

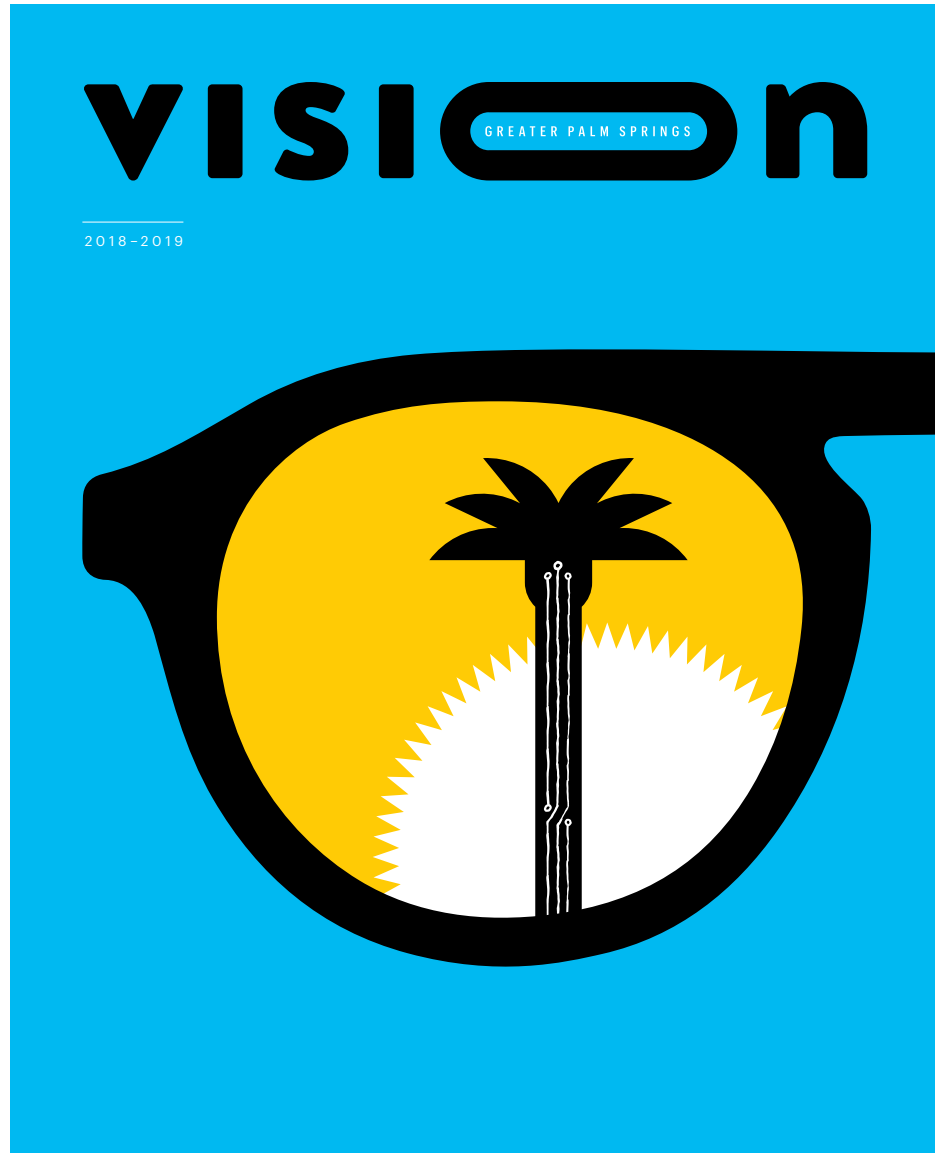
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DRIVING INNOVATION AND ENTERPRISE
IN GREATER PALM SPRINGS

2018 GREATER PALM SPRINGS ECONOMIC REPORT

cvep

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At CVEP's 2017 Economic Summit, we opened our eyes and minds to the long-term prospects of the Greater Palm Springs region. CVEP's video, Coachella Valley 2050, set forth the realities of what we need to attract technology-based enterprises and to broaden and strengthen our economic base.

Last year we learned about bandwidth limitations across our region. Yes, it disrupts watching movies at home. But most importantly, without new digital infrastructure, the business community's ability to function and grow will remain hampered. When the new Palm Desert Digital iHub opens in the spring of 2019, the partnership among the City of Palm Desert, CSUSB-Palm Desert Campus, and CVEP will offer data transfer speeds that exceed 1 gigabit per second. In addition, the program will have the Comcast MachineQ internet of things (IOT) development platform in place.

We believe this is the first innovation hub in the country to offer both ultra-high speed bandwidth and an IOT development platform. This is a substantial, positive step to establish the digital infrastructure we need to put our region on entrepreneurs' minds as

a place to start or grow a technology business. For students, this will create a place to obtain a high-quality and relevant education.

The City of Palm Springs has made a major commitment to the iHub program with a 5-year agreement for CVEP to continue running the Palm Springs iHub and Accelerator Campus. College of the Desert's West Valley Campus will be built within walking distance of CVEP headquarters, seeding the promise for ultra-high bandwidth at both campuses.

I became chairperson of CVEP only 4 months ago, and I profoundly thank Gary Honts of Desert Care Network for his two years of leadership as chairperson of CVEP. His vision encouraged CVEP's evolution to an organization that is leading our region into a year-round economy and an emerging technology center. As chairperson, the next two years will be exciting. I welcome the challenge to work together with CVEP's board of directors, staff and stakeholders to elevate the region's economy to the next level. We've got this!



GULF-CALIFORNIA
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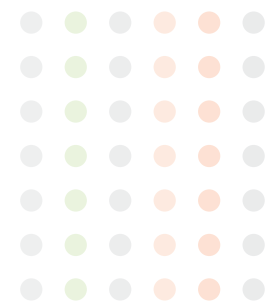
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2018 GREATER PALM SPRINGS ECONOMIC REPORT

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LEADERSHIP AND INVESTORS

2018-2019

We would like to welcome the new officers and Board members for 2018-2019.

EXECUTIVE COMMITTEE

Chair: Jan Harnik
Vice-Chair: Holly Lassak
Treasurer: Randy Florence
Secretary: Rick Axelrod
Immediate Past Chair: Gary Honts

City of Palm Desert
Massage Envy
US Bank
LifeStream Blood Bank
Desert Care Network

2017-2018

Thank you to the following individuals and organizations they represent, for their dedication and commitment to CVEP this past year:

EXECUTIVE COMMITTEE

Chair: Gary Honts
Vice-Chair: Jan Harnik
Treasurer: Phil Smith
Secretary: Holly Lassak
Immediate Past Chair: Rick Axelrod, M.D.

JFK Memorial Hospital
City of Palm Desert
Sunrise Company
Massage Envy
LifeStream Blood Bank

CVEP BOARD MEMBERS

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Andrew Lansing
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Mark Messenger
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Jan Pye
Robert Radi

The Hemmingway Group
City of Indian Wells
The Desert Sun
Charter Communications
Agua Caliente Band of Cahuilla Indians
Imperial Irrigation District
University of California, Riverside
Hunter | Johnsen
City of Cathedral City
College of the Desert
Pacific Western Bank
Wells Fargo Bank
Southern California Gas Company
iHub Radio
Bank of America
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Oliphant Enterprises
Osborne Rincon
City of Desert Hot Springs
City of La Quinta

Julie Rogers
Jason Schneider

Patrick Sinclair

Phil Smith
Troy Strange
Joaquin Tijerina
Jill Tremblay
Jerry Upham
Ted Weill
Ken Wheat
Scott White
Bob Wright

Palm Springs Life
Greater Coachella Valley
Chamber of Commerce
California Alliance for Renewable
Energy Solutions
Sunrise Company
City of Indio
Riverside County EDA
Best, Best & Krieger
Gulf California Broadcasting
City of Rancho Mirage
Eisenhower Medical Center
Greater Palm Springs CVB
East Valley Coalition

HONORARY BOARD MEMBERS

Brian Murray
James Spee
Ron Vito
Doris Wilson

Palm Springs Unified School District
University of Redlands
Riverside County Office of Education
CSUSB Palm Desert Campus

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CVEP INVESTORS

BUSINESS DEVELOPMENT

East Valley Coalition
Greater Coachella Valley Chamber
of Commerce
Riverside County Economic
Development Agency

EDUCATION

College of the Desert
University of California, Riverside -
Palm Desert Campus

ENERGY

California Alliance for Renewable
Energy Solutions

FINANCIAL AND CAPITAL SERVICES

Bank of America
Pacific Western Bank
US Bank
Wells Fargo Bank

GOVERNMENT: CITIES

City of Cathedral City
City of Desert Hot Springs
City of Indian Wells
City of Indio
City of La Quinta
City of Palm Desert
City of Palm Springs
City of Rancho Mirage

GOVERNMENT: TRIBAL

Agua Caliente Band of Cahuilla Indians

HEALTH SERVICES/HOSPITALS

Desert Care Network (Desert Regional
Medical Center, Hi-Desert Medical Center
and JFK Memorial Hospital)
Eisenhower Medical Center
LifeStream Blood Bank

MANAGEMENT SERVICES

Oliphant Enterprises
The Hemmingway Group

MARKETING, ADVERTISING,
DESIGN AND PUBLIC RELATIONS
Hunter | Johnsen
Kiner Communications

MEDIA

Gannett Foundation/The Desert Sun
Gulf California Broadcast Company
iHub Radio
Palm Springs Life

PROFESSIONAL SERVICES

Best Best & Krieger
Osborne Rincon

REAL ESTATE DEVELOPMENT

Sunrise Company

RETAIL

Gelson's
Massage Envy

TOURISM

Greater Palm Springs Convention
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TECHNOLOGY AND COMMUNICATIONS

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Helping Drive Innovation and Enterprise in Greater Palm Springs



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WELCOME to the 2018 Greater Palm Springs Economic Summit. The past year has been one of much activity, with a focus on things that need to be done now to enhance the probability of a more prosperous and less cyclical economic future for the Greater Palm Springs region.

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As you recall, CVEP capitalized on the opportunity to analyze last year's announcement of Amazon HQ2, taking a hard look at what the Coachella Valley needs to do to respond competitively to business needs. Our addressable needs with respect to the Amazon request for proposal were and remain a comprehensive stand-alone university that offers STEM (science, technology, engineering, and math) and bandwidth availability exceeding 1Gbps. Much has been done to address these two critical issues and we are positioned more favorably than we were last year, but the barriers still exist.

CVEP was successful in securing two long-term funding commitments during this past year that are, from an operational perspective, game changers. First, the Palm Springs City Council

approved a 5-year agreement for general funding plus contractual funding for the Palm Springs iHub and Accelerator Campus. The burden of ongoing capital improvements at the Accelerator Campus was also shifted from CVEP to the owners of the facility, allowing for timely and necessary maintenance and upgrades.

The second game changing commitment happened when the City of Palm Desert voted unanimously to establish a digital innovation hub. This iHub will be a partnership between CVEP, the City of Palm Desert, and the California State University Palm Desert Campus. This critical alliance will enable the digital iHub to tap into the CENIC fiber that is capable of transferring data at over 10Gbps. CVEP has also secured a private commitment to install the Comcast MachineQ IOT (internet of things) development platform at the digital iHub. When this facility opens in the spring of 2019 we expect that it will be the only innovation hub in the nation that offers both of these pieces of critical digital infrastructure.

The importance of this combination of services cannot be overstated. At the present time, there are companies in

the digital sector that cannot conduct business in the Coachella Valley due to the bandwidth limitations. That problem will be solved when the digital iHub opens its doors, enabling the recruitment of entrepreneurs from the high-cost coastal areas of California and leveraging our affordable cost of housing and easy predictable commutes. The reality is that Greater Palm Springs is one of the only places where the California lifestyle is coupled with tranquility and affordable housing.

We are also within just over 100 miles of a customer base of over 20 million people. With the much publicized problems of homelessness, filth, and overpriced life on the coast, Greater Palm Springs is very well positioned to attract a critical mass of highly educated and ambitious technology entrepreneurs.

Huntsville, Alabama was recently named the best place to start a technology business by Forbes Magazine and others. CVEP examined this choice and discovered as you will

learn in today's presentations that the financial demographics and educational achievements of Alabama and especially Huntsville are better than those of the Coachella Valley, Riverside County, and even the State of California. One must ask, how did a small agricultural community of less than 25,000 people grow to a Metro area of over 400,000 with the distinction of being named the best place to start a tech business?

The answer to the question is people. At the end of World War II, Huntsville was selected by the United States government as the place where a group of between 50 and 100 literal "rocket scientists" would be located to carry on their scientific work. From that core of highly educated technologists, a significant technology business base has grown, as has a research university with a digital business park.

CVEP's plan is to follow that model and fill our digital innovation hub with today's "rocket scientists" from coastal California. Today's "rocket scientists" are

those who work in the IOT space, cyber security and fields like GIS that require high bandwidth in place to do business. There are currently 360,000 cyber security job openings with another 3 million expected by 2021. As a country we are training only 15,000 such people per year. These jobs are resistant to automation, pay in excess of \$100,000 per year, and will most certainly uplift the financial demographics of the Coachella Valley.

To assure Greater Palm Springs' strength in these new business clusters, we need to attract 50 to 100 entrepreneurs with the tools to develop products, a program on the CSU-PD Campus to address the training needs, and a willing local community to invest in the ventures.

CVEP appreciates the support during our transformative year and thanks you all in advance for keeping the ball moving forward toward a prosperous future.



Desert Care Network

Three Hospitals. Primary and Specialty Care. Devoted to everyone's health here in the desert.



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KEY FACTS

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709	Beds	\$33.8M	Charity care provided
3,277	Employees	\$47.2M	Discounts to uninsured
5,558	Babies delivered	\$343.5M	Salaries, wages, benefits
28,688	Admissions	\$1.8M	Property taxes paid
124,829	ER visits	\$3.3M	Sales taxes paid
7,564	Inpatient surgeries	\$15.5M	Capital funds reinvested



**DESERT REGIONAL
MEDICAL CENTER**



**JFK MEMORIAL
HOSPITAL**



**HI-DESERT
MEDICAL CENTER**

Desert Regional Medical Center, JFK Memorial Hospital, and Hi-Desert Medical Center have joined together to provide a new community of care: Desert Care Network. With three hospitals, specialty centers, and one of the largest primary care networks in the Coachella Valley, Desert Care Network sets a new standard of service and dedication to the health and well-being of the people of the desert region.

DesertCareNetwork.com



More than
3,200 employees



hospitals



outpatient
centers/clinics



local impact

\$4.5M

\$4.5M pledged to Desert AIDS Project for Get Tested Coachella Valley initiative and for support of expanded healthcare options for the underserved in the Coachella Valley.

\$600k

Provided \$600,000 since 2012 for Volunteers in Medicine to serve the healthcare needs of immigrants and the uninsured.

In partnership with UC Riverside School of Medicine, new Family Medicine Residency Program at Desert Regional is training new physicians to address the local shortage of primary care doctors.

All hospital figures are for calendar year 2017. Local impact includes salaries, wages and benefits, capital spending and local taxes paid.

Charity care includes discounts to uninsured patients.



Don't Panic: The "R" Word Angst

BY MANFRED W. KEIL, PH. D.



There is a lot of talk going around about the “Recession of 2020” or the “Recession of 2021.” Given the severity of the Great Recession of 2007-2009 and its devastating effect on California, and especially the Inland Empire including the Coachella Valley, we will spend some time talking you through what to look for when the time comes. The current economic expansion, which started in July of 2009, is the second longest one during the post World War II period. By June of 2019, it will become the longest. Should you look at contingency plans if sales, employment, tax revenue, etc. are about to contract?

Next time you listen to the pessimists warning you about future doom and gloom, ask them exactly what they think will trigger the next recession. These events are relatively rare and only dips in the long-run picture (the U.S. economy has grown at an average at 3% per year since 1896). However, for those affected by the recession, these temporary dips seem anything but small short term interruptions from a trend. But if they happen, they are typically caused by monetary shocks (the Fed stepping hard on the brake), severe oil price increases (as in 1973 during OPEC I and the late '80s during OPEC II - but perhaps also in 2007...), or some inventory problem in housing or automobiles. Monetary contractions and oil price increases are seen as shocks, or unanticipated events, and hence we cannot really forecast them. And there no signs currently of inventory problems. Again, ask these experts what shock they foresee.

Over the next 12-month period, expect:

- National GDP growth will continue at an elevated pace of 3% or slightly more, with both the state and the regional economy growing at least at that pace, if not slightly more. In last year's report, we forecasted the national economy to grow at 2.8% in 2018. 2018 Q1 saw 2.2% growth, this accelerated to 4.1% in the second quarter, which is the last data point we have available. We believe that we will be quite close. When we presented our 2017 forecast, numbers for the third and fourth quarter were not available yet, and we forecasted 2.6% growth for the year as a whole. The actually growth rate was 2.5% and we were off by very little.
- The Federal Reserve will raise the Federal Funds Rate one more time before the end of this year, and at least three more times in 2019. We do not believe that these actions, each being an 0.25% (quarter of a percentage point) will invert the yield curve, or be out of line with what real interest rates were during this phase of past expansions.
- We were way off with our oil price predictions, saying that we expected them to be at \$50 for West Texas Intermediate by this time. The latest price at the beginning of October is around \$75, and the average over the last year being close to \$62. Frankly we had expected the oil fields of Texas and North Dakota to make up for any shortfall caused by OPEC production cuts. Our forecast for the next 12-months period is that oil prices will not climb much above the current levels.
- We projected employment growth to slow to about 1% and for the national unemployment rate to end up at 4.1%. The U.S. unemployment rate was 3.9% in August 2018 and fell to 3.7% in September. For the last 12 months period, the average was 4%. We actually think that the rate will fall to 3.5%. Both unemployment rates for California and the Inland Empire will be slightly above that rate. Employment growth will slow down further as we are reaching pre-recession peaks in the employment to population ratio (for 25 to 54 year olds).
- Housing starts have been the big mystery in this recovery, with monthly levels finally reaching 1,300,000 last March. We had forecasted a 6% increase for the U.S., and housing starts are actually 9% higher than a year ago. However, they are still over 40% below their 2006 values, and almost 20% below the long run average.
- We continue to expect housing starts to grow at a pace faster than the overall economy, another 8% increase over the following 12-months period.
- We had expected consumer confidence as measured by the University of Michigan consumer sentiment to remain strong. It actually increased slightly over the last year and we feel confident that it will remain around current levels. Electronic orders will continue to outperform retail sales from more traditional places.
- We do not provide financial forecasts for the stock market or the exchange rate, since we believe that your best bet is today's price plus the average growth rate in the market. The Dow Jones average has been setting record levels recently and is roughly 19% above last year's level, and the U.S. dollar exchange rate relative to the

Canadian dollar, the most relevant exchange rate for the Coachella Valley, is virtually unchanged from a year ago at C\$1.29/\$1.

