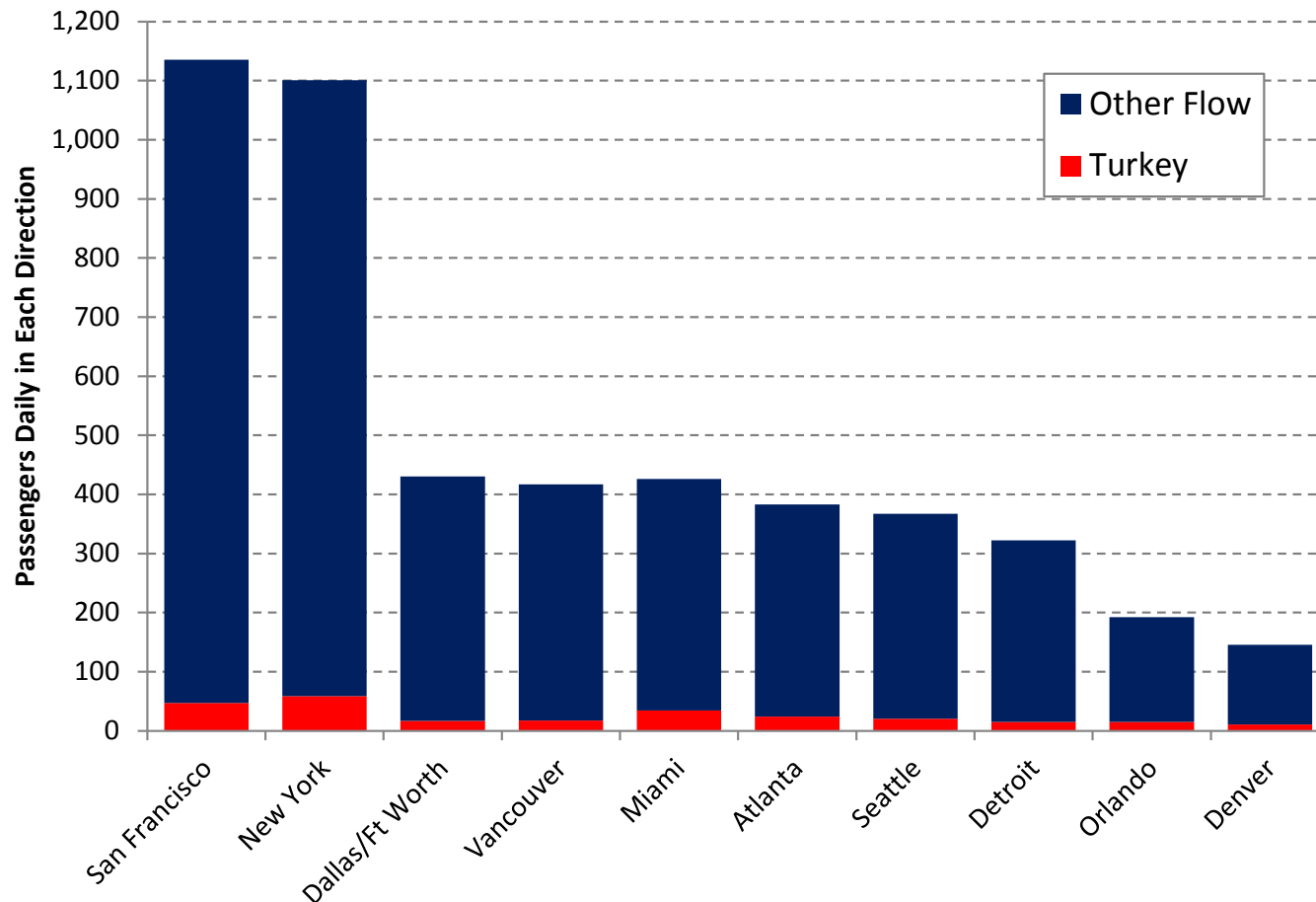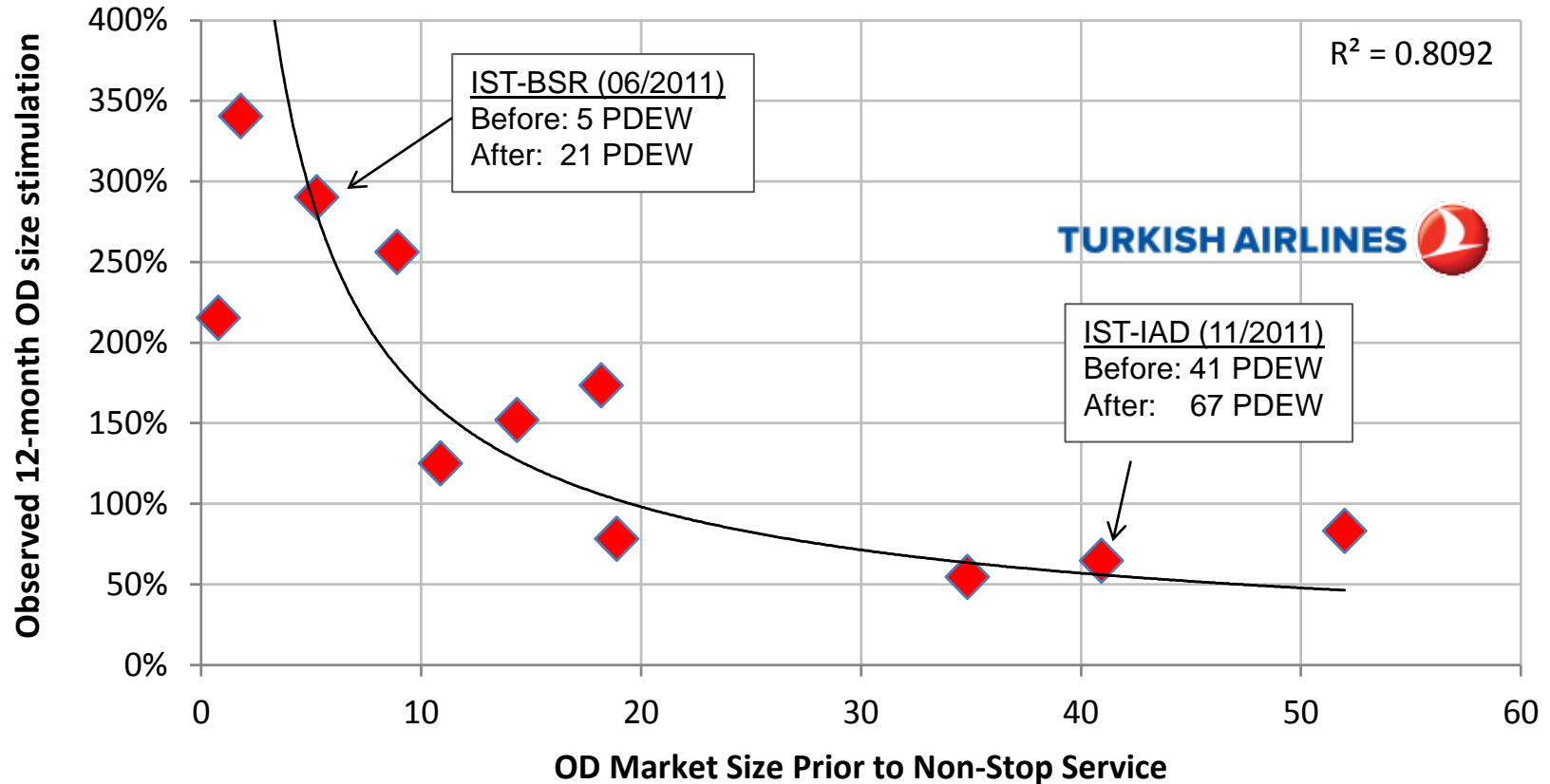
How might this change the way a planner evaluates markets?

