



# Regional Aviation Demand Forecast

Presentation to the Aviation Technical  
Advisory Committee (ATAC)

**April 23, 2015**

# Introduction and Overview

## Purpose of the Air Traffic Forecast

- Objective of the forecast study is to generate long-term forecasts for air passengers and cargo at the SCAG Region Airports
  - Forecasts are prepared through 2040
- The Air Traffic Forecast serves a number of purposes:
  - Indicate range of long-term passenger demand
  - Inform long-term strategic aviation policy
  - Inform long-term strategic regional transportation plans

# SCAG Region Airports Matter

SCAG Region Airports combined handled **88 million annual passengers** in 2013

- In 2015, the SCAG Region Airports combined:
  - Serve **169** nonstop destinations daily in **37** countries
  - Have **1,200** daily departures
  - Have over **170,000** daily departing seats on **64** airlines

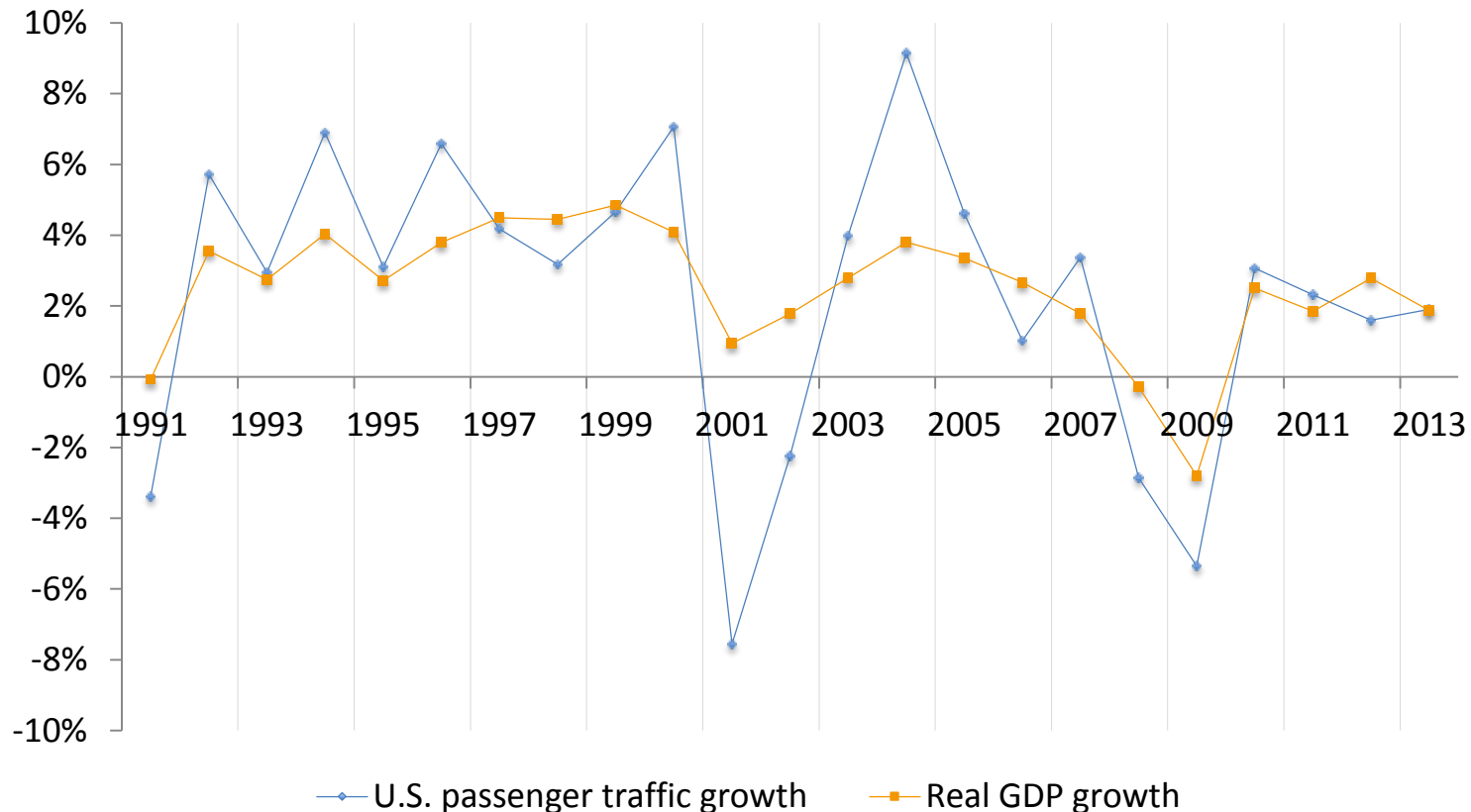


Sources: United States Department of Transportation T-100 Onboard Passenger and 298(c) Commuter Onboard databases, Innovata Schedules via Diio, March 2015.

# Southern California's Aviation Assets



# Strong relationship between demand for air travel and economic conditions



- For every 1% growth in GDP, air travel typically increases between 1% and 2%

Sources: United States Department of Transportation T-100 Onboard Passenger and 298(c) Commuter Onboard databases, Bureau of Economic Analysis.

# Every long-term traffic forecast therefore starts with a good understanding of the socio-economic trends...

- Air travel demand is derived from socio-economic interactions between origin and destination markets:
  - The size and wealth of the population quantifies the potential pool of travelers
  - Economic activity is a measure for business travel
  - Currency exchange rate with destination country affects leisure traveler's decision to travel

## ...at **both ends** of the trip

- Since we make a distinction between:
  - **Outbound passengers:** passengers having the SCAG Region Airports as the origin, or starting point, of their trip
  - **Inbound passengers:** passengers having the SCAG Region Airports as the destination of their trip

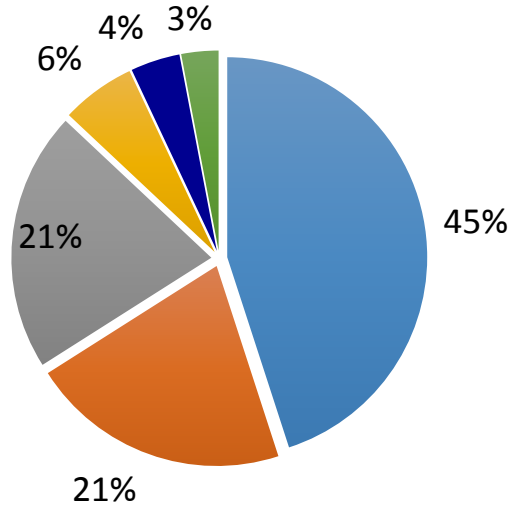
...the socio-economic trends at *both ends of the trip* need to be analyzed

# Drivers for air travel demand depend on trip purpose

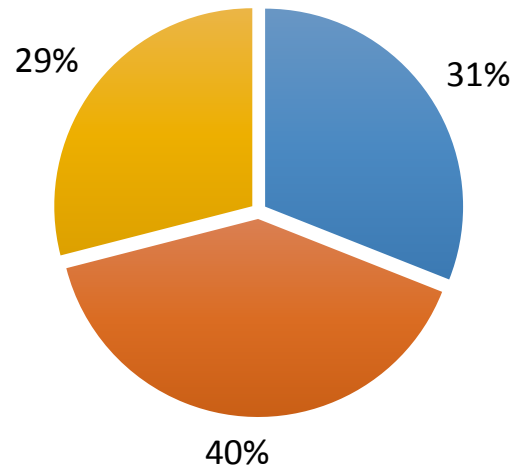
- Passengers can be divided according to the following reasons for undertaking air travel:
  - **Business travel:** driven by the level of business and trade activity, level of foreign investments, presence of large companies
  - **Leisure (inbound and outbound):** consumer spending, household income, currency exchange rates, fares
  - **Visiting friend and relatives:** driven by the presence of an ethnically diverse population, fares

# Business and leisure are the key travel purposes

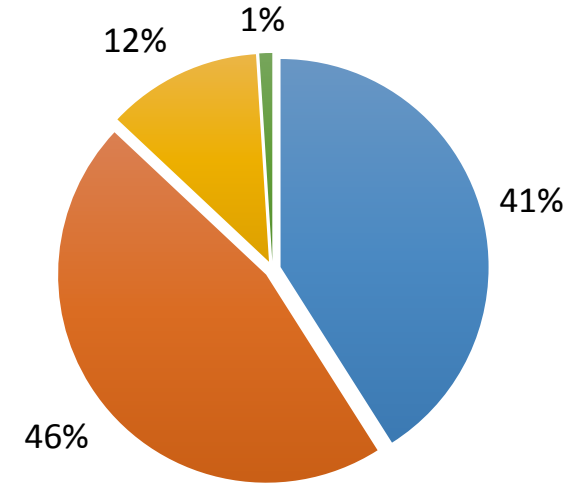
ONT Passenger Survey (2001)



LAX Passenger Survey (2011)



SNA Passenger Survey (2013)



- Business or convention
- Visit friends and relatives
- Business and pleasure
- Vacation or pleasure trip
- Personal, family, or other
- School/Military

Sources: ONT, SNA, and LAX passenger surveys.

