Caltrans Airport Forecasting Study

The Role of California Airports in Smart Growth and Economic Vitality

prepared for

California Department of Transportation
Division of Aeronautics

prepared by

Cambridge Systematics, Inc.

with

Mead & Hunt
Economic Development Research Group

February 28, 2014

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1.0 Introduction

1.1 PURPOSE OF THIS STUDY

California has shown a progressive embrace of smart growth and more attention to multimodal transportation connectivity. The implementation of Senate Bill (SB) 375 and SB 391 are driving the most ambitious and comprehensive efforts to integrate smart growth policies and multimodal transportation investments at the regional level. In their first round of Sustainable Community Strategies (SCS) and Regional Transportation Plans (RTP), the State's metropolitan regions have focused their attention on increasing the density and diversity of land use and transportation in downtowns, commercial and community centers and other nodes of jobs and housing.

A similar focus on airports, however, has been much more of an afterthought. As its first objective, this study sought to determine to what degree metropolitan planning organizations (MPO) and regional transportation planning agencies (RTPA) have integrated airports into their regional SCS/RTPs by measuring the effectiveness of integration in a sample of MPOs in terms of socioeconomic impacts.

Our second objective was to demonstrate the potential for greater integration of airports into regional smart growth strategies and multimodal transportation planning. Our demonstration was intended to provide MPOs as well as airport managers with a deeper and more nuanced understanding of how each type of airport has potential to stimulate economic growth and guide them to exploit their potential with some best practices. In this report, we showed how airport areas perform economically under typical conditions, then how they might perform with the incorporation of SCS and smart growth initiatives. Not all airports are the same – and thus the way they support SCS objectives also differ.

This project explored airports as employment agglomeration economies, as auxiliary or support areas for nearby agglomeration economies, and as land-banking opportunities for future development. We used qualitative structured interviews to inform a set of quantitative and qualitative economic case studies. Regional plans may be less inclined to shy away from airport accessibility and community integration plans once decision makers and the public understand the economic benefits of airport and airport area development.

This work comes during a vital transition for the role of airports in a region's economic development. Historically, many regions valued their airports first and foremost for their air transportation services and only secondarily if at all as economic engines for community and regional development. The subject of this report was much less about airplanes and runways and more about promoting

airports as transportation and commerce hubs needing to be connected to communities via various modes of transportation.

Our goal in this study was to provide objective, compelling analysis of how airports may be integrated with transportation and land use systems so that business, commerce, economic and travel activities occurring at an airport are integrated with regional efforts to reduce greenhouse gases in California, namely through the SCS planning process. By keeping SCS at the forefront of airport connectivity programs, airports can find their own unique ways to incorporate smart growth supportive activities into their plans, programs and projects.

1.2 THE PRIMARY AUDIENCE

This report was developed for three main audiences.

1. **Airport Planners and Airport Managers.** Transportation and land use planning is frequently led by city, county and regional agencies, and airports are not often considered as a major driver of land use within a region. This study is meant to determine the various roles that airports can play in smart growth and multimodal connectivity and provide airport planners and managers a guide as to how their airports may fit into the transportation and land use equation in the wake of SB 375 and SB 391.
2. **Regional Agencies.** Through SB 375 and SB 391, transportation and land use have become increasingly linked. Most regions include an airport and aviation uses. To date there has not been a discussion about how airports are included in this regional planning vision. This report plans to address these issues and communicate to regional agencies how airports can play a role in smart growth for the region.
3. **Economic Development Agencies.** One of the challenges is determining whether there is economic impact associated with measures supporting smart growth initiatives. Economic development agencies may use airport connectivity as a reason for promoting local development. This paper may inform these agencies whether it is worthwhile to consider smart growth within the context of airport land use development.

1.3 DATA SOURCES USED

To assess the economic opportunities near California airports, the case studies in this report relied on a variety of qualitative and quantitative data and information sources related to demographics, socioeconomics, land use, and transportation. The two main sources, and their use in this study, are described below. Other data sources are noted in individual case studies where needed.

- **California Department of Finance.** The Department of Finance provides socioeconomic and demographic data for the current year, and provides forecasts based on county-level and state-level trends. Department of

Finance data was used to compare statewide and regional demographic and socioeconomic trends with areas developing near California airports.

- **U.S. Census Bureau Census and American Community Survey.** The U.S. Census provides the basis for the socioeconomic and demographic data developed by California's MPOs and the Department of Finance. Census data is available at the county, city, and census tract level in California.

The California Department of Transportation (Caltrans) has recently worked to coordinate resources developed as part of regional land use and transportation planning efforts. The resulting reports include Caltrans' California Interregional Blueprint[1], the Caltrans' State Rail Plan[2], and the California Transportation Commission's Statewide Transportation System Needs Assessment.[3] These coordinated regional data sources, and visions for future development, support and drive this study.

1.4 STUDY OUTLINE

The report includes six chapters providing an in-depth discussion of the project background, methodology, detailed case studies and a discussion of the results. The remaining chapters include:

- **Chapter 2: Background Information.** This chapter provides information Caltrans Division of Aeronautics airport categories, land use categories based on surroundings and relationships with nearby land use, how the first set of airports were selected for review, and a discussion of the study approach.
- **Chapter 3: Airports and Smart Growth.** This chapter introduces key elements of smart growth, and outlines how they apply in identifying potential smart growth areas.
- **Chapter 4: Economic Analysis Context and Methodology.** This chapter describes why smart growth is important to the economy, and the economic analysis methodology applied to the selected airport study areas.
- **Chapter 5: Airport Case Studies.** This chapter includes 20 case studies detailing the economic potential for each airport in its regional economic context. The chapter is divided into three sections corresponding to the potential for the airport to serve as a smart growth area, an indirect smart growth area, or a land bank area. A fourth category, transit hubs, was

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[1] http://www.dot.ca.gov/hq/tpp/californiainterregionalblueprint/.

[2] http://californiastaterailplan.dot.ca.gov/.

[3] http://www.catc.ca.gov/reports/2012%20Reports/Trans_Needs_Assessment_corrected_01172012.pdf.

included with the other smart growth roles, given the importance of public transit to many concepts of smart growth development types.

- **Chapter 6: Findings and Implications.** This chapter provides an overview of the results and process of the study. This chapter includes discussion of how the airside and landside categories can be used to support California land use and transportation planning, and the development of Regional Transportation Plans and Sustainable Communities Strategies.

2.0 Background Information

2.1 CALTRANS DIVISION OF AERONAUTICS AIRPORT AIRSIDE FUNCTIONAL CLASSIFICATION CATEGORIES

California Department of Transportation Division of Aeronautics (DoA) uses its Airport Functional Classification System, which includes five airport categories. The first category includes commercial airports, and the remaining four categories designate general aviation airport types. A description of each airport type is provided below. The number of California airports in this category is indicated in parentheses after each category title.

- **Commercial/Primary (29 airports).** The Federal Aviation Administration (FAA) considers commercial airports to be publicly owned airports with more than 2,500 enplanements, and have regularly scheduled passenger service. Primary airports have more than 10,000 annual enplanements. Primary airports are categorized by hub size (small, medium, or large). Airports having 2,500 to 10,000 enplanements are considered "nonprimary" airports, or nonhub airports.
- **Metropolitan (20 airports).** Airports that serve the same activities as Regional airports, are located in urbanized areas, provide for the same flying activities as Regional airports with an emphasis on business, charter and corporate flying, accommodate all business jet services for pilots and aircraft, including jet fuel, has a published instrument approach and a control tower, provides flight planning facilities.
- **Regional (66 airports).** Airports that provide the same access as Community airports but may provide international access, located in an area with a larger population base than Community airports, while serving a number of cities or counties, serve the same activities as Community airports with a higher concentration of business and corporate flying, accommodate most business, multiengine and jet aircraft, provide most services for pilots and aircraft including aviation fuel, has a published instrument approach and may have a tower.
- **Community (97 airports).** Airports that provide access to other regions and states; located near small communities or in remote locations; serve, but are not limited to, recreational flying, training, and local emergencies, accommodate predominantly single engine aircraft under 12,500 pounds gross vehicle weight, provide basic or limited services for pilots or aircraft.

- **Limited Use (33 airports).** Airports that provide limited access, usually located in nonurban areas, may be used for a single purpose, have a few or no based aircraft, and provide no services.

2.2 SELECTING INITIAL AIRPORT STUDY AREAS

The case studies were selected through an iterative process that considered the airport airside category, the size of the airport, existing development on and near the airport, regional development patterns, airport manager availability to participate in the study, and the presence of past studies on smart growth that included the airport.

The Caltrans DoA provided an initial set of 36 of the 245 public use airports to study based on their most recent research informing both land use development potential and expected willingness of airport managers to participate in the study. The consultant team assessed the nearby population, employment activity, and other land uses near these short-listed airports in order to identify those that represent a range of development conditions near airports in California. The study team refined the list based on this input, resulting in 20 airports identified for further study. The selected study airports and their airside classification are shown below (Table 2.1).

Table 2.1 Study Airports by Airside Classification

Symbol	Name	Symbol	Name
Commercial or Primary		Regional	
FAT	Fresno Yosemite International	AUN	Auburn Municipal
RDD	Redding Municipal	SEE	Gillespie Field
SAN	San Diego International	3O7	Hollister Municipal
SMX	Santa Maria Public	APC	Napa County
STS	Charles M. Schultz	MYV	Yuba County
Metropolitan		Community and Limited Use	
CCR	Buchanan Field	O61	Cameron Air Park
HWD	Hayward Executive	MER	Castle
LVK	Livermore Municipal	BLU	Blue Canyon (Limited Use)
SMO	Santa Monica Municipal	Q25	Dinsmore (Limited Use)
VNY	Van Nuys	1Q5	Gravelly Valley (Limited Use)

Source: Caltrans DoA.

2.3 AIRPORT LANDSIDE CLASSIFICATION AND ROLES

Caltrans DoA organizes airports in five classification categories, described above. The airside classification categories pertain to the volume and type of airside operations, and the level of urban development immediately surrounding the airport. Relating airports to community growth strategies, however, required a broader analytical scale related to the role an airport could play in supporting regional planning.

This study used a parallel airport landside typology to organize the airports based on their role in regional land use and transportation planning. The typology considered land use activity in nearby cities, urban design, and multimodal transportation access in addition to the airside categories. The typology's three roles included:

- Role 1 – Smart growth area;
- Role 2 – Smart growth support area; and
- Role 3 – Land-bank areas.

Each role is exclusive in that an airport analyzed in this study as a smart growth area (Role 1) would not also be analyzed as a smart growth support area (Role 2). Likewise, potential land-bank areas (Role 3) do not overlap with the other roles in the typology. See the appendices for further description of the study airports' role assignment, as well as summaries of statewide land use data, airport characteristics supporting land use, and the economic analysis methodology.

Public transit can be an important planning opportunity for some airports. This study typology initially considered potential transit hubs as a separate role. However, given how public transit complements smart growth development, public transit was added to the Role 1 typology analysis as applicable.

2.4 OVERALL METHOD OF ANALYSIS: A CASE STUDY APPROACH

This study provided case studies to examine the unique characteristics and potential for future development at a sub-set of California airports. This approach provided detailed results allowing for comparison across diverse land areas and metropolitan regions. The case studies provided a method to account for the range of unique attributes characterizing each airport in a consistent format accessible to a broad audience.

The study team recognized that the role of airports in promoting smart growth, or championing airports as part of a community smart or sustainable growth strategy, is dependent on a diverse and complex set of local geographic, economic and demographic conditions. In other words, a case study will primarily show how the unique characteristics of one airport explained its

unique role in supporting smart growth in its region. Nevertheless, the case studies provide valuable lessons and insights that planners can apply to their own airports and regions.

The goal of this study was to determine to what degree Sustainable Communities Strategy (SCS) policies and intermodal accessibility may affect the long-range[4] economic performance of airports. We expected the 20 case studies to reveal that the effects would range between low and moderate. This was consistent with other studies evaluating the long-range effects of SCS policies on regional economic performance.

The study team supported a subset of airport case studies with quantitative economic modeling. This included both Role 1 and Role 2 airport areas with sufficient land development and existing economic activity that SCS policies and intermodal investments could appreciably affect socioeconomic performance. The team applied the economic modeling tools TREDIS and IMPLAN, and long-term forecasts statewide and county-specific forecasts from Moody's analytics mapped to 3-digit NAICS industries, to analyze economic effects of development pattern changes, based on expected land development under SCS policies.

The remaining case studies included airport areas with some potential for SCS policies and intermodal investments to generate regional socioeconomic impacts, but expected economic impacts were not sufficiently measureable using the first tier method. The study team qualitatively analyzed these Role 1 and Role 2 airports to assess opportunities for development pattern changes and potential socioeconomic impacts.

The land bank airports (Role 3) are small or rural airports with little relationship to regional SCS policies given the low density development surrounding the airport. Therefore, these airports would not present opportunities for appreciable development pattern changes in the region. Two of the five Role 3 airports may benefit from land banking strategies. The last case study section provides an overview of the potential benefits and application of land banking strategies.

[4] SCS plans are designed over a 30-year timeframe, consistent with regional transportation plans. This study assumed the same long-range timeframe.

3.0 Airports and Smart Growth

The study team identified several ways airports can play a role in the future regional development in California. These roles, introduced in Section 2.2, are based a literature review and interviews with leading smart growth experts. This section provides greater detail about the landside classification introduced above.

3.1 SMART GROWTH CHARACTERISTICS IN THE CONTEXT OF AIRPORT AREAS

The role an airport can play in its region's smart growth in general, and its SCS in particular, depends on the interaction between many circumstances and trends both internal and external to each region. This section describes the methodology used to screen the initial study airports and allocate them into one or more of three possible roles. The roles were used to establish a case study approach, as defined in this section. A methodology was advanced and refined with a comprehensive review of the literature, interviews with smart growth experts, and first hand experience of Caltrans DoA staff and the study team.

Those interviewed by the study team included Chris Ratekin, Sustainable Mobility Branch, Caltrans; Dr. Daniel Chatman, Department of City and Regional Planning, University of California, Berkeley; and William Fulton, Smart Growth America.[5] The study team also reviewed the following documents for information regarding smart growth supportive areas:

- California Department of Housing and Community Development (HCD) Transit-Oriented Development (TOD) Housing Program Third Round Guidelines[6];
- HCD Infill Infrastructure Grant (IIG) Program Guidelines[7];
- Congress for New Urbanism and U.S. Environmental Protection Agency (EPA), Smart Scorecard for Development Projects[8];

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[5] Smart Growth America is a national coalition that advocating for smart growth through research, coalition building, and policy development assistance.

[6] Accessed May 2013 at http://www.hcd.ca.gov/fa/tod/FINAL_TOD_HOUSING_PROGRAM_GUIDELINES_051013.pdf.

[7] Accessed May 2013 at http://www.hcd.ca.gov/fa/iig/IIG_Guidelines_ 05.15.13.pdf.

[8] Accessed May 2013 at http://www.epa.gov/dced/scorecards/Scorecard_expfleissigjacobsen.pdf.

- New Jersey Future, Smart Growth Scorecard[9]; and
- Maryland Office of Smart Growth, Smart Growth Scorecard[10].

These efforts were followed with a review of five completed SCS programs: Sacramento Area Council of Governments (SACOG), Southern California Association of Governments (SCAG), One Plan Bay Area [a joint SCS/RTP by the Metropolitan Transportation Commission (MTC) and Association of Bay Area Governments (ABAG)], the San Diego Association of Governments (SANDAG) and a subregional SCS developed by the Gateway Cities Council of Governments (GCCOG), which took delegation from SCAG. In addition, the study team reviewed the pending legal challenges to the SANDAG and MTC/ABAG SCS.

The first of the following four subsections presents the 11 criteria used to evaluate the role of each airport in supporting smart growth within its region. The four subsections that follow define each of the four roles an airport area can play.

3.2 CRITERIA FOR DETERMINING THE AIRPORT AREA ROLES IN THE REGION'S SCS

Based on the research, interviews with experts, and a literature review, the suitability of an airport area to support local or regional smart growth development is based on 11 land use and transportation criteria. The criteria and their application in this study are described in more detail in Appendix B and Appendix F. These 11 criteria are:

1. **Surrounding population density.** The population density near airports is important in how well the area would attract smart growth, in particular how it compares to densities across the region. The higher the population density the more workers live closer to businesses and transportation within airport area. Access to labor is one of the most important drivers of productivity and higher productivity increases competitiveness, which in turn expands business growth opportunities.
2. **Surrounding employment density**. Employment density drives productivity because of what economists call spillover effects, which involve interactions between workers that improves work efficiency. Higher productivity increases a firm's competitiveness relative to firms in lower density employment areas. As businesses become more competitive, they

[9] Accessed May 2013 at http://www.epa.gov/dced/scorecards/NJFuturemunicipal_card.pdf.

[10] Accessed May 2013 at http://www.epa.gov/dced/scorecards/Maryland_Scorecard.pdf.

could acquire more market share, which in turn expands their output, workforce, and the workers' incomes.

3. **Good supporting transportation infrastructure.** Apart from transportation (e.g. automobile, transit, bicycle, and pedestrian) that gets people to and from the airport terminal complex itself, good supporting transportation is needed to move workers quickly and reliably to and from their jobs near airports.

4. **Level of transit service and infrastructure.** High frequency rail transit maximizes worker access to an airport area, and the permanence of rail transit provides businesses with more certainty that they can have more access to labor than would be expected from bus transit, which is not necessarily permanent, as bus transit relies on farebox revenues to retain a route.

5. **Pedestrian environment.** The ease of pedestrian circulation within a commercial district improves the spillover effects described above. In addition, a pleasant pedestrian environment (e.g., block length, continuous sidewalks, lighting, street width) attracts businesses that are better adapted to higher density development.

6. **Supportive parking environment.** Airports generally have ample parking supply. Plentiful parking promotes more car trips and thus less transit, pedestrian and bicycle travel. Higher use of non-auto modes promotes higher density and more mixed-use development. Therefore a smart growth supporting parking environment would be one that is pedestrian friendly and does not include large expanses of parking area.

7. **Amenities within one-half mile.** A mix of ancillary land uses such as retail, restaurants, entertainment, and business support and help attract commercial office development. While high density commercial office development can attract these amenities if they are underrepresented, this attraction can take time and slow the pace of higher density development.

8. **Availability of land for development.** The availability of raw land or land that can be easily redeveloped stands out as one of the most critical conditions for attracting new businesses or allowing existing businesses to expand.

9. **Suitability of land for development** (e.g., level slopes, absent floodplains or streams). The suitability of land for development drives the cost of construction and the length and uncertainty of time needed to move a parcel through an entitlement process.

10. **Proximity to service infrastructure** (e.g., water, sewer, fire, police). The availability of parcels with sufficient and existing utility hook-ups will increase demand from developers relative to greenfield sites that require expensive and uncertain access to basic services.