Source: Sabre ADI YE 7/2013
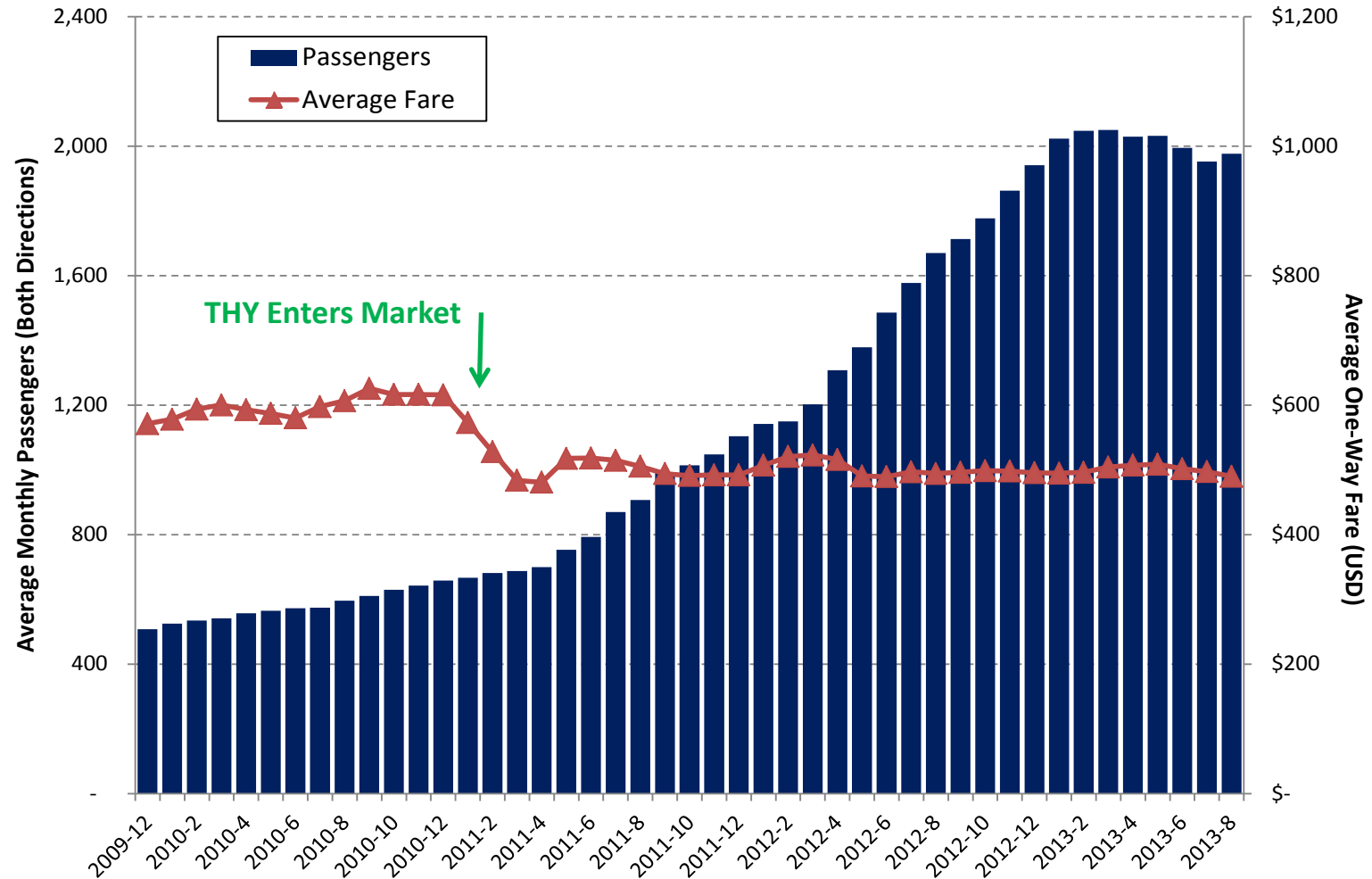
Market stimulation from new non-stop service