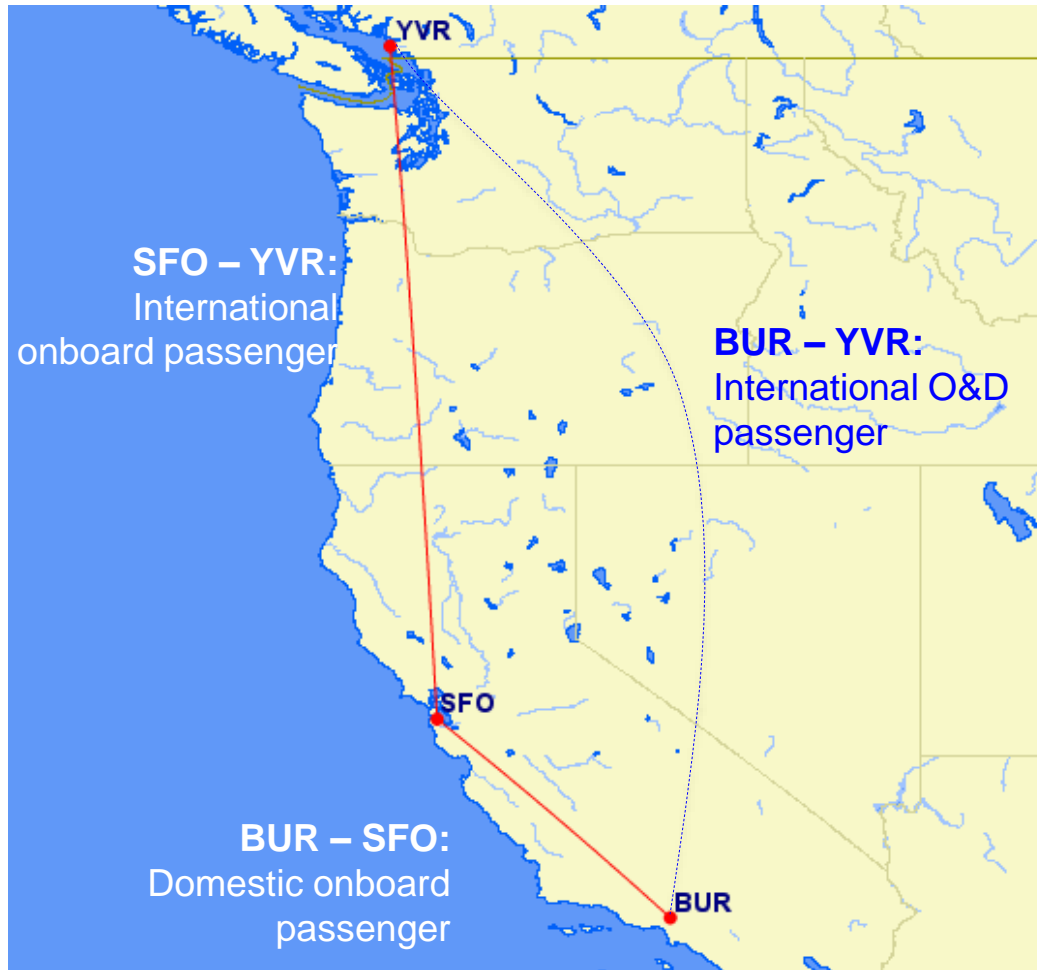


## Some definitions: the concept of O&D passengers

- Distinction is made between **Origin & Destination (O&D)** passengers and **onboard, or Enplaned/Deplaned** passengers
  - O&D passengers: relates to a passenger's *first and final destination*
  - Onboard passengers: relates to a passenger's *next destination*
- Total Onboard Pax = O&D Pax + Connecting Pax

# Example 1: BUR – SFO – YVR

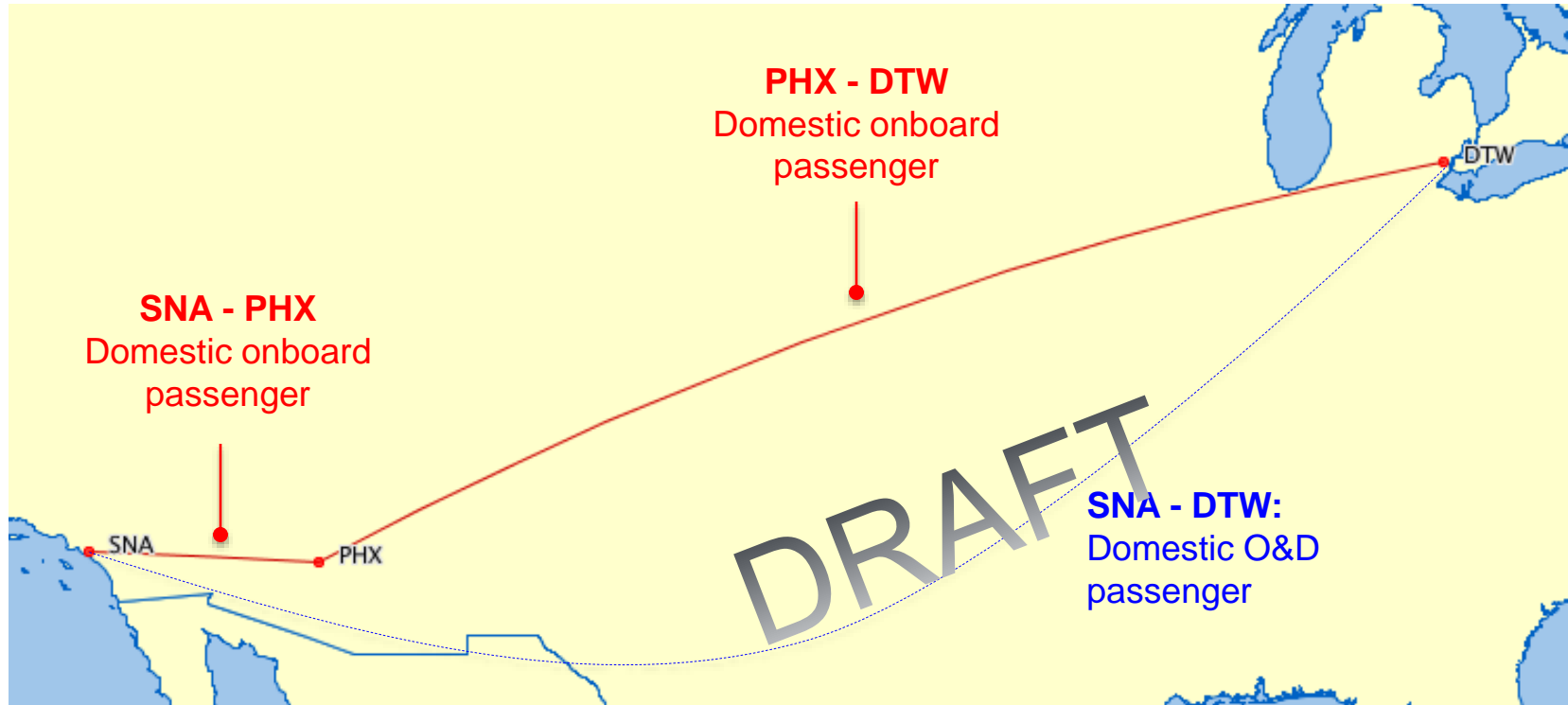
Passenger traveling from Burbank to Vancouver via SFO



- Demand for air travel between BUR and YVR depends on socio-economic conditions in Burbank and Vancouver, not SFO

## Example 2: SNA – PHX - DTW

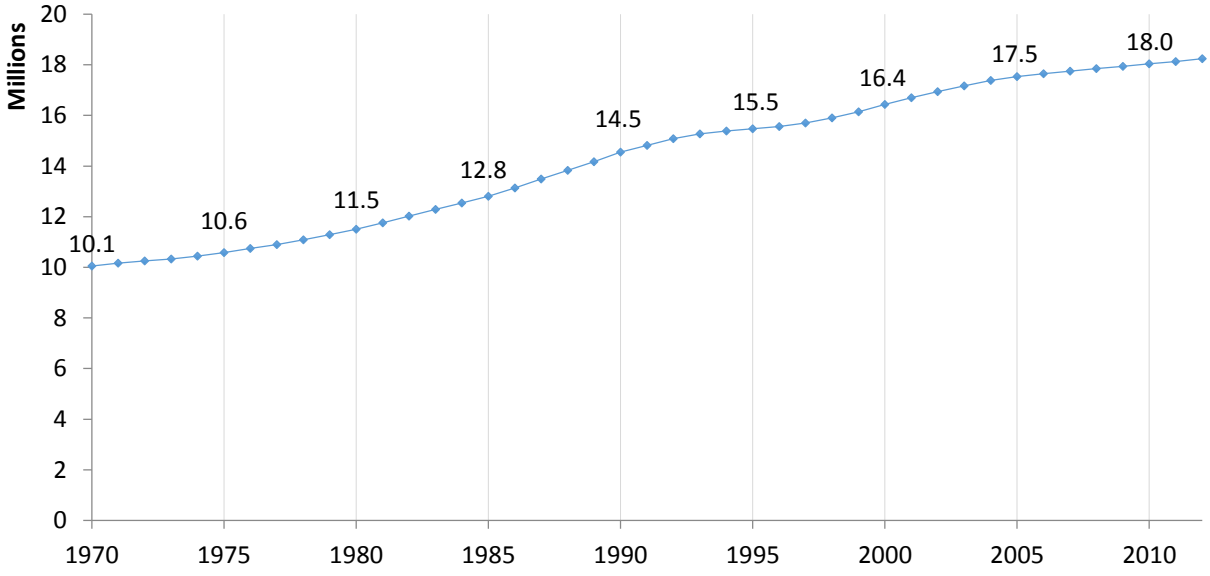
Passenger traveling from Orange County to Detroit via Phoenix



