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CHAPTER 7 HIGHLIGHTS

A PLAN THAT CREATES ECONOMIC OPPORTUNITY: THE BIG PICTURE

Southern California is a huge geographic region. Often, employers in one area cannot easily access workers living in another. A more efficient transportation system, with increased public transit, will create a more efficient and competitive labor market and add economic activity and jobs into the economy.

The 2016 RTP/SCS outlines strategies for investing in transportation infrastructure that will benefit Southern California, the state and the nation in terms of economic development, job creation, economic growth and poverty reduction—as well as overall business and economic competitive advantages in the global economy. Over the 2016–2040 period, the 2016 RTP/SCS calls for spending more than $556.5 billion on transportation improvement projects. The economic analysis prepared for the 2016 RTP/SCS, shown in more detail in the Economic & Job Creation Analysis Appendix, shows that significant employment will be generated throughout our region over the 25-year period of the Plan. The 2016 RTP/SCS boosts employment in two ways—providing jobs for people in highway and rail construction, operation and maintenance; and boosting the economic competitiveness of the region by making it a more attractive place to do business.

Even though we have gained back many of the jobs lost in the Great Recession, the region is contending with a larger population base and stagnant wages, which has resulted in even more of Southern California's population slipping into poverty. More concerning is the fact that a staggering one in four children live below the poverty line in the region. The 2016 RTP/SCS is a major job creation engine, and the types of jobs created by the Plan, coupled with improved access to those jobs, have the potential to provide greater economic opportunity throughout the region. With jobs that can help sustain people in need, we can rebuild our infrastructure, rebuild our middle class and move citizens throughout Southern California from poverty to prosperity.

The economic analysis shows that construction, maintenance and operations expenditures specified in the 2016 RTP/SCS, as well as the indirect and induced jobs that flow from those expenditures, will generate an average of more than 188,000 new jobs annually on average.

When investments are made in the transportation system, the economic benefits go far beyond the jobs created building, operating and maintaining it. Unlike spending to satisfy current needs, infrastructure delivers benefits for decades. The infrastructure, once built, can enhance the economic competitiveness of a region. Projects that reduce congestion may help firms produce at lower cost, or allow those firms to reach larger markets or hire more capable employees. An economy with a well-functioning transportation system is a more attractive place for firms to do business, enhancing the economic competitiveness of our region. An additional 351,000 annual jobs will be created by the SCAG region's increased competitiveness and improved economic performance that will result from congestion reduction and improvements in regional amenities due to implementation of the 2016 RTP/SCS.

THE ECONOMIC BENEFITS OF INVESTING IN TRANSPORTATION

As we mentioned briefly above, the 2016 RTP/SCS will lead to more jobs in at least two ways:

1. Providing direct jobs in highway and rail construction, transportation, and transit operations and maintenance
2. Enhancing economic competitiveness in the region by making it a more attractive place to do business and to live

These two impacts are summarized below.

- **Providing direct jobs in highway and rail construction, transportation, and transit operations and maintenance:** The 2016 RTP/SCS will employ people to build, operate and maintain transportation projects as a result of the Plan's regional infrastructure investments. Economists refer to these jobs as the "direct effect" of the investments. Direct effects ripple through the economy, creating additional jobs in two ways:
  - **Indirect Effects:** Indirect effects are the jobs in companies that support the direct jobs created by the RTP/SCS spending. The firms and agencies that build and maintain the transportation system with RTP/SCS funding buy materials, office supplies and business services. All of those supply purchases that are necessitated by the RTP/SCS spending are indirect effects.
  - **Induced Effects:** Additionally, employees of the firms and agencies that build, operate and maintain the Southern California regional transportation system use their wages to buy all kinds of goods—housing, food, clothing, entertainment and more—and that supports additional jobs. This ripple effect creates what economists call "induced effects." Employees who build, operate and maintain the RTP/SCS will earn wages to buy goods and services associated with daily living.
- **Enhancing economic competitiveness in the region by making it a more attractive place to do business:** Academic scholars have long understood that public infrastructure investments create direct jobs and additional multiplier effects from those jobs. But recently, economic research has illuminated how transportation spending also improves the viability and productivity of firms in regions, by increasing economic competitiveness through the increased

efficiency of a transportation system. A well-planned, well-functioning transportation system and integrated land use pattern can allow firms to communicate and conduct business with one another more quickly, draw workers from larger labor market pools, and ship and receive goods and services at lower costs. All of this can contribute to enhanced regional economic competitiveness, raising the productivity of firms in the region and leading to more jobs than those generated to build, operate and maintain the RTP/SCS.