11. **Lack of resistance to development in surrounding area.** Most community opposition (i.e., NIMBY or "not-in-my-backyard"; growth is seen as a threat

of intolerable increases in vehicle traffic and noise, or reduced air quality) to high density commercial development comes from residents. Areas with fewer or no residents (typical of airports) reduce the risk to developers significantly that their project will be halted or forced to reduce density.

Table 3.1 presents these 11 criteria and their expected comparative value for development near airports, relative to areas elsewhere in a region.

Table 3.1 Airport Land Smart Growth Relative Smart Growth Compatibility

	Smart Growth Attractive Characteristics	Typical Rating for Airport Land (+ = better than surrounding region, – = worse than surrounding region)
1	Surrounding population density	–
2	Surrounding employment density	+/–
3	Good supporting transportation infrastructure (e.g. auto, transit, bicycle, pedestrian)	+
4	Permanence of transportation infrastructure	+
5	Easy to walk around (e.g., block length, continuous sidewalks, lighting, street width)	–
6	Supportive parking environment	+/–
7	Amenities within ½ mile	–
8	Availability of land for development	+/–
9	Suitability of land for development (e.g., not steep slope, floodplain, stream)	+
10	Proximity to service infrastructure (e.g., water, sewer, fire, police)	+
11	Lack of resistance to development in surrounding area	+

Source: Cambridge Systematics, 2013.

3.3 CATEGORIZING AIRPORT ROLES TO SUPPORT SMART GROWTH

The study team assessed the 20 case study airports using the 11 qualitative land use criteria as a lens to categorize airports by potential future roles related to smart growth. The assessment included desktop and on-the-ground research regarding the built environment around each airport, as well as interviews with airport managers and staff. This qualitative method allowed the team to assess potential for smart growth and smart growth supportive land use, based primarily on the existing built environment and activity. The team assigned each airport to one of three roles based on how they could support smart growth in their region. This qualitative method was built on the assumption that the uncertainty of economic development in the study areas precludes rigid

application of scores or analysis, particularly to select airports for case studies. That is, an airport area could be analyzed through the perspective of all the roles identified in this study. However, selecting one provided useful bounds for the case study and illuminated issues that could be lost when considering every possible future scenario.

Airport noise all but precludes most types of residential development, so the definition of development is all four categories are confined to commercial (office and retail) and industrial (manufacturing and warehousing). While public transit supportive areas were initially considered as a unique landside role for this study, instead the transit infrastructure description was brought into each applicable case study. Given the importance of public transit in any future land use types, providing safe, legal, and efficient access to public transportation service is relevant to each airport study where such service exists. For more information on the categorizing methodology, please see Appendix F.

Table 3.2 summarizes the results in alphabetical order for each role. Assigning a case study role to an airport occurred consecutively, assessing each airport and assuring that each role included a range of airport area types. Role 1 case studies included areas with the greatest potential for smart growth near the airport. Role 2 airport areas include those with some potential for future development, but were less likely to support adjacent smart growth development. Role 3 airports included those that were not as likely as the other airport areas to directly support future regional development in the timeframe of this study but offered examples of where land banking may be a beneficial strategy. The following sections summarize the case study roles and key criteria of each. The appendix includes a full technical memorandum that describes the categorizing process in greater detail.

Table 3.2 Study Airport Role Categorization Results

Role 1 Smart Growth	Role 2 Smart Growth Supporting	Role 3 Land Bank
Buchanan Field	Auburn	Blue Canyon
Fresno Yosemite International	Castle	Cameron Airpark
Gillespie Field	Charles M. Schulz	Dinsmore
Hayward Executive	Livermore Municipal	Gravelly Valley
San Diego International	Napa County	Hollister Municipal
Santa Monica Municipal	Redding Municipal	
Van Nuys	Santa Maria Public	
	Yuba County	

Source: Cambridge Systematics.

Role 1: Airports as Smart Growth Areas

The study team expected a very limited number if any of airports within the case study group of 20 to present potential opportunities for smart growth. Many of California's airports were built to support WWII military effort and are intentionally far from populated areas such as today's central business districts or residential communities. As populations grew over the last 65 to 70 years, development is increasingly closer in proximity to the airports, and much of this development is typical of suburban sprawl on the outer edges of metropolitan areas.

Another expectation was rooted in the emphasis most regions place on attracting high density commercial development to central business districts (CBD) or urban commercial nodes. The team and many of the experts consulted expected airports would rarely present sufficient market opportunities or regulatory advantages to compete with the established urban centers. Fortunately, these expectations proved wrong.

For Role 1 airports, all 11 criteria come into play. The availability and suitability of land for development are the most important, followed by the surrounding employment density, and then the surrounding population density. Among the 20 airports studied, the study team designated seven of the airports into the smart growth area role. The competitive advantages of these seven airports over alternative sites in the region include the lower potential for neighborhood opposition against higher density development, less traffic congestion than CBDs and other urban commercial centers, and the relative availability of developable land. In addition, some industrial or commercial office tenants want immediate access to aviation services.

Role 2: Airports as Smart Growth Support Areas

The study team formulated this role because airports provide one of the most well suited environments for industrial development that creates jobs, but is not compatible with the pedestrian friendly, transit dense, and diverse mix of smart growth land use. Nevertheless, industrial activities not only provide numerous jobs, but these jobs are often available to lower skilled, older workers. Our State's economy has favored expansion of industries such as heath care, food service, entertainment, knowledge and technology industries (i.e., software, high-technology, etc.), and agriculture, leaving many people out of the economic growth. All of California's regions are struggling to retain these manufacturing and warehousing industries that provide employment to the cohort of workers most adversely affected by the Great Recession. As the state economy recovers, these industries will not be retained without a cheap supply of raw land and suitable zoning requirements.

For Role 2 smart growth support areas, six of the 11 characteristics come into play. Again, the availability and suitability of land for development are the most important. Surrounding population density and surrounding employment

density play a role, but are not as critical as for Role 1. Many of the other characteristics do not come into play for Role 2 because they are not necessary for smart growth support areas. Of the 20 airports, 8 airports were assigned Role 2 case studies. Each region can foster retention of industries that sustain the economic and fiscal benefits these businesses and employees generate while allowing the urban centers to pursue smart growth strategies.

Role 3: Airports as Land-Banking for Smart Growth Development

Some airports are located far from developed areas or support limited rural communities. Role 3 Land Bank case studies were applied to these areas. These areas could potentially serve as a land bank that would provide future parcels for either smart growth or smart growth supporting development.

An airport area with nearby vacant land today could accommodate future development – for smart growth development patterns, industrial development supporting regional smart growth developments – or provide regional open space as an offset for development on sensitive habitat in another part of the region. This practice is known as land or mitigation banking. Land banking is often used in California to mitigate environmental impacts associated with development projects. The California Department of Fish and Wildlife defines a land bank as a privately or publicly owned land managed for its natural resource values. The availability of land could alleviate some of the concerns of businesses that fear they may not be able to expand should demand for their products or services warrant growth. Should these airports find a role in their areas SCS goals, they may also serve as a catalyst for new development that otherwise may seek a location away from their target market area.

4.0 Economic Analysis Context and Methodology Overview

4.1 CALIFORNIA ECONOMIC CONTEXT

The case study approach used in this study will be best understood through trends in the U.S. and California economies. According to the most recent long-range California Economic Forecast[11], the national and state economies grew in 2013 and will continue to gain strength in the near- and long-term forecasts. Unemployment rates have declined and consumer spending has continued to increase. The housing market has gained strength and is supporting economic recovery across the State.

National employment is forecast to grow rapidly through 2014 and taper moderately in 2015, with unemployment declining to 6.6 percent in that period. Job growth has been strong in California, and forecasts estimate nearly 250,000 new jobs in 2014. Leading industrial sectors include technology, leisure and hospitality, and business services. California is expected to post faster job growth than the nation through 2014 and 2015. Likewise, state household incomes and consumer spending should continue to grow. Exports and housing construction in California should remain strong, helping drive the transportation and warehousing, and construction sectors. However, unemployment is expected to remain high over the short-term forecast as labor force growth outpaces job creation.

4.2 ECONOMIC ANALYSIS METHODOLOGY

The economic analysis methodology was created to analyze four airports from both Role 1 and Role 2 each, as described in Chapter 3. The number of economic analysis airports was selected to match the resources of the study. The approach included economic modeling tools forecasting results to the year 2040. The methodology is divided into two distinct parts based on these roles. The first approach is applied to Role 1 airports that would directly support smart growth development. The second approach is applied to Role 2 airports that would support regional smart growth by helping retain uses that might otherwise be pushed out of future smart growth developments based on incompatible land

[11] California Economic Forecast, *California County-Level Economic Forecast 2013-2014*, prepared for Caltrans, October 2013.

uses. Economic analysis did not consider Role 3 Land Bank airports, as there was not sufficient data or expected development for this study. The two economic analysis approaches are described below.

Smart Growth Area Airports

The relationship between employment density (i.e., agglomeration) and productivity have been well established, with research tracing back well over a century.[12] Increasing the spatial concentration of economic activity reduces shared costs, facilitates knowledge spillovers, and stimulates innovation – all of which increases productivity and growth. Behind these broad outcomes, however, lie a range of specific mechanisms that operate across a range of spatial and industrial scales.

Buchanan Field, Santa Monica Municipal, Fresno Yosemite International, and Gillespie Field were designated as smart growth area case studies and include quantitative economic analysis. Conversely, Hayward, San Diego International, and Van Nuys airports are described through qualitative case study analysis. The four quantitative studies all are expected to experience two distinct types of agglomeration. The first recognizes the airport as a transportation hub. As such, it can provide rapid access to intermediate and long-distance destinations, depending on sizes of runways, types of aircraft used, and connectivity to major hub airports. The second recognizes the airport as a locus of economic activity – a sub-metropolitan agglomeration of firms that, through colocation, can enjoy greater efficiency and productivity than if the firms were more spatially dispersed.

While these two categories are measured distinctly, the second is related to the first through the processes of agglomeration (i.e., positive spatial feedback). For example, two firms are attracted to an airport as a *transportation asset* and one develops a warehouse and the other a small corporate headquarters, both to take advantage of the airport (for freight shipment and passenger travel, respectively). A trucking company and a sandwich shop are then attracted to the site be near to the first two firms, but this secondary attraction is not directly related to the airport itself, but might not have occurred were it not for the presence of the first two anchor firms. Finally, the first two airport-dependent firms may move or go out of business, and the buildings may become re-occupied by firms that have no interest in the airport at all, but are instead attracted by the clustered activity, including the trucking firm and sandwich shop. These specific replacement firms or new tenants may not be directly dependent on the airport, but the airport's locus of business activity remains a strong driver of the agglomeration process.

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[12] See Weisbrod et al., 2012, http://www.edrgroup.com/pdf/Alstadt-Weisbrod-Market%20Access-TRB-2012.pdf.

The methodology used to measure these two agglomeration benefits is described in Appendix E. This methodology first forecasts the future change in employment that could be expected without applying smart growth policies to the four airports based on economic forecasts for each airport's region. The methodology then estimates that differences in additional economic growth (measures in employment, income, value added, and total output) between scenarios with and without smart growth policies. The following outcomes summarize the results of this analytical process, which show that the agglomeration of the same number of future employees into a more compact space around the airport generates significant additional economic growth because the agglomeration improves the productivity of these businesses. This increased economic efficiency has the ultimate effect of increasing statewide employment between 855 and 2,000 additional workers, additional value added or gross state product (GSP) between $12 and $286 million, total economic output between $211 million and $585 million, and higher income worth between $78 million and $179 million.

Smart Growth Support Area Airports

The purpose of a Role 2 smart growth support airport area is to retain companies that could leave California without supportive land use and incentive policies. The hypothesis of this analysis is that manufacturing and industrial service companies would disinvest from their current locations because of inadequate local support, including infrastructure, land available for expansion, and communities that view such companies as undesirable neighbors.

Four Role 2 airport case studies were supported by quantitative economic analysis, including Castle, Santa Maria, Charles M. Schultz, and Yuba County airports. The quantitative analysis looked at potential outcomes for counties by 2040 if jobs are saved in airport study areas.

Preliminary analysis in each of the airport host counties indicated declining manufacturing, transportation, and warehousing jobs through the year 2040. Job losses and company closings of course can stem from multiple causes, including poor management, searches for dramatically lower labor wages, and loss of market shares. There is little that smart growth policies can do to mitigate these factors. However, if job dislocation is due to a lack of suitable land, or residential communities that do not want associated social and environmental impacts associated with industrial establishments, then smart growth support areas may be an outlet to allow the counties to retain these jobs. The analysis assumed that these jobs would not decline if areas near airports were supported by manufacturing and industrial services. The total job losses in these industrial sectors ranged from 120 jobs in Yuba County to almost 4,300 jobs in Sonoma County. The location of these airports precluded retail and consumer services, given their relatively distant locations from major transportation thoroughfares and business districts, or dense residential development.

Direct impacts represent the retained industrial jobs projected to decline from 2013 to 2040, and the dollars (in 2013 value) associated with those jobs in terms of personal income, value added to the economy and output (which is the business revenue that supports the jobs and includes personal income and value added). The multipliers embody the penetration of these direct activities in all sectors of the county economies. The total impacts included approximately 3,000 jobs and $138 million in labor income at Castle Airport; nearly 8,500 jobs and $556 million in labor income at Santa Maria Public; nearly 7,000 jobs and $419 million in labor income at Charles M. Schultz Airport; and 165 jobs and $11 million in labor income at Yuba County Airport. A detailed description of the methodology is provided in Appendix E. Full analysis results are available in the last section of the relevant case studies and in Appendix E.

5.0 Airport Case Studies

The following subsections summarize the analysis of 20 airports selected for individual case study. Each case study describes the potential role the airport and the area surrounding will most likely play in supporting its region's SCS. While each airport has unique opportunities and challenges, the framework developed by the consultant team and Caltrans DoA project staff defined three roles that the 20 airports, and by extension most if not all of the State's airports, can play in supporting SCS policies and the overall goals of reducing greenhouse gases (GHG) from transportation. The three roles are defined in detail in Section 3.0 (Airports and Smart Growth), which consist of smart growth area, non-smart growth area, land bank, and transportation hub.

The assignment of 20 case study airports into one of the three roles is as follows and presented in Table 5.1 below:

- The seven smart growth area case study airports are Buchanan Field, Fresno Yosemite International, Gillespie Field, Hayward Executive, Santa Monica Municipal, San Diego International, and Van Nuys;
- The eight smart growth support area case study airports are Charles M. Schulz, Santa Maria Public, Castle, Yuba County, Auburn Municipal, Livermore Municipal, Napa, and Redding Municipal; and
- The remaining five case study airports, which are likely to serve in a land bank role, are Blue Canyon, Cameron Airpark, Dinsmore, Gravelly Valley, and Hollister Municipal.

Each case study airport in the first two of these roles is organized into the four subsections:

- The first subsection presents a market assessment that evaluates the current conditions and future trends for the population, employment and land use of the region and the airport area. These trends provide a rough assessment of the demand from the region's households and businesses and the land available for existing and new businesses to locate within the airport area.
- The second subsection describes the case study airport's regulatory environment and community perspectives:
  - The regulatory environment includes zoning, height restrictions, historical preservation, noise abatement, recreational uses, open space or park preservation, agricultural preservation (i.e., Williamson Act), etc. These regulations control the future use of land near the airport. A city or county's zoning code sets forth where and what type of new development or redevelopment can occur. A municipal zoning code will describe not only the type of use (such as commercial, residential,

industrial, or mixed-use) but will also specify qualities such as height and density limits or requirements and parking requirements.

– Community perspectives involve the support or lack of it for amount and character of land use development among the airport area current residents and businesses or what is termed the level of not-in-my-backyard (NIMBY), which can frustrate or propel proposed development and/or redevelopment.

Table 5.1 Study Airports by Landside Role and Caltrans DoA Airside Category

Symbol	Airport Name	Airside Category
Role 1. Smart Growth Areas		
CCR[a]	Buchanan Field	Metropolitan
FAT[a]	Fresno Yosemite International	Commercial/Primary
SEE[a]	Gillespie Field	Regional
HWD	Hayward Executive	Metropolitan
SAN	San Diego International	Commercial/Primary
SMO[a]	Santa Monica Municipal	Metropolitan
VNY	Van Nuys	Metropolitan
Role 2. Smart Growth Support Areas		
AUN	Auburn Municipal	Regional
MER[a]	Castle	Community
STS[a]	Charles M. Schulz	Commercial/Primary
LVK	Livermore Municipal	Metropolitan
APC	Napa County	Regional
RDD	Redding Municipal	Commercial/Primary
SMX[a]	Santa Maria Public	Commercial/Primary
MYV[a]	Yuba County	Regional
Role 3. Land Bank Areas		
O61	Cameron Air Park	Community
BLU	Blue Canyon	Limited Use
Q25	Dinsmore	Limited Use
3O7	Hollister Municipal	Regional
1Q5	Gravelly Valley	Limited Use

[a] Case study includes quantitative economic analysis.

- The third subsection describes the transportation infrastructure and services accessing the airport area including roadways, public transit, any applicable transportation planning activities, and overall travel patterns that will drive travel demand in the future. Higher density development demands more transit service and more roadway infrastructure (e.g., interchanges and freeway access) that supports industrial and warehousing land use.
- The fourth subsection estimates the economic activity that could be generated at each case study airport with the future implementation of smart growth policies and supportive business attraction strategies in the regions. Initially, statewide growth projected between 2013 and 2040 are reallocated to the smart growth areas commensurate with local land use and economic development potential.[13] Such reallocations do not represent statewide economic development above baseline forecasts. The economic analysis results of each potential smart growth area portray the agglomeration effects generated as a result of this concentrated economic development, which does account for new jobs, income and value added to California above baseline 2040 levels. For the smart growth support areas, the economic results represent the potential relocation and retention of manufacturing and industrial service jobs within each county based on expected losses in specific three-digit NAICS sectors as projected by Moody's Analytics.

This four-part framework is truncated for the land bank case study airports because their potential to support their region's SCS process is likely to be modest given current trends. The following sections include the quantitative and qualitative airport case studies.

5.1 AIRPORTS DIRECTLY SUPPORTING SMART GROWTH

The seven smart growth area and transportation hub case study airports are Buchanan Field, Fresno Yosemite International, Gillespie Field, Hayward Executive, Santa Monica Municipal, San Diego International, and Van Nuys. These airports have sufficient potential to attract high density commercial and retail development to serve as a node for smart growth because of two conditions. First, the region has sufficient economic demand for the types of goods and services provided by businesses that are well adapted for compact, pedestrian and transit-friendly design. Second, the supply of available land that is well suited for this type of development is in short supply and the sites available around the airport are competitive relative to other areas within the region.