# SECTION TWO

# Economic and Demographic Trends

HISTORICAL POPULATION DEVELOPMENT  
SCAG Region

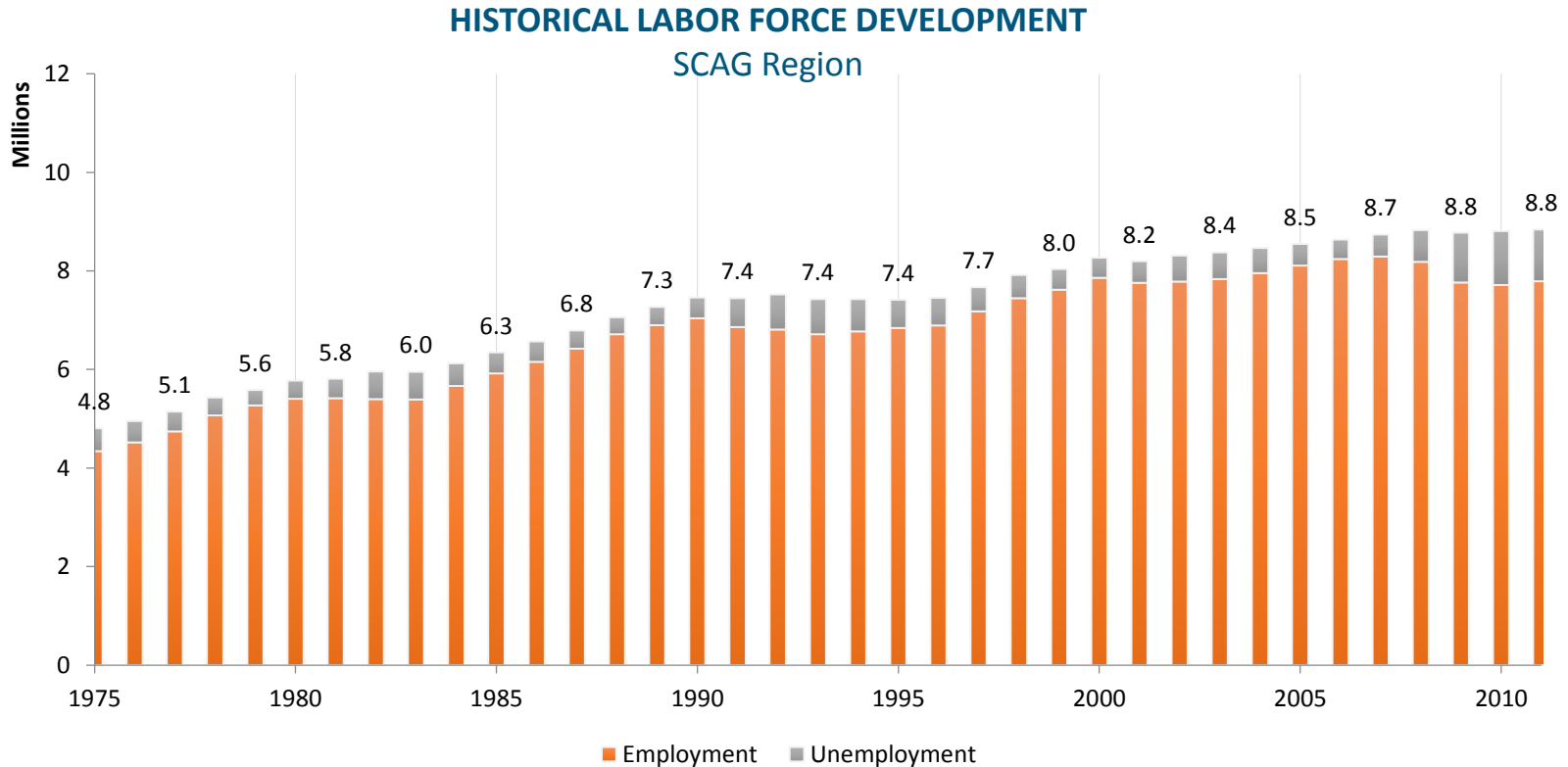


- Population in the SCAG region increased from 10.1 million in 1970 to 18.2 million in 2012
- Between 1970 and 2012, the population in the SCAG Region increased by a compound annual growth rate of 1.4%
- Average growth slowed down to 0.9% over the last decade between 2002 and 2012

Source: SCAG GIS/Data Services



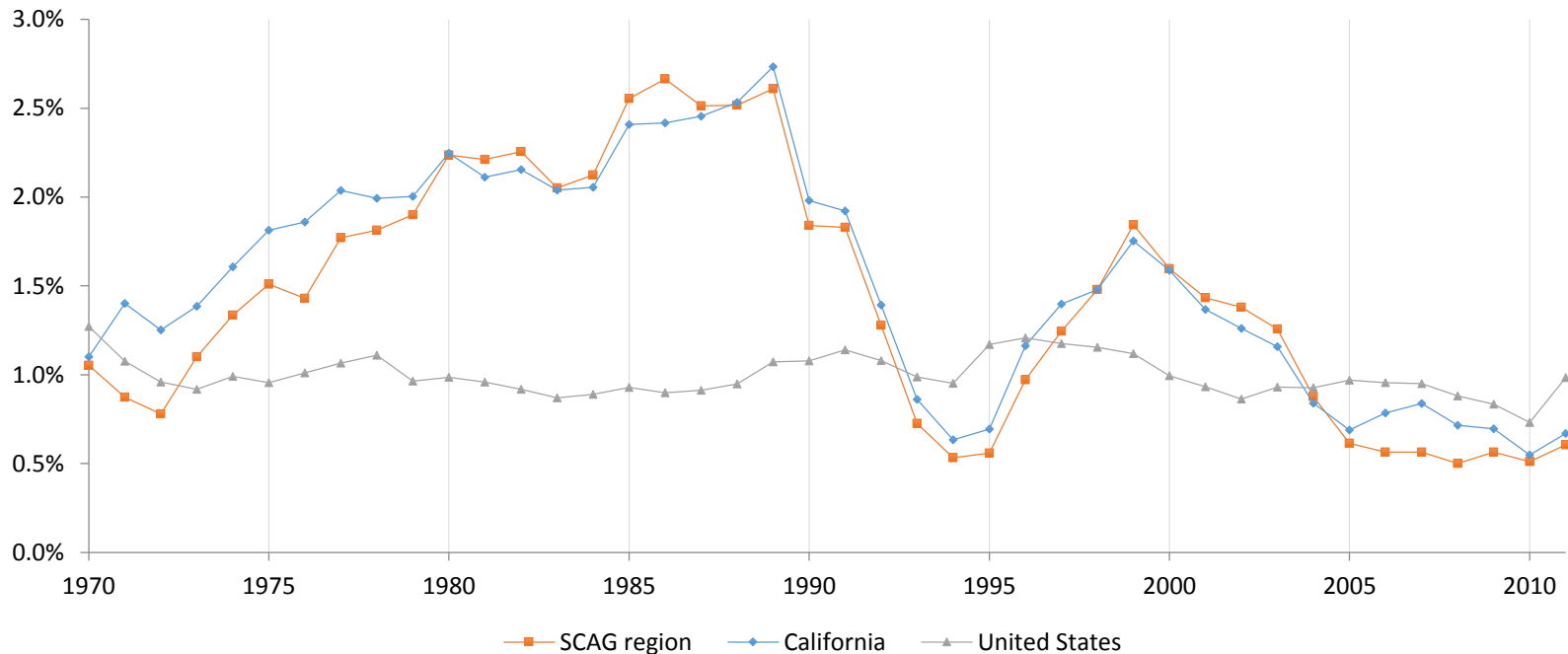
# The number of jobs increased at an annual rate of 1.7% between 1975 and 2011



- The number of jobs increased at a compound annual growth rate of 1.7% between 1975 and 2011
- However, employment growth has slowed down to 0.7% since 2002 and has actually decreased since the start of the financial crisis in 2007

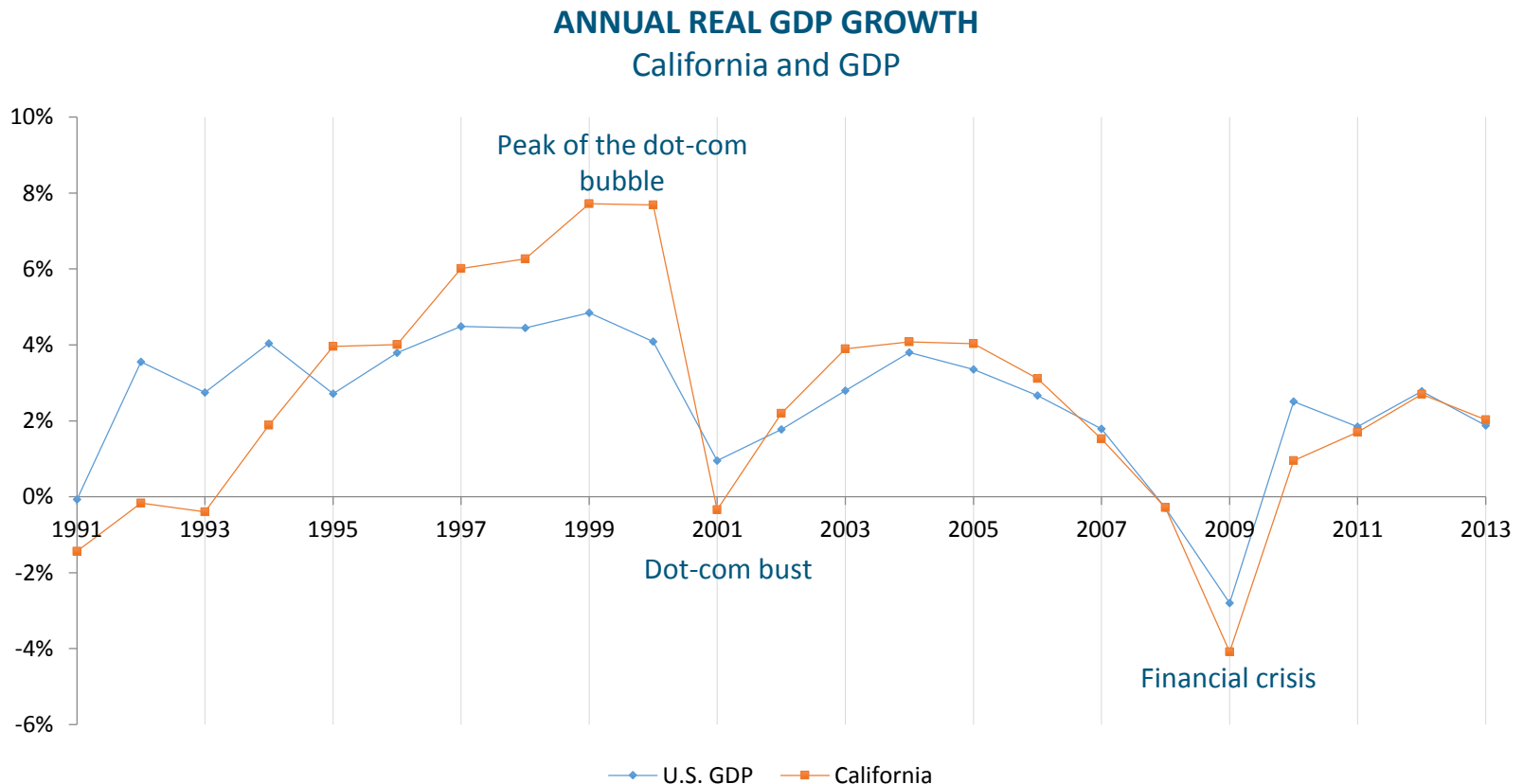
# Until 2004, population growth in California and the SCAG region outpaced national population growth