WHY TRANSPORTATION ACCESS IS IMPORTANT FOR THE REGIONAL ECONOMY

Two economic transformations have occurred over the past two to three decades that have made transportation access an increasingly important element of regional economies. First, metropolitan economies increasingly rely on the value of proximity—what urban economists call "agglomeration economies," or the propensity of successful local economies to cluster. Second, congestion has risen to levels that limit economic growth, research shows.

- **Agglomeration Economies and the Need for Access:** Firms benefit from being near other firms. Santa Monica's "Silicon Beach" is a location where technology firms have easy access to other nearby peer firms, creating an environment of shared ideas, talent and interaction. Yet, that access is not always as readily available as it might seem. A video gaming company in Santa Monica might benefit from access to talent at Caltech or movie studios in Burbank, but both are easily an hour away during much of the day because of traffic congestion. So, the benefit of agglomeration—nearby access to business partners, customers and ideas—is diminished by a congested transportation system.

  The benefits of local concentrations of firms are increasingly based on face-to-face communication. Research has shown that firms have higher productivity when locating near other firms, and those productivity benefits are often short-distance phenomena. Good transportation access "shrinks distance" by allowing businesses to more quickly access knowledge, suppliers and customers. Well-performing transportation systems, by contributing to dense, lively, walkable neighborhoods, can also create communities that are conducive to serendipitous meetings and face-to-face communication. This is particularly important in knowledge-intensive or creative industries.

- **Congestion and Employment:** Traffic congestion has been increasing in nearly all U.S. metropolitan areas. Research shows that traffic delays inhibit job growth. In the Los Angeles metropolitan area, actual employment growth from 1990 to 2003 was 567,983 new jobs, but researchers have estimated that with a 50 percent reduction in congestion in the region's metropolitan areas, employment growth from 1990 to 2003 would have been 700,235 new jobs. Research suggests that the employment enhancing effect of reducing congestion by implementing the 2016 RTP/SCS investments is larger in more congested urban areas. This is intuitive; the "distance shrinking" effect of managing congestion is more important in more congested urban areas. This is also a non-linear effect; congestion relief grows more important for the economy as congestion levels rise.

This sets the background and context for the economic impact study of the 2016 RTP/SCS. Metropolitan economies are increasingly relying on agglomeration benefits, as knowledge-based firms desire to locate near other similar firms. This phenomenon has long been familiar in Silicon Valley, and evidence suggests that the need to locate near similar firms is becoming pervasive in many segments of modern economies. At the same time, congestion has increased the "effective distance" within metropolitan areas and the evidence suggests that the negative economic effects of congestion are largest (and growing) in our most congested cities. Creating better access and mobility, a key goal of 2016 RTP/SCS, can be a clear pathway toward stimulating economic growth.

There are five possible paths through which transportation improvements can increase regional economic competitiveness. Each of these is described in the following sections.

1. **Improved labor market matching:** Reducing travel time allows firms to hire from a larger geographic area. This effectively increases the firm's labor market—particularly in a large urban area like the SCAG region where reductions in commuting time can yield access to many more potential employees. Increasing the size of the labor pool allows firms to find a better employee match for its needs. By hiring employees who better suit their needs, the firm can produce more (i.e., employees are more productive) for the same cost. This allows the firm to be more competitive and capture a larger market share. And that, in turn, can lead to increased hiring if the increase in market share overcomes

the tendency of firms to produce more with fewer employees due to improved employer-employee job matches.