[13] Economic projections by County and State are by Moody's Analytics, mapped to three-digit NAICS levels by EDR Group.

Buchanan Field Airport

Buchanan Field Airport (CCR) is a general aviation reliever airport in Contra Costa County. The study area is located in the City of Concord, and a portion of the area is located in unincorporated Contra Costa County. The nearest major commercial airports are Oakland International Airport and San Francisco International Airport, each about 40 miles away. Nearby general aviation airports include Byron, Napa, Charles M. Schultz, Livermore Municipal, Rio Vista Airport, and Marin County. The airport is owned and operated by Contra Costa County. Aviation-related services include several fixed base operators (FBO), six flight clubs, and miscellaneous aviation services.

The airport was built in 1943 and served as a military aviation training site. Since then, the airport has continued to develop civilian operations and the area around the airport has developed as part of the neighboring cities. The airport no longer offers commercial air service. Approximately 60 percent of airport revenues come from non-aviation uses located on airport property, including a hotel, dining, retail, a golf course, and various small commercial offices. Other nearby land uses include retail shopping centers, business parks, two hotels, a water treatment facility, and low density manufactured housing.

Business-related airport users have included local housing developers with both airport-based and transient aircraft. There is no air freight activity due to the airport's proximity to the Oakland and San Francisco airports. Off-airport uses are generally compatible with airport operations, and are not directly related to air travel. The industrial nature of the area has appeared to attract users looking for low-profile, flexible development requirements.

CCR is located in a built-out environment. The mix of commercial uses, accessible location, and location within a built out suburban environment indicate the area's potential as a smart growth area. Quantitative economic analysis presented in this case study suggests that smart growth consisting of higher density development could lead to $152 million in additional value added, and $105 million in increased income.

Market Assessment

This subsection presents a market assessment that evaluates the trends current conditions and future projections for the population, employment and land use of the region and the airport area. The market conditions that position CCR as a smart growth area involve the strength of demand from households and businesses for goods and services produced by companies located in the airport area. Household demand is manifested by the number and composition of the population, which is measured by demographic trends. Firms and employees drive the local business demand. In addition, CCR's feasibility as a smart growth area depends on the competitive advantages of land located within the CCR area over the land outside the airport area.

Population

Concord's[14] population of just over 120,000 has held stable and grown in at a pace similar to nearby cities, including nearby Walnut Creek, Pleasant Hill, and Martinez[15]. Contra Costa's population growth was largely driven by the Cities of Brentwood, San Ramon, and Antioch. MTC forecasted that county households would increase 23 percent from 2010 to 2040, and Concord households are forecast to increase 43 percent.[16]

The population and labor force are sufficient to support the type of dense, active development that would be desired in a smart growth area. Population in Contra Costa County and Concord has increased one percent from 2000 to 2012, but continue to be strong regional population centers (Table 5.2).

Table 5.2 Contra Costa County and Concord Population and Population Change (1990 to 2012)

				1990-2000		2000-2012	
Area	1990	2000	2012	% Change	Avg. Annual Change	% Change	Avg. Annual Change
California	29,760,021	33,871,648	38,041,430	14%	1%	10%	1%
Contra Costa County	803,732	948,816	1,079,597	18%	2%	14%	1%
Concord City	111,348	121,780	121,989	9%	1%	1%	<1%

Source: U.S. Census Bureau Census 1990, Census 2000, American Community Survey 2012.

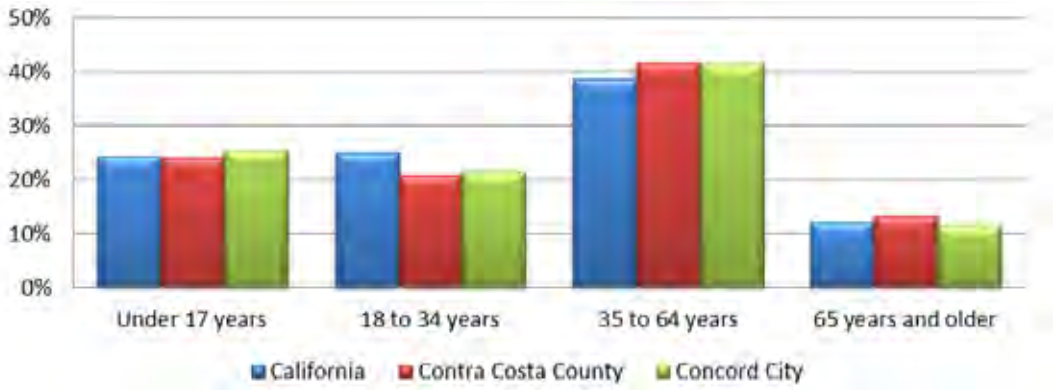
The Concord population is slightly older than California and Contra Costa populations (Figure 5.1). The city and county cohorts of 35 to 64 year olds are higher than the State, suggesting an above-average Baby Boomer population. The cohort of people aged 65 and older is somewhat below average, as is the cohort of people aged 18 to 34, which includes young professionals generally known as Generation Y.

[14] While CCR is bordered by Concord, Pleasant Hill, and Martinez, Concord provides the largest population and, therefore, most representative of household demand in the area.

[15] City of Concord, Downtown Concord Specific Plan Existing Conditions Report, 2013.

[16] MTC, *Plan Bay Area Strategy for a Sustainable Region*, 2013.

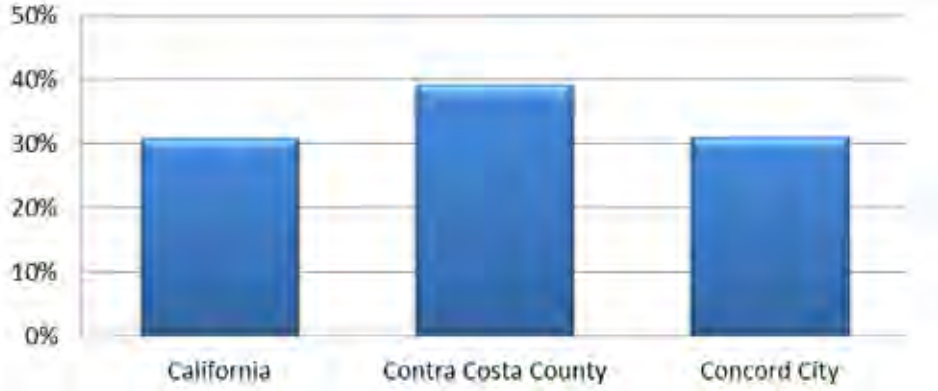
Figure 5.1 Contra Costa and Concord Population by Age (2012)



Source: U.S. Census Bureau American Community Survey 2012.

Contra Costa County has a higher share of residents with college degrees than the statewide and city averages. While the City is on par with the rest of the State, the surrounding county and regional education levels indicate good access to a well educated labor force, which is a critical competitive advantage for a location for higher density commercial office.

Figure 5.2 Contra Costa and Concord Share of Population with a Bachelor's Degree or Higher (2012)



Source: U.S. Census Bureau American Community Survey 2012.

Employment

The City of Concord's unemployment rate from 2000 to 2013 shows that residents were hit by the Great Recession and have recovered at a slightly better rate compared to Contra Costa County and California. Data from the past year demonstrates that the effects of the recession on employment are abating locally. Table 5.2 presents the unemployment rates by decade from 2000 to 2013.

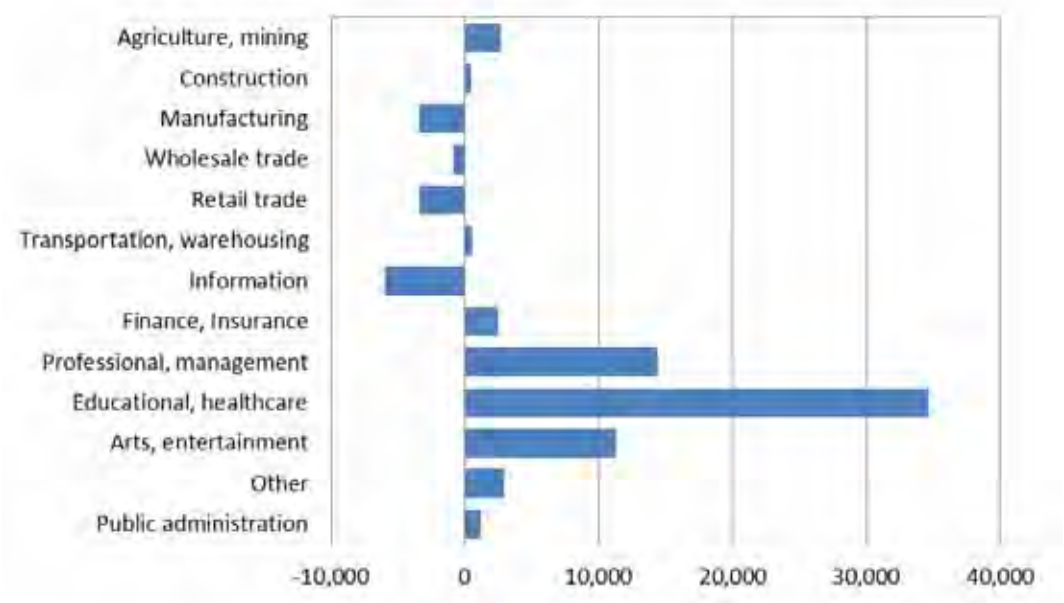
Table 5.3 Contra Costa County and Concord Unemployment Rate (1990 to 2013)

Area	2000	2012	2013 (Nov)
California	4.9%	10.5%	8.3%
Contra Costa County	4.8%	7.1%	6.9%
City of Concord	3.5%	9.7%	7.5%

Source: U.S. Census Bureau Census 2000; Bureau of Labor Statistics.

Contra Costa County employment grew approximately 13 percent from 2000 to 2012. Growth by industry sector illustrates industry-level trends witnessed across the U.S. and California. County manufacturing employment declined 9 percent from 2000 to 2012. Major service-providing industry sectors increased employment over the same period. The education and health care services sector increased employment 43 percent; the arts, entertainment, accommodation, and food services sector grew 40 percent; and the professional, scientific and management sector increased 22 percent. Figure 5.3 shows 2000 to 2012 industry-level employment change in Contra Costa County. Biomedicine, home health, and professional services occupations are several employment sectors anticipated to experience significant growth in the County.

Figure 5.3 Contra Costa County Change in Employment by Industry (2000 to 2012)



Source: U.S. Census Bureau Census 2000, American Community Survey 2012.

Land Use

This section reviews existing land uses and provides an overview of the residential, commercial and other activities occurring in the study area. Analysis of existing land uses can provide insight as to what constraints and opportunities may guide growth and development. Professional office uses, industrial research and development, and retail uses will be key to CCR's role as a smart growth area. Many of these uses fit medium to high density development types. Housing is not considered a likely high density land use adjacent to the airport, as airport areas are generally not attractive to residents due to aircraft noise[17]. Nevertheless, the presence and growth of residential development in the City and County can support business location and consumer patronage of retail near the airport.

The CCR study area has little available vacant land and significant employment density, which is one of the 11 criteria indicating potential smart growth opportunity. The area to the airport's south and east is occupied by large-footprint industrial and office park facilities, including retail and hotels. A golf course is located at southwest corner, and a residential subdivision extends along the eastern side. The west side is separated from neighboring development by Walnut Creek, with crossings at the north (Marsh Drive) and south (Concord Avenue) ends of the airport. Residential development extends along the airport's eastern side, on the far side of Walnut Creek.

This economic analysis focused on a 620-acre study area, broken into six geographic areas containing varying development conditions. The CCR project area is fully built-out (i.e., contains occupied structures and parking areas) with only one, single three-acre infill site remaining to be developed. The study area includes approximately 3.4 million square feet of single floor general commercial business space, two shopping centers, and two hotels. The study areas are shown in Figure 5.4 and described below.

- Area A contains 178 acres of housing, with primarily single-family houses;
- Area B is a small 93-acre golf course;
- Area C includes some Class A office space with name brand corporate tenants, such as Chevron;
- Area D includes large-scale retail, including the Willows Shopping Center anchored by Old Navy and a hotel;
- Area E contains big box retail stores of Lowes and Sport Mart as the primary anchors; and

[17] CCR regulations and the Airport Land Use Compatibility Plan outline noise mitigation procedures for aircraft users.

- Area F is fully built-out with active single story light industrial and business park space.

A recent Colliers International real estate market report verified that Concord and the North I-680/Highway 4 area have high commercial and industrial building vacancy rates. The regional vacancy rate increased slightly to approximately 16 percent in fourth quarter of 2013 from the fourth quarter of 2012[18]. Concord Class A office space vacancy declined at the end of 2013, while Class B and Class C office vacancy rate increased. Concord industrial and warehouse space remains in high demand, with warehouse space 100 percent occupied, and industrial flex space (research and development) vacancy rate was at only 4.7 percent at the end of 2013.[19]

Figure 5.4 CCR Area Land Use Assessment Map

Source: ESRI.

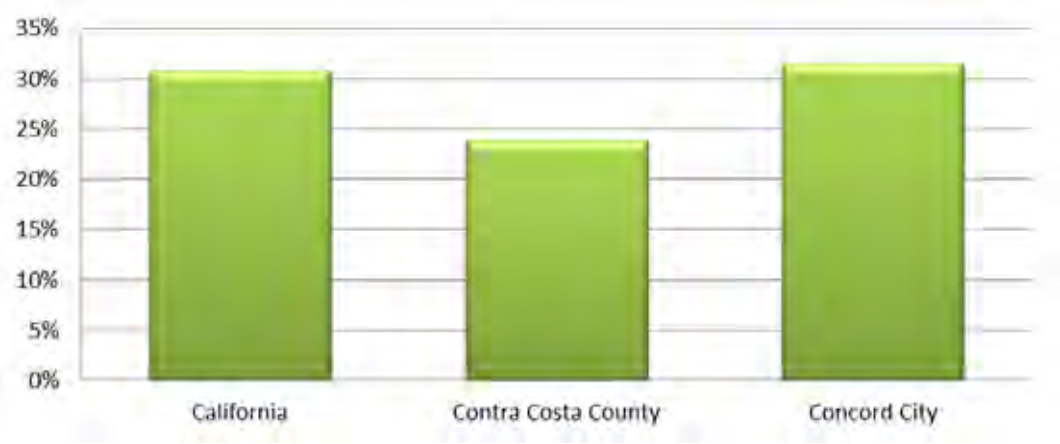
[18] Colliers International, *North I-680 Corridor Research and Forecast Report – Office*, accessed December 2013 at http://www.colliers.com/-/media/D1CAD622CC4B4111B99D605F11F0EBC2.ashx.

[19] Colliers International, *North I-680 Corridor Research and Forecast Report – Industrial*, accessed December 2013 at http://www.colliers.com/-/media/D3966B55C0EA4B538533EA8118BD7877.ashx.

Interviews with Concord staff indicated that the City would look favorably on any proposal to redevelop and create more business space on underutilized sites. The City's land use and zoning policies allow for greater development density near the airport. However, the recent market potential to attract new private real estate investment is not strong enough to support redevelopment for more intensive business uses. Buchanan Field is not a primary target for the City's limited staff time and fiscal resources, which area focused on redeveloping the former Concord Naval Weapons Station, Downtown, and vacant sites adjacent to the Concord Bay Area Rapid Transit (BART) Station.

About 65 percent of housing units in Concord are single family homes, reflecting the City's suburban setting in Contra Costa County. The share of multifamily housing in the City is higher than both the County and the State, however, indicating a higher development density than the surrounding region. Multifamily housing may be indicative of lower-than-average housing prices, which would not be surprising given that the share of college-educated residents is lower than the rest of the County. The share of multifamily housing is summarized below in Figure 5.5.

Figure 5.5 Contra Costa and Concord Share of Multifamily Housing (2012)



Source: U.S. Census Bureau American Community Survey 2012.

In summary, the market conditions illustrated by population, employment, and land use described above support the designation of CCR as a potential smart growth area. This demand is the first and most critical of three elements that are needed to justify CCR's smart growth area designation. The other two are the airport area's land use and regulatory environment and access to infrastructure and transit service. Each of these is described below.

Regulatory Environment and Community Perspectives

This section describes the regulations, such as zoning, noise abatements, and environmental controls near CCR. These regulations control different aspects of

future use of land near the airport, and also inform the community's support or lack thereof for future development in the region.

Zoning and Other Regulations

Contra Costa County owns the Buchanan Field runway. The golf course and retail space in study are E are located in the County. The project area remainder is located in the City of Concord, but also borders the City of Pleasant Hill. The primary areas investigated for this case study are located in the City of Concord (Figure 5.6).

Table 5.4 Concord Zoning Districts near CCR

Zoning Category	Description	Maximum Building Height
Business Park (BP)	BP is intended for campus-like office complexes as well as industrial parks.	Floor Area Ratio (FAR) 0.8
Public-Quasi-Public (PQP)	PQP is applied to property owned by governmental entities and to semi-public facilities.	FAR 1.5
West Concord Mixed-Use (WMX)	WMX is intended for use in the area generally located between the I-680 and Highway 242 freeways, south of Concord Avenue. It allows for a mix of office and commercial development.	FAR 4.0
Service Commercial (SC)	SC allows small scale commercial uses that provide goods and services to employees, residents and visitors. It includes automotive sales and services, building materials, warehousing, distribution and personal storage located on major arterial streets, as well as retail uses, services, and small offices.	FAR 0.8
CCR Airport Overlay (Denoted by ■)	The airport overlay assures development compatibility with airport operations. These restrictions have been incorporated into the General Plan Land Use Map.	Zone 1. Aviation only. Zone 2. 30 to 45 people per acre; 2 stories Zone 3. 125 to 250 people per acre; 3 stories Zone 4: 4 stories

Source: City of Concord, *Zoning Atlas*, accessed December 2013 at http://www.ci.concord.ca.us/pdf/dept/planning/zoning_mapbook.pdf.

Figure 5.6 Concord Zoning in Southeast Quadrant

Source: City of Concord, *Zoning Atlas*, accessed December 2013 at http://www.ci.concord.ca.us/pdf/dept/planning/zoning_mapbook.pdf.

Community Perspectives

Community opposition to growth near CCR could constrain future development near the airport. Opposition to airport growth and operations has generally come from residents living close to the airport and affected by noise from the flight patterns. However, the City of Concord has expressed interest in increased development near and around the airport to the extent allowed by safety and noise regulations. The City's objectives are presented in three plans: City of Concord 2030 General Plan, the Downtown Specific Plan, and Plan Bay Area (the Regional RTP/SCS); and in the City's zoning code, which lays out FAR of up to 4.0 in some areas.