THY New Market Stimulation

IST-BSR (06/2011)
Before: 5 PDEW
After: 21 PDEW

IST-IAD (11/2011)
Before: 41 PDEW
After: 67 PDEW

$R^2 = 0.8092$

TURKISH AIRLINES

Observed 12-month OD size stimulation (y-axis: 0% to 400%)

OD Market Size Prior to Non-Stop Service (x-axis: 0 to 60)

What factors might cause stimulation of these markets?

Source: Sabre ADI

New entrant effect on market dynamics

Istanbul – Dacca OD Traffic and Fare Trend
12-month Moving Average

THY Enters Market

Legend:
- Passengers
- Average Fare

Y-axis (left): Average Monthly Passengers (Both Directions) — 0 to 2,400
Y-axis (right): Average One-Way Fare (USD) — $- to $1,200
X-axis: 2009-12 to 2013-8

Source: Sabre ADI

Passenger Market Analysis Summary

- Network planners must fully understand the passenger market in order to make informed decisions

- A wealth of data is available, some of it is free, some of it can be very expensive

- No one data source will answer every question – the successful planner synthesizes disparate data to reach educated conclusions on the passenger market place

- Macro-level economic data and forecasts can be very useful for high level planning

- Market and flight level planning necessitates the use of segment or O&D level data

- O&D data useful to determining airline's strength relative to others in existing markets; most useful for new market "hunting"

- Key new market data elements include local/flow OD demand size, passenger yield and variability of demand

- New service has the potential to greatly increase the size of a market, planners must account for this stimulation and discounting needed to drive additional traffic

The best data is useless without the ability to understand what it means!

Questions?