- A year ago, we felt that the inflation rate would increase slightly from the 1.7% level and end up at 2.3%. The latest available data shows a 2.7% from a year ago. We expect inflation to remain below 3% but above the Federal Reserve Target.

- The CVEP conference was held right after the November election. We expect the outcome to result in even more of a stalemate than is currently the case, and certainly do not expect any consensus on infrastructure investments at the federal level.
- Minimum wages will continue to be raised in California. For employers with 25 employees or more, minimum

wages will increase to \$12 an hour by January 1, 2019. We see continued automation replacing teenagers, especially in the Leisure and Hospitality Industry.

TABLE 1 below summarizes the general economic conditions over the last three years.

TABLE 1: GENERAL ECONOMIC CONDITIONS, 2016 - 2018

	2016 Q4	2017 Q3	2018 Q3
PRESIDENT	OBAMA	TRUMP	TRUMP
STOCK MARKET (DOW JONES)	17,930 (EARLY NOV)	22,268	26,828
\$CAD/\$US	1.28	1.21	1.30
CONSUMER SENTIMENT	87.2	93.4	96.2
URUS	4.8 (OCTOBER)	4.3	3.7
URCA	5.3	5.1	4.2
URIE	5.8	5.3	4.0
INFLATION	1.6	1.7	2.7
OIL PRICES (WEST TEX INT)	\$46.83	\$46.46	\$75.37
FEDERAL FUNDS RATE	0.25-0.50	1.00-1.25	2.00-2.25
HOUSING STARTS U.S.	1,328,000	1,155,000	1,282,000

Finally, **TABLE 2** provides our forecast of GDP growth for the nation, the state, and the region.

The “R” Word

The economy of the Coachella Valley is quite different from the rest of the Inland Empire (REM) and that of the rest of the United States (RUST). Most obviously, the socio-economic and industrial composition are not similar. As a result, certain factors that are important for analyzing economic development both in REM and RUST play less of a role locally (and vice versa). When we discuss the national economy here, we will limit ourselves to looking at developments that are of direct relevance to the Coachella Valley, which are of more interest to you.

One such variable of interest currently is growth in national real Gross Domestic Product (GDP), which is the most general indicator of economic well-being for an area. Think of it as total output or income earned. GDP is the most common yardstick used to determine whether or not we are in a national recession. While the proper definition of such a downturn refers to a period determined by the dating committee of the National Bureau of Economic Research (NBER), a reasonable rule of thumb often cited in the popular press is a persistent decline in national economic activity, for example two quarters. There seems

TABLE 2: GDP FORECAST, 2018 – 2020

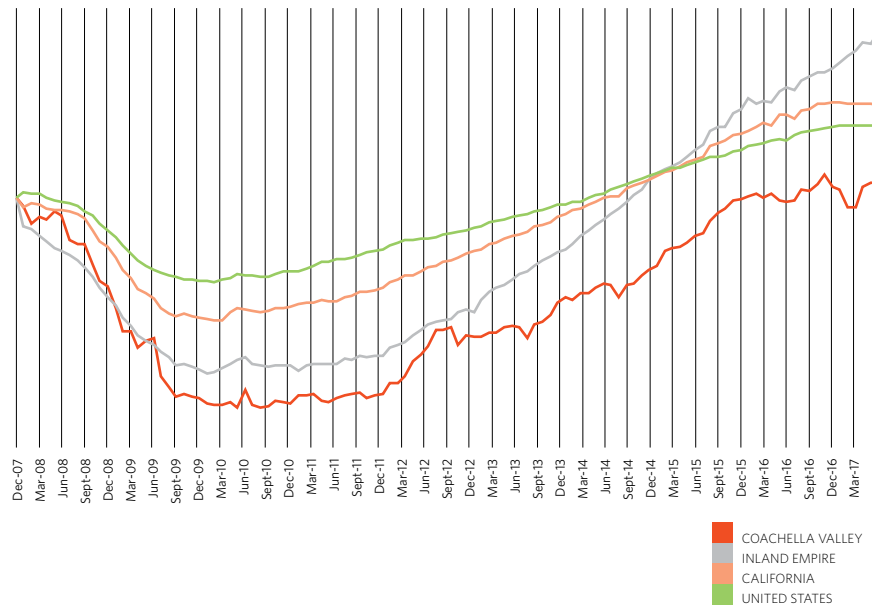
	2018	2019	2020
UNITED STATES	3.2	2.9	2.5
CALIFORNIA	3.3	3.0	2.7
INLAND EMPIRE	3.4	3.1	2.8

to be a Zeitgeist circulating that is on the pessimistic side: the next recession is around the corner (2020 or the latest 2021). The cynical person would say it is just a way to sell magazines. You are obviously aware of this concern going around, since it has been brought up in meetings with your associates and colleagues. The main question I will try to answer regarding the national economy therefore is: Should you be concerned about a national economic downturn in the near future? And, as a follow up, if the recession is about to hit, what economic variables will tell me that this is about to happen?

FIGURE 1 shows employment losses (in percent) beginning in December 2007, the start of the last national recession (“Great Recession”). You could argue that the downturn in Southern California started earlier, given that housing prices in Los Angeles peaked in the summer of 2007 and construction employment leveled off as early as March 2006 in the Inland Empire.

Regardless, once the recession started, tourism declined substantially and hotel bookings plus retail sales in the Coachella Valley went south quickly. Figure 1 indicates that at the trough, seasonally adjusted employment in the Coachella Valley was down by roughly 13%; basically every 8th person lost her or his job (actually mostly his, since this was a “mancession” with most job losses occurring in construction and manufacturing; but manufacturing plays only a minor role in the Coachella Valley). It took the employment in the nine cities until December of 2015 to return to pre-recession levels. The Coachella Valley employment continues to display lower growth rates and as of May 2017, employment is still only a mere 1% above the pre-recession level. As a result, it is of considerable interest to gauge whether or not we are about to go into another recession at the national level.

Figure 1 | Employment Changes, U.S., California, Inland Empire. Coachella Valley, seasonally adjusted, 2007M12 - 2018M3



National Economy: The Past, the Present, and the Future

There has been a lot of talk lately about the end of the current economic expansion. The August 2018 title story of Fortune Magazine was “The End is Near.” Also on the front page of that issue: “The U.S. Economy Will Slow. The Bull Market Will End. Here’s Why - And What You Should Do Now.” Geoff Colvin, a senior editor, strongly hints at the next recession starting by 2020. The problem is that, of course, we cannot tell with much certainty what the future holds. Think of the U.S. economy being an aircraft carrier that is entering a fog bank. On the bridge, the captain relies on a radar to spot obstacles. The radar

equivalent is economic forecasting. However, even when the iceberg comes into plain sight, it will take quite a while for a ship as large as an aircraft carrier to turn. That is, even after the obstacle has been spotted and the rudder has been turned (“internal lag of policy making”), there will be a delay before the economy reacts to the change in monetary and fiscal policy (“external lag of policy making”). The last time the U.S. economy encountered a huge obstacle in the fog bank was in 2007. With hind sight it is hard to believe that we did not recognize in time how big it was. When we finally did, it was too late to do anything significant before hitting it. The aircraft carrier was severely damaged and needed serious repairs (remember

the \$787 billion rescue package and quantitative easing).

So, what does the radar indicate currently? It took us quite some time to slay the “Great Recession” monster - recall that we initially had a “Not So Great Recovery” - in both the private and public sector and some of the battle scars are still visible. But let’s now attempt to look into the future by analyzing some of the objective facts together. This will hopefully allow you to make up your own mind before I will tell you what I think will happen. Come along for the ride and I promise it won’t be too complicated or boring.

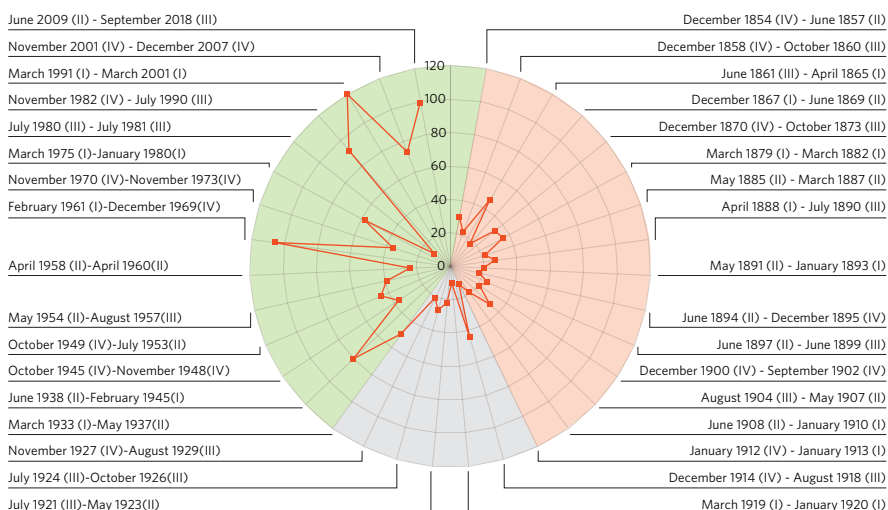
We will list several claims that have been made, and for each one of these we will do a “Fact Check.”

Claim: “The current economic expansion is much nearer its end than its beginning...” (Fortune Magazine, August 2018, p. 72).

Fact Check: Almost certainly true (#duh).

But what exactly does “near” mean? Maybe something different for Mr. Golvin than for you and me. The current expansion started in July 2009 and by now we have reached the point (November 2018: 113 months) where only one previous expansion has lasted longer (120 months from March 1991 to March 2001). If the current upswing goes beyond June 2019, then we will have set a new record. **FIGURE 2** displays all U.S. expansions since December 1854 (not a misprint). Clearly we will not see another 9 or 10 years of an expansion - well, wait: Australia holds the OECD (rich country club) record for the longest expansion on record. The country experienced its last recession in 1991, or 27 years ago. And, by the way, that recession coincided with a financial crisis in Australia (“Black Tuesday” better known as “Black Monday” to you - but remember, OZ is quite a few hours ahead of us). It survived the Asian Financial Crisis of 1997/1998, the dot-com recession around the turn of the century, and the Great Recession of 2007-2009 unscathed.

Figure 2 | Historical Duration of Economic Expansions, U.S., in Months



One lesson from the Australian post-1991 and the U.S. post-2007 to 2009 experience might be that the more severe the recession was, the longer the subsequent expansion. Unfortunately when we plot the relationship between the severity of the previous recession against the length of the subsequent recovery in the U.S. and for the post World War II period, we find no relationship. There have not been sufficient numbers of financial crisis during the post World War II period to check whether or not that would make a difference. On the other hand, we can also say with some confidence that economic expansions do not die of old age...

Claim: “In addition to knowing which indicators are best at predicting recessions, we also know whom not to ask: economists. At least on this

one task, they’re terrible.” (Fortune Magazine, August 2018, p. 78).

Fact Check: #harsh. Sad but true.

In their (economists) defense, recessions just do not happen that often. There have been 11 such episodes in the post World War (1945) era. It is as if you restricted yourself to look at 11 people with a certain disease to figure out the underlying causes. What is even more disturbing is when the doctor sees a patient who clearly is sick and still does not foresee the severity of the illness. This is a case of the iceberg being in front of the aircraft carrier and for some reason the captain or his officers, or the lookout, not seeing how big it is and judging it to be a minor obstacle. If that

is the case, then the captain (Captain Bush or was it Captain Bernanke? Or was it one of the previous captains, Captain Greenspan who was responsible for having a blurred vision?) cannot give the command to take evasive action. Equivalently the medical doctor fails to prescribe the appropriate dose of a medicine in time for it to take effect before the patient becomes severely ill. Surveying 47 professional forecasters (we are talking about those working at Goldman Sachs, Barclays, JP Morgan, Mitsubishi, etc.) in August 2008 when we were already more than seven months into the recession and Bear Stearns had failed earlier that year, the median forecast for 2008 Q4 was (plus) 0.7% when it turned out to be -8.5%. (The Lehman Brother debacle

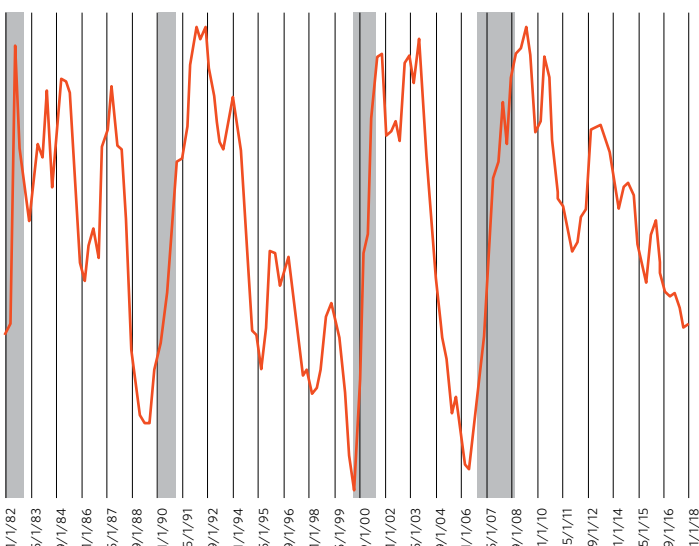
did not occur until mid-September 2008; the NBER, through its business cycle dating committee, did not declare the start of the recession in December 2007, until December 2008. But you should think of the NBER as a medical board that determines when the illness started, not a doctor). Similarly having a panel discussion with five economists at Claremont McKenna College's Athenaeum in February 2008, four of the five economists present mumbled something about "regional recession," "minor banking problems," and so on, when it should have been clear by then that the light at the end of the tunnel was the oncoming train (my actual words at the event). Even Federal Reserve Chairman Ben Bernanke, in June 2008, at the 53rd annual economic

conference of the Federal Reserve Boston, said that the central bank, at that point, was more concerned about inflation than unemployment.

What do these professional economists tell us these days? According to a survey by the Wall Street Journal in May of this year, almost 60% of the respondents (private-sector economists) saw the expansion ending in 2020. By 2021, that percentage increases to over 80%. Think about what that means in a weather forecast - even in California, you will carry the umbrella with you. We therefore find ourselves in a different situation from previous expansions: the vast majority of professional economists forecasts a recession within the next 3, if not, 2 years.

What do they rely on for being for having such a pessimistic outlook? What sort of radar equipment do they have?

Figure 3 | Term Spread, 10-Year Treasury Bond minus 3-Month Treasury Bill, U.S., Quarterly Averages, 1982-2018



Claim: "When the yield on long-term (10-year) Treasury securities falls below the yield on short-term (three month) Treasuries - an inversion of the yield curve - a recession is on the way." (Fortune Magazine, August 2018, p. 78)

Fact Check: True. But not relevant (yet).

FIGURE 3 shows the slope of the yield curve since 1962, with the grey bars indicating U.S. recessions. Every recession is preceded by the 3-Month Treasury Bill being higher than the 10-Year Treasury bond (this holds when you start looking at data towards the end of the '80s using

monthly data). Following this inversion, a recession is typically on its way within a year. However, this is an average and there is some variation here: before the Great Recession, it took 16 months, or over a year and a quarter for the negative term spread to result in a downturn.

What is the current situation? The yield curve is not inverted, but the spread is smaller than it has been since the end of the Great Recession in June 2009. Based on past behavior, and using this measure alone, we calculate currently that there is a 30% chance of a recession happening in the near future (there is some research at the Federal Reserve that also indicates that in the current recovery this probability should be lower once you take certain facts, not present during previous expansions such as the extremely low interest rates we observed, into account). In the past, there have been similar situations, but it takes a 60% chance to be quite certain that a downturn will happen. For that to occur, the 3-months treasury bill must be above the 10-year government bond, even if it is by a very small amount (for those of you interested in detail, our point estimate of that to happen is as small as 0.04 percentage points).

Despite another upcoming increase in the Federal Funds Rate this year, which has been announced by the Federal Reserve, we do not see an inversion in

the term spread in the near future, and certainly not before the end of 2018. The Federal Reserve no longer buys long term bonds ("Quantitative Easing") and with a decrease in the demand for these, it is tempting to argue that their prices should fall and the long term interest rates should increase. However, the market should have taken this already into account. What about another big fear out there - the Chinese government, in retaliation for President Trump's tariffs, sells some of its huge reserves of U.S. government bonds. This would simply lower the price of long term bonds and thereby increase its yield. It would also, most likely, result in a depreciation of the U.S. dollar against the Chinese Yuan, making Chinese goods more expensive in the U.S. and cutting into Chinese exports. This is not likely to happen, but if it did, there would be even less of a chance of an inversion in the term spread.

Should the inversion of the yield curve happen by early 2019, then a recession in 2019 or early 2020 would be in the cards, since this indicator is quite reliable in that there have been no false positives in forecasting future recessions - meaning this measure has not failed in predicting an economic downturn. Hence look out for that. There are some very smart people at the Federal Reserve who know about this relationship; and they will use their instruments to avoid for this to happen if possible. I can hear it: then why did the Federal Reserve allow this to happen in the past? Good question

(I promise not to say that to every question you will ask like some of my friends and colleagues tend to do...). In the past, the Federal Reserve sometimes actually created a recession to lower high inflation rates (hard to believe these days, but they were as high as 15% in the late '70s early '80s). Again, we do not think this is likely given the current economic situation, since inflation is not a problem in the current economic environment. The most recent increase in the Federal Funds Rate by the Federal Reserve did not result in lowering the spread further - instead it increased slightly as we are sending the report to the printer. In our current economic situation, an increase in long term interest rates signals that the market believes that the economy will continue to do well, and that there is more inflation in the making as a result. It is a sign of strength, not of weakness, in the U.S. economy.

One last bit of news: the Index of Leading Economic Indicators (LEI; more on this below, but basically a forecasting tool constructed by the Conference Board, an umbrella organization for businesses) contains the difference between the 10-Year Treasury Bond minus the Federal Funds Rate, not the 3-months Treasury Bill. I will spare you the graph, but it looks less dramatic than the spread in **FIGURE 3**; and that difference did not tighten further either when the Federal Reserve raised the Federal Funds Rate another notch at its end of September meeting. It stands at

1 percent (one percentage point), a level it was at previously, at the end of June with a few fluctuations since; and a level we saw at the end of 2017; and again, just before our last conference in September 2017; also in June 2017; and in July 2016. I think you are getting my point by now: the most recent situation is not that different from what it was two years ago and we did not hear many economists “cry wolf” then.

This latest increase in the Federal Funds Rate had been signalled previously and was the result of a continuing “hot” economy that added more than the forecasted number of jobs in August, showed decent annual wage increases of 2.9%, and kept the unemployment rate at low levels by historical standards. Without sounding alarm bells, the

Federal Reserve will hike the Federal Funds Rate one more time by a quarter of a percentage point following its December meeting and it will do so again, probably three times, in 2019.