- **The Concord 2030 General Plan** presents a long-range vision for the City. The plan describes a busy urban center with opportunities for residents and businesses, and developing a sense of community through enjoyable public spaces and safe, connected transportation network. The plan provides guidelines with which plans and development proposals must be consistent in order to be approved, and provides a touchstone for guiding and prioritizing investments and development policies. Key priorities include enhancing downtown as a vibrant center, supporting a diverse job base, supporting commercial and residential mixed-use development, a multimodal transportation system, integrating the former Naval Weapons Station into the City, and protecting open and park spaces.
- **The Downtown Specific Plan** is the City's short- and long-term development plan for the Downtown area. The Downtown area is located within approximately one-half mile of the Concord BART station, extending

west to Highway 242, east to San Carlos Avenue, north to the John Muir Medical Center, and south to Cowell Road. The area is designated a Priority Development Area (PDA) through ABAG and MTC, and Concord successfully secured funds from these agencies to support their planning activities. The goal of the plan is to implement policies and incentives to encourage and retain smart growth development in the downtown area. The City expects to complete the Final Specific Plan and Implementation Strategy in September 2014.

- **Plan Bay Area** is the RTP/SCS for the San Francisco Bay Area. The plan was prepared by the MTC and the ABAG in 2013. The plans goals are supported by identification of PDA. PDAs are transit-oriented neighborhoods that provide key infill development opportunities, supporting residents and workers, and contributing to pedestrian- and transit-friendly environments. Local jurisdictions help define the character of their PDAs, identifying regional centers, city centers, suburban centers, transit town centers or rural centers. The RTP requires the Contra Costa County Transportation Commission to direct at least 70 percent of its funding to PDAs. PDAs near Concord included Downtown Concord, Concord Los Medanos (Naval Weapons Station) Redevelopment Area, and Pleasant Hill: Diablo Valley College.

Access to Infrastructure and Transit Service

CCR is well served by infrastructure and city services, as it is located in a built-out commercial and industrial area between I-680, State Highway 242, and State Highway 4, with access at major intersections. Concord Avenue provides local connection to Downtown Concord, and with connections to Willow Pass Road, Chilpancingo Parkway, and Contra Costa Road providing intraregional and local roadway connection.

The airport's accessible location and proximity to local and regional transit service indicate its potential to provide good transit access, which supports higher density, walkable environments. While smart growth can exist without frequent transit service, the combination of smart growth and transit provides the greatest opportunities to reduce vehicle miles traveled (VMT). The airport is served by five bus routes operated by the Contra Costa County Connection transit agency. Frequent transit service is important to smart growth developments and while local services operate with low frequencies, the existing services indicate opportunity to enhance high quality transit service. Key transit services include:

- Routes 19 and 28 provide service between the Concord BART station and the Martinez Amtrak/Capitol Corridor station. Route 19 stops at the south airport entrance with two-hour headways in each direction, staggered one hour apart. Route 28 serves residential areas on the north and west side of the airport.

- Route 649 is a shuttle between Diablo Valley College and Concord BART with stops near the business park and shopping area. The route offers about 80-minute frequencies in each direction.
- Route 91 Concord Commuter Express serves a loop from Concord BART to the airport commercial park area during morning and afternoon peak weekday commuting hours, with 30-minute frequencies.
- The airport is within two miles of the Concord BART station and about seven miles from the Martinez Amtrak / Capitol Corridor station.

There are no current plans to increase transit service to the CCR area. However, the regional PDA application process, and the nearby PDA in Downtown Concord indicate a local willingness to align land use and transportation to spur the economy, provide accessible neighborhoods, and help reduce VMT.

Economic Analysis

The following section summarizes the results of the economic analysis, which shows an agglomeration of the employees into a more compact space around the airport, which improves the productivity of these businesses and generates significant additional economic growth because the agglomeration improves the productivity of these businesses. The detailed methodology used to measure the economic agglomeration benefits is described in Appendix E. This section provides the CCR study area results.

Projecting Land Use and Employment

The CCR study area contains 620 acres of land that is fully built-out with only one, single three-acre infill site remaining to be developed. The area includes 474 private land owners and five public sector tenants, which employ a total of 5,790 workers. Table 5.5 displays the number of jobs by industry sector.

Table 5.5 CCR Project Area Employment by Industry (2012)

Industry Sector	Jobs	Industry Sector	Jobs
Agriculture	1	Finance, Insurance, real estate	559
Mining	47	Professional & technical services	475
Utilities	103	Management & administration	238
Construction	273	Education & health care	404
Manufacturing	397	Arts, entertainment & recreation	106
Wholesale	192	Accommodations	34
Retail	1,602	Food service & drinking	447
Transportation & warehousing	358	Other services	291
Information	176	Public administration	88
		Study Area Total	5,791

Source: ESRI Project Area Employment Estimate 2012.

The consultant team traveled to every subarea of Buchanan Field and spoke with City of Concord planning staff to assess existing conditions and future development potential.[20] Site visits included visual assessments of key businesses, vacant lots, infill sites, roadways, open space, and potential environmental constraints in the project area. This information was used to categorize developed areas by land use type. The analysis followed four key steps to assess existing conditions, which are detailed in Appendix E.

The existing FAR is relatively low, indicative of the suburban, office park settings of much of the study area. Commercial retail FAR was 0.25, light industrial was 0.4, and office park areas was approximately 0.8. The lowest calculated FAR was warehouse uses at 0.35.

Next, the study team estimated future growth assuming a strong future market for smart growth development typologies. The team assumed the CCR study area could accommodate a 0.3 FAR for commercial retail space, 1.0 FAR for light industrial and warehouse space, and 4.0 FAR for office space. These assumptions were based on existing conditions and discussions with local planners about desired land uses and city regulations. The future land use estimates assume the same employment per square feet ratios as the existing conditions analysis, yielding an estimate of total square feet of development by land use category.

Table 5.6 presents the results of the future land use estimates. The CCR area has the capacity to add 5.5 million square feet of new business space and 10,200 new jobs attracted from elsewhere in California by the year 2040. Overall by 2040 this would hold a total of 8.8 million square feet of business space, accommodating approximately 16,000 employees. It is important to note that these are jobs projected to be added to the statewide economy between 2013 and 2040. As such, jobs forecast to locate in this area cannot be described as “new” to California as a consequence of smart growth. However, the study team then used this projected reallocation as inputs to the economic model in order to estimate additional economic activity in California that can be generated by the agglomeration induced by smart growth.

[20] Interviews with Carol Johnson (Planning Manager) and John Montagh (Economic Development and Housing Manager) for the City of Concord.

Table 5.6 CCR Area Employment by Industry (2040)

Building Type	Acres	Jobs	Floor Area per Employee	Total Floor Area	FAR
Commercial Retail	117	3,054	500	1,527,204	0.3
Light Industrial & General Commercial	69	2,993	1,000	2,992,500	1.0
Office and Business Parks & General Commercial	21	9,288	400	3,715,000	4.0
Hotel	4				
Warehouse	15	634	1,000	634,286	1.0
Residential	178				
Golf Course	93				
Roadways and Public Spaces	124				
Total	621	16,000		8,870,000	
30-year gain	621	10,200		5,468,000	

Source: EDR Group.

Estimating Economic Impacts

The effect of greater smart growth development near CCR is forecast to result in 1,255 additional jobs, $152 million in additional value added, and nearly $105 million in additional income to the California economy by the year 2040. These are the potential economic impacts of smart growth/business attraction policies are due to agglomeration in the smart growth area above the baseline forecast. The results by industry sector are presented in Table 5.7 below.

The leading industrial sectors include professional, scientific and technical services; administrative support and waste management; real estate and rental; and manufacturing. Professional, scientific and technical services account for 31 percent of the increase in value added, and 37 percent of income growth. Administrative support and waste management accounts for 23 percent of value added growth, and 29 percent of income growth. Real estate and rental/lease services account for 10 percent of value added growth, but only 2 percent of income change. Though declining over recent years, manufacturing accounts for 8 percent of value added, and 6 percent of income growth.

Table 5.7 CCR Economic Analysis Results (2040)
(In Millions of Current 2013 U.S. Dollars)

	Total Impacts to California			
NAICS Sector and Name	Jobs	Output	Value Added	Income
11 Agriculture, Forestry, Fishing, and Hunting	6	0.90	0.44	0.33
21 Mining, Quarrying, and Oil and Gas Extraction	2	0.73	0.40	0.12
22 Utilities	1	1.35	0.65	0.21
23 Construction	11	1.91	1.14	1.00
31-33 Manufacturing	43	41.28	12.46	5.89
42 Wholesale Trade	25	6.01	4.43	2.55
44-45 Retail Trade	91	9.74	7.28	4.64
48-49 Transportation and Warehousing	34	6.23	3.40	2.68
51 Information	14	5.46	3.22	1.79
52 Finance and Insurance	39	9.24	5.28	2.72
53 Real Estate and Rental and Leasing	68	20.43	15.61	2.34
54 Professional, Scientific, and Technical Services	253	65.55	47.78	38.80
55 Management of Companies and Enterprises	14	4.12	2.57	2.23
56 Administrative and Support and Waste Management and Remediation Services	428	52.14	35.68	30.17
61 Educational Services	12	0.82	0.54	0.48
62 Health Care and Social Assistance	56	5.73	3.85	3.38
71 Arts, Entertainment, and Recreation	13	1.12	0.76	0.48
72 Accommodation and Food Services	75	6.94	4.02	2.71
81 Other Services [except Public Administration]	32	2.42	1.61	1.41
92 Public Administration	7	0.82	0.79	0.68
Total	1,225	242.94	151.90	104.61

Source: EDR Group.

Fresno Yosemite International

Fresno Yosemite International Airport (FAT) is a major metropolitan commercial air service airport located in the City of Fresno. Fresno is in central California about 60 miles south of Yosemite National Park and 110 miles north of Bakersfield. FAT is owned by the City of Fresno and offers a full range of aviation services, including commercial air service, air freight service, and general aviation services with an emphasis on business and corporate aircraft. In addition, the airport accommodates military activities, including the California

Air National Guard Base (144th Wing with F-16s) and an Army Air Maintenance Depot.

According to FAT's airport properties manager, land uses on airport property consist primarily of aviation-related use, with scattered commercial and industrial buildings. The entire airport encompasses 1,728 acres, of which the California Air National Guard Reserve occupies a 58 acre area in the southeast corner. Two FBOs are located onsite – Corporate Air and Signature Flight Support – and provide fuel, air maintenance, aircraft rental, and aircraft parking services. In addition, the Fresno Airways Golf Course is located on airport property north of the runways.

The study team applied 11 characteristics to determine the role of the airport area in the regional SCS. The results of this screening indicated that FAT is one of the four case study airports (out of 20 total case studies) that can play the role of a smart growth area and a transportation hub. These roles involve the potential to attract denser, mixed-use development because of:

- Proximity to high employment density;
- Proximity to multimodal infrastructure;
- Land that is potentially suitable for high density mix use for development;
- Proximity to service infrastructure (e.g., water, sewer, fire, police); and
- The community stance on development.

Quantitative economic analysis presented in this case study suggests that smart growth consisting of higher density, walkable development connected to new or expanded transit services could lead to $286 million in additional value added, and $179 million in increased income. The following case study evaluates three different types of conditions within FAT area to determine constraints and opportunities.

Market Assessment

The market assessment describes three economic forces that drive the market feasibility for developing high density, mixed-use development with in the FAT area: population growth and characteristics, employment, and land use.

Population

The size of a region's population, as well as the employment, education, and age of the population, indicates the types of consumers and workers that would be patronizing FAT-area retail land use and employees available to the FAT-area businesses. As shown in Tables 5.8 through 5.12, demographic trends reveal that the study area around FAT has adequate population, higher than state average population growth, and a labor force to potentially support the type of dense, active development that would be desired for a smart growth area.

Table 5.8 shows the City and County of Fresno's population growth has outpaced state population growth since 1990. The City and County of Fresno have experienced relatively similar population growth rate during the same period. This trend is projected to continue and the County of Fresno's population is projected to increase to 1.7 million by 2040.[21]

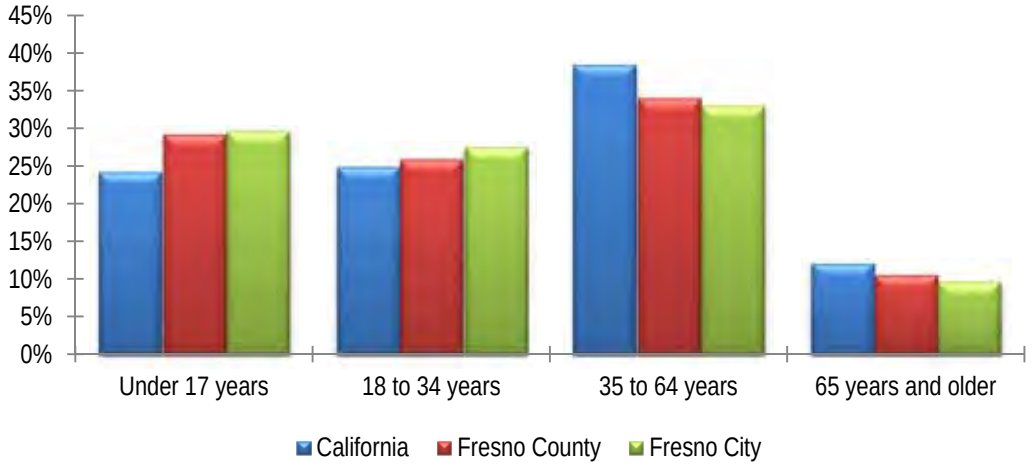
Table 5.8 Fresno County and City Population and Population Change (1990 to 2012)

				1990-2000		2000-2012	
Area	1990	2000	2012	% Change	Avg Annual Change	% Change	Avg Annual Change
California	29,760,021	33,871,648	38,041,430	14%	1%	12%	1%
Fresno County	667,490	799,407	947,895	20%	2%	19%	1%
Fresno City	354,202	427,652	505,870	21%	2%	18%	1%

Sources: U.S. Census Bureau, Census 1990, Census 2000, American Community Survey 2012.

The population of the City and County of Fresno is younger than California's population. Figure 5.7 shows that the City of Fresno's population has a larger cohort of individuals under 17 years old and between 18 and 34 years old than the State or County. In addition, the City of Fresno has a smaller share of individuals 35 to 64 years old and a smaller share of individuals over age 65. In addition, Fresno County has a slightly higher number of people per household (3.1) than the state average (2.9).

Figure 5.7 Fresno County and City Population Age Profile (2012)

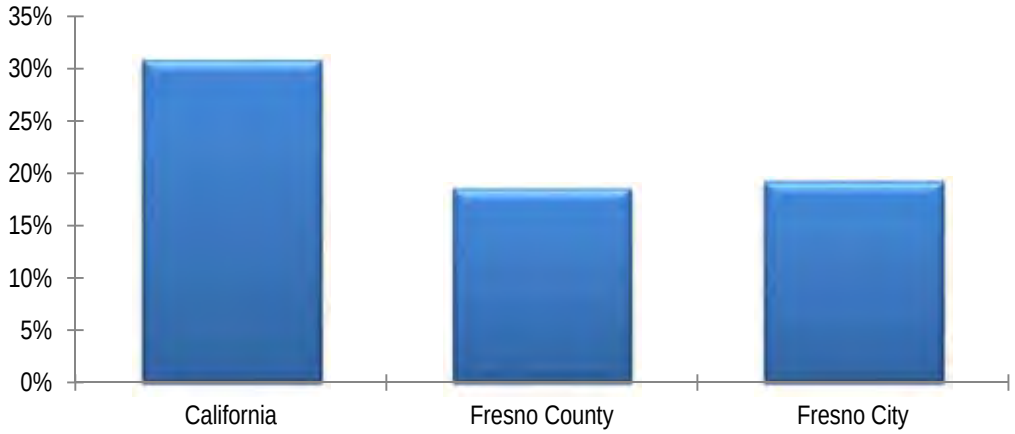


Source: U.S. Census Bureau American Community Survey 2012.

[21] Fresno COG's Regional Transportation Plan 2035.

Higher levels of educational attainment in the City and County of Fresno are slightly lower than the statewide average. Figure 5.8 shows that the City and County of Fresno have a lower share of individuals with a Bachelor's degrees and above than the State of California. The City has a higher percentage of individuals with less than a high school diploma.

Figure 5.8 Fresno County and City Share of Population with a Bachelor's Degree or Higher (2012)



Source: U.S. Census Bureau American Community Survey 2012.

Fresno's population profile is characterized by a younger, less educated population than the state average, which increases for multi-unit and smaller lot single family housing at lower price points. In addition, this household demographic profile has higher demand for transit, biking, and walking, which provide younger household members with more affordable transportation options and spend a smaller portion of their income to transportation.

Employment

Table 5.9 shows the unemployment rates for California and the City and County of Fresno. Overall, Fresno County has seen higher rates of unemployment than the state average, perhaps due to the younger population.

Table 5.9 Fresno County and City Unemployment Rates (1990 to 2013)

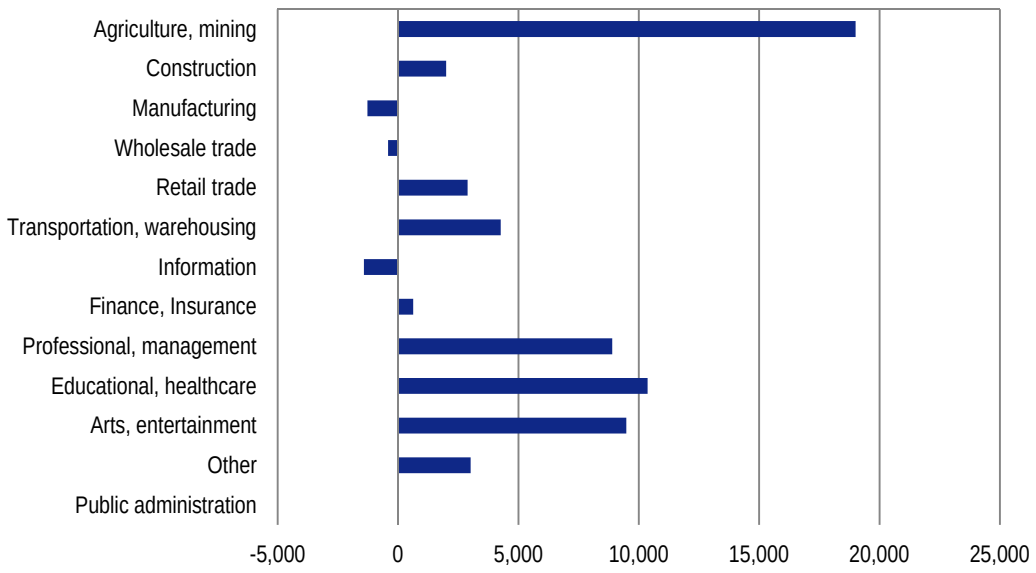
Area	1990	2000	2012	2013 [a]
California	5.8%	4.9%	10.5%	8.3%
Fresno County	11.7%	10.4%	15.2%	12.0%
Fresno City	10.5%	9.7%	14.3%	11.2%

Source: U.S. Census Bureau Census 1990, Census 2000, and American Community Survey 2012.