**HISTORICAL POPULATION GROWTH**  
SCAG Region, California, United States



- Traditionally, population growth in California and SCAG Region has outpaced national population growth
- Since 2004, however, the trend has reversed, and the country's overall population increases at a faster rate than the SCAG Region

# California's economic output boomed before dot-com bubble bust in 2000

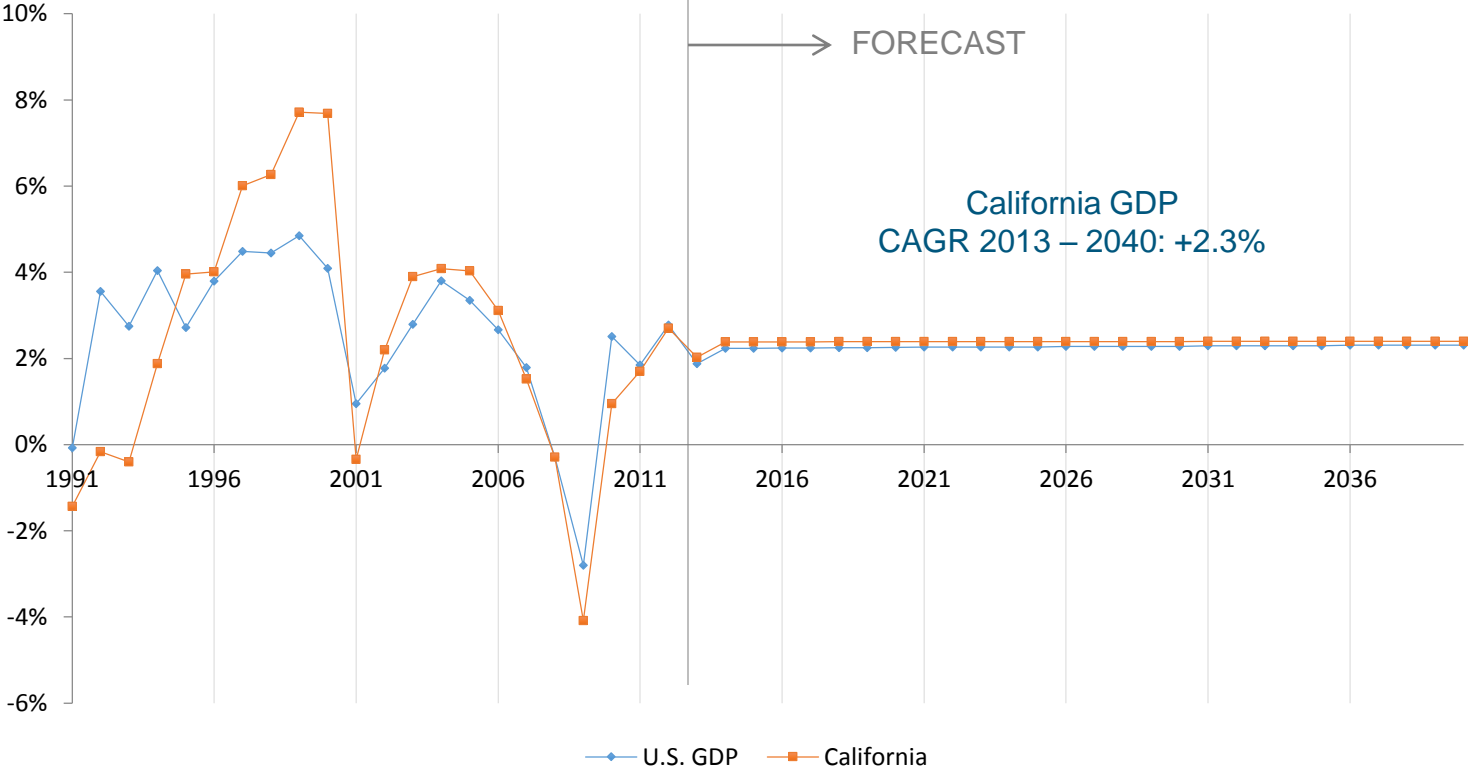


- California's economic output surged before the dot-com bubble bust in 2000
- After 2001, California GDP increases at a similar growth rate as the national output

Source: Woods & Poole

# California's economic output is expected to increase 2.3% per annum over the forecast period

**FORECAST OF REAL GDP**  
California and United States



Source: Woods & Poole

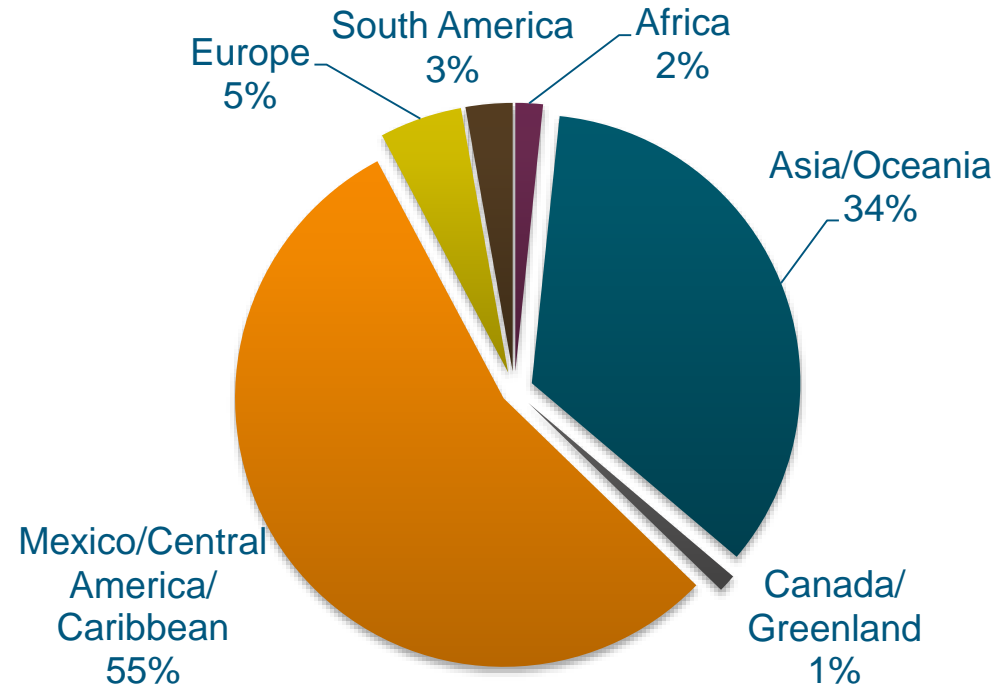


# SCAG is home to a significant foreign-born communities that generate demand for air travel

The SCAG Region is an ethnically diverse region:

- More than 5.3 million people in the Los Angeles-Long Beach-Santa Ana and Riverside-San Bernardino-Ontario Metro Area were born in another country
- With friends and relatives becoming more and more dispersed, the need for travel increases to maintain close links

**FOREIGN BORN RESIDENTS BY REGION**  
Los Angeles-Long Beach-Santa Ana, CA Metro Area  
Riverside-San Bernardino-Ontario, CA Metro Area



## SECTION THREE

# Business Profile

Technology is a vital force in the SCAG Region economy...

- Technology sector includes:
  - Bio-medical
  - Digital information technology
  - Environmental Technology
  - Computer Software
  - Semiconductors

## ...while the SCAG Region also hosts major manufacturing centers

- The SCAG Region hosts major manufacturing centers:
  - Los Angeles County is the largest manufacturing center in the U.S., employing 365,500 workers in 2012.
    - The largest sectors include transportation equipment, apparel, fabricated metal products, computer and electronic products, and food products
  - Orange County is also home to a major manufacturing center with 157,700 jobs
    - Main sectors here include computer and electronic products, fabricated metal products, medical equipment, transportation (primarily aerospace), and machinery
  - The Inland Empire is also an important manufacturing center with employment reaching 93,600 jobs in 2012