The U.S. central bank has an inflation target (inflation measured through personal consumption expenditures) and the economy has reached that level recently. Most people, different from the Fed, focus on the consumer price index, and that measure shows a year-on-year increase of 2.7%, thereby wiping out any significant real wage (“command over goods”) gain.

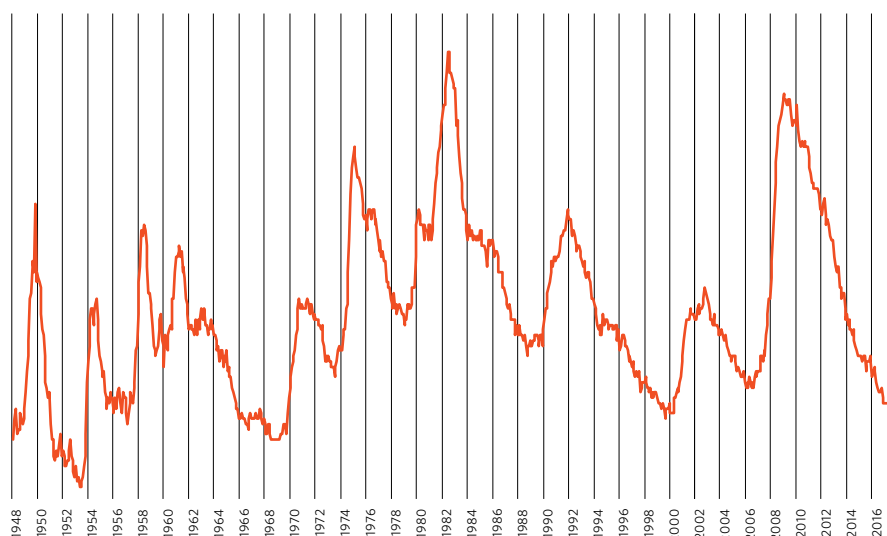
Claim: “Another highly reliable presage of downturns is ... a trough in the unemployment rate... Super-low unemployment ... means the expansion

is pressing up against its limits.” (Fortune Magazine, August 2018, p. 78).

Fact Check: Right but for the wrong reason.

FIGURE 4 displays the U.S. unemployment rate since 1948. It is true that the unemployment rate increases in every recession, which is another way of saying that it is “super-low” before a downturn, but the claim confuses signals. Umbrellas stay closed before the rain starts and they open once the water drops hit you. Carrying an umbrella, or even opening it will not cause the rain to fall. Unemployment rates are considered a lagging indicator, not a leading economic indicator. By looking at the figure, you can see that the unemployment rate peaks after

Figure 4 | Civilian Unemployment Rate, U.S., seasonally adjusted, 1947M1-2018M9



the recession is over (in October 2009 during the last episode, when the recession ended in June 2009) - meaning you keep the umbrella up for a little while even after the rain stops.

There is no reason why we cannot remain at full employment for an extended time - a level of the unemployment rate economist call the "natural rate of unemployment." As a matter of fact, it is a target of economic policy to get the economy to that point, and then to keep it there as long as we can. Are we currently below that rate (in September, the unemployment rate was 3.7% after falling from 3.9% in August)? Perhaps, although the full employment unemployment rate (that sounds funny, I know) cannot be observed but has to be estimated, and it varies over time. If we were below that lower bound unemployment rate, then we should see wages and prices increase faster currently. Inflation has certainly increased over the last year, but it is still remarkably low by historical standards and for this time in the economic cycle. Also, the length we spend at these super-low unemployment rates in the past seems to be unrelated to the onset of a recession: note that unemployment rates were at 4% or below for 52 months, or more than 4 years, before the 1970 recession; and for 64 months below 5% before the 2001 downturn (the natural rate had increased for demographic reasons from 4% to 5% from the late '60s to the end of the century).

TABLE 3: SIGNIFICANT STOCK MARKET DECLINE AND SUBSEQUENT ECONOMIC RECESSION, 1959 - 2018

Date	Decline in Stock Prices	Subsequent Recession
1959 Q4 - 1960 Q4	-4.2%	April 1960 -February 1961
1962 Q1 - 1962 Q3	-17.3%	None
1966 Q1 - 1966 Q4	-13.0%	None
1969 Q3 - 1970 Q3	-16.6%	Dec 1969 - November 1970
1973 Q2 - 1974 Q4	-35.4%	November 1973 - March 1975
1976 Q4 - 1978 Q1	-12.9%	None
1980 Q1 - 1980 Q2*	-1.7%	January 1980 - July 1980
1981 Q1 - 1982 Q3**	-13.5%	July 1981 - November 1982
1990 Q1 - 1990 Q4***	-5.7%	July 1990 - March 1991
2000 Q4 - 2001 Q4	-18.2%	March 2001 - November 2001
2002 Q2 - 2003 Q1	-19.5%	None
2007 Q2 - 2009 Q1****	-45.7%	December 2007 - June 2009
2011 Q2 - 2011 Q4	-7.1%	None

Notes: We define a significant stock market decline as negative growth for 3 or more consecutive quarters. *Only one quarter of falling prices.**1981 Q2 saw .96% positive growth. ***1990 Q2 saw 4% positive growth. **** 2007 Q4 had a .21% positive growth and 2008 Q2 had a 1.6% positive growth.

Bottom line, low unemployment rates are not a good predictor for a subsequent recession. Nor do people get excited about the news that we have stayed at this level for a while - I had to go to page 5 of the October 6 business section of the Los Angeles Times to find a mentioning of the fall of 0.2% (percentage points) in the September unemployment rate. If these low unemployment rates result in wage and price increases, and the Federal Reserve then steps on the brake by raising short-term interest rates, thereby inverting the yield curve, then a monetary contraction will likely result in a subsequent recession with increasing unemployment rates. That is the proper way to look at it.

Claim: Stock Markets have forecasted every economic downturn after World War II.

Fact Check: True. But "stock markets have predicted 13 out of the last 7 recessions." - CNBC, February 2016 In 1966, Paul Samuelson, thought of by some as the father of modern economics, made a similar quote famously by saying that bear markets have predicted 9 of the last 5 recessions. **TABLE 3** shows the false positives in red, and the correct predictions in black.



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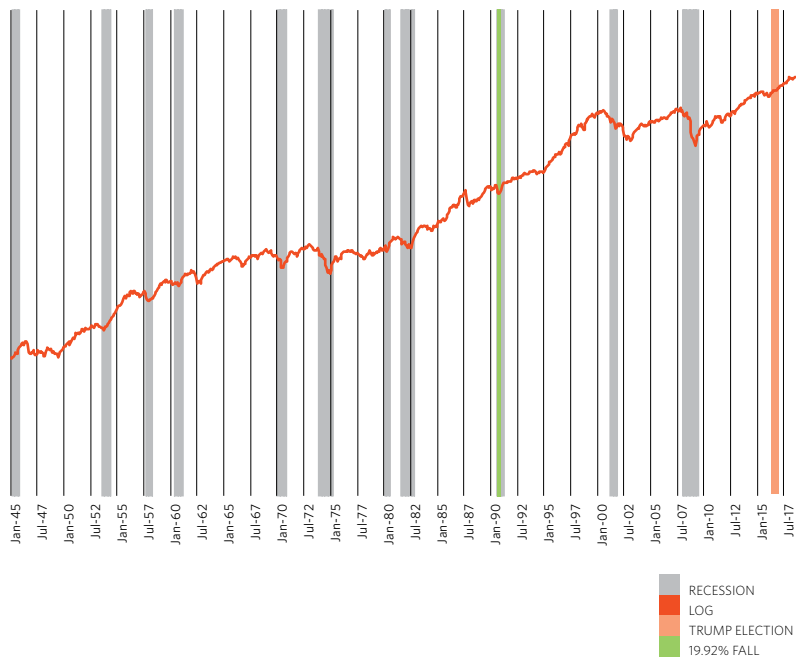
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FIGURE 5 shows the S&P 500 index since 1986. As before, the grey bars indicate recessions, while the red is the most recent Presidential election date. We added an orange line showing a 19.9% drop in October 1990. Recently, there has been a claim that the stock market is experiencing the longest expansionary period on record. Not sure why we should care other than celebrating that our investments are growing. Also the celebration is dependent on the interpretation of the starting date of the current upswing. The longest rally before the 2009 to 2018 run on record occurred from the start of the tech rally in October 1990 through March 2001 (3,453 days) when the tech bubble burst leading into the dot-com recession. However, what defines an expansionary period is a bull market that exceeds 20% growth and does not fall in the process by 20% or more. October 1990 saw a 19.92% decline which some interpret as qualifying as a bear market and some do not. If you say that the hard and fast rule (“technically”) is 20% and therefore 19.92% does not qualify, then we are not in the longest expansion on record. In that case, the previous record expansion started in December 1987. The current expansion that began in March 2009 would have to pass 4,494 days to beat the expansion of the ‘90s. But let’s worry about important things and leave this debate for the nerds.

Figure 5 | S&P 500 Index, U.S., Monthly Averages, August 1945-July 2018



So we can go on now debating if the stock market has had a record rally, or we could discuss whether or not it is a reliable forecaster for an oncoming recession. Regardless, this sort of argument is irrelevant for the big picture: the stock market is not turning down currently other than through its usual day by day fluctuations. This forward looking indicator (future discounted earnings) clearly does not forecast that the “End is Near.”

Claim: By asking “The Man-on-the-Street” where the economy is heading, we will get a reliable forecast for the next recession.

Fact Check: Don’t worry about what people say they feel, look at what they do.

What is the idea behind using survey responses conducted by the University of Michigan as an indicator where the economy is heading? Almost 70% of total U.S. aggregate demand (GDP) comes from consumer expenditures. This does not even include residential investment (building houses). If you can predict future consumption expenditures through consumer expectations regarding the future state of the economy, you are basically there.

As it turns out, consumer sentiment is also part of the Index of Leading Economic Indicators (LEI), just like the stock market. Similar to the stock market, there have been several false positives in the past. Unless you assume that “The Man-on-the-Street” has more insights than what information we can extract out of the behavior of economic variables, then we should not pay too much attention to the index. Famously consumer sentiment plummeted after the 9/11 terrorist attacks, just before retail sales roared in October 2001.

Perhaps I have convinced some of you that we do not want to place too much weight on the consumer sentiment index, but what if you did so despite my argument? Let’s follow the simple approach that if consumers “feel” that we will be heading into bad times, then we will (the self-fulfilling hypothesis). Where would this point us to currently?

FIGURE 6 shows the current and past values of the consumer sentiment index (CSI) as calculated by the University of Michigan. We have added a red line to the graph indicating President Trump’s election date.

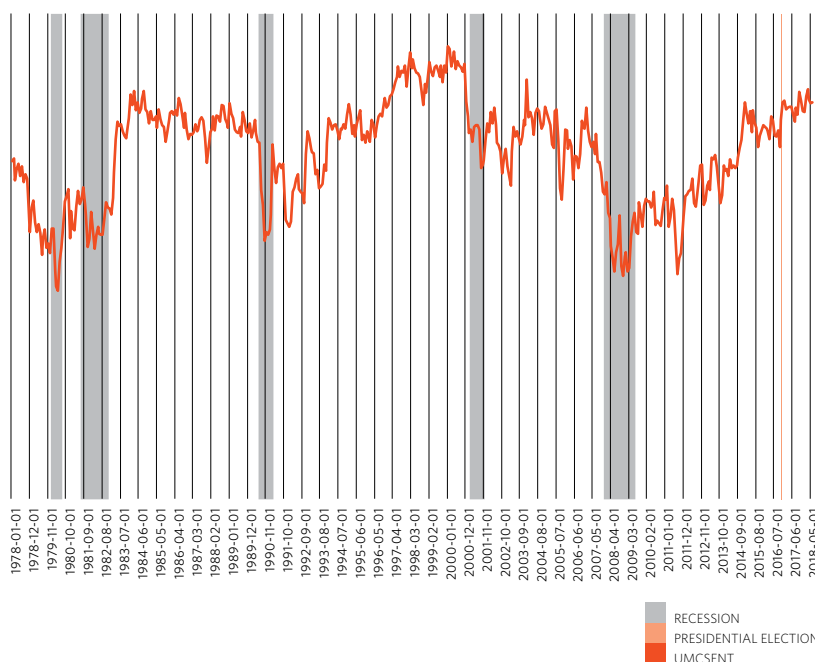
U.S. consumer confidence is currently extremely high, according to these numbers. Similar to the stock market, this forward looking variable certainly improved since President Trump’s election. CSI reached values that had not been seen since January 2004 (a one-

month spike within the margin of error) and the late 2000 before that. The CSI seems to behave erratically at times, but that is simply the result of its relatively small sample size of 500 respondents, which makes it likely that the true index stayed the same even if the sample index fluctuates by $\pm 4.5\%$. Bottom line, this radar does not show any icebergs lurking around.

Claim: The Index of Leading Economic Indicators is a reliable forecaster for the start and the end of economic recessions. When the index declines for 3 months in a row, then the economy will go into a recession within the next half year.

Fact Check: Mostly true

Figure 6 | Consumer Sentiment Index, U.S., 1978-2018



The “Index of Leading Economic Indicators” has come up several times in my presentation by now. Originally developed by the NBER and MIT, it is now maintained by the Conference Board. Think of it as a weighted average of various economic series that turn before the economy turns. Don’t worry about details here such as how the weights are determined and how the underlying series are chosen. The bottom line is that there are ten variables that are somewhat combined into a common index.

What are some of these variables? Well, the interest rate spread between the 10-year government bonds and the federal funds rate mentioned above is in there, so is the stock market and consumer confidence (sort of like

consumer sentiment, but collected by the Conference Board). Again, let's not worry about the details here. We could have gone on and showed you graphs of how each of the variables in the index was behaving. But there is a reason why we form averages - extremes cancel. Think about if I showed a picture of a camel participating in a camel race at the Riverside County Fair, and offered a prize for the person who could come closest in guessing the weight of the camel. When people have done such experiments in the past, it is remarkable to see how close the average of the entries is to the true weight. This is the simple idea here behind combining the 10 variables into one index.

FIGURE 7 shows how the Index has behaved over time. It also plots the Coincident Economic Index (CEI), which is a composite of current economic conditions.

How did the 3-month downturn rule perform in the past? **TABLE 4** presents the predictive power of the Index of Leading Economic Indicators. Again, false positives are listed in red.

As you can see, this composite index performs fairly well as a forecasting tool, hence explaining its popularity among corporations and political administrations. Perhaps its simplicity, basically forming a weighted average of ten series that have forecasted well in the past, also explains why it is circulated widely, rather than the alternative forecasting tool of

Figure 7 | Index of Leading Economic Indicators and Coincident Economic Indicators, 1979-2108, Monthly data

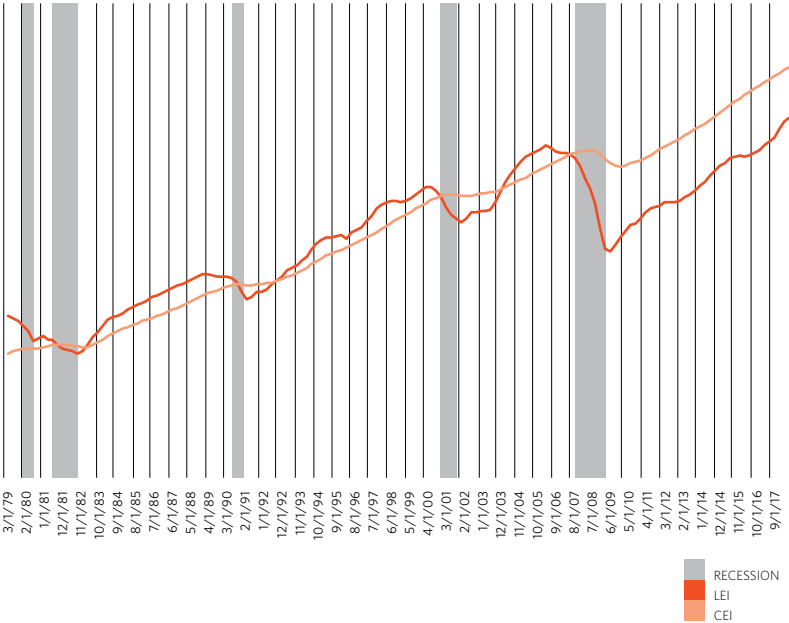


TABLE 4: S3-MONTH DECLINE IN LEI AND SUBSEQUENT ECONOMIC RECESSION, 1959 - 2018

Date	Decline in LEI	Subsequent Recession
July 1959 - October 1959	None	April 1960 - February 1961
April 1966 - July 1966	0.8%	None
April 1969 - July 1969	1.8%	December 1969 - November 1970
May 1973 - August 1973	1.8%	November 1973 - March 1975
May 1979 - August 1979	1.8%	January 1980 - July 1980
November 1980 - February 1981	2.5%	July 1981 - November 1982
June 1990 - September 1990	2.9%	July 1990 - March 1991
September 2000 - December 2000	3.2%	March 2001 - November 2001
March 2006 - June 2006	1.3%	None
May 2007 - August 2007	0.9%	December 2007 - June 2009

econometric models, which are much more complicated and certainly harder to understand.

What is the latest news? Well, the LEI continues to increase and shows no sign of declining. Of course the LEI is constructed for the nation, not for the region. However, at the Lowe Institute we have constructed a similar index for the Inland Empire (see **FIGURE 8**). It also shows no imminent economic decline on the radar.

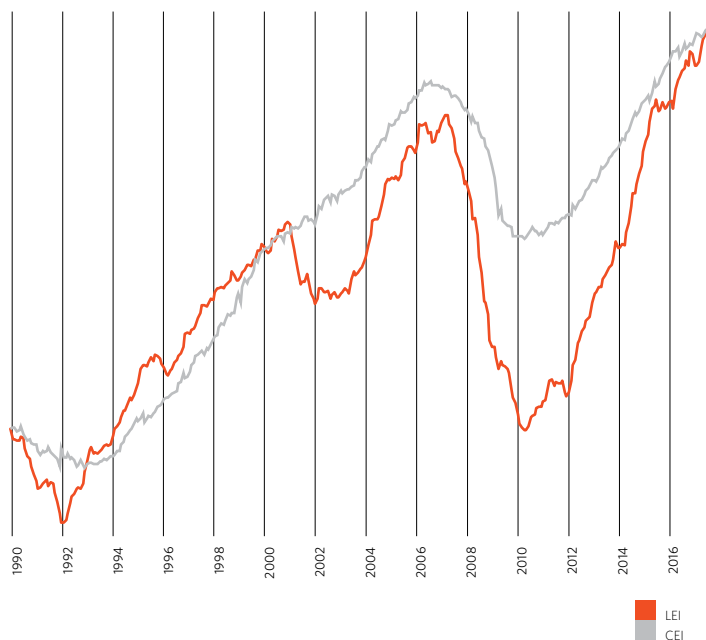
Claim: The Inland Empire is FILO - first in, last out. As a result, you should pay special attention to employment numbers in the Inland Empire. The Inland Empire becomes a Leading Economic Indicator going into a recession, but is a lagging indicator when coming out of it.