[a] 2013 data is preliminary data for the month of October 2013.

Between 2000 and 2012, Fresno County's total employment grew by 19 percent. Figure 5.9 shows these trends by industry-level sector. Agriculture and mining employment saw the largest absolute increase (19,000 workers) and percentage increase (75 percent) during this period. Employment in professional and management, educational and healthcare, and arts and entertainment also experienced between 8,000 and 11,000 new employment from 2000 to 2012. Employment in manufacturing and information, however, decreased during this period.

Figure 5.9 Fresno County Change in Employment by Industry (2000 to 2012)



Source: U.S. Census Bureau Census 2000 and American Community Survey 2012.

Land Use

The City of Fresno is located in a mid-sized urban area in California's Central Valley. The area surrounding the airport is largely built out, but there is some undeveloped land to the airport's east, some of which is farmland. Existing land uses near the airport include single family and multifamily residential homes, neighborhood-serving retail, and light industrial parks. This analysis divides the study area surrounding FAT (2,040 acres), into seven areas for the economic analysis. These areas are shown in Figure 5.10 and described below:

- **Area A** is a fully built-out light industrial area with general commercial along the main thoroughfares of Clovis and Shields;
- **Area B** is almost entirely comprised of vacant land, some of which is located under the flight path and may be unbuildable;
- **Area C** is composed of the Airways Golf Course adjacent to 150 acres of undeveloped land;

- **Area D** has a mix of business space, housing, and the Fresno Adventist Academy;
- **Area E** is close to the airport entrance and has a hotel and higher-end business park space;
- **Area F** includes more than 100 acres of vacant land, along with the giant warehouse buildings, one of which is occupied by the GAP Pacific Distribution Center; and
- **Area G**, located in the City of Clovis, includes the 70-acre Clovis Shopping Center anchored by Winco and Costco, along with a scattering of light industrial uses and vacant land sites.

Figure 5.10 FAT Area Land Use Assessment Map

Source: ESRI.

The project team interviewed airport staff to learn about activities and land uses on and off airport property. A number of commercial and industrial buildings are located on airport property. Land on the airport property is fairly constrained by surrounding development, reserved for aviation-related land uses; however, the airport is considering releasing some of its land from aviation

use to sell for additional commercial and industrial development.[22] Staff reported that many of commercial and industrial buildings nearby the airport are currently vacant. Neighboring business parks are not owned by the airport, including the GAP Pacific Distribution Center and an auto parts distribution center. When it was announced, in 1997, that the GAP Pacific Distribution Center would locate in Fresno, media reported that the mid-state location, attractiveness, affordability, available labor pool, enterprise zone status (no longer existing), and accessibility to road and air transportation influenced the decision.[23]

A recent Colliers International real estate market report verified that the area surrounding FAT has high commercial and industrial building vacancy. The report found that of all Fresno County's neighborhoods, the Airport/Southeast area experiences relatively high vacancy rates. In 2013, the Airport/Southeast region experienced a 14.8-percent vacancy rate, as compared to a 13-percent rate in Fresno County. These vacancy rate increases were attributed to businesses moving north because of shrinking space needs.[24]

Table 5.10 shows that Fresno County has a larger share (70 percent) of single family housing than both the City and the State. The City of Fresno has a higher share of multifamily housing units than both California and Fresno County, although this may be because the City is home to California State University, which includes dormitories and apartments catering to students. The university is located 1.6 miles northwest of FAT, and creates demand for multifamily housing units in FAT's vicinity.

Table 5.10 Fresno County Housing Type and Vacancy Rate (2012)

Housing Type and Occupancy Rate	California		Fresno (County)		Fresno (City)	
	Number	Percent	Number	Percent	Number	Percent
Single Family	8,983,275	65%	223,008	70%	111,175	64%
Multifamily 2+ units	4,243,133	31%	82,830	26%	58,822	34%
Mobile Homes	559,389	4%	14,805	5%	4,748	3%
Total	13,785,797	100%	320,643	100%	174,745	100%
Vacancy Rate	–	8.1%	–	6.2%	–	6.1%

Source: U.S. Census Bureau American Community Survey 2012.

[22] Telephone interview with Rhonda Jorn, Marketing and PR Manager and Daniel Webster, Airport Properties Manager for Fresno Yosemite International Airport.

[23] San Francisco Chronicle, "Gap to build Fresno distribution center," September 17, 1997, accessed January 2013 at http://www.sfgate.com/business/article/Gap-to-build-Fresno-distribution-center-3099803.php, accessed December 10, 2013.

[24] Colliers International, Fresno/Clovis Metro Area Office Market Report, Quarter 1 2013.

Regulatory Environment and Community Perspective

This section describes the Fresno County regulations, such as zoning, FAR, height restrictions, historical preservation, noise abatement, toxic or chemical restriction, recreational uses, open space, or agricultural preservation, which could affect future growth development in the vicinity of FAT. These regulations control different aspects of future use of land near the airport, and also inform the community's support or lack thereof for future development in the region.

Zoning and Other Regulations

A City or County's zoning code sets forth where and what type of new development or redevelopment can occur. A municipal zoning code will describe not only the type of use (such as commercial, residential, industrial, or mixed-use), but will also specify qualities such as height and density limits or requirements and parking requirements.

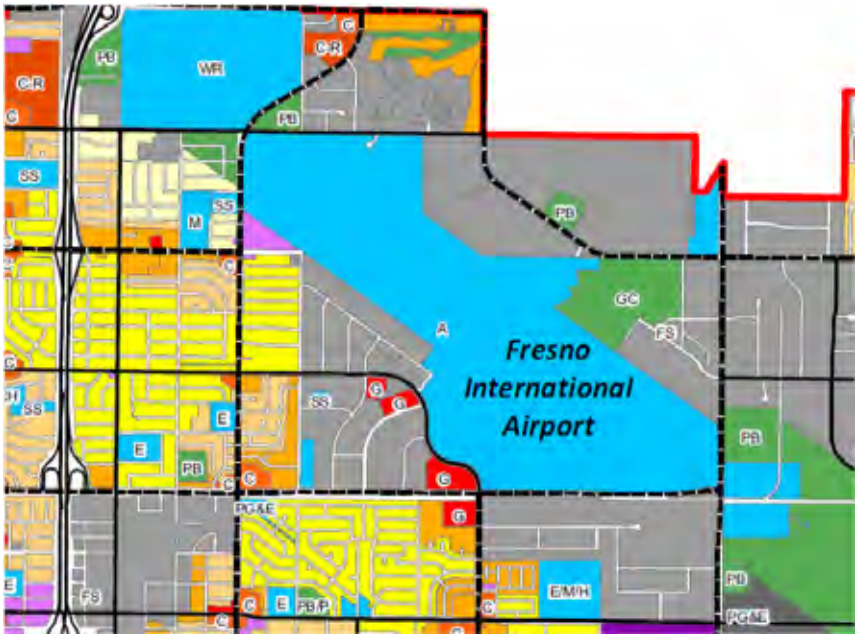
The City of Fresno Municipal Zoning Code uses categories and zoning to classify land uses near the airport for current and future development. Table 5.11 shows the primary land use types zoned nearby the airport, and Figure 5.11 illustrates the zoning district map.

Table 5.11 Fresno Zoning Districts near FAT (2012)

Zoning Category	Description	Maximum Building Height (in Feet)
C – Regional Shopping District (City of Fresno)	The "C-3" Planning Shopping Center District is intended to provide the facilities of a General Commercial District in a planned shopping center.	60
C – General Commercial (City of Fresno)	The "C-1" and "C-2" Districts are intended to serve as planned unified shopping centers. The stores are intended to fit into the residential pattern of development.	35
M-1 – Light Manufacturing District (City of Fresno)	The "M-1" Light Manufacturing District is intended to provide for the development of industrial uses which include fabrication, manufacturing, assembly or processing of materials.	60
R – Residential- Single Family (City of Fresno)	The "R" Districts is intended to provide for the development of residential homes at urban standards.	35 to 60
R-A, AE-5, or AE-20 (City of Fresno)	The "R-A" District allows one family residential estate homes in a semi-rural environment. The "AE Districts allow for agricultural uses.	35
O – Open Conservation District	The "O" Open Conservation District is intended to provide for permanent open spaces.	35

Source: City of Fresno Municipal Code.

Figure 5.11 City of Fresno Zoning Map Excerpt



Source: City of Fresno.

The City of Fresno also offers a Foreign Trade Zone (FTZ) as an incentive to attract businesses.[25] Businesses located in Fresno's FTZ may qualify to avoid customs duties under the following scenarios: any previously-imported material is re-exported; rejected, scrapped, destroyed, waste, or returned-to-vendor material; sales to companies operating in other domestic FTZs. The Merced FTZ neighbors the airport to the northeast, and may have impacts on future development and land uses.

Three plans guide growth near FAT. They support continued smart growth development near the Airport while maintaining the Airport's strong role in regional transportation. The City of Fresno has land use plans and regulations that govern land use and future development across the region and near the airport. Plans and policies most relevant to this study include the following: the City of Fresno Municipal Zoning Code, the Fresno Yosemite International Airport Land Use Compatibility Plan, and the Fresno COG RTP/SCS.

- **Fresno Yosemite International Airport Land Use Compatibility Plan.**[26] The City of Fresno prepared this plan to promote land use compatibility in FAT's

[25] City of Fresno Incentive Zones and Tax Credits, http://www.fresno.gov/Businesses/IncentiveZones/Default.htm, accessed December 10, 2013.

[26] For more information see http://www.fresno.gov/planningdocs/Plans/FYI.pdf, accessed January 13, 2014.

Airport Influence Area (AIA) pursuant to the California State Aeronautics Act. This plan identified compatible land use that met three criteria:

- Noise. Avoid establishment of new noise sensitive land uses and exposure of the users to levels of aircraft noise that can disrupt activities;
- Safety. Minimize the risks associated with an off airport aircraft accident or emergency landing; and
- Airspace protection. Ensure that structures and other land uses do not cause hazards to aircraft in the airport vicinity.

- **Fresno COG RTP/SCS.** The Fresno Council of Governments (COG) is preparing the 2014 RTP/SCS, which is expected to be released by February 2014. The RTP/SCS will consider the region's long-term housing, transportation, and land use needs with consideration on how the region can accommodate population and economic growth while using resources efficiently, protecting existing communities, and conserving farmland and open space. The Draft Policy Element includes goals that address the continued development of aviation facilities and services that complement the regional transportation system, and the promotion of urban development near existing urban centers in the region.
- **The San Joaquin Valley Blueprint Planning Process** is a joint initiative between the San Joaquin Valley COG, the San Joaquin Valley Air Pollution Control District, and the Great Valley Center to develop a regional land use and transportation vision that will guide growth over the next 50 years. Several growth scenarios were developed; and in April 1, 2009, the San Joaquin Valley Regional Policy Council adopted "Scenario B+" as the Preferred Blueprint Growth Scenario. "Scenario B+" places increased emphasis on protecting agricultural lands and environmental resources and enhancing regional transportation infrastructure. In the "Scenario B+" map, the airport is located in an area characterized as existing development.

Community Perspectives

This section provides an overview of the surrounding communities' perspectives on growth and development near the airport. FAT has not faced challenges from community groups in response to development activities at the airport. The City of Fresno conducted public workshops in 2011 and 2012 regarding proposed airport improvements and received no comments. There was no opposition to proposals to extend and reconfigure the airport's runway per FAA design standards.

According to the Airport Land Use Compatibility Plan, the community plans of two surrounding neighborhoods – Hoover and McLane – recommend the continuation of land use controls to help mitigate airport noise. However, FAT's noise contours have decreased substantially since the adoption of the Hoover and McLane Community Plans in 1979 and 1980, respectively, thanks to

advances in airplane engine technology and an ongoing noise compatibility program.

Access to Infrastructure and Transit Service

The City of Fresno is located in a major metropolitan area, with a well-connected transportation network that links with destinations across the State by road and rail. The City is located off Route 99, a major north-south state highway that parallels Interstate 5. Numerous other limited access highways connect with Fresno with cities throughout the Central Valley, including Routes 41, 168, and 180. Around the airport, the area is generally characterized by multilane arterials with smaller residential areas off the main thoroughfares. Most high-traffic streets do not have particularly pedestrian- or bike-friendly environments, but many do have sidewalks. In addition, there are several bike paths throughout the region.

Figure 5.12 Fresno Aerial Photo

Source: Fresno County Airport Land Use Commission.

Fresno is served by local bus service and an Amtrak station. Fresno Area Express (FAX) bus service serves Fresno County and has been making many improvements recently to address air quality, accessible service objectives, and pursue Intelligent Transportation Systems (ITS) technology. Amtrak's San Joaquin passenger rail route provides service in downtown Fresno, approximately five miles southwest of the airport. The San Joaquin route provides service from the San Francisco Bay Area and Sacramento through the San Joaquin Valley to Bakersfield. In addition, the Burlington Northern Santa Fe and Union Pacific railroads run through Fresno. The Fresno COG completed the Bus Rapid Transit Master Plan in 2008 to advance future service planning. According to the 2011 RTP, the region is interested in identifying transportation corridors where rights-of-way can be preserved and developed to improve mobility.

Economic Analysis

The following section summarizes the results of the economic analysis, which show that the development of vacant land around the airport in smart growth development typologies generates significant additional economic growth. The detailed methodology used to measure the economic agglomeration benefits is described in Appendix E. This section provides the FAT study area results.

Projecting Land Use and Employment

The Fresno Yosemite International Airport economic analysis study area contains 2,040 acres surrounding the airport, of which 25 percent are vacant and undeveloped. The project area includes 8.1 million square feet of built-out light industrial, warehouse, general commercial, and retail business space, along with 50 acres of housing, a golf course a school, a shopping center, and some unusual features such as a 1 million square foot and a second 500,000 square foot warehouse building adjacent to each other. Approximately 931 private firms and 20 government agency tenants that employ 10,880 workers are located in the project area. Table 5.12 presents today's employment by industry sector.

Table 5.12 FAT Area Employment by Industry (2012)

Industry Sector	Jobs	Industry Sector	Jobs
Agriculture and mining	100	Professional & tech services	20
Utilities	40	Management & administration	0
Construction	1,810	Education & health care	400
Manufacturing	1,670	Arts, entertainment & recreation	100
Wholesale	670	Accommodations	10
Retail	640	Food service & drinking	80
Transportation & communication	1,030	Automotive Services	160
Information	0	Other services	1,520
Finance, insurance, real estate	1,210	Public administration	1,450
		Study Area Total	10,910

Source: ESRI Project Area Employment Estimate 2012.

The consultant team visited the FAT study area and spoke with city planning staff to assess existing conditions and future development potential[27]. Site visits included visual assessments of key businesses, vacant lots, infill sites, roadways, open space, and potential environmental constraints in the project area. This information was used to categorize developed areas by land use type. The analysis followed four key steps to assess existing conditions, which are detailed in Appendix E.

The existing FAR is relatively low, indicative of the low-lying office park settings of much of the study area. Commercial retail FAR was 0.30, light industrial was 0.33, and office park FAR was approximately 0.57. The lowest calculated FAR was for warehouse, at 0.35. The area has 2,040 acres of developed land, yielding about 8,142,000 square feet of total floor area. The area also has 540 acres of

[27] Interviews with Dwight Kroll, City of Clovis Planning Director; Jennifer Clark, City of Fresno Department of Development and Resource Management Director; and Sophia Pogoulatos, City of Fresno Supervising Planner.

undeveloped land, which provides the most immediate opportunity for smart growth development.

The study team estimated future growth assuming the future market for smart growth development typologies would lead to development on the 540 acres that are currently vacant. However, relatively weak market demand is the primary constraint to attracting more growth to the Fresno Yosemite International Airport project area, so no further land use assumptions were changed.

Table 5.13 shows the estimate that the development of study area vacant land could add 8.9 million square feet of new business space and create 13,100 new jobs attracted from elsewhere in California by the year 2040 years. Overall by 2040 the study area could hold 17.1 million square feet of business space that would accommodate 24,000 employees. It is important to note that these are jobs projected to be added to the statewide economy between 2013 and 2040. As such, jobs forecast to locate in this area cannot be described as "new" to California as a consequence of smart growth. However, the study team then used this projected reallocation as inputs to the economic model in order to estimate additional economic activity in California that can be generated by the agglomeration induced by smart growth.

Table 5.13 FAT Area Employment by Industry (2040)

Building type	Acres	Jobs	Building SF per Employee	Total Floor Area	FAR
Commercial Retail	120	3,160	500	1,580,000	0.30
Light Industrial & General Commercial	673	9,760	1,000	9,760,000	0.33
Office and Business Parks & General Commercial	169	10,490	400	4,198,000	0.57
Warehouse	272	520	3,000	1,550,000	0.13
Hotel	4	20			
Vacant	0				
Residential	50				
Golf Course	330				
School	30				
Roadways and Public Spaces	391				
Total	2,040	24,000		17,100,000	
30-year gain		13,100		9,000,000	

Source: EDR Group.

Estimating Economic Impacts

The total impacts to California by industry sector are presented in Table 5.14 below. The effect of greater smart growth development near FAT is forecast to result in 2,009 additional jobs, $285.58 million in additional value added, and

nearly $180 million in additional income to the California economy by the year 2040. These are the potential economic impacts of smart growth/business attraction policies are due to agglomeration in the smart growth area above the baseline forecast.

Table 5.14 FAT Area Economic Analysis Results (2040)
(In Millions of Current 2013 U.S. Dollars)

	Total Impacts to California			
NAICS Sector	Jobs	Output	Value Added	Income
11 Agriculture, Forestry, Fishing and Hunting	27	3.86	1.88	1.43
21 Mining, Quarrying, and Oil and Gas Extraction	8	3.51	1.90	0.58
22 Utilities	4	3.44	1.64	0.54
23 Construction	33	6.01	3.56	3.13
31-33 Manufacturing	264	288.41	87.08	41.16
42 Wholesale Trade	96	25.34	18.66	10.75
44-45 Retail Trade	121	10.49	7.85	4.99
48-49 Transportation and Warehousing	153	33.27	18.16	14.33
51 Information	28	10.92	6.44	3.58
52 Finance and Insurance	72	17.04	9.75	5.02
53 Real Estate and Rental and Leasing	94	25.19	19.25	2.89
54 Professional, Scientific, and Technical Services	289	67.11	48.91	39.72
55 Management of Companies and Enterprises	35	8.61	5.37	4.66
56 Administrative and Support and Waste Management and Remediation Services	471	54.36	37.20	31.46
61 Educational Services	22	1.48	0.98	0.86
62 Health Care and Social Assistance	101	10.40	6.98	6.13
71 Arts, Entertainment, and Recreation	23	1.97	1.34	0.83
72 Accommodation and Food Services	95	7.25	4.20	2.83
81 Other Services (except Public Administration)	61	4.60	3.05	2.67
92 Public Administration	13	1.43	1.37	1.18
Total	2,009	584.68	285.58	178.75

Source: EDR Group.