# Largest Public Companies in SCAG Region

Annual revenues range from \$12 billion to \$48 billion



Health Net®



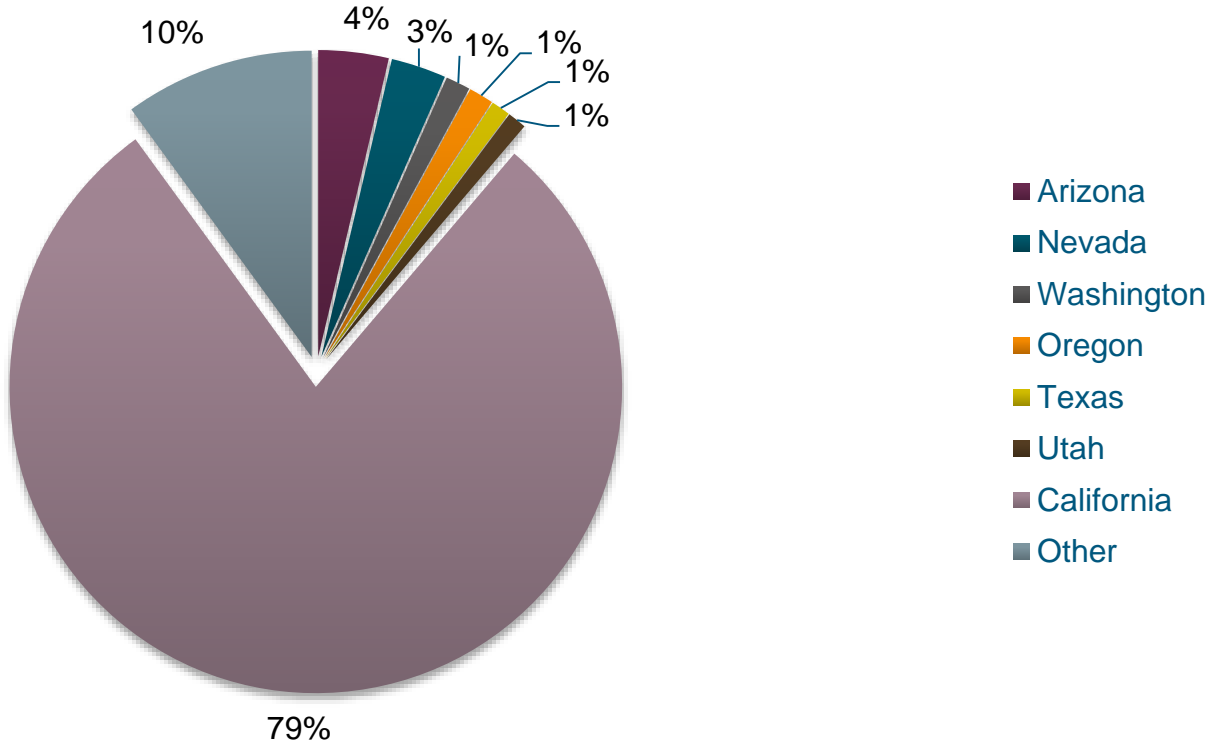
# Higher and specialized education is a core strength of the SCAG Region

- The SCAG region hosts well over 100 four-year public and private college and university campuses:
  - Three University of California campuses (UCLA, UCI, UCR)
  - Eight Cal State campuses, including Cal Poly Pomona
  - Nationally recognized private institutions, including USC, California Institute of Technology, the Claremont Colleges, the University of Redlands
  - Top-rated specialized institutions, such as the Art Center College of Design and the California Institute for the Arts
  - Medical research centers, such as the Loma Linda University School of Medicine



# SECTION FOUR Tourism Profile

### BREAKDOWN OF DOMESTIC LEISURE VISITORS California

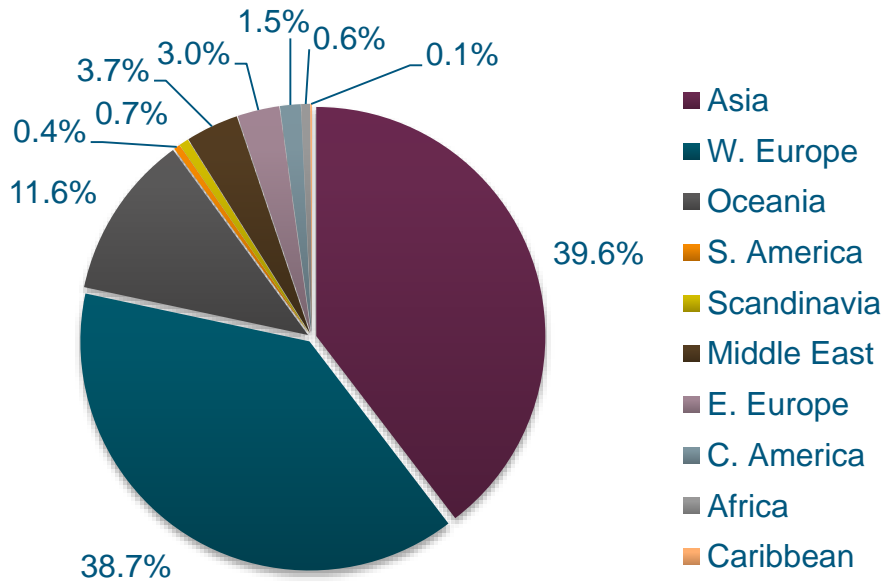


- In 2013, California had 227.2 million domestic person-trips, 184.2 million of which were for leisure
- 78.6% of California’s domestic leisure visitors in 2013 were residents of California

Source: VisitCalifornia.com

# 15.6 million international visitors traveled to California in 2013

- Of these inbound visitors:
  - 6.6 million were from overseas origin



Country / region	Number of Visitors
China	819,000
United Kingdom	652,000
Australia	553,000
Japan	536,000
Germany	421,000
South Korea	389,000
France	388,000
Scandinavia	241,000

- 7.4 million were from Mexico
- 1.5 million were from Canada

# 15.6 million international visitors traveled to California in 2013

- Hollywood
- Downtown Los Angeles
- Santa Monica / Venice Beach
- Malibu
- Amusement Parks
  - Disneyland
  - Universal Studios
  - Knott's Berry Farm
  - Magic Mountain
- Palm Springs/Coachella Valley
- Joshua Tree National Park
- Big Bear
- Ventura/Channel Islands