Fact Check: True, unless the recession in Southern California does not coincide with a national recession.

While the Coachella Valley community, similar to that of the Victor Valley, cities such as Beaumont, Banning, Temecula, and Murrieta, may not feel that they are really part of the Inland Empire, businesses and local governments should carefully pay attention to employment developments in the Inland Empire if they want to receive an early warning signal of an oncoming recession.

The Inland Empire: a leading economic indicator for Greater Los Angeles, and perhaps even the nation? #ruserious?

Figure 8 | Inland Empire Leading Economic Indicator and Coincident Economic Indicator, 1990-2017



Let me explain. 40% of the Inland Empire labor force commutes, primarily into the Greater Los Angeles area, and to a lesser extent into the San Diego MSA. This is different from the Coachella Valley, which is much more self contained. It does explain, though, why it takes me three hours to commute from Claremont to the UCLA Anderson School four times a year to attend their quarterly forecast conference: typically the event starts at 9:30 a.m. and unless I leave later than 6:30 from Claremont, I typically will not make it in time. None of us like commuting in rush hour traffic - "hating" is the word that comes to mind (remember, "hatin' is bad"). What if you had to do it every day of the week?

Why on earth would you take on such pain by choice?

Employees who reside in the Inland Empire and work in the more coastal regions do so since they cannot afford to live in Orange County, Los Angeles County, and San Diego County. On average, they are endowed with less human capital than those who can afford to live in desirable communities closer to the coast. On the other hand, they have more human capital than that required for the average job in the Inland Empire, meaning they could work in the Inland Empire but they would not get the salary that they receive in the areas they commute to. Why commute otherwise?

Figure 9 | Unemployment Rates, U.S., California, and the Inland Empire, 1990-2018



If you follow this argument, then who will get laid off first in an economic downturn that hits the coastal regions? The commuters - certainly a firm will lay off those first who have less human capital. Next, the now unemployed commuters will stop spending at Home Depot, Red Lobster, etc., and those workers, who work and live in the Inland Empire, will then lose their jobs. Finally, if the recession becomes sufficiently severe, those who live and work in the coastal areas will also be laid off - this is the “first in” part of the FILO phenomenon. You can see this sort of behavior of the labor market shown in **FIGURE 9**.

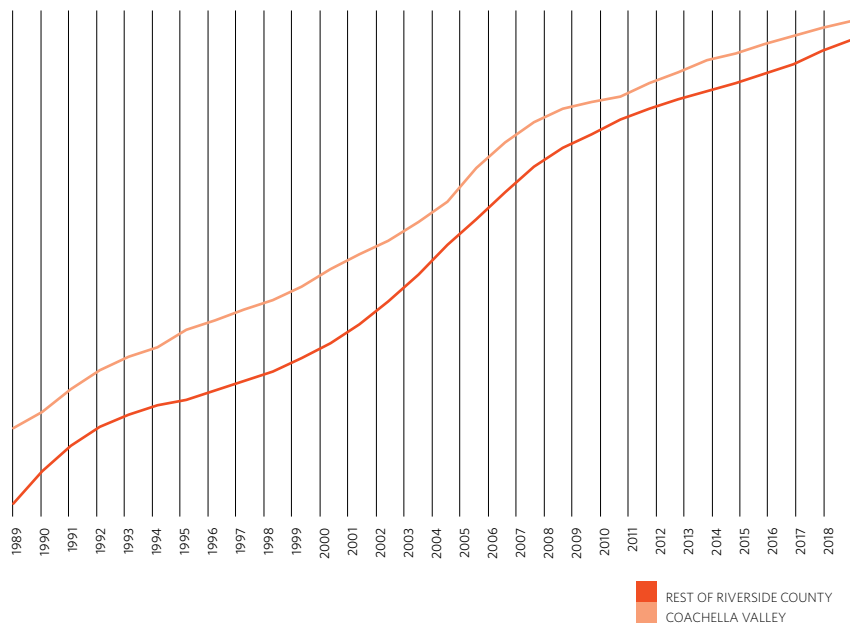
The figure shows that during the recession of the early ‘90s and the Great Recession, the unemployment rate (remember that this is measured by residency, meaning if you live in Indio and lose your job in Palm Springs, then the unemployment rate of Palm Springs is unaffected, but that of Indio will increase) in the Inland Empire went up before it did for the state and the nation. Construction employment in the Inland Empire peaked as early as the spring of 2006, if you look at seasonally adjusted data (housing prices in Los Angeles peaked in the summer of 2007). This is the first in part we have been talking about. Why does this not apply

to the recession around the turn of the millennium? The dot-com recession was centered in Northern California and the SoCal economy was not heavily affected. The reverse (last out) is true for the recovery: those who were laid off first will find jobs last; or at least not as quickly as the coastal area workers who reside there. A lake freezing from the periphery first comes to mind; those are also the areas that thaw out after the middle of the lake is clear of ice. You can see this again in **FIGURE 9**. Note that over the last two years or so, it is the Inland Empire that has seen the highest job growth rates among the ten largest MSAs in California - higher rates than Silicon Valley (that MSA is called San Jose - Santa Clara - Sunnyvale).

Final words: I hope that by now you can make up your mind if you think we will see a recession in 2020 or 2021. I have given you what I perceive as the relevant information. Perhaps you see something in the figures I presented that I have not noticed. This is always possible and it would be nice to hear from you (mkeil@cmc.edu).

If you are worried about the next recession affecting your business or community, look at employment figures for the Inland Empire, specifically the Current Population Survey (done by residency), not the Current Employment

Figure 10 | Population Levels for the Coachella Valley and the Rest of Riverside County, 2000-2018



Statistics (an establishment survey), regardless of whether you “feel being a part” of it or not. Once you see those numbers declining, then that should be an early warning signal of an imminent recession, not only in Southern California, but also elsewhere. Beyond that, pay attention to the Index of Leading Economic Indicators, which is published monthly by the Conference Board and widely circulated in the press.

To make a long story short (for which it is too late by now) and in the words of

the Hitchhiker’s Guide to the Galaxy and displayed on Elon Musk’s Tesla going to Mars: DON’T PANIC.

POPULATION

In this report, the Coachella Valley population is the sum of residents living in the nine major cities. We exclude unincorporated areas and smaller places. We refer to the “Coachella Valley Total Population” as the number of people living in the following cities: Cathedral City, City of Coachella, Desert Hot Springs, Indian Wells, Indio, La Quinta,

Palm Desert, Palm Springs, and Rancho Mirage. The population of these nine cities in 2018 is approximately 385,000, representing about 19% of Riverside County’s total population.

Population levels for Coachella Valley and the Rest of Riverside County (RORC) are displayed in **FIGURE 10**. Although plots for both regions are shown on different scales in the graph, both Coachella Valley and RORC have experienced positive trends in population growth over time.



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Figure 11 | Population Growth Rate, Coachella Valley and Rest of Riverside County, 2000-2018

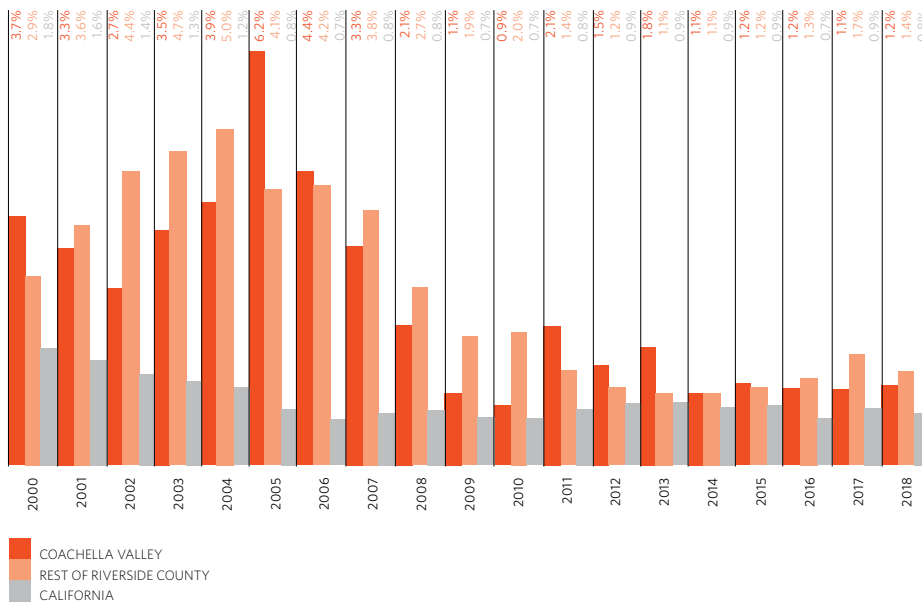


FIGURE 11 provides a closer look in the year-on-year percentage changes in the population growth rates of Coachella Valley, RORC, and California. The following details stand out.

- Growth Rates for the for the Coachella Valley and Riverside County have remained within two percentage points since 1990 with two exceptions: 1990 and 1995. However, from 2001 to 2004 Riverside County experienced much higher population growth rates, while the population of Coachella Valley grew more slowly.
- The previous trough in population growth rates was associated with the prolonged recovery of the economy and unemployment rates from the 1990-91 recession (the so called “peace dividend”). Due to structural changes in Southern California’s aerospace industry with the end of the Cold War, the the local economy did not recover to full employment till 1999. This regional economic downturn depressed population growth figures until the beginning of the new millennium.
- Coachella Valley and Riverside County growth rates in 2018 are both between 1% and 1.5%. They are unlikely to jump back to the previous highs seen in the early to mid 2000s. The 4% population growth rats are simply unsustainable in the long run, as they imply that the population would double every 18 years.
- Before the Great Recession, immigration into the Coachella Valley and Riverside County caused the population to grow much faster than for California as a whole. However, we have yet to see the growth rates

return to these pre-recession levels, as population growth has barely risen past California’s long-term growth rate of 1%, seen since 2005.

FIGURE 12 further emphasizes differences between the population growth rates in the pre-recession and post-recession periods for both Coachella Valley and Riverside County. As both periods have seen substantially different growth rates, calculating an average for the entire period would be misleading and would undermine the accuracy of

Figure 12 | Compounded Annual Growth Rate of Population, 1999-2007 vs. 2008-2018, Coachella Valley, Riverside

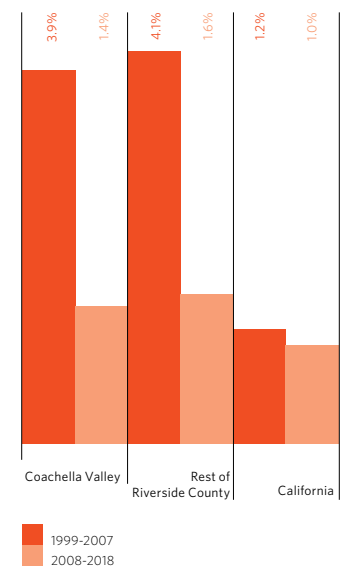


Figure 13 | City Population, Coachella Valley, 2018 (Estimate)

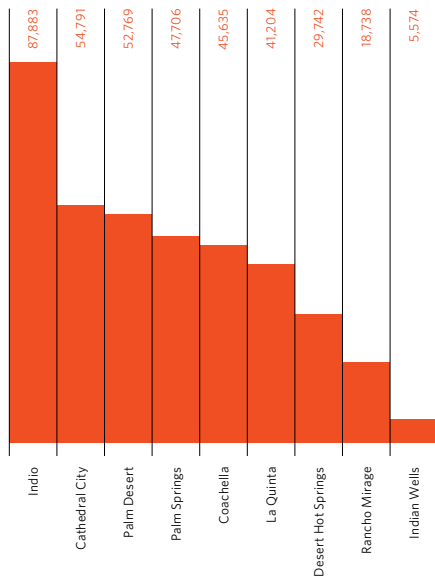
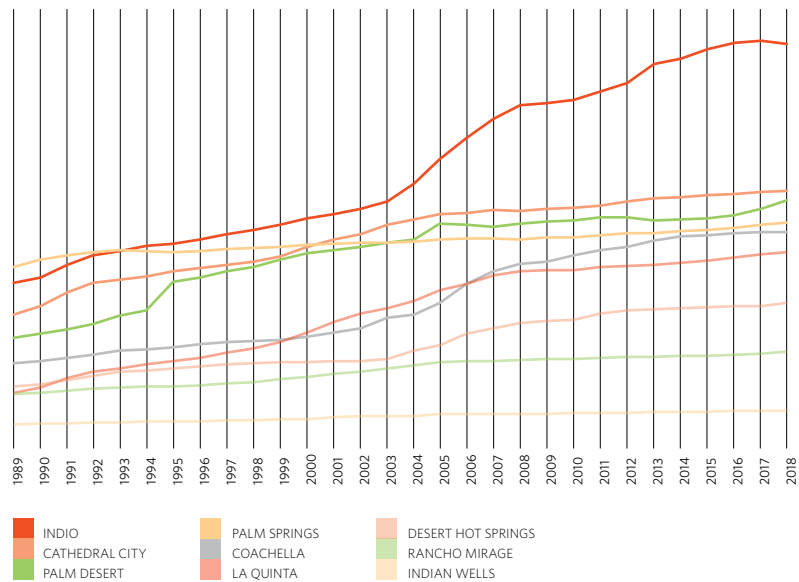


Figure 14 | City Population: Coachella Valley, 1989 to 2018 (Estimate)



future predictions by camouflaging the underlying trends. Coachella Valley's population growth rate now resembles the California average of 1%, growing by about 4,000 people over the last year. Evidently, the great Recession had a surprisingly similar impact on both the Rest of Riverside County and Coachella Valley. This similarity points to a system of interdependence between the two areas, despite significant differences in the overall economies of the region.

2018 saw a population growth rate of 1.2% for the Coachella Valley, not that different from the previous year's growth rate of 1.1%. If the current trends continue, we expect the population of the nine cities to be just below the 400,000 mark by the end of the decade, by about 6,000 people. This number, however, is very large by any metric

and represents an opportunity for the Coachella Valley in terms of economic power through population size.

That said, Coachella Valley should perhaps not aspire to raise its population growth rates to the pre-recession levels, as any significant population rises could potentially cause problems for the smaller cities. Although places like Indio can absorb larger populations, the smaller cities on the edge of the valley simply cannot. This situation is best exemplified by Palm Springs, whose potential for expansion is limited by geographic factors. If the pre-recession growth rates continued, Palm Springs would have to provide utilities for a population of over 70,000 rather than its current population of 47,000, potentially hurting its economic future. It is perhaps

for the best, that the population of Coachella Valley does not double every 18 years.

FIGURE 13 presents the current population of the nine cities. Indio is the largest city, with a population of roughly 88,000, while Indian Wells only has close to 5,500 residents. There are five cities with more than 45,000 inhabitants (Indio, Cathedral City, Palm Desert, Palm Springs, Coachella).

These five cities make up 75% of the nine-city population.

FIGURE 14 comparing the relative populations of the cities over time, displays an interesting trend, as Palm Springs, which was the largest city by population in 1989, has experienced relatively stable growth rates, while

Indio, Cathedral City, and Palm Desert have all eclipsed it by population size; and the City of Coachella is close to overtaking Palm Springs, despite having half the population of Palm Springs 30 years ago. The most interesting trend has to be rapid population growth of Indio and Coachella, both of which saw their populations double as a result of the mid-2000s population boom.

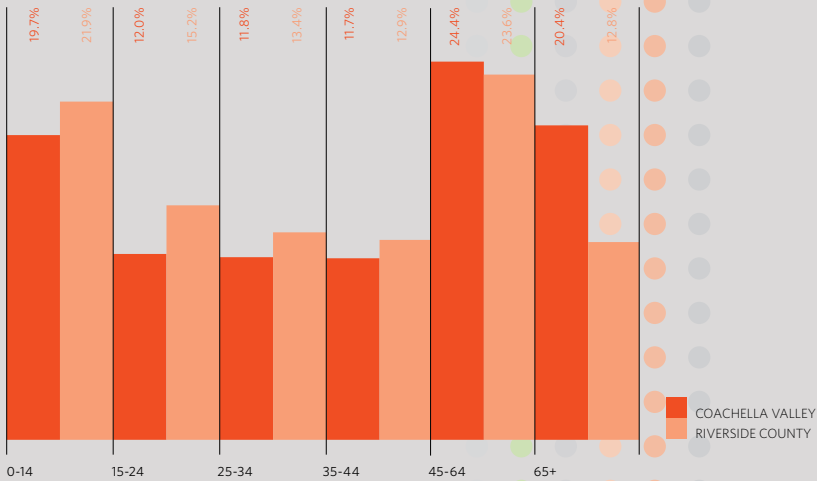
FIGURE 15 illustrates the differences in age compositions between Coachella Valley and Riverside County. The data supports traditional wisdom, as Coachella Valley has a significantly higher proportion of its population above retirement age. Almost 45% of the region’s population is over 45.

PLACE OF WORK

While the complexity of this data may appear daunting, we believe that it is valuable for Coachella Valley city planners and transportation experts. Our report in the previous year was the first to touch on these economic patterns.

TABLE 5 lists the cities where people reside in rows and shows the cities where they work in columns in 2015 (data for 2016 is not available yet). For example, there are 1,989 people who live in Cathedral City, but work in Palm Desert. Cities are sorted by size of population.

Figure 15 | Age Distribution: Coachella Valley and Riverside County, 2016



The following facts stand out:

- Indio has the most people who live and work within its boundaries. However, as the largest city, this number only represents 25% of the labor force. Workers tend to find jobs elsewhere; one in four people in Indio work outside of Indio. The other 75% come from outside the city.
- Palm Springs, in contrast to Indio, provides most of its workers to itself.

60% of people who live in Palm Springs work in Palm Springs, the largest percentage of this kind in the Coachella Valley.

- Palm Desert is the city closest to matching that figure. 40% of people who live in Palm Desert work in Palm Desert. Together with Palm Springs, these two cities have the highest number of commuters coming into the city.
- Cathedral City, unlike Palm Springs,

has the lowest number of workers who reside in the city. Only about 16% of its residents also work there. We do not find this fact surprising, as Cathedral City's proximity to Palm Spring makes commuting quite easy and convenient.

- Indian Wells serves as another extreme; 96.9% of its workers come from other cities, while 87.1% of its residents go to work elsewhere.