The leading industrial sectors include manufacturing; professional, scientific and technical services; and administrative support and waste management. Manufacturing accounts for 30 percent of total change in value added, and

23 percent in total change in come. Professional, scientific and technical services account for 17 percent of the increase in value added, and 22 percent of income growth. Administrative support and waste management accounts for 13 percent of value added growth, and 18 percent of income growth.

Gillespie Field Airport

Gillespie Field Airport (SEE) is the oldest and largest of San Diego County's eight airports. The airport is located in El Cajon, a city 15 miles due east of the City of San Diego and the fifth largest of 18 cities in San Diego County. Gillespie Field is a public use reliever airport which includes runways, tower, and a terminal. The airport includes two business parks, which provide more than 3,000 jobs in the City of El Cajon and a $110 million contribution to the local economy in direct, indirect and induced revenues.[28] The businesses at the airport include flight schools, repair and maintenance shops, aircraft storage, food and beverage services, fuel, instrument and avionics shops, rental cars and aircraft sales and rental services.

The study team applied 11 characteristics to determine the role of the airport area in the regional SCS. The results of this screening indicated that SEE is one of the eight case study airports in this study that can play the role of a smart growth area and a transportation hub. These roles involve the potential to attract denser, mixed-use development because of:

- Proximity to high employment density;
- Proximity to multimodal infrastructure;
- Land that is potentially suitable for high density mix use for development; and
- Proximity to service infrastructure (e.g., water, sewer, fire, police).

Quantitative economic analysis presented in this case study suggests that smart growth consisting of higher density, walkable development connected to new or expanded transit services could lead to $121.26 million in additional value added, and $80.4 million in increased income. The following case study evaluates the market, regulatory environment, and access to infrastructure that help determine the area's constraints and opportunities.

Market Assessment

The market conditions that drive feasibility of Gillespie Field as a smart growth area may be divided between demand and supply. Demand comes from households and businesses for goods and services produces by businesses that

[28] County of San Diego website, Accessed 12-27-2013: http://www.sdcounty.ca.gov/dpw/airports/apinfo.html

locate within the Gillespie Field area. Household demand is manifested by the number and composition of the population and measured by demographic trends in the areas surrounding Gillespie Field. Business demand is generated from the Gillespie Field area firms and employees. The supply side is assessed by evaluating the competitive advantages of land located within the Gillespie Field area over the alternative land outside the Gillespie Field area. These population, employment, and land use trends are presented below.

Population

According to the El Cajon 2013 Draft Housing Element, the most significant increase in the rate of El Cajon's population growth occurred during the 1950s; during the decade, the City's population increased over 500 percent. By 2000, El Cajon remained the fifth largest city in the County with a population over 94,000, but the population had grown only seven percent. A growth rate of about 4 percent has been maintained from 2000 to 2012, during which El Cajon's population increased from 94,869 in 2000 to 98,813.[29]

Although the City's population growth has been slower than in the County, El Cajon's population growth is comparable to nearby jurisdictions.[30] Table 5.15 shows the population growth in El Cajon, Santee, and the County of San Diego has been slightly lower than growth at the state level between 2000 and 2012.

Table 5.15 San Diego County and El Cajon Population and Population Change (1990 to 2012)

				1990-2000		2000-2012	
Area	1990	2000	2012	% Change	Avg. Annual Change	% Change	Avg. Annual Change
California	29,760,021	33,871,648	38,041,430	14%	1%	12%	1%
San Diego County	2,498,016	2,813,833	3,177,063	13%	1%	13%	1%
El Cajon	88,693	94,869	98,813	7%	0.7%	4%	0.3%

Sources: U.S. Census Bureau Census 1990, Census 2000, American Community Survey 2012.

The population age profiles for the State, County, and El Cajon, shown in Figure 5.13, reveal that nearly one-third of the population is under age 17. The 18- to 34-year old cohort, which represents a potential emerging market for both housing and jobs, makes up 24 percent of the city population, slightly lower than San Diego County and California. The 35- to 64-year old cohort makes up

[29] El Cajon Housing 2013-2021, http://www.ci.el-cajon.ca.us/dept/comm/Forms/1Draft%20Housing% 20Element%208-7-2013.pdf.

[30] El Cajon Housing 2013-2021, http://www.ci.el-cajon.ca.us/dept/comm/Forms/1Draft%20Housing%20Element%208-7-2013.pdf.

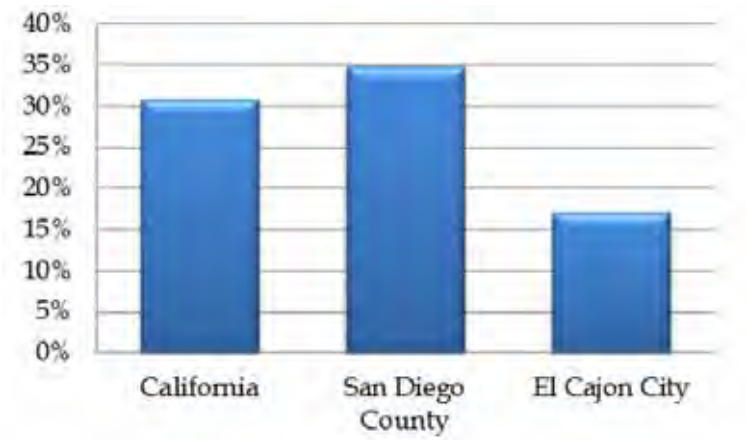
47 percent of the population in the City, which is on par with the county and California averages.

Figure 5.13 San Diego County and City Population by Age (2012)

Source: U.S. Census Bureau American Community Survey 2012.

As shown in Figure 5.14, the percent of people in the City with a Bachelor's degree and above is about one-half that when compared to the County and California. This labor force composition suggests better employee match for industries requiring blue collar professions, such as service occupations, warehousing, and manufacturing, rather than professional or high-skilled technical jobs requiring advanced degrees.

Figure 5.14 San Diego County and City Share of Residents with a Bachelor's Degree or Higher (2012)



Source: U.S. Census Bureau American Community Survey 2012.

Employment

Table 5.16 presents the 2000 and 2013 unemployment for the State, County, and City. The trends show that El Cajon also has an unemployment rate that is approximately two to three percentage points higher than that of the County and State. All 2012 unemployment rates are more than double the rate in 2000, a

result of the Great Recession, but by 2013 the City, County, and State show decreased unemployment of approximately two percent from 2012.

Table 5.16 San Diego County and El Cajon Unemployment Rates (1990 to 2013)

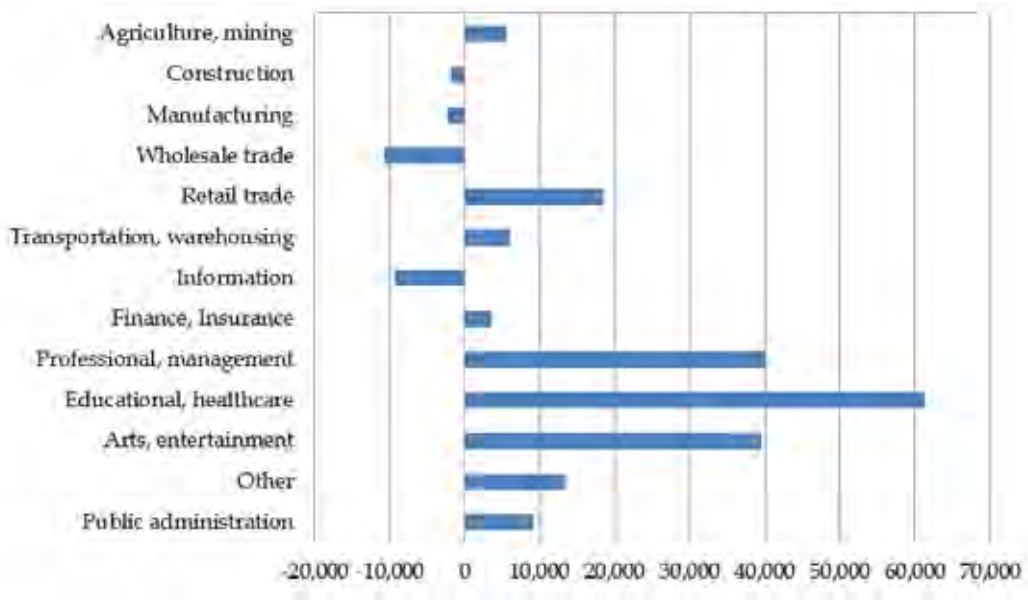
Area	1990	2000	2012	2013
California	5.8%	4.9%	10.5%	8.3%
San Diego County	4.6%	3.9%	8.9%	7.0%[a]
El Cajon City	5.6%	5.4%	12.2%	9.7%[a]

Sources: US Census Bureau Census 1990, Census 2000 and American Community 2012.

[a] 2013 data is preliminary data for the month of October 2013.

The labor trends represented in Figure 5.15 reflect a similar employment profile in 2012 as in 2000 for the County of San Diego. According to the El Cajon draft 2013 to 2021 Housing Element, the top three largest occupational categories for city residents remain the same as in 2000. Those include sales and office, management, business, science and arts; and service.[31] These categories accounted for 79 percent of the jobs held by El Cajon residents. By comparison, these occupations accounted for 83 percent of the jobs held by county residents.

Figure 5.15 San Diego County Change in Employment by Industry (2000 to 2012)



Source: U.S. Census Bureau Census 2000 and American Community Survey 2012.

[31] El Cajon draft Housing Element, 2013 to 2021.

In summary, the population, employment and land use trends support the use of SEE as a smart growth area the given the demand for and supply of commercial property described above. The population is of sufficient size and density to create demand for smart growth land use patterns that allow residents and employees to access goods and services via multimodal options, including walking, bicycling, and transit services. The education and employment trends – leaning towards creative and professional services – create a demand for office and commercial developments, which are compatible with smart growth. The existing land uses hold the potential to be redeveloped into more structurally dense, pedestrian friendly, transit supportive environments.

Land Use

This section provides a survey of the study area land use conditions. The City of El Cajon has land use authority for Gillespie Field; but the land surrounding the airport lies within three different jurisdictions: the City of El Cajon to the west and south; the City of Santee to the north; and San Diego County to the east. The total study areas are approximately 1.3 square miles or 890 acres, of which roughly 123 acres are vacant.

The study area surrounding Gillespie Field was evaluated in four geographic parts. Figure 5.16 illustrates SEE and the surrounding study area parts.

- **Area A** is in the City of Santee and generally follows Prospect Avenue. It contains Class B or Class C commercial space and strip malls.
- **Area B**, in El Cajon, includes two business parks. This area is the highest quality development found in the study area.
- **Area C**, also located in El Cajon, is fully built out with light industrial uses and a few shopping centers. The area includes a total of 400 acres bifurcated by roads. There are no vacant sites for infill or redevelopment in this area.
- **Area D** is a small section of land that is in both El Cajon and San Diego County. Currently, there are 70 acres of vacant land, which used to be called the El Cajon speedway.

Figure 5.16 SEE Area Land Use Assessment Map

Source: ESRI.

Other studies and plans indicate potential for land development near the airport. The City of Santee has plans and has designated approximately $26 million to redevelop the Prospect Avenue corridor, which runs east-west just north of the airport. Figure 5.17 provides an overview of the Prospect Avenue project area. The project includes mobility improvements and other upgrades to civil infrastructure to improve drainage, street lighting, curbs and beautification. Construction is expected to be completed by January 2015.

Figure 5.17 Prospect Avenue Project Area Map

Source: City of El Cajon.

Table 5.17 describes potential development projects or plans underway in the study area, as described through local plans and conversations with local development professionals.[32]

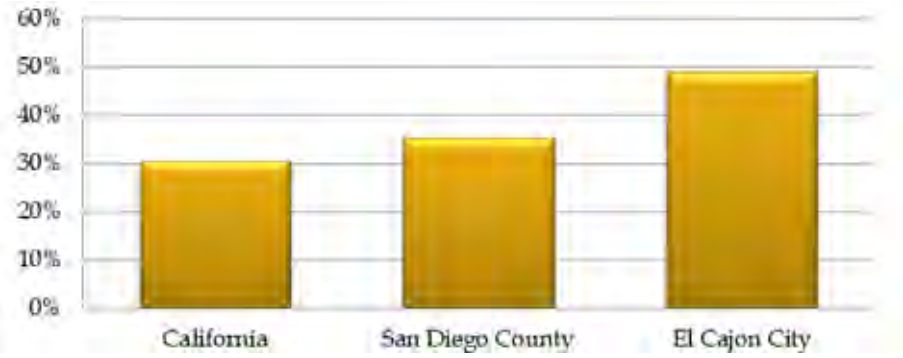
Table 5.17 SEE Area Development Activities

Area	Jurisdiction	Planned development Description
A	City of Santee	According to a board member of Santee, the City of Santee has committed $26 million to improve Prospect Avenue corridor. The board member noted that a private owner is pursuing one of the vacant sites proximate to the Airport for Airport-related commercial use.
B	City of El Cajon	In 2013 the County of San Diego Department of Public works issued a Request for Proposals to develop the vacant 31-acre area located at Gillespie Field in El Cajon with a mix of business park and light industrial uses.
D	City of El Cajon and San Diego County	According to the City of El Cajon, the 70 acre parcel located between Joe Crosson Drive and Wing Avenue will be developed for aviation use.

Source: EDR Group.

The City of El Cajon housing stock has a significantly higher portion of multifamily housing units than California and Los Angeles County, as shown in Figure 5.18. The 2013 to 2021 draft Housing Element notes that with limited vacant land remaining, opportunity for new single-family construction in El Cajon is limited. This housing profile suggests that there is a movement towards dense development that may stimulate demand for more robust transit service.

Figure 5.18 El Cajon Share of Multifamily Housing (2012)



Source: U.S. Census Bureau American Community Survey 2012.

[32] Based partially on interviews with Marie Jo Diamond, East County Economic Development Council President and CEO; Melanie Kush, City of Santee Planning Manager; Dana Quitner, County of San Diego Long Range Planning Administrator; and Manjeet Ranu, City of El Cajon Planning Manager.

Regulatory Environment and Community Perspectives

This section describes the regulations, such as zoning, height restrictions, historical preservation, noise abatement, recreational uses, open space or park preservation, or agricultural preservation. These regulations control the future use of land near Gillespie Field. In addition, it describes the level of community support for continued development.

Zoning and Other Regulations

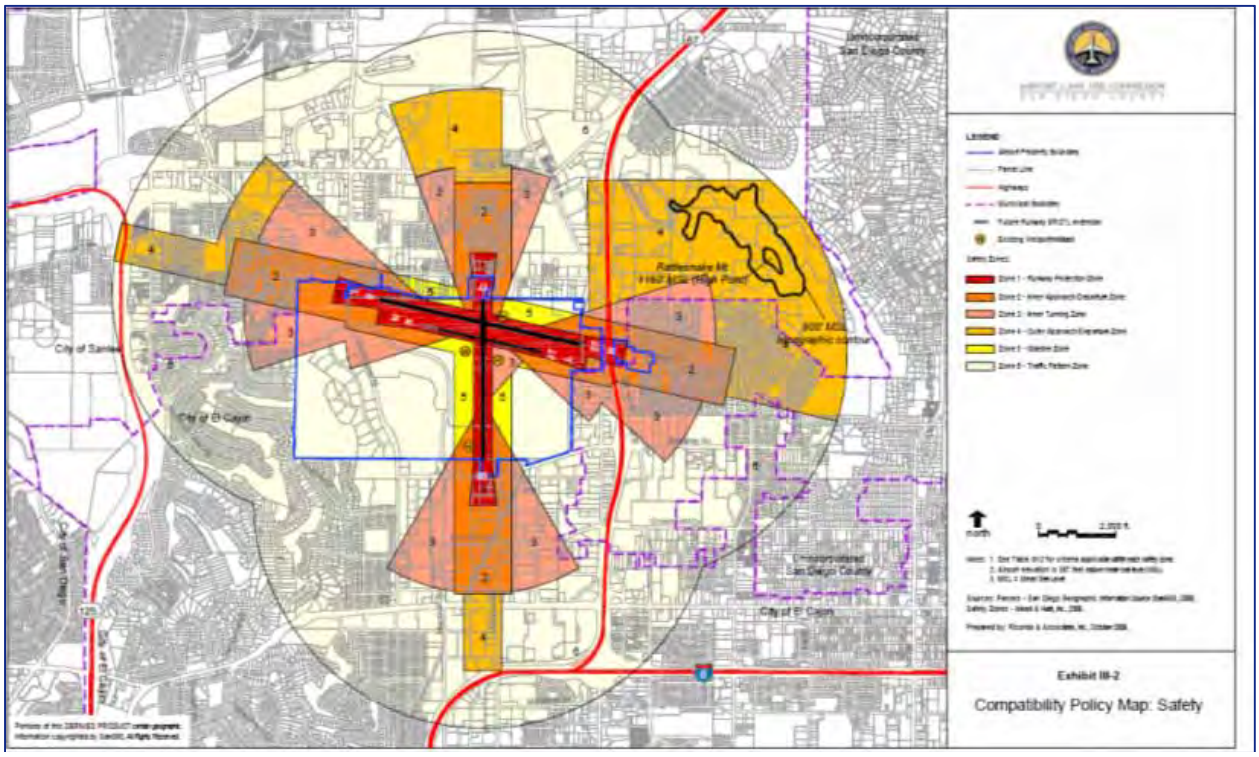
The City of El Cajon has land use authority over the airport itself and has prepared plans and regulations that govern development capacity near the airport. Figure 19 shows the airport Compatibility Map for El Cajon. In El Cajon, the airport is zoned Manufacturing (M), described below.

- The M district is intended provide for manufacturing, warehousing, and limited industrial uses as well as certain employment generating office and service uses characterized by: a lack of public contact, a nonretail orientation, limited traffic generation, and no need for advertising or retail signage; and
- No building in the M or Heavy Commercial – Light Manufacturing (C-M) zones may exceed a height of 35 feet unless a greater height is approved by specific plan[33].

Figures 5.20 and 5.21 show zoning for areas near to the airport in the Cities of El Cajon and Santee. The Cities have not set floor area ratio requirements. Essentially, local government policies allow the project area to expand as high and dense as the market can support.

[33] City of El Cajon Municipal Code Chapter 4950 Section 3.

Figure 5.19 El Cajon Airport Compatibility Policy Map



Source: City of El Cajon, *Municipal Zoning Code*, accessed December 2013.