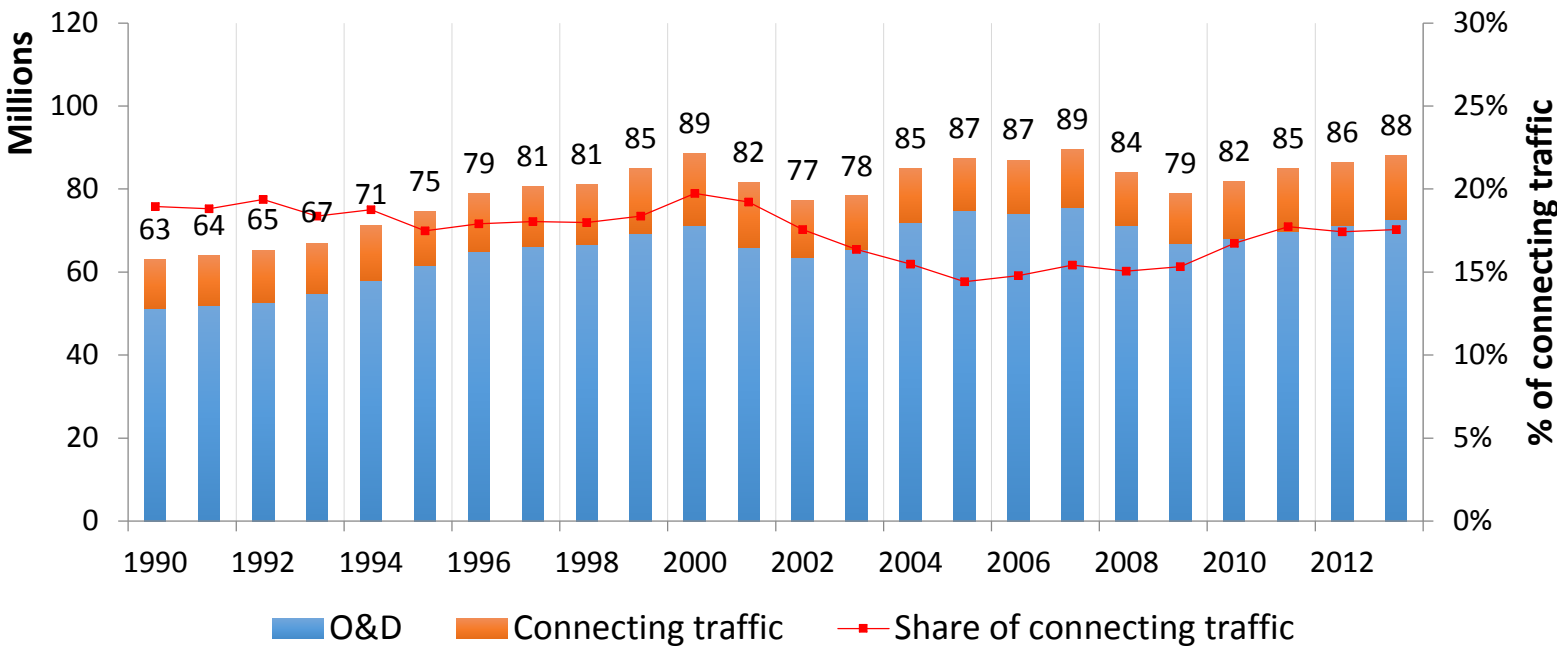




# SECTION FIVE

# Historical Air Traffic

**HISTORICAL ENPLANED/DEPLANED PASSENGERS**  
SCAG Region Airports

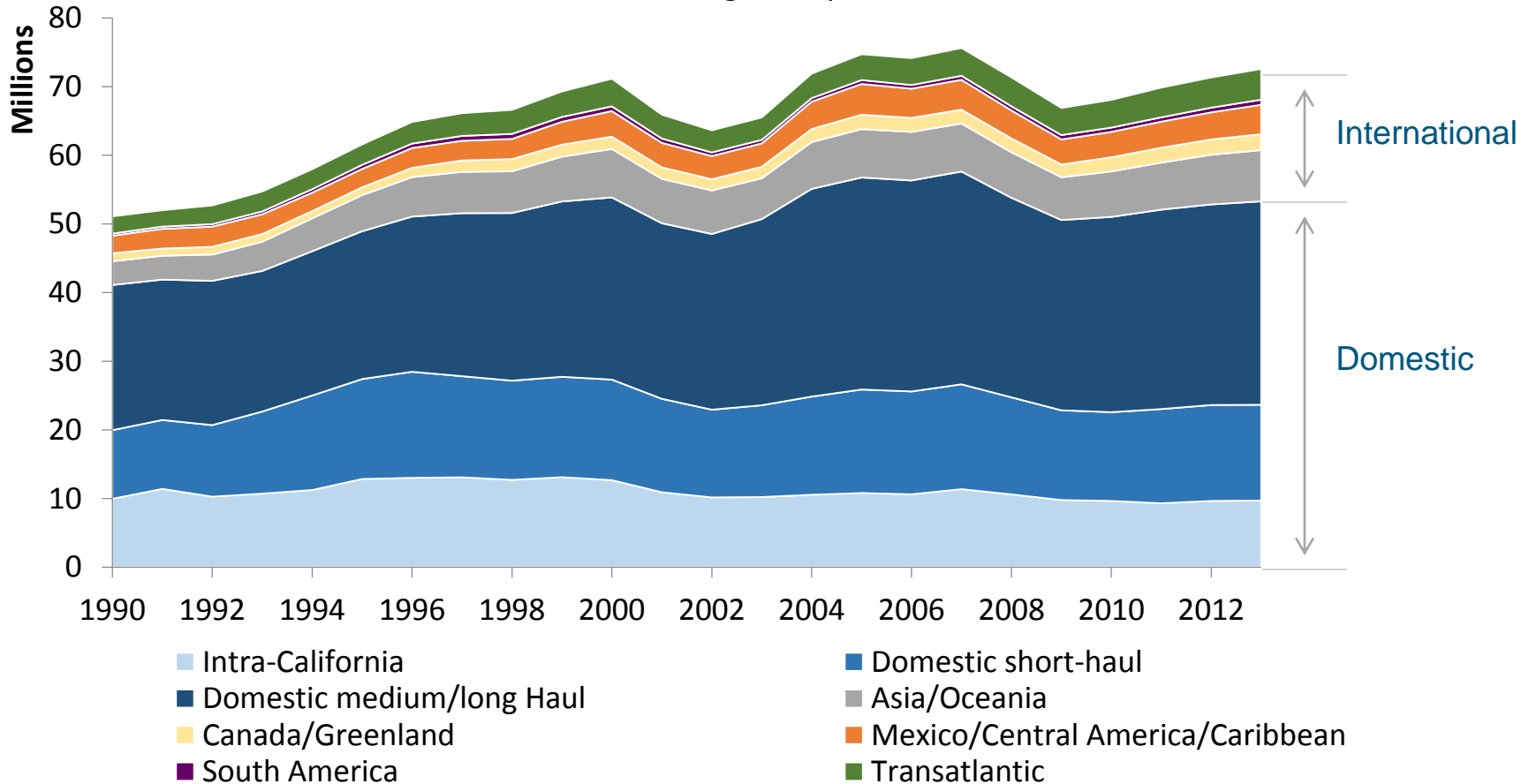


- Total enplaned traffic at SCAG Region Airports increased from 63.0 MAP in 1990 to 88.0 MAP in 2013 – equivalent to a compound annual growth rate of 1.5%
- Combined, the share of connecting passenger at SCAG Region Airports hovers around 17% during the historic period reviewed

Sources: United States Department of Transportation Origin and Destination Passenger Survey, T-100 Onboard Passenger, and 298(c) Commuter Onboard databases.

# Total O&D traffic to the SCAG Region Airports increased from 51.1 MAP in 1990 to 72.6 MAP in 2013

**HISTORICAL O&D PASSENGER DEVELOPMENT**  
SCAG Region Airports

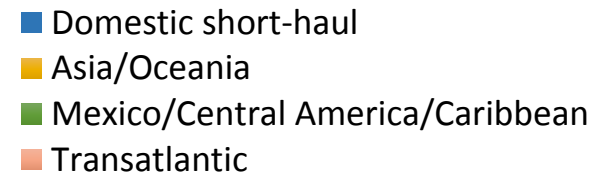
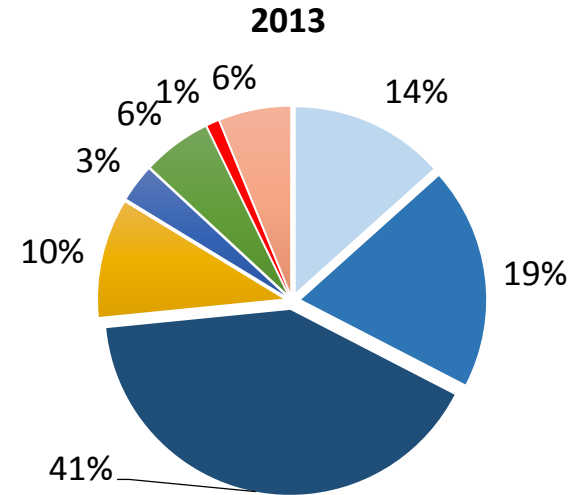
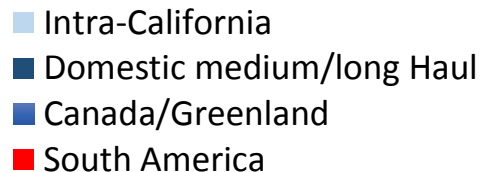
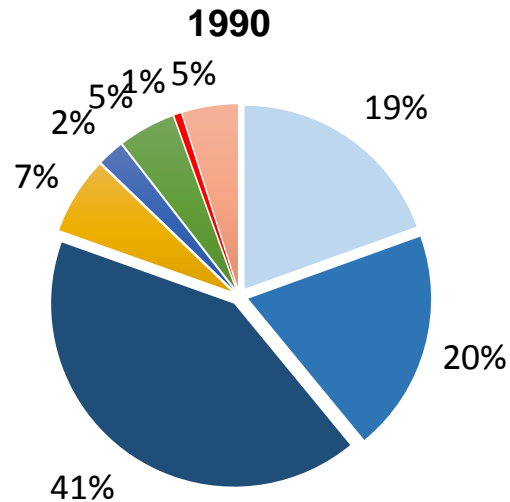


Sources: United States Department of Transportation Origin and Destination Passenger Survey

# Domestic medium/long-haul remains the largest O&D market

But Asia-Pacific is among the fastest growing segments, together with South America

**SHARE OF O&D TRAFFIC BY MARKET SEGMENT**  
SCAG Region Airports



- Although its share decreased from 80.4% in 1990 to 73.4% in 2013, domestic O&D traffic remains the largest O&D segment
- Decrease in Intra-California O&D passenger traffic

## SECTION SIX

# Air Traffic Forecast Methodology

Forecast methodology builds on recognized relationship between air travel demand and socio-economic variables

- There is a proven close relationship between socio-economic conditions and traffic growth, e.g.:
  - Demand increases with positive growth in source-market GDP levels
  - Demand decreases with increases in oil prices and fares
- For each of the market segments, the forecast methodology aims to statistically explain changes in the historical number of air passengers through changes in the economic variables
  - A regression analysis is a statistical tool that can find the relationship that best explains historical air traffic development
  - A number of variables were tested to identify the factors that show the best correlation with historic traffic developments:
    - U.S. GDP, California State GRP, GDP of the main source markets, income per capita, oil prices, currency exchange rates and real air fare data.

# Forecast approach focuses on aggregate demand to SCAG Region Airports plus SBA, SAN, and CLD

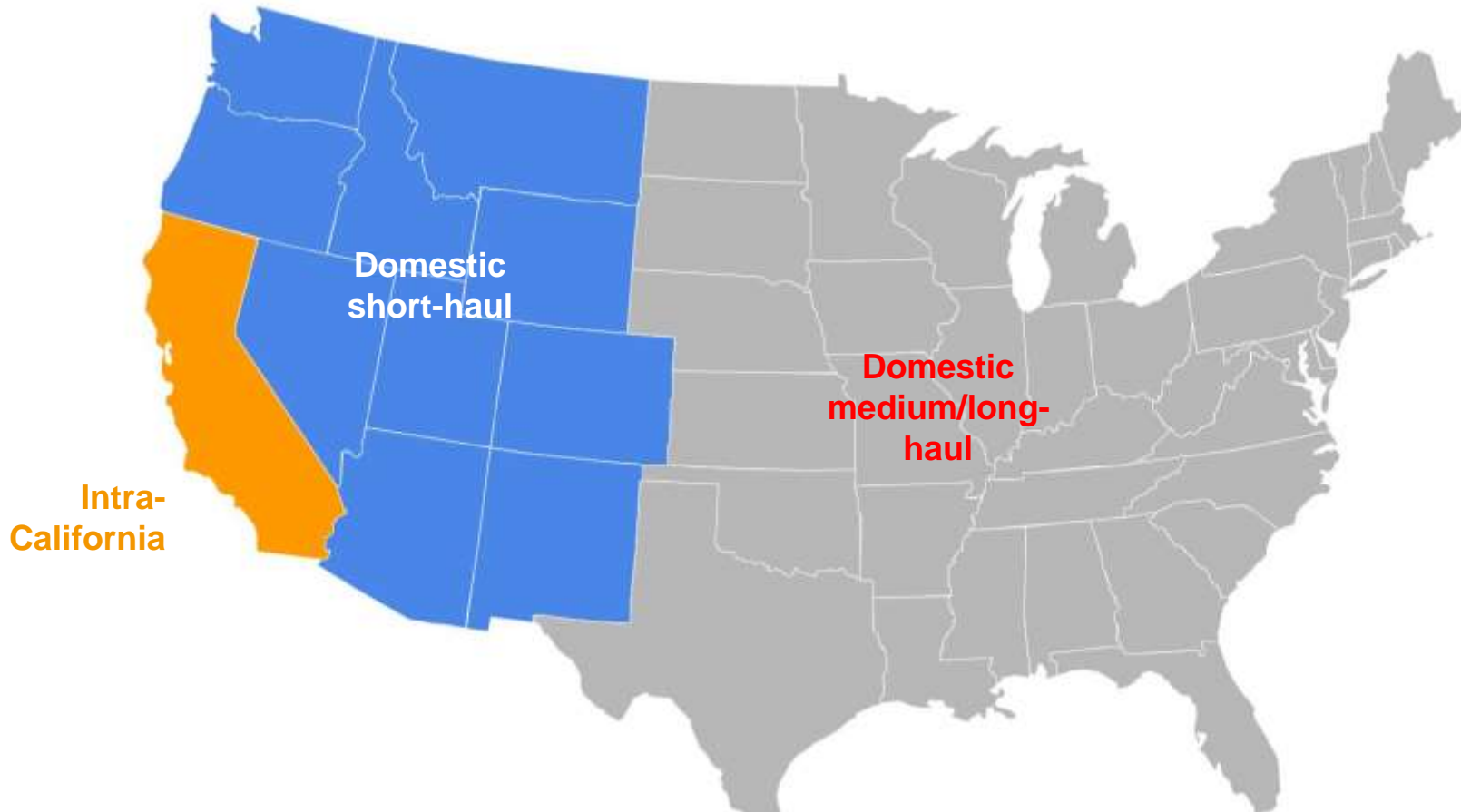
- SCAG Region is home to multiple airports that have overlapping catchment areas
  - Travelers to/from SCAG region have the option to choose between several airports for their needs
  - Predicting future traffic levels at individual airports in the SCAG region cannot be done in isolation and should consider the region-wide trends and dynamics
- The airports of SBA, SAN and CLD are also included in the forecast methodology as their catchment areas overlap with the SCAG Region Airports
- The forecasting process starts by producing a Macro-Economic Forecast Model to predict total O&D traffic to the region