TABLE 5 | RESIDENCE AND WORK LOCATION IN COACHELLA VALLEY, 2015

LIVES/WORKS	INDIO	CATHEDRAL CITY	PALM DESERT	PALM SPRINGS	COACHELLA	LA QUINTA	DESERT HOT SPRINGS	RANCHO MIRAGE	INDIAN WELLS
INDIO	4,193	625	3,726	1,546	1,534	2,281	102	1,509	804
CATHEDRAL CITY	571	1,808	1,989	4,097	204	431	232	1,912	317
PALM DESERT	737	436	3,749	1,193	238	892	93	1,555	572
PALM SPRINGS	269	667	1,022	4,954	76	203	180	1,011	129
COACHELLA	1,958	270	1,548	477	1,770	1,099	45	513	336
LA QUINTA	1,087	254	1,933	827	438	1,788	44	879	484
DESERT HOT SPRINGS	275	489	766	1,555	90	154	809	479	82
RANCHO MIRAGE	139	229	619	569	49	137	32	744	85
INDIAN WELLS	60	28	221	80	18	93	1	109	90
INFLOW (HOW MANY PEOPLE FROM OUTSIDE THE CITY WORK IN THE CITY)	5,096	2,998	11,824	10,344	2,647	5,290	729	7,967	2,809
OUTFLOW (HOW MANY PEOPLE FROM WITHIN THE CITY WORK OUTSIDE THE CITY)	12,127	9,753	5,716	3,557	6,246	5,946	3,890	1,859	610
STATIC (HOW MANY PEOPLE FROM WITHIN THE CITY WORK WITHIN THE CITY)	4,193	1,808	3,749	4,954	1,770	1,788	809	744	90
% INFLOW (WHAT PERCENT OF A CITY'S WORKFORCE IS FROM ANOTHER CITY IN THE CV)	54.9	62.4	75.9	67.6	59.9	74.7	47.4	91.5	96.9
% OUTFLOW (WHAT PERCENT OF A CITY'S EMPLOYED POPULATION WORKS ELSEWHERE IN THE CV)	74.3	84.4	60.4	41.8	77.9	76.9	82.8	71.4	87.1
% STATIC (WHAT PERCENT OF A CITY'S EMPLOYED POPULATION LIVES AND WORKS IN THE SAME PLACE)	25.7	15.6	39.6	58.2	22.1	23.1	17.2	28.6	12.9

- Rancho Mirage is somewhat similar to Indian Wells: about 92% of its workforce comes from outside of the city, while about 71% of its residents work somewhere else in the Coachella Valley.
- For Desert Hot Springs, 83% of its residents commute to work elsewhere, many of them in Palm Springs.

Figures 16A, 16B, and 16C display this information in a pleasant graphic (made by CVEP GIS Coordinator David Robinson).

EMPLOYMENT

We are shifting our attention now from places of residency to places of work. As we saw in the previous section, given the amount of commuting that occurs within the Coachella Valley, it would be hard

Figure 16a | Commuting Flows: Coachella Valley, 2015

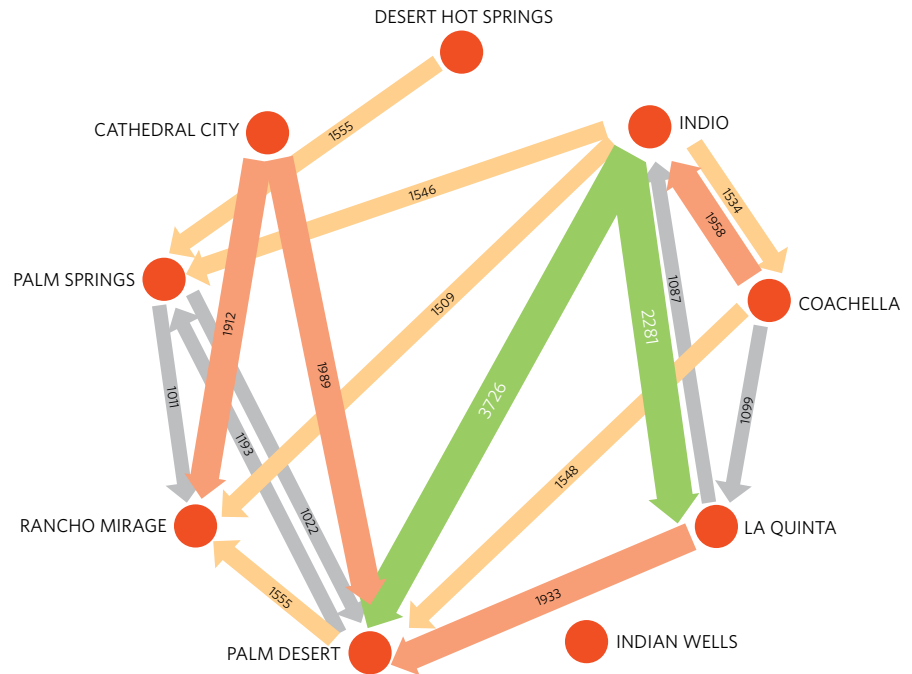


Figure 16b | Working and Living in the Same City:
Outflow of Workers from a City, Coachella Valley, 2015

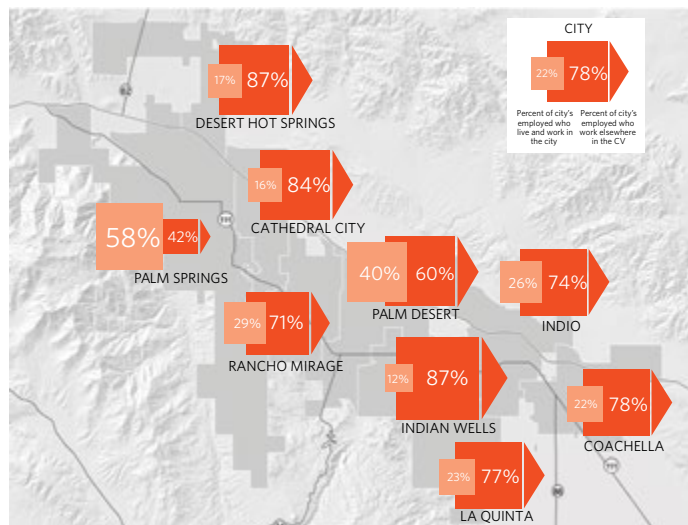
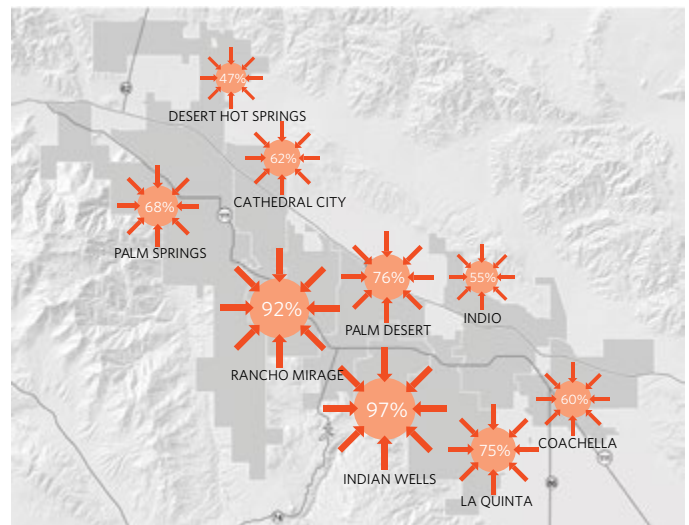


Figure 16c | Inflow of Workers into a City:
Coachella Valley, 2015



to analyze changes in working patterns, or industrial composition, if we focused only on the residents of one of the nine cities.

FIGURE 17 presents the employment growth experienced by the nine cities over the period 2006 to 2017. There was strong employment growth prior to the Great Recession, but note that even in the recession year, employment increased by 6%. This is quite different from the rest of the Inland Empire, which experienced employment declines in 2007 already. We interpret that as a result of the Great Recession appearing to be quite mild at the national level until the middle of 2008. There is also a slight chance that the “seasonal adjustment” statistical procedure did not pick up the employment losses around that time of the year, since the Coachella Valley always experiences large employment losses from June to August.

2009 was definitely not an easy year to survive in keeping your job in the Coachella Valley. One in eleven employees lost their jobs. It took until 2011 for employment to start increasing by relatively small amounts, but it took until 2015 for the recovery to show solid job gains year-to-year. The last year for which we have data available (2017) was quite disappointing: while still showing positive growth, employment increased by an abysmal 0.1%. These aggregate numbers hide the fact that there is substantial variation between the nine

Figure 17 | Percent Change in Employment, Coachella Valley, 2006-2017

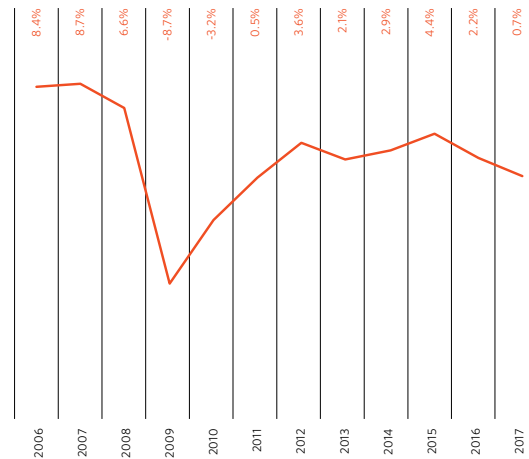
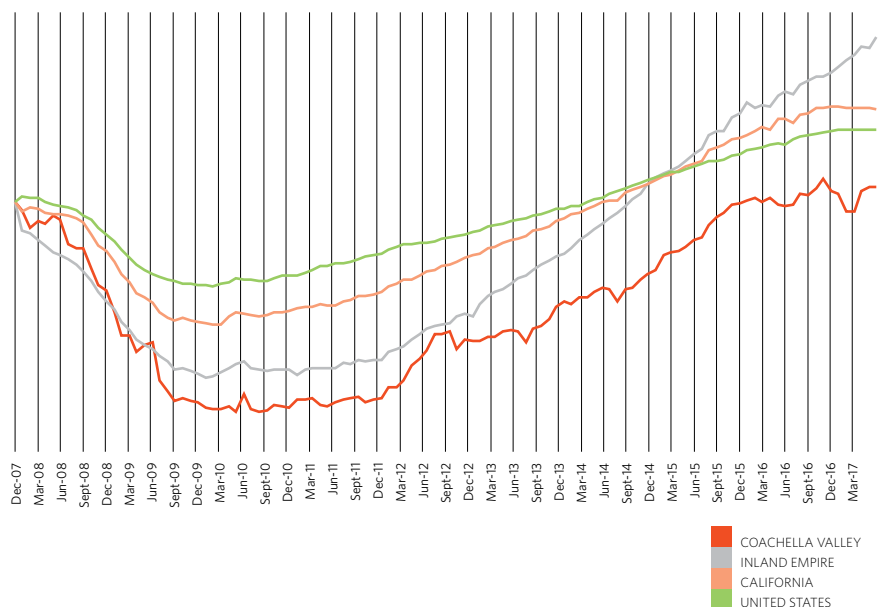


Figure 18 | Employment Changes, U.S., California, Inland Empire. Coachella Valley, seasonally adjusted, 2007M12 - 2018M3



cities when it comes to job growth, and we will talk about this further below. Finally, note that although jobs have been recovered since late in 2015, the population of the Coachella Valley has grown in the meantime. If we took that into account, then we would still have a gap with respect to previous peak employment.

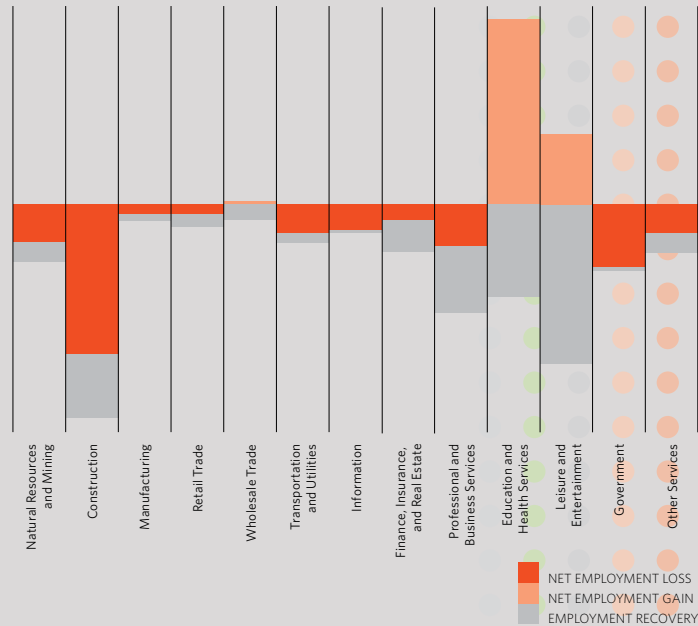
We also display a copy of **FIGURE 1** here (**FIGURE 18**), which makes it easier for the reader to put the growth rates shown in **FIGURE 17** in perspective.

STRUCTURAL CHANGE

Although jobs have been recovered, this does not imply that the same jobs were recovered. If a construction worker loses his job and immediately finds employment as a valet parking attendant, then employment totals do not change, but surely income from employment will go down. Which sectors were the winners and which were the losers? **FIGURE 19** answers that question.

The biggest loser has been, and continues to be, the Construction sector. At some point roughly 11,000 jobs were lost in the Coachella Valley, and to this day, only about 3,000 have been recovered. The situation is similar in the rest of the Inland Empire, although Construction there has made more progress towards pre-recession levels. Manufacturing, which was the other “big loser” at the national level and in

Figure 19 | Change in Employment by Industry, Coachella Valley, Peak to Trough, 2016 EDD



the state, is relatively unimportant in the Coachella Valley, and therefore did not shed many positions.

The big winners, better, the “only” winners were Education and Health Services, and Leisure and Entertainment. Both sectors also lost substantial number of workers early on in the recession, but have more than recovered by now. The increases in Education and Health Services are primarily due to Obamacare. 10,000 new positions were created by this sector. Particularly disappointing has

been the performance of Professional and Business Services. Positions in this relatively well paying sector have not recovered to the extent as they did in the state and the nation. However, the relatively poor performance mirrors that of the rest of the Inland Empire.

Converting the job gains/losses into percentages can give you a more objective picture of the development. **FIGURE 20** shows that roughly 70% of construction jobs were lost when the recession bottomed out. The industry is still 50% below its pre-recession level. The top performance of the Education and Health Services sector stands out even more now.

There is good news and bad news. The job losses in construction came from a sector where the average pay is close to \$45,000 - a relatively well paying sector. However, the sector that expanded most, Education and Health Services shows a high average of over \$50,000 for the Coachella Valley - although we are slightly worried that the mean is driven up here by some highly paid doctors and surgeons. Income in the Leisure and Hospitality sector, which is the other expanding sector, is relatively low, as we would expect.

Note that there is quite some income variation across the sectors. The three low pay sectors are Retail Trade, Leisure and Hospitality, and Other Services, with pay of roughly \$32,000. Compare that to the high paying sectors of Information and Government, where the average pay is close to \$60,000. Also, when

comparing 2017 data to 2016, ten of the twelve sectors saw average pay increases (the exception was Information, and Education and Health Services, and those losses were relatively small.

The next two figures look at employment changes across the nine cities of the Coachella Valley. These are clearly driven by the sectoral composition in city employment and the job gains/losses in those sectors over the one year period.

FIGURE 22 presents a mixed picture. We calculated peak employment before the Great Recession, compared those numbers with the subsequent fall, and then show where we are for the latest data available. Note that the peak may have happened to different cities at different times. At any rate, five of the nine cities (Rancho Mirage, Palm Springs, the City of Coachella, Desert Hot Springs, and Indio) have now seen new peaks. Compared to last year, Indio has been added to this list. The other four (La Quinta, Palm Desert, Indian Wells, and Cathedral City) have not climbed back fully. The Palm Springs performance seems the most outstanding one since the city lost more than 8,000 jobs, recovered them, and

has added more than 2,000 compared to its previous peak. Palm Desert, which showed the second highest decline in terms of job numbers, has not fully recovered and therefore, together with La Quinta, still shows the highest net job loss. Indio, on the other hand, which saw the third highest job losses, has now recovered and sees a net gain.

FIGURE 23 takes into account differences in the size of the respective labor force by calculating the same changes as percentage of overall employment in the cities. The losses for Indian Wells stand out more now since it has a relatively small labor force. Rancho Mirage's performance now appears to be more remarkable: almost one in four workers had been laid off peak to trough, but there is a net gain of over 35% now.