Figure 5.20 Excerpt of El Cajon Zoning Map

Source: City of El Cajon.

Figure 5.21 Excerpt of Santee Zoning Map

Source: City of El Santee.

Table 5.18 provides a summary of the municipal zoning codes that apply to the area within approximately one-half mile of the airport. The color blocks in the table represent the various zoning districts (residential, commercial, open space) and match the use of color used in the excerpt of the Santee zoning map shown in Figure 5.21 above.

Table 5.18 El Cajon and Santee Zoning near SEE

Jurisdiction	Code Abbreviation	Zoning District
City of El Cajon	M -	The "M" zone is intended provide for manufacturing, warehousing, and limited industrial uses as well as certain employment generating office and service uses. The Airport, zoned "M" is a permitted use.
City of El Cajon	O- S	Open Space
City of El Cajon	RS-6, RS-9, RS-14-H	Residential, single-family homes 6,000 to 14,000 square feet.
City of El Cajon	C-M	Heavy Commercial—Light Manufacturing
City of Santee	R-2	Low-Medium Density Residential (R-2)—(Two to Five Dwelling units/Gross Acre). (Single-family homes in standard subdivision). R2
City of Santee	R-7	Medium Density Residential (R-7)—(7 to 14 Dwelling Units/Gross Acre). (Attached and detached single-family units at the lower end of the density range, multiple family attached units at the higher end). R7

Jurisdiction	Code Abbreviation	Zoning District
City of Santee	R-14	Medium High Density Residential (R-14)—(14 to 22 Dwelling Units/Gross Acre). (Multiple family such as apartment and condominium buildings). It is intended that this category utilize innovative site planning, provide on-site recreational amenities and be located in close proximity to major community facilities, business centers and streets of at least major capacity. R14
City of Santee	IG	General Industrial District (IG). This district is intended for a wide range of industrial activities including manufacturing, wholesale distribution, storage, etc. IG
City of Santee	IL	This district is intended primarily for light industrial uses such as manufacturing, assembly, research and development and similar industrial uses, as well as limited commercial and office uses which are compatible and appropriate in this district. IL
City of Santee	GC	General Commercial District (GC). This district is intended for general commercial activities and services of more intensive nature. GC
City of Santee	PD	Planned Development – (PD) is intended for select properties within the City where a variety of development opportunities may be viable and where the City wishes to encourage innovative and very high quality development in a manner which may not be possible under standard land use designations and their corresponding zones. PD

Source: City of El Cajon, Municipal Zoning Code, Accessed December 2013; City of Santee, Municipal Zoning Code, accessed December 2013.

Community Support

Some members of the communities surrounding Gillespie Field do not embrace the same perspective on growth and development near the airport as the City and other stakeholders. For example, in response to the East County EDC "Aerotropolis" concept, an opposition group has formed to push back on any nonairport use on any airport lands. Other East County residents have noted they do not want more flight training at the airport as the low-flying and often circling aircraft make noise.[34] More information can be found in the Regional Growth Potential section at the end of this case study.

[34] Santee Patch, *Gillespie Field Airport to Expand, Council Talks 'Santee Aerotropolis'*, January 22, 2013, accessed December 2013 at http://santee.patch.com/groups/business-news/p/ kpbs-highlights-gillespie-field-airport-expansion-san5754688c6d.

Access to Infrastructure and Transit Service

Immediately to the east of Gillespie Field CA-67 (San Vincente Freeway) runs north-south, parallel to the eastern edge of the airport. To the north is a major east-west corridor in Santee, Prospect Avenue. Immediately to the north of Prospect Avenue, running parallel, is CA-52 (Mt. Soledad Freeway). Approximately one mile to the west of the airport, CA-125 runs north-south. About a mile south of the airport I-8 connects with CA-67.

The area has a low-moderate level of bicycle facilities, which would be likely to increase over time with the implementation of the El Cajon Bicycle Master Plan. At this time, there are very few bicycling-lanes on streets in the study area. As the surrounding area is dominated by residential housing and most residential streets have sidewalks, these basic amenities are not sufficient to constitute a multimodal approach typical of complete streets design standards. Nevertheless, there are opportunities for integrating the design of walking, biking, transit, and auto connections.

The City's existing and future population and employment density support compact land use patterns supported by good transit service. A number of bus lines currently service the Gillespie Field study area and surrounding neighborhoods. El Cajon is served by the San Diego Metropolitan Transit System (MTS); Routes 833, 848, and 870 carry passengers in the vicinity of the airport. For Routes 833 and 848, service is every 60 minutes or less, depending on the time of day; Route 870 is weekday only, offering very limited service.

Gillespie Field has a San Diego Trolley station located across Marshall Avenue from Gillespie Field Airport served by the Green Line. The trolley connects the airport to the City of Santee one stop to the north at the station located in Santee Town Center (the Green Line's terminus). There is also light-rail that goes through this area. There used to be a Tijuana trolley that went through here as the rail goes to the border, but there is a transit stop in the area not far from the airport.

Economic Analysis

The following section summarizes the results of the economic analysis, which show that the agglomeration of the employees into a more compact space around the airport generates significant additional economic growth because the agglomeration improves the productivity of these businesses. The detailed methodology used to measure the economic agglomeration benefits is described in Appendix E.

Projecting Land Use and Employment

The SEE project area contains 890 acres of land that include 123 acres of undeveloped land, 22 acres of housing, and approximately 7.6 million square feet of industrial and general commercial business space. The project area is dominated by light industrial and commercial service uses with scattered retail

uses along the major corridors. Approximately 1,020 private firms and 10 public sector tenants with established business operations within the project area employ 11,810 workers. Table 5.19 shows the number of jobs by industry sector.

Table 5.19 SEE Area Employment by Industry (2012)

Industry Sector	Jobs	Industry Sector	Jobs
Agriculture and Mining	109	Professional & tech services	6
Utilities	57	Management & administration	0
Construction	1,931	Education & health care	218
Manufacturing	2,456	Arts, Entertainment & recreation	76
Wholesale	1,650	Accommodations	2
Retail	1,631	Food service & drinking	399
Transportation & Communication	175	Automotive Services	247
Information	0	Other services	1,842
Finance, Insurance, real estate	241	Public administration	767
		Total	11,807

Source: ESRI Project Area Employment Estimate, 2012.

The consultant team traveled to and completed a driving survey of the Gillespie Field project area. Team members compiled notes about key businesses, vacant land areas, infill sites, roadways, open space and potential environmental constraints. This information was used to categorize developed areas by land use type. The analysis followed four key steps to assess existing conditions, which are detailed in Appendix E.

The existing FAR is indicative of the light industrial and office park settings of much of the study area. Commercial retail FAR was 0.31, light industrial was 0.32, and office park areas was approximately 0.35. The lowest calculated FAR was warehouse uses, at 0.14. The study area had 123 acres of undeveloped or vacant land.

The projections of new business space assumed that sufficient market demand will emerge during the next 30 years to absorb the 122 acres of vacant land. The study team allocated growth to the vacant land under the following assumptions:

- 50 percent of the vacant land will be converted to light industrial space.
- 50 percent of vacant land will be converted to office and business park space.
- 80,000 square feet of warehouse space will be converted to light industrial space.
- 20,000 square feet of warehouse space will be converted to office or business park space.
- The employment densities of the warehouse, light industrial and office park space will increase (i.e., floor area per employee decreases) to be more

consistent with industry averages. Floor area per employee drops from 1,000 to 900 square feet in light industrial, drops from 400 to 215 in office/business parks, and from 1,200 to 1,000 for warehouse space.

Table 5.20 shows that the Gillespie Field study area has the capacity to add 1.8 million square feet of new business space and 8,800 new jobs from elsewhere in California by the year 2040. Overall, by 2040 the smart growth area could hold 9.35 million square feet of business space that would accommodate 20,600 employees. It is important to note that these are jobs projected to be added to the statewide economy between 2013 and 2040. As such, jobs forecast to locate in this area cannot be described as "new" to California as a consequence of smart growth. However, the study team then used this projected reallocation as inputs to the economic model in order to estimate additional economic activity in California that can be generated by the agglomeration induced by smart growth.

Table 5.20 SEE Area Employment by Industry (2040)

Building type	Acres	Jobs	Floor Area per Employee	Total Floor Area	FAR
Retail commercial	95	3,651	350	1,278,000	0.31
Light Industrial	369	5,815	900	5,233,777	0.32
Office, business park & general commercial	148	10,605	215	2,280,054	0.35
Warehouse	110	563	1,000	563,000	0.14
Residential	22				
Roadways and Public Spaces	146				
Total	890	20,635		9,354,830	
Projected new jobs and business space		8,830		1,796,830	

Source: EDR Group.

Estimating Economic Impacts

The effect of greater smart growth development near SEE is forecast to result in 921 additional jobs, $121 million in additional value added, and $80 million in additional income to the California economy by the year 2040. These are the potential economic impacts of smart growth/business attraction policies are due to agglomeration in the smart growth area above the baseline forecast. The total impacts to California by industry sector are presented in Table 5.21 below.

The leading industrial sectors include professional, scientific and technical services; and administrative support and waste management; and manufacturing. Professional, scientific and technical services account for 29 percent of the increase in value added, and 36 percent of income growth. Administrative support and waste management accounts for 21 percent of value

added growth, and 27 percent of income growth. Manufacturing accounts for 16 percent of total change in value added, and 11 percent in total change in come.

Table 5.21 See Area Economic Analysis Results (2040)
(In Millions of Current 2013 U.S. Dollars)

	Total Impacts to California			
NAICS Sector	Jobs	Output	Value Added	Income
11 Agriculture, Forestry, Fishing and Hunting	7	1.03	0.50	0.38
21 Mining, Quarrying, and Oil and Gas Extraction	2	0.87	0.47	0.14
22 Utilities	1	1.19	0.57	0.19
23 Construction	11	1.94	1.15	1.01
31-33 Manufacturing	61	64.11	19.36	9.15
42 Wholesale Trade	23	5.54	4.08	2.35
44-45 Retail Trade	50	4.29	3.21	2.04
48-49 Transportation and Warehousing	19	2.60	1.42	1.12
51 Information	11	4.42	2.61	1.45
52 Finance and Insurance	31	7.27	4.16	2.14
53 Real Estate and Rental and Leasing	58	17.57	13.43	2.02
54 Professional, Scientific, and Technical Services	189	48.30	35.21	28.59
55 Management of Companies and Enterprises	10	2.48	1.54	1.34
56 Administrative and Support and Waste Management and Remediation Services	313	37.86	25.91	21.91
61 Educational Services	9	0.64	0.42	0.37
62 Health Care and Social Assistance	43	4.47	3.00	2.63
71 Arts, Entertainment, and Recreation	10	0.87	0.59	0.37
72 Accommodation and Food Services	40	2.93	1.70	1.14
81 Other Services [except Public Administration]	26	1.91	1.27	1.11
92 Public Administration	6	0.70	0.67	0.58
Total	921	211.00	121.26	80.04

Source: EDR Group.

Regional Growth Potential

The region and study area for Gillespie Field will likely experience continued growth in population and employment. SANDAG's 2050 Regional

Transportation Plan projects the County will receive another 1.25 million residents, the creation of 500,00 new jobs and the construction of nearly 400,000 new homes over the next 40 years. Below is a summary of the plans created to guide that growth that are most relevant to this study:

- **SANDAG Sustainable Communities Strategic Plan (SCS)**. SANDAG's plan to accommodate the growth in people, jobs, and homes is based on the development of environmentally sustainable communities that are more conducive to walking and bicycling, and public transit use. The plan's vision has a focus on the preservation of open space, paired with development of "a compact urban core where more people live and use fewer resources." The 2050 land use scenario described in the SCS, identifies the Gillespie Field study area as an area with mixed-use development, as well as heavy and light industrial land uses.
- **City of El Cajon, Bicycle Master Plan (2011)**. The plans states that its overall goal is to "…maximize the connections between mass transit, employment and residential sectors and activity centers with bikeways to promote a viable alternative to automobile travel in a climate particularly conducive to bicycle transportation."[35]
- The **Aerotropolis** concept for Gillespie Field. The East (San Diego) County's Economic Development Council (East County EDC) Aerotropolis concept is also known as an airport city, where the layout, infrastructure, and economy are centered on an airport as an economic engine. As part of the funding and Aerotropolis Plan development, East and South County EDCs will conduct research to identify and define which industry clusters and types of development will stimulate economic development, spur investment and increase the number of higher paying jobs to the distressed areas.[36] The East County EDC maintains that the Aerotropolis concept has the capacity to support and advance these economies. The council's vision is to:
  - Align existing assets and opportunities that surround Gillespie Field;
  - Identify and plan for specific, targeted investment geared towards establishing the Aerotropolis; and
  - Turn the Aerotropolis concept into an economic engine that will benefit the entire San Diego region.[37]

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[35] City of El Cajon, Bicycle Master Plan, 2011.

[36] East (San Diego) County Economic Development Council web site: http://eastcountyedc.org/1220-east-and-south-county-edcs-awarded-40k-grant-to-develop-aerotropolis-plan-for-airports/.

[37] San Diego Foundation, *Aerotropolis White-Paper*, 2013.

- In March 2013, the San Diego Foundation Malin Burnham Center for Civic Engagement awarded the East County EDC a $50,000 grant to develop an Aerotropolis strategic roadmap.

Hayward Executive Airport

Hayward Executive Airport (HWD) is a general aviation airport located in the San Francisco Bay Area. Located approximately 14 miles south of Oakland in Alameda County, HWD offers a full range of general aviation services, but does not offer commercial passenger air service. The airport offers private jet service, flight training, aircraft service and maintenance, and helicopter operations, including tours and flight training.

HWD was identified as an area with potential to be a smart growth area (Role 1). HWD's urban environment has potential to directly support smart growth development. HWD has high population and employment density, amenities within one-half mile, suitability of land for development, and proximity to service infrastructure. Although there is limited undeveloped land, there is land nearby available for redevelopment.

Market Assessment

The market conditions that drive the feasibility of HWD as a smart growth area may be divided between demand for types of business activities that occupy dense commercial and retail development and the sufficient supply of vacant land or underutilized structures that can be redeveloped as more dense and mixed land use. Demand for this type of development is generated from households and businesses that are located close enough to the HWD area and regard the HWD businesses and the most competitive of the alternative. Household demand is manifested by the number and composition of the population and measured by demographic trends in the areas surrounding HWD. Business demand is generated from the HWD area firms and employees. For the businesses that choose to locate within the HWD area, they must determine if the parcel, infrastructure, location, and other attributes provide the best combination compared to alternative land outside the HWD area. These population, employment, and land use attributes and future trends are presented below.

Population

As presented in Table 5.22, Hayward's population grew at an average annual rate of about 2 percent between 1990 and 2000; this was nearly double that of the State. Between 2000 and 2012, Hayward's average annual population growth rate fell to 0.5 percent, nearly one-half that of the State.

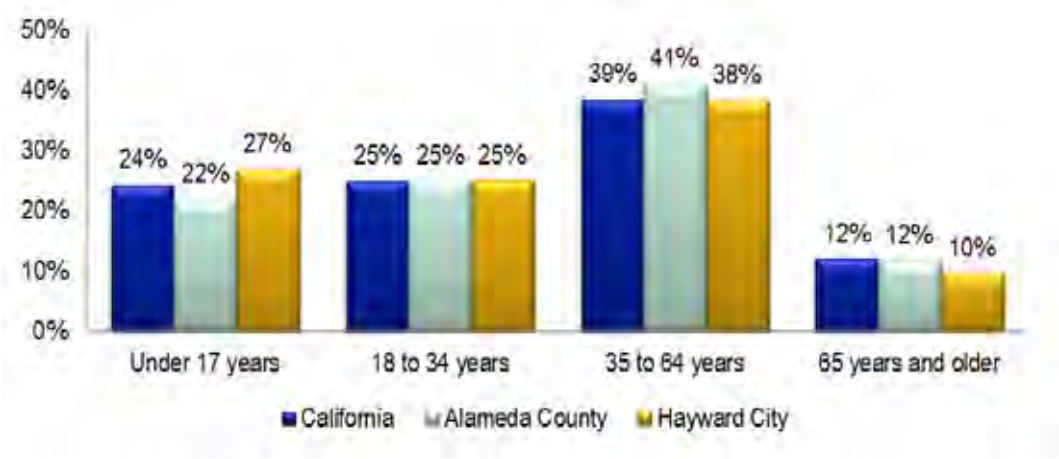
Table 5.22 Alameda County and Hayward Population and Population Change (1990 to 2012)

				1990-2000		2000-2012	
Area	1990	2000	2012	% Change	Avg Annual Change	% Change	Avg Annual Change
California	29,760,021	33,871,648	38,041,430	14%	1%	12%	1%
Alameda County	1,279,182	1,443,741	1,554,720	13%	1%	8%	0.6%
Hayward City	111,498	140,030	149,392	26%	2.3%	7%	0.5%

Sources: U.S. Census Bureau Census 1990, Census 2000, American Community Survey 2012.

In general, the populations of the City of Hayward and Alameda County are similar to that of the State. As presented in Figure 5.22, Hayward has a slightly younger population with more youths under 17 years old and fewer individuals over age 65. Hayward has a similar share of individuals between 18 and 64 years old. In addition, Hayward has a slightly higher number of people per household (3.17) than the state average (2.93).

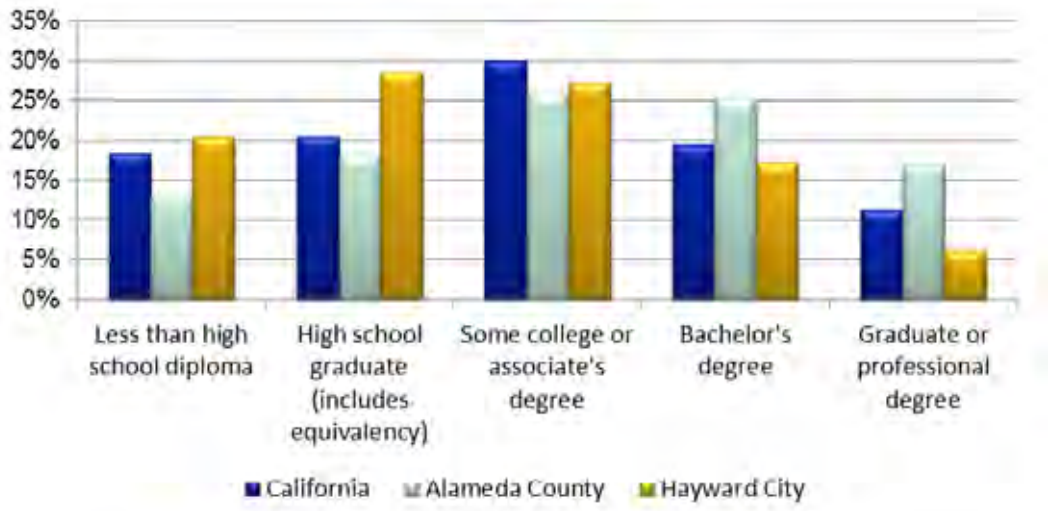
Figure 5.22 Alameda County and Hayward Population Age Profile (2012)



Source: U.S. Census Bureau American Community Survey 2012.