2. **Firms move into the region in response to enhanced economic competitiveness:** This effect flows in part from the first effect. If the region's transportation system supports more efficient commutes, then employers will be encouraged to draw from larger labor market pools. And if that larger employee pool allows firms to hire better employees, eventually those firms will move into the region in response to those improved hiring prospects. This is especially true for firms that rely on a skilled workforce. The increases in firm productivity that initially come from improved labor market matching will result in firms moving into the SCAG region from other locations over longer periods of time.
3. **Reduced congestion increases labor supply:** Metropolitan regions compete for mobile labor. That means that those regions with lower traffic congestion will (when all else is equal) lure more migrants—simply due to the value of offering commuters lower traffic congestion. This increases the supply of available labor. In metropolitan areas with high traffic congestion and longer commutes, the labor pool will have to be compensated either in the form of higher wages, lower house prices or both. These two related effects are, in fact, one and the same—the higher wages in high congestion metropolitan areas reflect the need to lure in a labor pool that otherwise might choose to locate in lower congestion locales. Reduced congestion can attract more workers to a region, allowing a firm to hire quality workers at reasonable wages.
4. **Increased market for firms' products:** Reductions in travel time also can allow firms to supply a larger market area, leading to increased economic competitiveness and regional job growth. One example is the goods movement/freight traffic that moves through the Ports of Los Angeles and Long Beach. Larger ports can build infrastructure that speeds up the processing of shipments, therefore lowering costs. Supply chain managers favor Southern California because of the speed and reliability that goods can be moved around the region and to the rest of the nation. As the economy expands, congestion robs the area of this competitive advantage. Reducing shipping times for landside freight, from the ports to points within and beyond the region, can help increase shipping volumes and lead to lower costs. This ultimately can add up to higher productivity, making the region's ports more cost effective than other competitive points of entry.
5. **Learning:** In a growing knowledge-based economy, cities are increasingly engines of economic innovation. Nearly all economic advances—in consumer products, technology, medicine, consumer services, retailing and logistics, and entertainment and fine arts—are created in metropolitan areas. A large and growing body of literature argues that much of the economic advantage of cities is the learning that is possible when individuals and firms are in close proximity. Engineers in Silicon Valley interact regularly, within and across different firms, creating a world-class hub of knowledge and innovation that is unrivaled in the computing, advanced electronics and software industries. The movie industry in Los Angeles provides the same center for knowledge and learning in the entertainment industry. Such learning effects are central to many industries, including manufacturing processes and services that increasingly rely on innovations to remain competitive. Transportation investments that reduce traffic congestion can allow people to interact more readily with a larger pool of like-minded experts, increasing the learning and innovation in a regional economy. That can allow local firms to innovate in ways that lowers costs, improves products and leads to larger market share. Over time, that improved innovation environment will attract mobile labor and capital (workers and firms) from other regions, further boosting economic activity.

QUANTIFYING THE ECONOMIC IMPACT OF THE PLAN

To quantify the economic impact of the Plan's implementation, the SCAG economic team used data and software from Regional Economic Models, Inc. (REMI). The REMI TranSight model is an advanced economic analysis model that combines input-output approaches, coupled with a model of resident and firm migration into and out of our region to model the direct, indirect and induced effects of the 2016 RTP/SCS spending. REMI also includes a general equilibrium model combined with New Economic Geography approaches to model changes in economic competitiveness. REMI TranSight is the most advanced tool commercially available for analysis that forecasts the total economic effects of changes to transportation systems. All of the economic analysis of the Plan was conducted using REMI models. More details on the REMI models and the methodologies that SCAG used can be found in the Economic & Job Creation Analysis Appendix.

THE RESULTS OF OUR ANALYSIS

Results are reported in two parts:

1. Jobs that result from the 2016 RTP/SCS investment spending (direct, indirect and induced effects)
2. Additional jobs that flow from the improvements to the transportation network, resulting in network efficiencies and related increases in regional economic and business competitiveness

JOBS THAT RESULT FROM THE RTP/SCS INVESTMENT SPENDING (DIRECT, INDIRECT AND INDUCED EFFECTS)

TABLE 7.1 shows the annual average new jobs from the 2016 RTP/SCS financial plan spending. The job impact is reported as annual average jobs in five-year periods (starting with 2016–2020), for each county and for the entire region. The last column in TABLE 7.1 shows jobs, averaged over all Plan years, from 2016 RTP/SCS construction, operations and maintenance spending.

REMI TranSight model outputs predicted that jobs from transit operations and maintenance (O&M) expenditures in the region grow from an annual average of 119,000 in 2016–2020 to 173,000 in the last five years of the Plan (2036–2040). As a fraction of the total jobs from the Plan's spending (construction and O&M), transit O&M jobs grow from half of the jobs in 2016–2020 to nearly two-thirds of all jobs in 2036–2040. Transit O&M spending, as a fraction of the total Plan spending, was virtually constant across those two time periods—increasing from 37 percent of total Plan spending in 2016–2020 to 39 percent of Plan spending in 2036–2040. The large increase in the share of the Plan's jobs from transit O&M while the share of the Plan's spending from transit O&M stays constant is not consistent.