# A macro-economic forecast model was developed for each primary geographic market segment

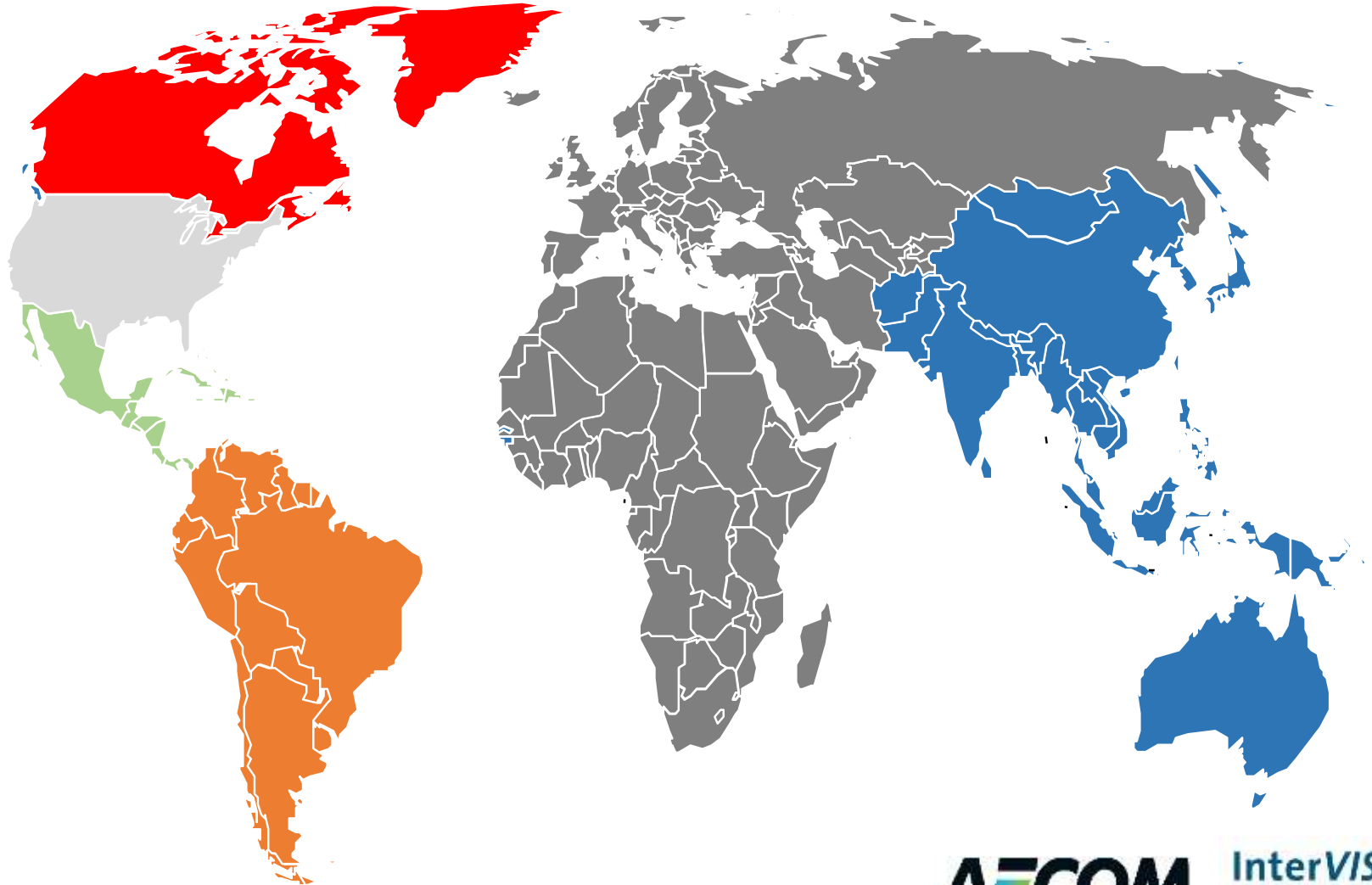
- Recognizing that different market regions have different demand drivers and dynamics, passenger O&D markets are typically divided into different market segments
- This can be done based on characteristics of the market, such as geography and length of flight
- By analyzing historic O&D traffic levels, air passenger traffic to the region was divided in terms of the key market segments:
  - **Domestic**
    - Intra-California, Short-haul, Medium-Long haul
  - **International**
    - Asia/Oceania, Canada/Greenland, Mexico/Central America/Caribbean, South America, Transatlantic

# Segmentation of domestic passenger traffic

Intra-California vs. short-haul vs. medium/long-haul



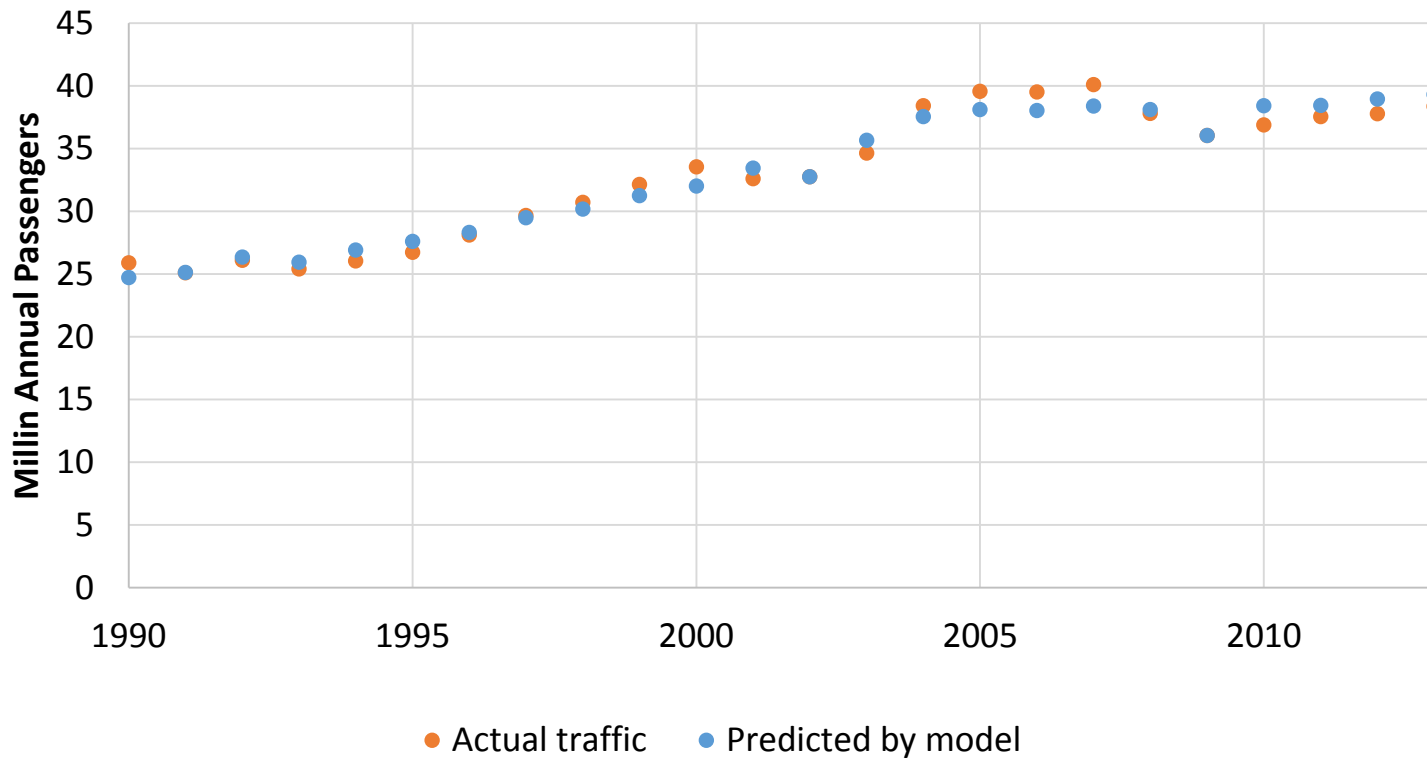
# Segmentation of international passenger traffic