INCOME

Having looked at the average pay per sector, it will also be useful to plot the income and its distribution for the Coachella Valley as a whole. For comparison purposes, we also add

Figure 20 | Percentage Change in Employment by Industry, Coachella Valley, Peak to Trough EDD

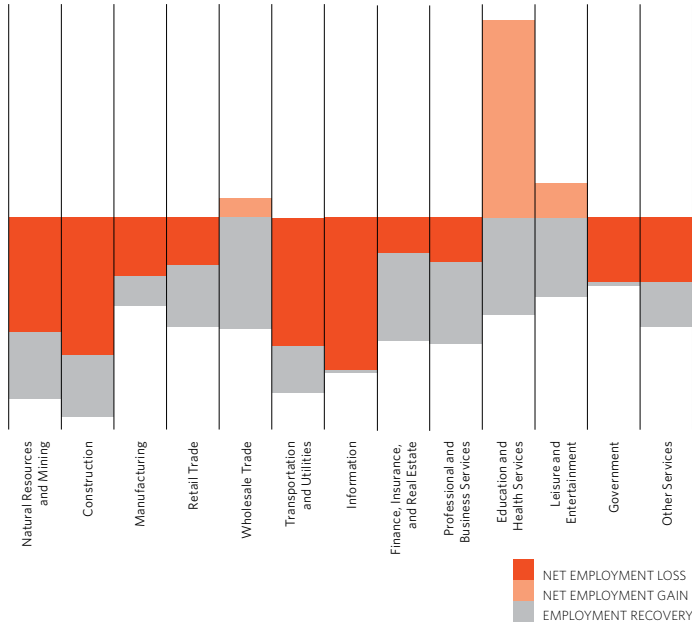


Figure 21 | Income per Worker by Industry: Coachella Valley, 2017

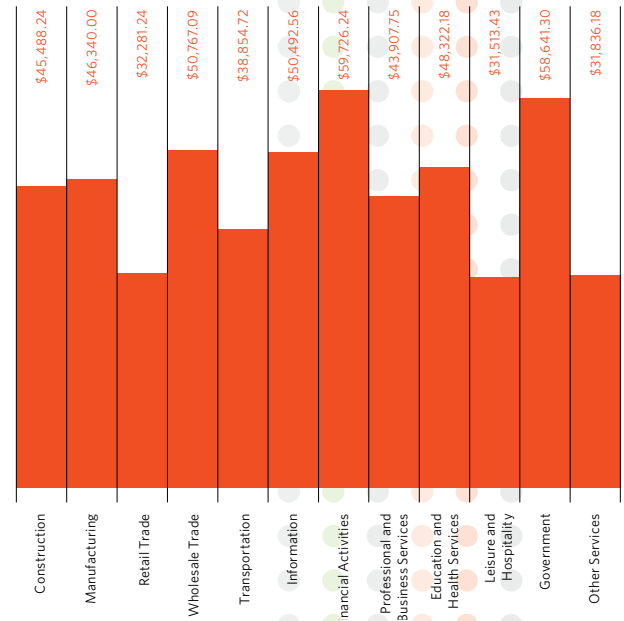


Figure 22 | Change in Employment by City, Coachella Valley, Peak to Trough, 2016

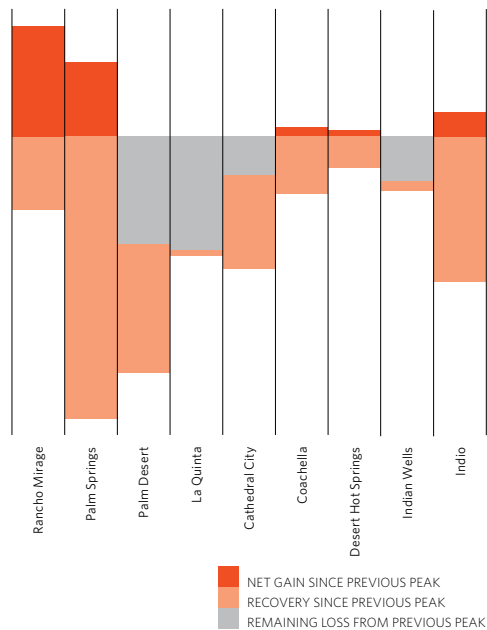


Figure 23 | Percentage Change in Employment by City, Coachella Valley, Peak to Trough, 2016

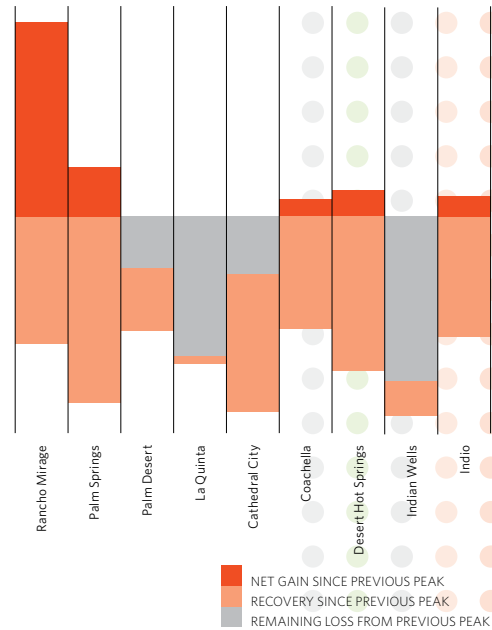


Figure 24 | Income Distribution: 2016, Coachella Valley and Rest of Riverside County

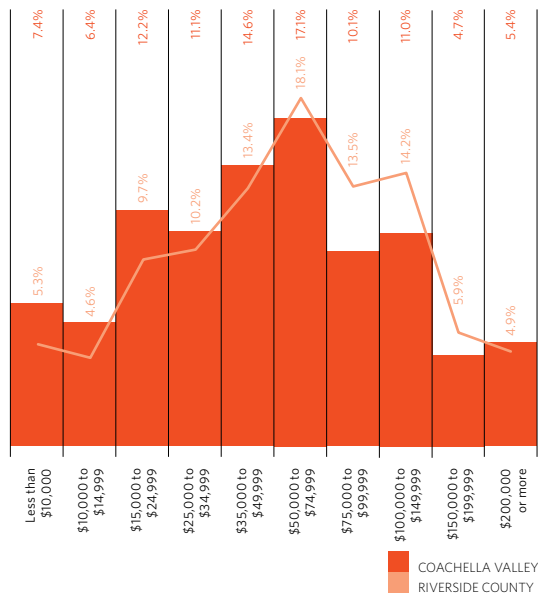
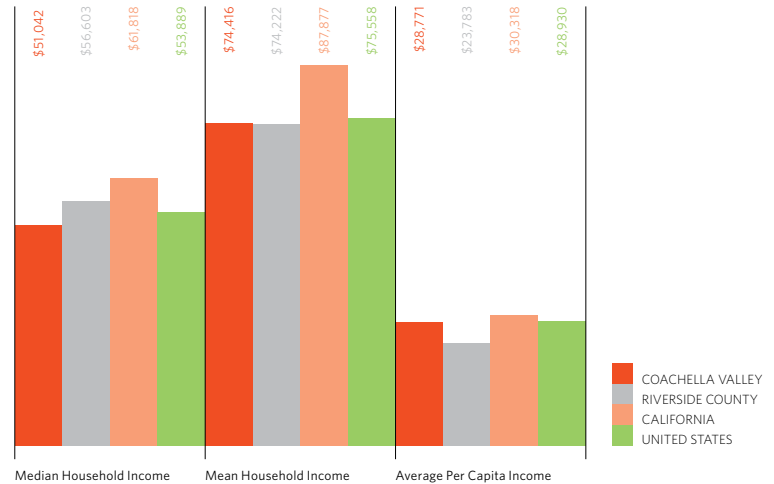


Figure 25 | Median, Average Household Income, CV, Riverside County, CA, US, 2016 (Estimate)



figures for the Rest of Riverside County (see **FIGURE 24**). The graph indicates that the income distribution varies considerably between Coachella Valley and the Rest of Riverside County.

In the Coachella Valley, 54% of households earn less than the median U.S. household income (\$50,000); compare this with the Rest of Riverside County, and we only find 43% of households having an income of less than \$50,000. Five cities within the Coachella Valley stand out regarding this number: Desert Hot Springs (72%), Coachella (63%), Cathedral City (61%), Palm Springs (58%), and Indio (51%). At the other extreme, a higher percentage of Coachella Valley households earn \$200,000 or more when compared to the Rest of Riverside

County. There is no city in Riverside County outside of the Coachella Valley that has 10% or more of its households in the \$200,000+ range, whereas 10% of households in La Quinta, 15% of households in Rancho Mirage, and 22% of households in Indian Wells earn more than \$200,000 annually.

FIGURE 25 depicts the average, median, and average per capita household income for the Coachella Valley, Riverside County, California and the United States. The median household income in the Coachella Valley is less than that in Riverside County; however, the average household income in the Coachella Valley is higher. Coachella Valley's larger mean household income can be attributed to the region's higher

percentage of households in the upper-most income bracket. In other words, the income distribution is more positively skewed (has a longer tail to the right). The average per capita income in the Coachella Valley is higher than in Riverside County. This may also be explained by the Coachella Valley's smaller average household size (2.7) as opposed to (3.4) for Riverside County.

UNEMPLOYMENT, HUMAN CAPITAL, ACADEMIC PERFORMANCE

The changing working environment affected many of those who work or reside in the Coachella Valley. After spending some time looking at people who have a job in the Coachella Valley, we will now focus on the unemployed.

TABLE 6 lists the unemployment rates of cities in the Inland Empire with 25,000 or more residents. This includes seven cities in the Coachella Valley (it excludes Rancho Mirage and Indian Wells). We sorted the table from highest unemployment rates to lowest. Why we include the other cities of the Inland Empire is twofold: (i) it allows you to compare the performance of the Coachella Valley with that of other nearby cities, and (ii) to give us more variation when we attempt to find explanations for the differences in unemployment rates by city.

The City of Coachella has the highest unemployment rate among the cities, even higher than Adelanto. Note that we are far into the recovery, and while the two cities no longer see unemployment rates in the 20s, resembling Great Depression levels in the U.S. in the 1930s, an unemployment rate of 10% is still remarkably high when the national rate is below 4%, and even in the Inland Empire as a whole, we are approaching 4%. At the other extreme, La Quinta, Palm Desert, and Palm Springs have low

unemployment rates in the 4.8%-5.8% percentage range. Even those are higher than the national average.

Note that these unemployment rates are based on a household survey and hence are by residence rather than location of work. Therefore, it is not where the job is located that matters, but instead where the employees live. For example, if a Cathedral City resident loses her job in Palm Springs, then Cathedral City's unemployment rate goes up while the unemployment rate in Palm Springs is unaffected.

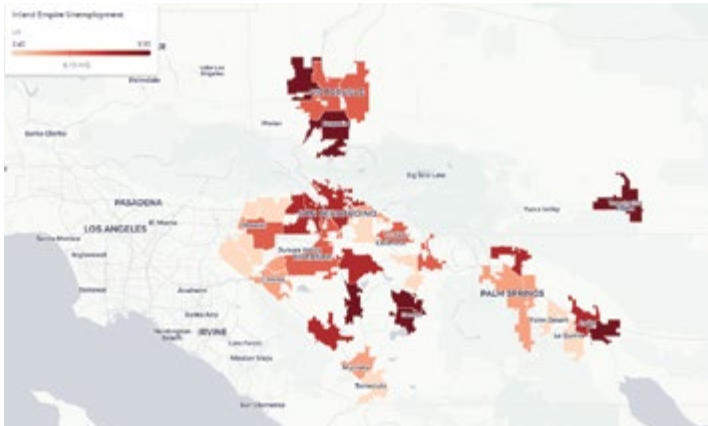
Strangely, a few of these cities are seeing their unemployment rates rise instead of fall. For example, Coachella's unemployment rate is up 0.3% (percentage point) while Desert Hot Springs is down 0.9% (percentage points).

FIGURE 26 displays the unemployment rates of the Inland Empire on a map. What can explain the differences in these unemployment rates? And do they contain information about the possibility of an upcoming recession? As we have seen, unemployment is not a good

TABLE 6 | UNEMPLOYMENT RATES: INLAND EMPIRE, 25,000 RESIDENTS OR MORE, 2017
SOURCE: EMPLOYMENT DEVELOPMENT DEPARTMENT, AMERICAN COMMUNITY SURVEY

CITY NAME	UR-JULY 2018
ADELANTO	8.0
APPLE VALLEY	5.2
BANNING	5.0
BEAUMONT	3.6
CATHEDRAL CITY	5.3
CHINO	3.5
CHINO HILLS	3.0
COACHELLA	10.2
COLTON	4.4
CORONA	3.6
DESERT HOT SPRINGS	6.6
FONTANA	4.2
HEMET	6.2
HESPERIA	5.8
HIGHLAND	4.6
INDIO	6.3
LA QUINTA	5.7
LAKE ELSINORE	4.4
MONTCLAIR	4.0
MORENO VALLEY	4.8
MURRIETA	3.8
NORCO	4.0
ONTARIO	3.9
PALM DESERT	5.8
PALM SPRINGS	4.6
PERRIS	5.3
RANCHO CUCAMONGA	3.3
REDLANDS	3.6
RIALTO	4.9
RIVERSIDE	4.2
SAN BERNARDINO	5.7
SAN JACINTO	5.7
TEMECULA	3.8
TWENTYNINE PALMS	6.0
UPLAND	3.7
VICTORVILLE	6.2
YUCAIPA	3.6

Figure 26 | Unemployment Rates of the Inland Empire



indicator of an impending recession. However, unemployment is costly in terms of idle human capital and also in terms of other social ills it brings with it from increases in domestic violence to crime and suicide rates. These effects worsen at times of recessions when employment losses are large. What can stakeholders do to reduce unemployment rates and prevent these from ending up in the high teens in the next recession as they did following the Great Recession?

To explain differences in unemployment rates by city, we have to take the geographic location into account, at least for those cities that have a large number of commuters. How much of a factor does location play in determining unemployment differences between the Inland Empire cities? **FIGURE 27** shows a fitted “trend line” indicating that unemployment rates tend to increase the further the city is located away from the Greater Los Angeles and San Diego county line (typically on the I-210, I-10, CA 60, CA 91, and I-15). This continues to hold true as long as commuting is a valid option for the residents (for cities within 50 miles). Once we reach 50 miles, commuting becomes less likely and geography fails to explain unemployment rate differences.

Even so, there are many cities in the Inland Empire that are within 50 miles of these boundaries. For example, Redlands

has a much lower unemployment rate than what you would expect given its distance from Los Angeles County on the I-10 than Lake Elsinore, for example.

To explain the rest of the variation, we turn to the Human Capital Index (HCI, see **FIGURE 27**). Here we follow the methodology of UCLA’s Anderson School and construct an index basically reflecting the number of years of schooling for its residents. **FIGURE 28** presents the plot for the cities of the Inland Empire. Note that the cities of the Coachella Valley are not affected by the “geography” explanation because they are too far from the county line boundaries, making daily commuting impractical for almost all residents. The explanation for the high unemployment rate of Coachella (and Adelanto and Perris) is that people living here basically have a very low stock of human capital (accumulated education). On the other extreme, the average resident of Palm Desert and Palm Springs (and Redlands) has a very high level of education.

If the HCI is a driver to lower unemployment rates and to ensure that future unemployment rates do not end up as high as they were during the last recession, then stakeholders in the Coachella Valley and the nine cities should find ways to increase this index over time. This could be done by attracting new residents with a higher level of education. A more practical way

would be to have high school students obtain higher academic performance through standardized testing and then subsequently convince them to remain in the area by attending academic institutions beyond the high school level. They could attend the College of the Desert and Cal State San Bernardino, Palm Desert (CSUSB-PD), rather than leaving for colleges outside of the Coachella Valley. Ultimately, the aim must be to have them find attractive jobs after graduation, preferably in the Coachella Valley.

What are the current indicators of Coachella Valley students to raise the HCI in the future? **FIGURE 29** displays the percentage of students who reach the College and Career Readiness benchmark (established by the College Board based on the new 2016 SAT test format) both in Reading, Writing, and Math on the SAT for Coachella Valley students and some of their peers in Riverside County. The benchmark aims to help identify students who are thriving and require greater challenges, as well as to identify the students who require additional academic support. The values are as follows: 480 for Reading and Writing, and 530 for Math. The average total score for the U.S. in 2017 was 1,060, with an average of 533 in Reading and Writing and 527 in Math. The national average of students who took the SAT and met the benchmark is 46%. While this is an average, and many students score above the benchmark,

Figure 27 | City Unemployment Rates in the Inland Empire and Distance to Greater Los Angeles/San Diego County Line July 2017

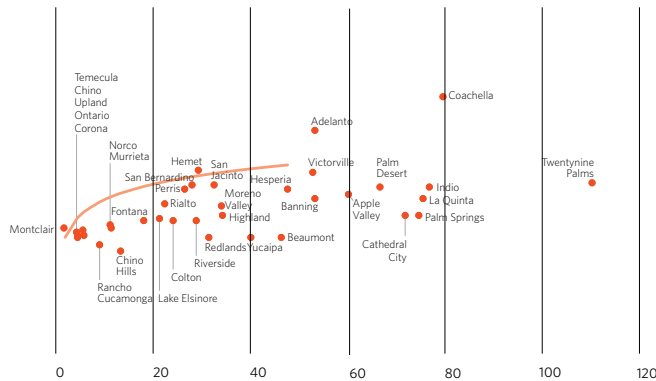


Figure 28 | City Unemployment and Human Capital Index: Inland Empire, 2017

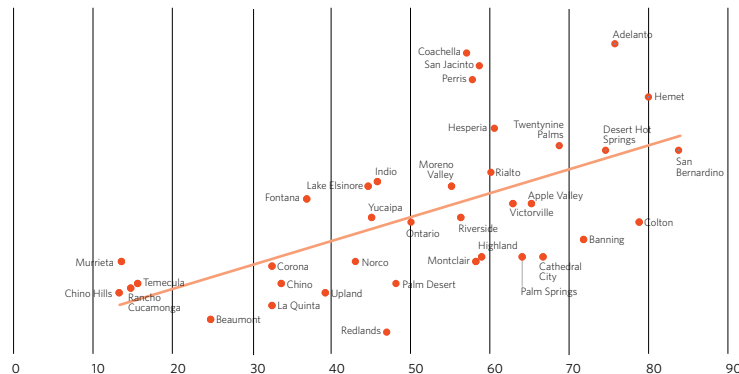
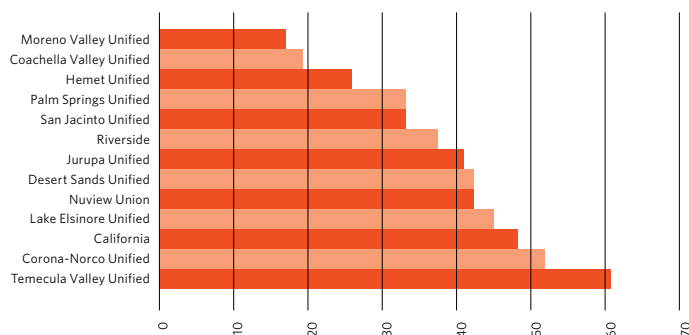


Figure 29 | Percentage of students reach the benchmark both in ELA and Math in SAT, 2017



there are also many students who score below it. To make matters worse, you will not take the SAT test if you do not plan to attend college.

The graph indicates that Coachella Valley students perform significantly worse than many of their peers within Riverside County. All three districts (Desert Sands, Palm Springs, and Coachella) show that less than 50% of the students who took the SAT hit the benchmark, with Coachella having the lowest percentage of the three at 19.5%. The Riverside County percentage is 37.5%. Desert Sands actually outperforms Riverside County. These numbers, while somewhat discouraging, also show the potential gains that can be made. The last CSU expansion campus was CSU Channel Islands (CSUCI) in 2003. If the Palm Desert campus of CSUSB wants to be the next CSU, then a large fraction of students will have to come from the Coachella Valley to show viability for state legislators. There are many hurdles to overcome to get a new CSU campus located in the Coachella Valley. One of them is to improve performance scores of its high school students.

Another measure we have of academic performance is ACT scores. Scores are measured out of 36, with 36 being the highest possible. Students receive a scaled score for each of the four multiple-choice test sections (English,

Math, Reading, and Science). The national average score is 21. **FIGURE 30** shows the average scores of Coachella Valley students and some of their peers in Riverside County. Coachella ranks last on this list, with a 17.75 as their average score. Palm Springs also ranks below the national average at 19.25. However, Desert Sands shows a score of 22.25, or the same as the average for California.

Unemployment rates are headline news, but only partially explain how well, or poorly, a geographic area is doing. We want to continue exploring a new measure we added last year: the Distressed Community Index (DCI) for the 37 larger cities of the Inland Empire. It is calculated by taking categories other than the labor market into account. In addition to looking at the percent of residents not working and changes in employment, it also adds housing vacancies, levels of education, the median income ratio (city median to county median), and the number of new establishments. If a given city has a higher DCI, then, on average, it is more distressed, according to this index. **Table 7** shows the results.

Not surprisingly, especially given its recent history, San Bernardino is ranked second to last (top) here. Chino Hills is still the winner, same as last year. According to this index, Desert Hot Springs performs poorest among the

seven cities of the Coachella Valley. The City of Coachella is much closer now to the middle in the DCI rankings. This is primarily the result of its higher growth in employment and number of new establishments.