Upon examination, the research team concluded that the size of the SCAG region's transit spending is outside of what REMI can accurately model in the later years of the Plan. In the years 2036–2040, the region will spend $7.5 billion per year on transit O&M, while REMI's baseline forecast of the size of the transit industry in the region during that same time period is about $2 billion per year. The large difference is not due to any fault of the REMI model, but rather is due to the fact that the SCAG region is building the largest transit public works project in the history of the U.S.—an investment at a scale well beyond what has been experienced in other similar metropolitan areas during recent decades and even of a magnitude unprecedented compared to prior SCAG RTPs. The scale of the transit investment and the resulting magnitude of the increase in transit O&M are beyond what the research team believes the REMI TranSight model can reliably forecast at this point in time, therefore, the growth in jobs from transit O&M spending was adjusted downward.

TABLE 7.1 2016 RTP/SCS EMPLOYMENT IMPACT FROM CONSTRUCTION, OPERATIONS AND MAINTENANCE SPENDING

Annual Average Jobs Relative to Baseline (Thousands)

REGION	2016–2020	2021–2025	2026–2030	2031–2035	2036–2040	AVG PER YEAR
Imperial	1.68	2.14	4.54	4.55	4.55	3.49
Los Angeles	110.74	112.71	99.16	86.01	93.78	100.48
Orange	52.99	21.17	16.75	17.41	20.05	25.67
Riverside	31.99	19.33	25.09	28.84	24.90	26.03
San Bernardino	32.53	26.41	26.98	27.11	25.13	27.63
Ventura	7.13	6.00	6.02	3.71	4.04	5.38
SCAG REGION	237.06	187.76	178.53	167.63	172.45	188.69

Source: SCAG calculations from 2016 RTP/SCS financial plan input into REMI model. Note that the REMI model reports full and part-time jobs and the job numbers include both full-time and part-time jobs. Figures may not add up due to rounding.

ADDITIONAL JOBS THAT FLOW FROM THE IMPROVEMENTS TO THE TRANSPORTATION NETWORK, RESULTING IN NETWORK EFFICIENCIES AND RELATED INCREASES IN REGIONAL ECONOMIC AND BUSINESS COMPETITIVENESS

Network efficiency in the form of improved transportation access is a second source of job growth. TABLE 7.2 shows the jobs from improved economic competitiveness that result from decreases in travel times and less costly trip-making relative to the baseline. Note that the economic competitiveness jobs grow over time, as the effect of the 2016 RTP/SCS relative to baseline results in increasingly larger transportation improvements and resulting cumulative network efficiencies over the course of the Plan.

FULL RESULTS

The full economic results of the 2016 RTP/SCS investment are summarized in the table, with millions of new jobs (annual average) resulting from the Plan in five-year time periods and an annual average shown for 2016-2040. The total combined jobs from the two effects—Plan investment (construction, operations and maintenance spending) and network efficiency/economic competitiveness—are shown summed together in the table to highlight the total economic impact of the 2016 RTP/SCS.

TABLE 7.2 2016 RTP/SCS JOBS FROM ENHANCED ECONOMIC COMPETITIVENESS, REMI ESTIMATES OF JOBS FROM NETWORK EFFICIENCY PLUS AMENITIES AND OPERATIONS

Annual Average Jobs Relative to Baseline (Thousands)

REGION	2016–2020	2021–2025	2026–2030	2031–2035	2036–2040	AVG PER YEAR
Imperial	0.1	0.4	0.73	1.19	1.73	0.83
Los Angeles	40.62	137.22	225.15	292.13	320.1	203.04
Orange	7.43	25.6	42.42	65.98	99	48.09
Riverside	9.11	31.37	48.78	66.25	83.43	47.78
San Bernardino	6.36	25.56	47.08	65.72	79.91	44.93
Ventura	0.81	3.6	7.33	10.1	10.7	6.51
SCAG REGION	64.4	223.74	371.49	501.38	594.87	351.19

Source: SCAG calculations from 2016 RTP/SCS travel model results input into REMI TranSight model.
Figures may not add up due to rounding.

CREATING JOBS IN THE SCAG REGION

539,900

AVG Total JOBS
per year
in the SCAG region

Total jobs, all sources, construction, operations and maintenance, network benefits, from 2016 RTP/SCS. In comparison, the 2012 RTP/SCS would create 528,500 average total jobs during the life of the plan.