# Forecast model for medium-and long-haul domestic traffic focuses on GDP and Fares

**GOODNESS-OF-FIT ECONOMETRIC MODEL**  
Domestic medium-to long-haul O&D traffic



## SECTION SEVEN

# Air Traffic Forecast Results

- Total **O&D** passenger movements to the region increase from

72.6 MAP in 2013 to

**112.2 MAP in 2040**

*(Equivalent to annual growth of 1.6%)*

- Total passengers increase from

88.0 MAP in 2013 to

**136.2 MAP in 2040**

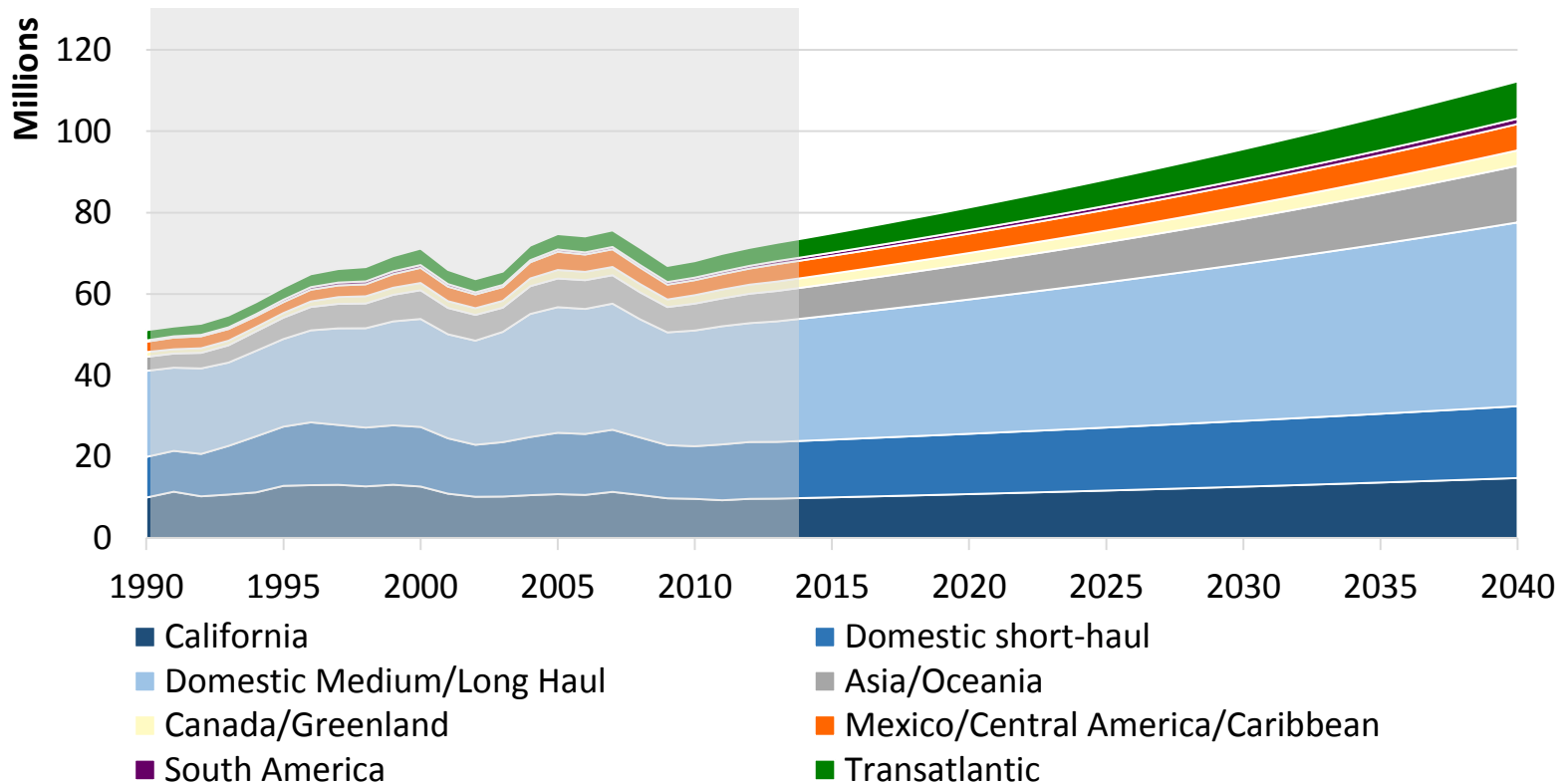
*(Equivalent to annual growth of 1.6%)*

# Comparison to previous RTP forecasts

- 1998 RTP—157.4 MAP in 2020
- 2001 RTP—167 MAP in 2025
- 2004 RTP—170 MAP in 2030
- 2008 RTP—165.3 MAP in 2035
- 2012-2035 RTP—145.9 MAP in 2035 (Baseline Scenario)
  
- Current forecast is 136 MAP in 2040
  - Events since 9/11, including the sharp increase in fuel prices in the early 2000s followed by the financial crisis, have resulted in consistently less aggressive forecasts of aviation demand

# Total O&D passenger movements to the region increase from 72.6 MAP in 2013 to 112.2 MAP in 2040

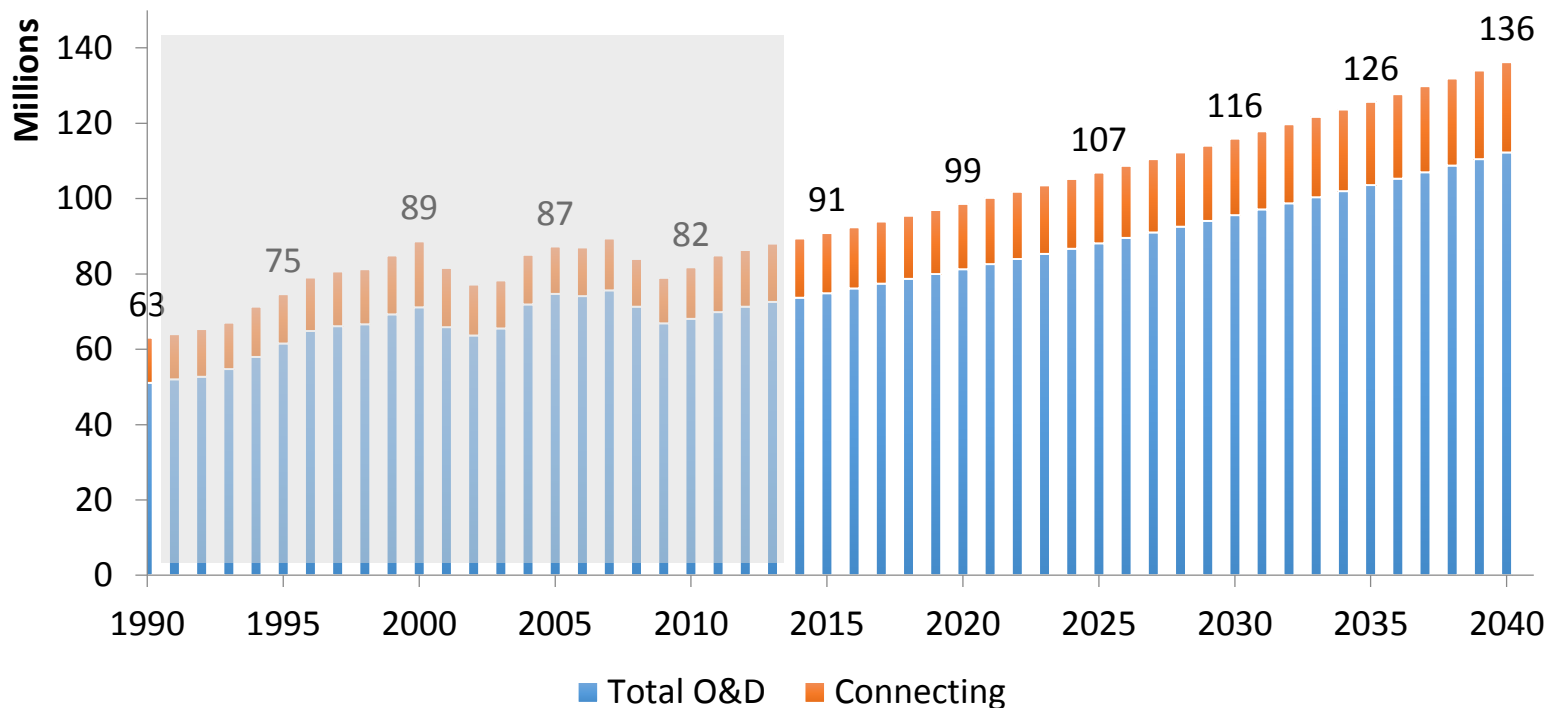
**FORECAST OF O&D PASSENGER MOVEMENTS**  
SCAG Region Airports



- Although international traffic grows at slightly higher clip, the domestic market remains the largest segment, representing 69.1% in 2040

# Total enplaned/deplaned passengers increase from 88.0 MAP in 2013 to 136.2 MAP in 2040

**FORECAST OF TOTAL ENPLANED/DEPLANED PASSENGERS**  
SCAG Region Airports



- The share of connecting passengers remains stable around 17%

## SECTION EIGHT

# Next Steps

- Allocate aggregate demand for the SCAG region over the individual commercial airports
- Distinguish between the regional forecast and the FAA generated Terminal Area Forecast (TAF)
- Analyze demand scenarios as directed by the Transportation Committee
- Solicit ideas for ground access improvements from the airport sponsors
- Refine the projects in Aviation Ground Access Element for the 2016 RTP
- Develop air cargo and aircraft operations forecasts
- Incorporate available economic impact information from the region's commercial service and general aviation airports

## Questions? Comments? Thank you...

For more information on this presentation or the **SCAG Aviation Program** please contact:

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