La Quinta, which has one of the lowest unemployment rates, is ranked surprisingly low, but it is the result of its vacancy rate. This means a high percentage of La Quinta’s houses are vacant for a longer part of the year, which increases seasonal fluctuations in the local economy. Of course to those of us that look beyond simple statistics, this would not be a negative

indicator but instead be a function of the profiles of residents. The same holds for Palm Springs. There is less seasonal fluctuation in Cathedral City, but this is offset by higher poverty rates and a low income ratio of median household income to the county median.

SEASONALITY

There cannot be an economic report about the Coachella Valley without mentioning seasonality. There are seasons everywhere in the country, but there very few places in the U.S. where seasonality affects the economy in such a drastic way as it does here. Take Phoenix at the one extreme and Salt Lake

Figure 30 | ACT Averages, Coachella Valley School Districts and Selected Districts in Riverside County, 2017

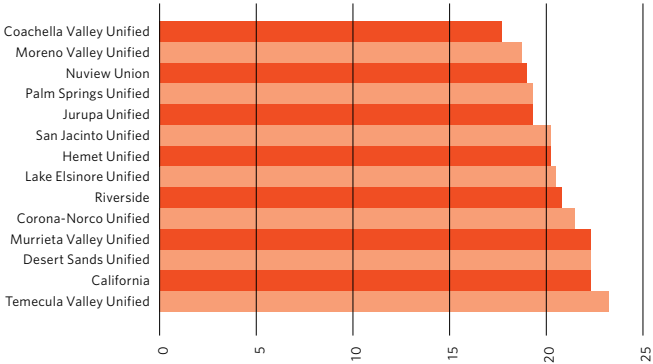


TABLE 7 | DISTRESSED COMMUNITY INDEXSOURCE: : AMERICAN COMMUNITY SURVEY,
EMPLOYMENT DEVELOPMENT DEPARTMENT

CITY	DCI 2016	DCI 2017
ADELANTO	75.7	83
APPLE VALLEY	65.3	78.4
BANNING	71.8	80.1
BEAUMONT	25.1	34.4
CATHEDRAL CITY	66.8	48
CHINO	34.0	40.3
CHINO HILLS	13.5	3
COACHELLA	57.1	73.3
COLTON	78.8	85.6
CORONA	32.8	30.6
DESERT HOT SPRINGS	74.5	76.4
FONTANA	37.1	71.3
HEMET	79.9	98.5
HESPERIA	60.6	75.3
HIGHLAND	59.1	61
INDIO	45.9	64.5
LA QUINTA	32.8	33.6
LAKE ELSINORE	44.8	77.9
MONTCLAIR	58.3	67.3
MORENO VALLEY	55.2	75.8
MURRIETA	13.9	11.7
NORCO	43.2	28.2
ONTARIO	50.2	58.9
PALM DESERT	48.3	48.1
PALM SPRINGS	64.1	52.5
PERRIS	57.9	75.1
RANCHO CUCAMONGA	15.1	34.3
REDLANDS	47.1	37.3
RIALTO	60.2	66.4
RIVERSIDE	56.4	50.2
SAN BERNARDINO	83.8	95.7
SAN JACINTO	58.7	87.6
TEMECULA	15.8	5.7
TWENTYNINE PALMS	68.7	89
UPLAND	39.4	57.5
VICTORVILLE	62.9	87.2
YUCAIPA	45.2	49.9

Figure 32 | Seasonality: Employment, Seasonally and Nonseasonally Adjusted, Coachella Valley

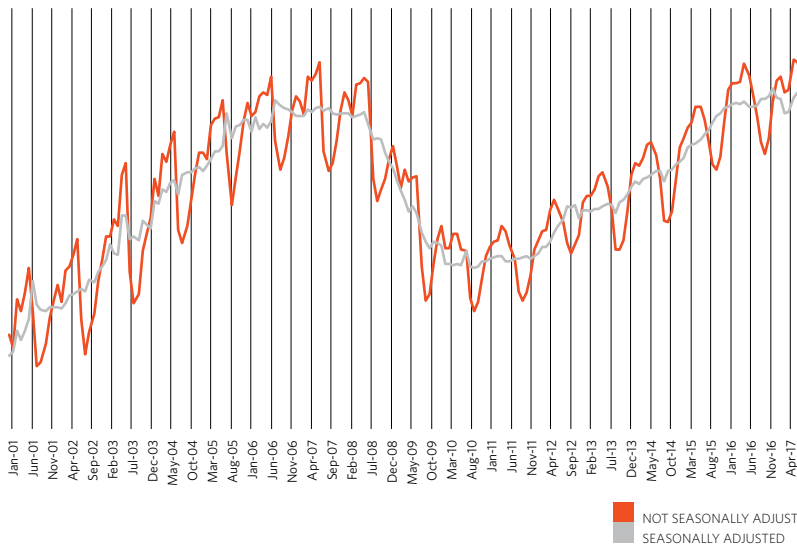
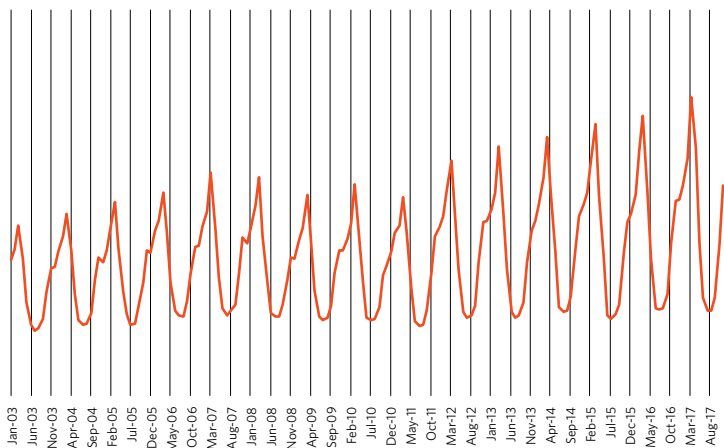


Figure 33 | Seasonality: Palm Springs Air Traffic



City at the other end of the temperature scale. As mentioned in previous reports, we do not find comparisons to those two cities useful, even if you looked at their industrial composition and employment 30 years ago. The big difference in both cases is that they are state capitals and have a large university. Both the Government and the Education sector do not display the kind of seasonal employment patterns we observe in the Coachella Valley. Also, note that seasonal patterns can change over time when sectors that were previously more important, such as agriculture, lose

employment shares, and other sectors, which have a different seasonal peak, become more important. This happened in the Coachella Valley if you compare pre-Great Recession data with today.

FIGURE 32 shows the large employment swings within a year - regardless if you are in a recession or in a boom. The seasonally adjusted series takes out regularly occurring seasonal patterns. I have seen few economic time series that display seasonality more dramatically than what you see in the figure. Of course this type of fluctuation is hard to manage for businesses, workers, and

policy makers. While you can plan for regular declines in businesses - think of dry cleaners or restaurants in a college town such as Claremont - you still have to shift around workers or lay them off temporarily. Since you cannot change the climate - well, at least in the short run - then the only way to reduce seasonal fluctuation is to change the industrial composition in favor of sectors that are less affected by seasonal demand fluctuations.

To give you an idea regarding the magnitudes, using the raw data, there were almost 126,000 people, on average, who were employed in the nine cities between November 2016 and April 2017. This number fell to 121,000, on average between May 2017 and October 2017. The average is 3.2% lower. More dramatically, if you look at employment numbers between April 2017 and October 2017, then the employment loss is close to 1,700 positions, a decline of 7.2% for the summer. 2017 was not in any way special. The average lost from April to August for the post Great Recession period is 7.3%. To put these numbers into perspective, if people did not stop looking for jobs during this period and simply declared themselves unemployed, then the unemployment rate would increase from 4% (say) to over 11%. Imagine we observed this for the country as a whole in such a short time span. Furthermore, this is an average, with city-by-city variation. Similar seasonal patterns can be seen when displaying passenger traffic (arrivals) in Palm Springs airport (PSP) (see **FIGURE 33**). Note also the trend increase of arrivals in March since 2012. Clearly the warm weather is quite attractive to those of our countrymen from colder regions in the U.S. and not to forget snowbirds from further north (Canada). I seem to recall a cruel Los Angeles weather forecaster mentioning



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that we invite people to visit us during snowstorms in the midwest and along the East Coast, only to end the forecast with “Oh, I forget you can’t. Your airports are closed.”

We want to mention in passing the strong employment effects of events such as the Coachella Valley Music and Arts Festival, Stagecoach, and the various sports events.

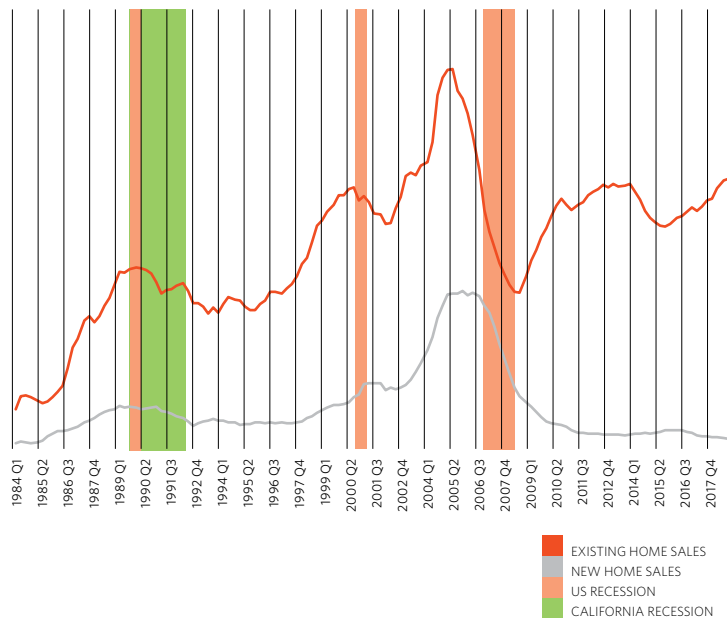
HOUSING

In this section we will focus on housing trends in the Coachella Valley. Many of the recent developments are quite encouraging. However, staying with the “fear of recession in 2020/2021” theme of this report, we will focus on the cyclical relation of local housing with U.S. recessions during the last 34 years. Finally, we will point to the emergence of a housing affordability crisis in the Valley as a potentially critical factor in how the local area might respond to a new recession.

As the Cycle Turns: Recession Lessons

Let’s get right into the cyclical behavior of Coachella Valley housing and how it has behaved historically during national recessions. The chart in **FIGURE 34** shows home sales trends since 1984. The shaded areas represent the U.S. recessions over that time period.

Figure 34 | Existing Versus New Home Sales, Coachella Valley Annual Running



The first U.S. recession we are looking at took place in late 1990/early 1991. It was largely the result of restrictive monetary policy (raising rates to fight inflation, which had reached 5%), a weakening housing sector, and the first Gulf War, which lowered consumer confidence. However, this recession was mild and lasted only 8 months. In contrast to the U.S. as a whole, California suffered a major recession caused by large aerospace and defense cutbacks. This recession started at the same time as the U.S. recession in 1990:Q4 and lasted 35 months until mid-1993. It resulted in over 500,000 job losses, most of which occurred in Southern California.

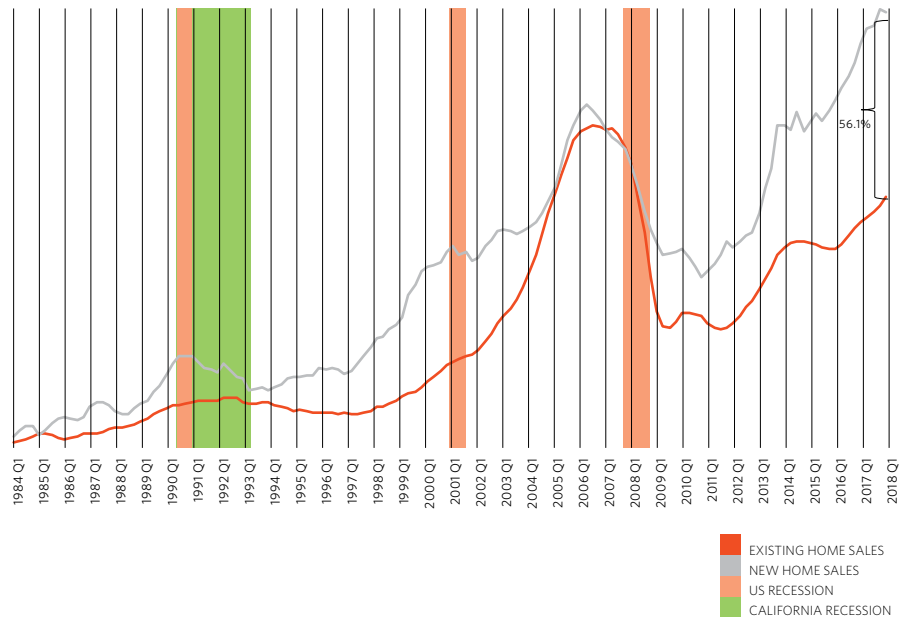
Coachella Valley’s new home sales almost immediately dropped with the onset of this regional recession in 1990:Q3. Three years later, in 1992 Q2, new home sales had declined by roughly 50% from peak. There was a turnaround approximately a year before the California recession ended. Existing home sales behaved differently from new home sales. Existing home sales started to decline one year before the national and California recession, and the end of the decline coincided with the end of the aerospace recession. At that point existing home sales were over 25% below their peak in 1989:Q3.

Home prices were also affected by the aerospace recession. New home prices peaked in 1990:Q4 and reached a trough in 1993:Q3 after a 21% drop. Meanwhile, the existing median home price continued to rise until close to the end of the aerospace recession before starting a 5-year descent with a loss of 13% when it was over.

What have we learned so far? We definitely see that a severe regional recession concentrated in Southern California had significant spillover effects in the Coachella Valley. At the time, some observers thought that the Coachella Valley would be immune to a general economic weakness since it is “its own place” and quite removed from the urban bustle. Also, discretionary buyers were viewed as the antidote to housing recessions. That turned out not to be true.

The second national economic downturn which occurred in 2001 was triggered by the bursting of the dot-com bubble in early 2000 and restrictive monetary policy to keep the stock market from overheating. It lasted only eight months from 2001:Q1 to 2001:Q4. The Coachella Valley sales chart in **FIGURE 34** shows that the bursting of the dot-com bubble started in March 2000 and lowered existing home sales during the following quarter. From then on existing home sales continued to

Figure 35 | Existing Versus New Home Sales, Coachella Valley Annual Running



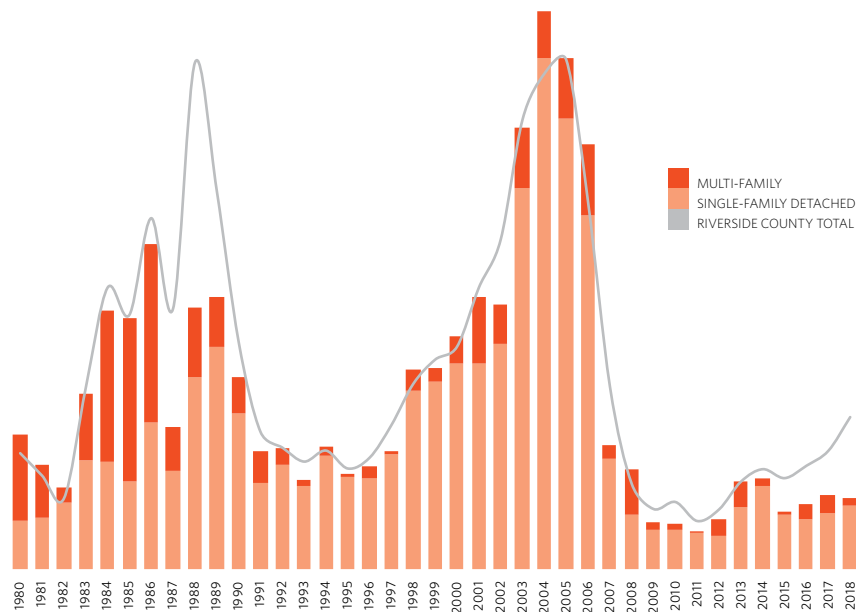
decline by 14% until the dot-com recession ended. The peak of new home sales essentially coincides with the onset of the recession but sales continued to tumble for another six months after the end of the national recession. In the end, new home sales had dropped 10% by 2002:Q2 from their 2001:Q3 peak. By contrast, existing median home prices remained unaffected and continued to rise throughout the dot-com recession. The new median home price was barely affected and declined just 5.2% between 2001:Q2 and 2002:Q1 which looks like an aberration.

What did we learn from this recession? Again, the Coachella Valley is not an island that is unaffected by storms even when they are creating the most damage

in faraway places. What happens in the Silicon Valley up north, for example, will affect the Coachella Valley. The good news is that a mild and short recession may trigger only moderately negative volume events and barely noticeable price declines in the Coachella Valley.

The third recession was the Great Recession, which occurred from 2007 Q4 to 2009 Q2. It was triggered by the burst of the housing market bubble which resulted ultimately in the virtual collapse of the mortgage-backed securities and derivatives market. The downturn lasted 18 months and was the worst recession since the Great Depression. **FIGURE 34** shows that existing home sales peaked in 2005:Q1,

Figure 36 | Housing Permits, Coachella Valley and Riverside County, 1980-2018



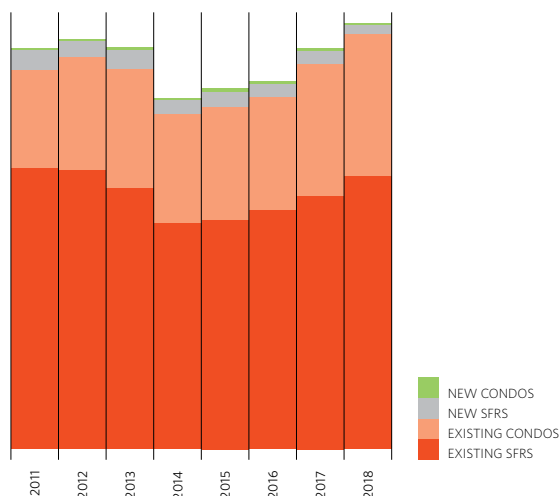
more than two years before the official peak of the U.S. business cycle. This all started with initially investors dropping out of the market, and ended with a massive wave of foreclosures. When existing home sales hit bottom during the midpoint of the recession, existing home sales had dropped 59%. New home sales started to decline in 2005:Q4 and bottomed out in 2013:Q2, after a massive plunge of over 91%.

Meanwhile, as can be seen in **FIGURE 35**, existing home prices peaked in 2006:Q4, a year before the official start of the recession. By 2011:Q4 they had shown a

loss of 51%. New home prices peaked in 2006:Q3 and found their floor in 2011:Q1 with a decline of 41%. These are quite remarkable losses. Note that new home sales never quite recovered, even when existing home sales reached pre-bubble sales levels, and new and existing median home prices showed large gains during the current up-cycle. The gap between new and existing home prices reached 56% by 2018:Q2, which contributed to the continued dismal state of the new home market. By 2018:Q2, new home sales were still below the cycle bottom of the aerospace recession in the 1990s – this is one of the great puzzles of the current “Not So Great Recovery.”

FIGURE 36 shows that the Coachella Valley permits follow the same pattern as new home sales – sharp declines during the aerospace recession, very limited impact during the dot-com recession, and a massive plunge starting before and ending after the Great Recession. You can also see the agonizingly dreary new housing production activity during the current up cycle. It is almost as if builders and financiers have lost confidence in the Coachella Valley given the volatility of the past years, which may be still lingering in their heads.

Figure 37 | Annual Housing Sales, Coachella Valley, 2011 - 2018



What can we conclude from looking at three down cycles? First, the Coachella Valley is not immune to outside forces during economic downturns. Its housing market is affected by recessions, whether they have a more regional or national character. Should we worry about the next recession, which may or may arrive in 2020/2021? Even if there will be a recession, we think that it is unlikely to be as severe as the Great Recession was. It certainly would not be triggered by the housing sector. The downturn could be mild and short similar to the “Great Moderation” recession in 2001. If that is the case, then we would expect only moderate sales and price declines in the Coachella Valley. As far as new home sales are concerned,

there is not a lot of space left to decline much further since the lower bound is zero. However, there is the emerging affordability crisis which could affect the Coachella Valley more significantly, a topic we will be discuss in the last section of the housing report.

Recent Short Term Sales and Price Trends

Looking at recent developments, there is good news for the Coachella Valley housing market except for new home sales. Overall, annual existing home sales are estimated to reach close to 12,000 sales in 2018, the highest in eight years (see **FIGURE 37**). Coachella Valley sales are expected to be up 6.6% in 2018, despite declines in new home sales.

FIGURE 38 shows the expected performance of existing home sales in the Coachella Valley cities for the 2017-2018 period. Every city in the Coachella Valley will see positive growth in single-family detached home sales during 2018 with communities that have more affordable housing, such as Desert Hot Springs, and upscale Rancho Mirage leading the way. The North Valley cities combined will likely be the sales leaders in 2018. This is a reversal from last year when Down Valley resort cities were doing this. Note also that Indio will be on the forefront of attached resale housing growth in 2018.

Figure 38 | Existing Home Sales % Change from a Year Ago, 2017 to 2018, Coachella Valley Cities

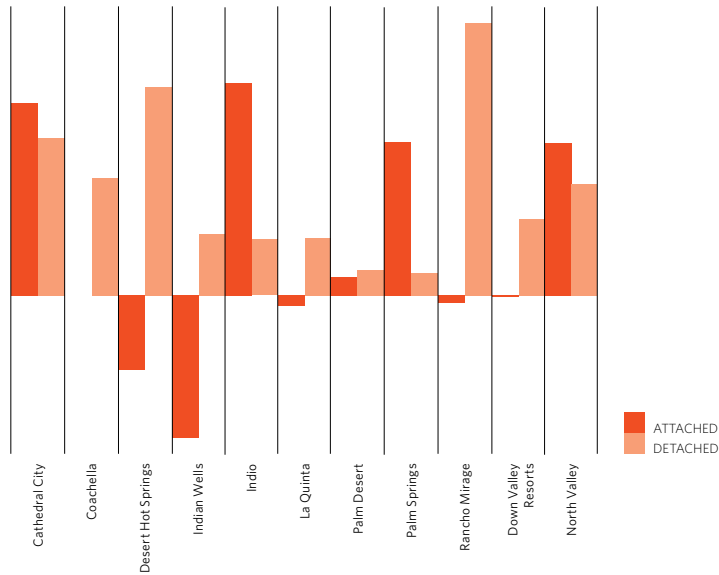


Figure 39 | Existing Median Home Prices: % Change, 2017 to 2018, Coachella Valley Cities

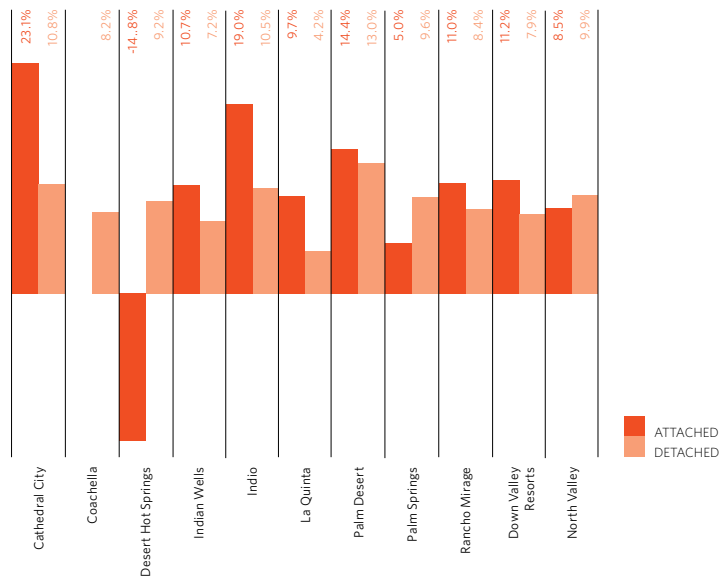


FIGURE 39 displays the percentage change of existing home prices for both attached and detached single-family units from 2017 to 2018. It looks like there will be very good news on the home price front in 2018. With the exception of a drop in attached home sales in Desert Hot Springs, every Coachella Valley city will experience solid annual price growth for existing attached and detached homes in 2018. Note also that the North Valley is likely to outperform Down Valley Resorts for existing detached homes, which will be led by a strong performance in Palm Springs.

Figure 40 | Coachella Valley Affordability Owners and Renters 2018

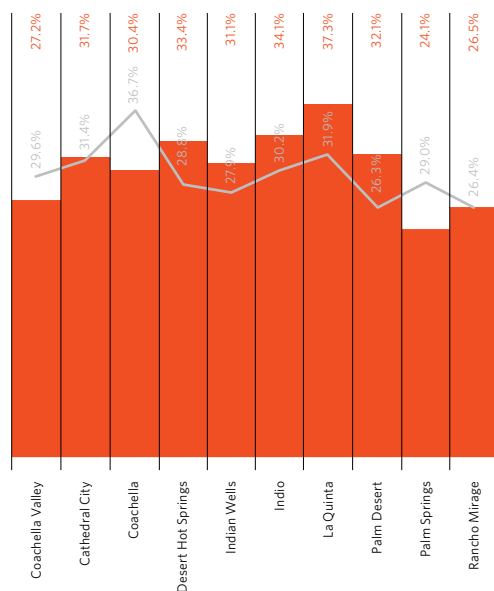
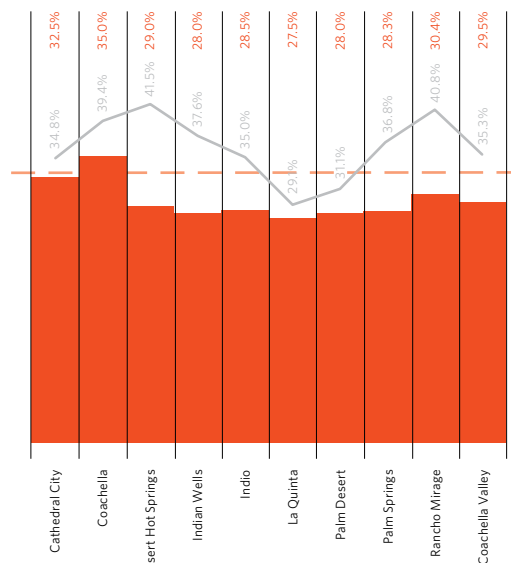


Figure 41 | Housing Costs as % of Income, Coachella Valley 2016, Mortgage Costs versus Rental Costs



Overall, the existing housing market is showing some strength, which is encouraging. However, new home sales continue to suffer, partially because new median home prices are so much higher than existing median home prices.

Housing Affordability: A Social Problem and a Cyclical Risk

The Coachella Valley housing market currently appears to be stable and the painful experience of previous downturns described earlier in this report seem to be a distant memory. But there is a hitch: The Southern California housing affordability crisis has arrived in the Coachella Valley, which could have social and cyclical implications. The data in **FIGURE 40** depicts the percentage of households that can afford to purchase the median price of existing homes and

the median rent of apartments given the local income distribution and standard underwriting assumptions.

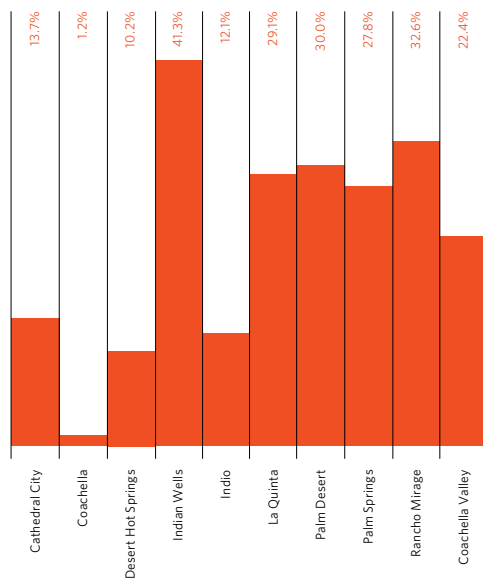
What stands out from this figure is the low housing affordability in 2018 – both for renters and ownership homes. For example, only 27% of households can afford to purchase properties at the expected 2018 median home price. Furthermore, the rent in the Coachella Valley is actually only slightly more affordable than homes, with rents reaching 30% of household income. The picture for housing affordability is similar in many cities, basically staying within a range of 24% and 37% for both ownership and rental homes.

Furthermore, the median cost burden for all ownership and rental households in **FIGURE 41** indicates that in 2016 rental and mortgage costs in the Coachella

Valley were already perilously close to, or even higher than, the critical benchmark of 33% of incomes. This is considered a reasonable cost burden for a household. The median mortgage cost as a percent of household income in the Coachella Valley was almost 30% in 2016, while median rental costs as a percent of income were 35% in 2016 (the latest date for which we have the data available).

All these affordability measures point to potential social problems for the Coachella Valley. It might become increasingly hard to live and work year round in the Coachella Valley. Why should we be concerned about this? For one, it is local residents who work and live in the area. For another, the 140,000 local Coachella Valley households represent a much bigger housing market (and constituency) than the often touted

Figure 42 | Vacation Homes, % Share, Cities of Coachella Valley, 2016



45,000 vacation home units. We do not mean to suggest that the second home market is unimportant. After all, it represented 22% of total housing units in 2016, but it must be said that local households are the ones who suffer most directly from the local affordability crisis. Many second home buyers are affluent and basically discretionary buyers. To put this in the context of the original question of whether we should be worried about the next recession, we should include declining affordability as an added risk factor. This could worsen the expected moderate impact of a possibly short and mild recession in 2020/2021 should it occur at all. This is why low affordability could be the wild card when we think about cyclical effects from housing market developments in the Coachella Valley.

In summary, while we are not forecasting a recession for 2020/2021, it may be time to worry about the impact of the next recession. Every national recession during the last 34 years was associated with a downturn in the housing market in the Coachella Valley. Furthermore, a national recession would coincide with an affordability crisis in the Coachella Valley, which could worsen its impact. This needs to be watched carefully and may urgently require creative housing policy discussions while the good times last. Such a talk may not be easy to pull off politically and there may be a lack of willingness by home builders to engage in local housing production — particularly of the affordable kind. In this context it is likely that a mild national

recession could affect Coachella Valley housing quite negatively, resulting in lower sales and lower prices. However this environment could be quickly overcome as people respond to better affordability and improving economic conditions. This ends the housing report. Final words: If you are still reading, you made it to the end of the Economic Report. CVEP has been a wonderful organization in producing this type of analysis for the Coachella Valley for many years now. We only became involved three years ago. Let us mention that we could not have done all this work without many talented research assistants and especially the student leadership team at the Lowe Institute at Claremont McKenna College. Let's hope that our baseline forecast of no imminent recession, or even economic slowdown, is correct. As my friend G.U. Krueger pointed out towards the end of his housing report, "it is not unreasonable to worry about another recession" despite our expressed doubts regarding the arguments of "The End is Near" proponents. And hopefully we will see you again with smiling faces in November 2019.

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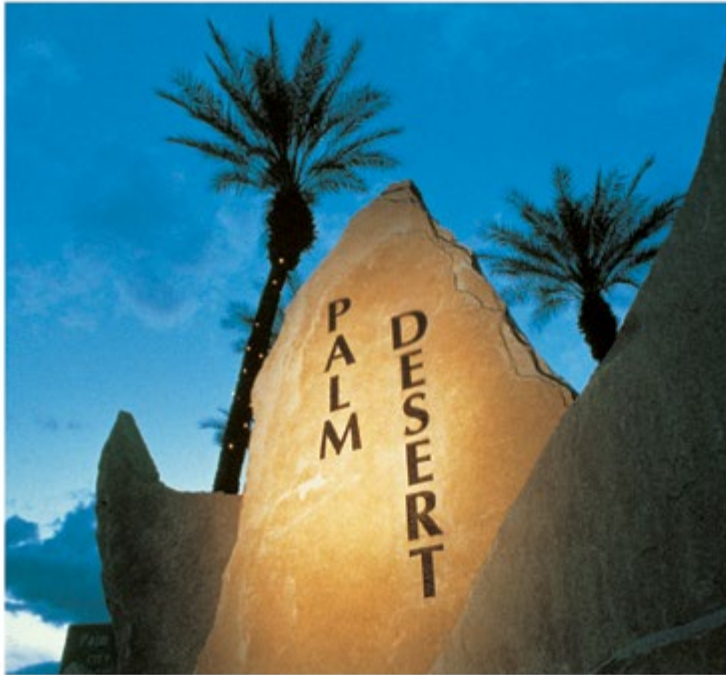
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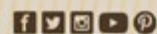
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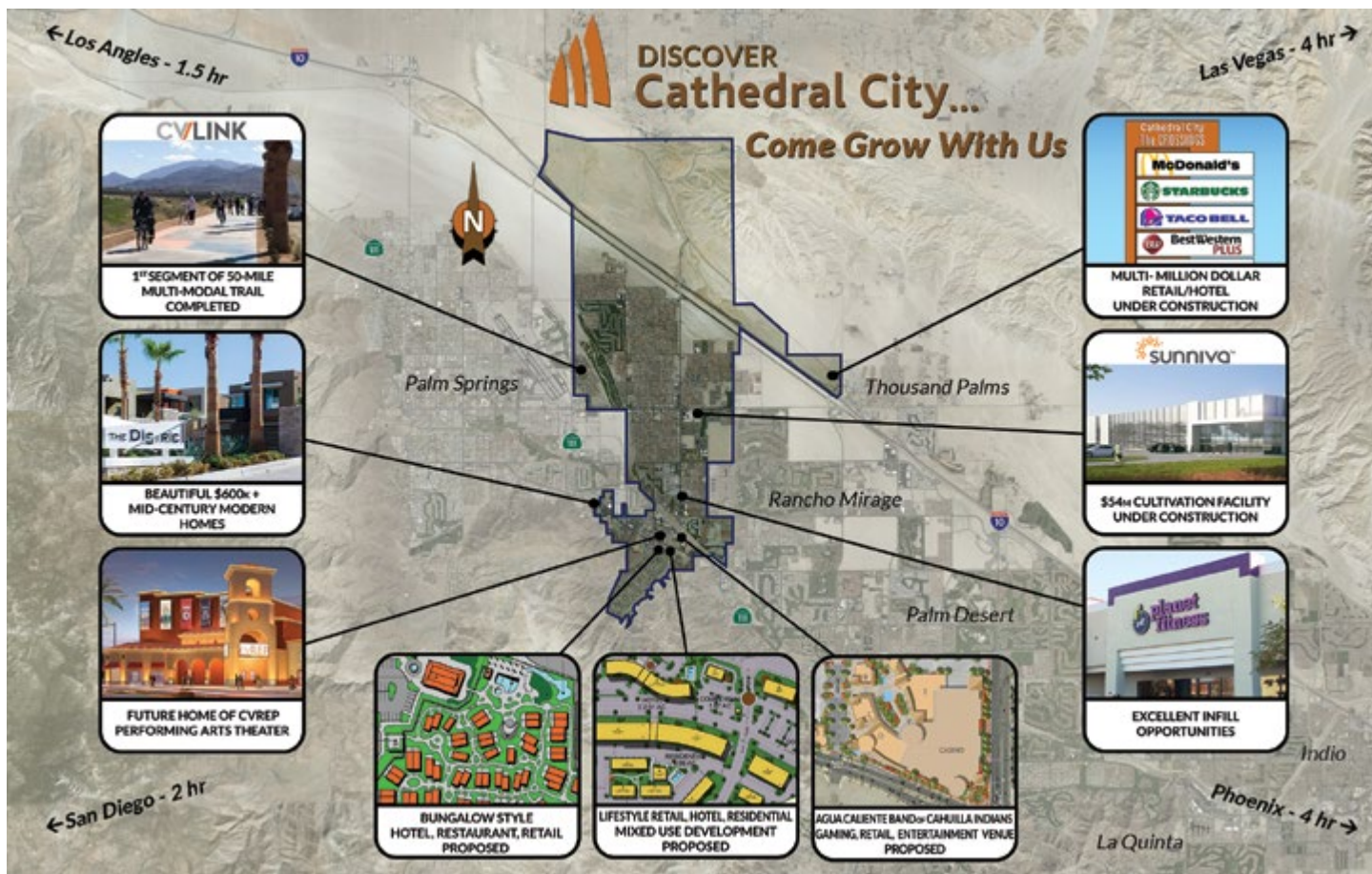
Wells Fargo is proud to sponsor Coachella Valley Economic Partnership and the 14th Annual Greater Palm Springs Economic Summit.

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Rancho Mirage Branch

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Our thanks to the Coachella Valley Economic Partnership for supporting economic growth and opportunity in the Coachella Valley.

UC Riverside is committed to strengthening the economic sustainability of the Coachella Valley, providing relevant regional research, delivering compassionate, state-of-the-art healthcare, offering innovative academic programs, and convening and creating partnerships that advance the public good and enrich the cultural life of the community.

We look forward to continuing to grow our programs and services in the region, and are proud to support the 2018 Coachella Valley Annual Economic Summit.

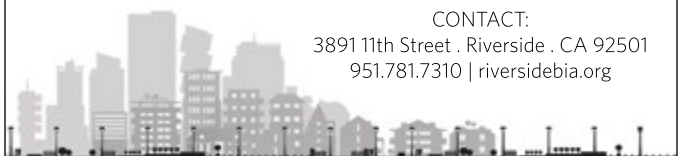


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