Educational attainment in Hayward is slightly lower than the statewide average. Figure 5.23 shows that Hayward has a smaller share of individuals with a Bachelor's, graduate or professional degree (24 percent) than both Alameda County (42 percent) and the State (31 percent).

Figure 5.23 Alameda County and Hayward Share of Bachelor's Degree or Higher (2012)



Source: U.S. Census Bureau American Community Survey 2012.

Employment

The City of Hayward and County of Alameda are slightly outperforming the State as a whole in regards to employed workers. Although the City and County had similar unemployment in 1990 and 2000, Hayward is lagging behind Alameda County in putting people back to work following the Great Recession (Table 5.23). In October 2013, Alameda County had a lower unemployment rate than the State of California. Alameda County's unemployment rate was 7.0 percent compared to 8.3 percent statewide.

Table 5.23 Alameda County and Hayward Unemployment Rates (1990 to 2013)

Area	1990	2000	2012[a]	2013
California	5.8%	4.9%	10.5%	8.3%
Alameda County	4.1%	3.6%	9.0%	7.0%[a]
City of Hayward	4.1%	4.0%	10.1%	7.8%[a]

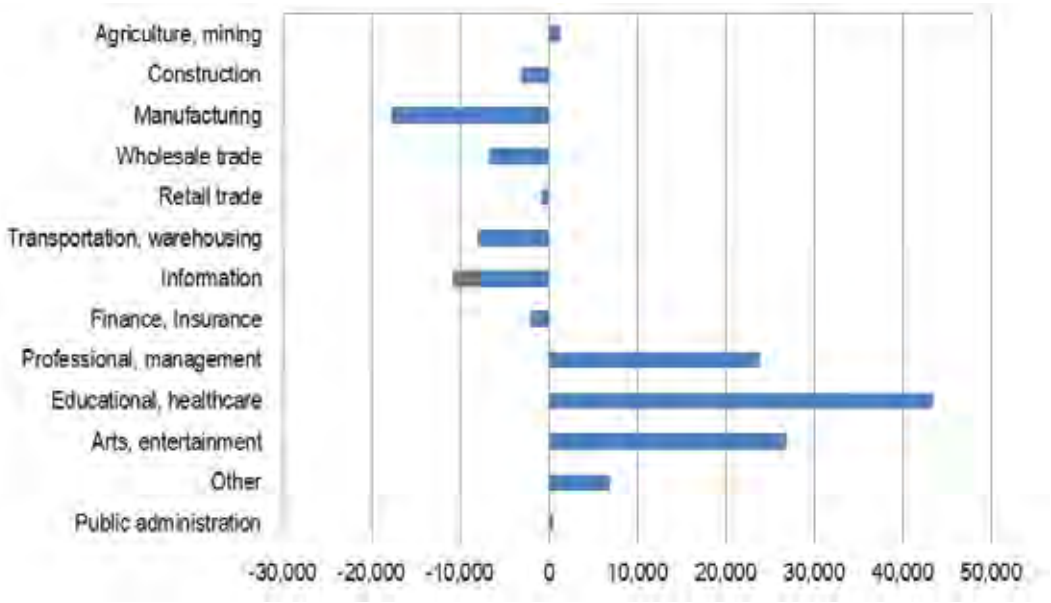
Sources: U.S. Census Bureau, Census 1990, Census 2000 and 2012 American Community Survey 2012.

[a] 2013 data is preliminary data for the month of October 2013.

Figure 5.24 represents the composition of employment for Alameda County's residents. As shown, in 2012 the largest industry sectors were educational services, healthcare, and social assistance and professional, scientific, and management, administrative and waste management services. Between 2000 and 2012, the fastest growing sectors included retail and entertainment-related services (4 percent average annual rate), education-, social assistance-, and health

care-related services (3 percent average annual rate), and professional, scientific, and management services (2 percent average annual rate). Alameda County has experienced the most significant decline in the information sector (-3 percent decline annually), wholesale trade (-2 percent decline annually), transportation, warehousing, and utilities (-2 percent decline annually), and manufacturing (-2 percent decline annually).

Figure 5.24 Alameda County Change in Employment by Industry (2000 to 2012)



Source: U.S. Census Bureau Census 2000 and American Community Survey 2012.

Growth in professional, scientific, and management services and the decline in wholesale trade, transportation, warehousing, utilities and manufacturing present economic trends that support more development of office space, which can be configured as more dense, pedestrian-friendly land uses.

Land Use

This section reviews existing land uses and provides an overview of the residential, commercial and other activities that transpire in the study area. A map of the study area is shown in Figure 5.25.

Analysis of existing land uses can provide insight as to what constraints and opportunities there might be for future growth and development. The redevelopment of the airport area becomes more likely if existing land uses are no longer successful.

Figure 5.25 HWD Area Land Use Assessment Map

Source: ESRI.

Aviation uses on airport property include APP Jet Center and CTP Aviation which provide charter jet service, Mather Aviation, which provides aircraft service and maintenance, and ATP flight training and helicopter training by Golden Gate Helicopters. In addition, a number of small fixed-base operators also do flight training, maintenance, and rent hangars.

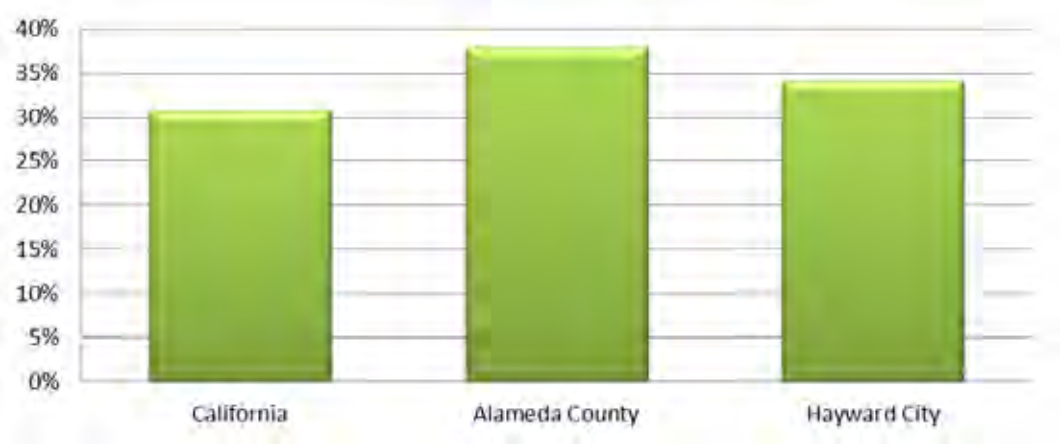
Existing nonaviation uses on airport property include Target, Home Depot, Smart and Final grocery store, a private nursing college, a La Quinta motel and various small retail establishments (e.g., insurance, restaurants, T-Mobile, Wells Fargo Bank, Game Stop, UPS store). Airport staff report that nonaviation tenants are primarily drawn to the location, because of its location on a main arterial through the East Bay and proximity to a major cross street rather than the proximity of HWD airport.

Airport staff report that HWD regularly receives calls inquiring about remaining available property; but most are not interested once they learn that the parcels will only be leased. Target is an exception; the retailer approached HWD to

acquire the parcel stating that leasing was against Target's policies. The City sold the property, but subsequent parcels have been leased.

Hayward has a similar housing profile as the State, although it has a higher share of multifamily homes in buildings with five or more units and a slightly lower share of single family homes and multifamily homes in buildings with two to four units. On average, Alameda County has more multifamily units than California or Hayward, as presented in Figure 5.26.

Figure 5.26 Alameda County and Hayward Share of Multifamily Housing (2012)



Source: U.S. Census Bureau American Community Survey 2012.

In summary, the population, employment and land use trends support the use of Hayward as a smart growth area the given the demand for and supply of commercial property described above. The population is of sufficient size and density to create demand for smart growth land use patterns that allow residents and employees to access goods and services via multimodal options, including walking, bicycling, and transit services. The education and employment trends – leaning towards creative and professional services – create a demand for office and commercial developments, which are compatible with smart growth. The existing land uses hold the potential to be redeveloped into more structurally dense, pedestrian friendly, transit supportive environments.

Regulatory Environment

This section describes the regulations, such as zoning, height restrictions, historical preservation, noise abatement, recreational uses, open space or park preservation, agricultural preservation (i.e., Williamson Act), etc. These regulations control the future use of land near HWD.

Zoning and Other Regulations

The City of Hayward has land use authority over Hayward Executive Airport, and the lands immediately surrounding the airport. The City's zoning code sets forth where and what type of new development or redevelopment can occur. It

describes the type of land use and specifies qualities about structures such as height and density limits and parking requirements. The land within about one-half mile of the airport is primarily industrial, residential, and open space. Table 5.24 presents the primary land use types currently zoned in the study area, and Figure 5.27, an excerpt of the Hayward Zoning Map, shows the geographic distribution of the land uses surrounding the airport.

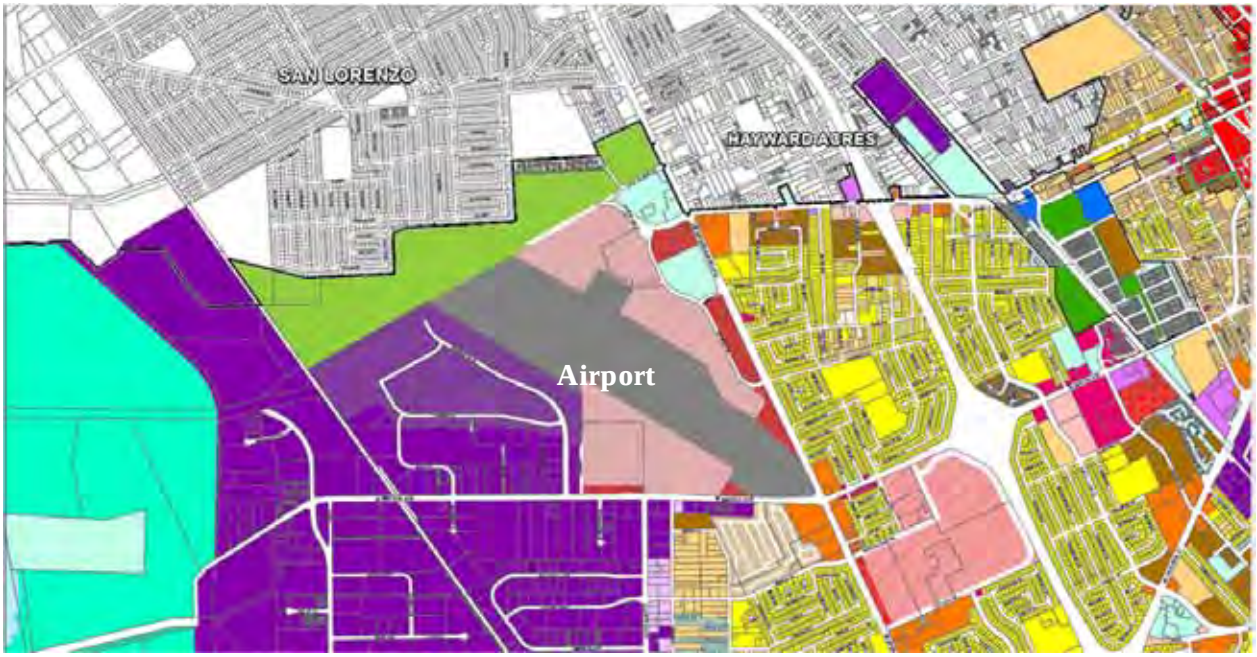
- **Height Restrictions.** The City of Hayward has regulations that restrict the height of structures within airport zones, which extend approximately within a two mile buffer of the airport. Structures near the airport in Hayward are limited to a maximum height of 40 feet.
- **Noise Abatement.** The City of Hayward has specified noise limits for aircraft operating at the Hayward Executive Airport as part of the Aircraft Noise Ordinance. The City has also established noise abatement and operational procedures for pilots, and makes a *Noise Abatement Procedures Guide* available to pilots so they are aware of areas to avoid.

Table 5.24 Hayward Zoning Districts near HWD

Jurisdiction	Zoning Category	Description
City of Hayward	PD – Planned Development	The purpose of the PD District is to encourage development, redevelopment, and rehabilitation, which through efficient and open space.
City of Hayward	I - Industrial	The purpose of the I District is to provide for and encourage the development of industrial uses in areas suitable for same.
City of Hayward	LM- Light Manufacturing	The LM District is intended to provide for limited manufacturing and other light industrial uses within the Industrial Corridor.
City of Hayward	RS and RM Single and Medium and High Multifamily residential- RS	The RS District allows single-family homes and some related community services.
City of Hayward	Commercial -several types,	The CN District allows products and services intended are those primarily represented by convenience goods and services.
City of Hayward	OS, Open Space	Open Space

Source: City of Hayward, *Municipal Code*, accessed December 2013.

Figure 5.27 Excerpt of Hayward Zoning Map



Source: City of Hayward, *Municipal Code*, accessed December 2013.

Access to Infrastructure and Transit Service

The City of Hayward is well-connected with destinations around the San Francisco Bay Area and across the State by road and rail. The City is located near the Interstate 880 / California State Route 92 interchange.

Hayward is served by two BART stations: Hayward and South Hayward. BART provides service to San Francisco and Richmond and Fremont in the East Bay. In addition, Amtrak's Capitol Corridor passenger rail route provides service in downtown Hayward, approximately 1.5 miles east of HWD on Union Pacific Railroad-owned right-of-way. The Capitol Corridor provides intercity commuter train service between San Jose, the San Francisco Bay Area, and the Sacramento region. The Capitol Corridor has 7 daily round trips between Oakland and San Jose, 15 weekday round trips between Sacramento and Oakland (11 on weekends), with 1 daily round trip extending from Sacramento to Auburn.

AC Transit provides limited local bus service between the HWD area and downtown Hayward. Two bus routes serve this area: Route 86 and Route 386. Route 86 runs on weekdays and Route 386 runs on weekends.

The HWD project area is generally characterized by industrial uses to the south and west, retail and office uses to the southeast, and residential uses south and east. Multilane arterials run through the HWD project area. While most arterials have sidewalks, generally the environments are not particularly pedestrian- or

bike-friendly environments. In addition, Class III bike lanes connect the HWD project area with the Hayward BART Station and the San Francisco Bay Trail.

Regional Growth Potential

The region and neighborhoods around HWD expect continued growth in population and employment. The Bay region's population is projected to add 2.1 million people, to a total of 9.3 million people by 2040, an increase of 30 percent or roughly 1 percent per year. The number of jobs is expected to grow by 1.1 million between 2010 and 2040, an increase of 33 percent. During this same time period the number of households is expected to increase by 27 percent to 700,000, and the number of housing units is expected to increase by 24 percent to 660,000.

The Bay Area's RTP/SCS or Plan Bay Area is a long-range integrated transportation, land-use and housing strategy through 2040 for the San Francisco Bay Area. Plan Bay Area accommodates this growth by guiding where and how growth should occur. Over the last decade, local governments and regional agencies have been working together to encourage the growth of jobs and production of housing in areas supported by amenities and infrastructure. In 2008, ABAG and MTC created a regional initiative to support these local efforts called FOCUS. In recent years, this initiative has helped to link local community development aspirations with regional land use and transportation planning objectives. Local governments have identified PDAs and Priority Conservation Areas (PCA), which form an implementing framework for Plan Bay Area.

The City of Hayward has existing plans that govern development capacity near the airport; the plans most relevant to this study are the following:

- **The City's General Plan.** This Plan contains a policy to encourage and promote airport-related business development, such as flight schools, aircraft maintenance, and executive airline services, at the Hayward Executive Airports.[38]
- **Hayward Executive Airport Land Use Compatibility Plan.** The plan serves as the primary document used by Alameda County Airport Land Use Commission (ALUC) to promote compatibility between HWD and new land uses proposed in the airport vicinity. ALUC policies can only be implemented by the local governments that have land use authority over the planning area.
- **Plan Bay Area (RTP/SCS).** The plan shows that Hayward Executive Airport is located in or directly south of the PDA located west of the I-880/I-238 interchange. A planned PDA has a formally adopted plan, as determined by a local jurisdiction, and is an area served by transit where new development

[38] City of Hayward, *Hayward General Plan: Looking Forward 2040*, 2013.

will promote pedestrian-friendly environment and support the needs of residents and workers. According to the plan, local jurisdictions determine the character of their PDAs according to existing local conditions and future expectations for PDAs to be regional centers, city centers, suburban centers or transit town centers, among other place types.

Santa Monica Municipal Airport

Santa Monica Municipal Airport (SMO) is a general aviation airport located in the City of Santa Monica in Los Angeles County. SMO offers a full range of general aviation services, including flying schools, chartered flights, aircraft maintenance, fixed base operators (FBO), and a flight club. It does not offer scheduled commercial air passenger service, but does serve as a reliever airport to Los Angeles International Airport. SMO is located in Los Angeles County in a densely populated part of the City of Santa Monica approximately 15 miles west of downtown Los Angeles and about two miles east of the Pacific coast. The airport is bounded by the City of Santa Monica to the north and northwest, and the City of Los Angeles communities Venice and Mar Vista to the east and southeast.

According to the Airport Manager, general aviation at SMO directly supports several businesses providing air transportation, legal services, and dining. Businesses located on airport property are primarily located on the Santa Monica Municipal Airport Campus, a 280 acre area accommodating 177 aviation and nonaviation businesses. These businesses provide a range of services and products, including aviation schools, offices, advertising, public relations, architecture, insurance, a television station, and various retail stores. More about these businesses and the contribution to the economy is discussed in the following sections.

SMO's urban environment has potential to directly support smart growth development. In light of the 11 smart growth criteria identified for this study, SMO's strengths are in its nearby activity centers, multimodal transportation infrastructure, and land potentially suitable for more dense development. Quantitative economic analysis presented in this case study suggests that smart growth consisting of higher density, walkable development could lead to $130 million in additional value added, and $78 million in increased income.

Market Assessment

The market conditions that drive feasibility of SMO as a smart growth area may be divided between demand and supply. Demand comes from households and businesses for goods and services produces by businesses that locate within the SMO area. Household demand is manifested by the number and composition of the population and measured by demographic trends in the areas surrounding SMO. Business demand is generated from the SMO area firms and employees. The supply side is assessed by evaluating the competitive advantages of land

located within the SMO area over the alternative land outside the SMO area. These population, employment, and land use trends are presented below.

Population

Santa Monica's population of just over 89,000 has grown less quickly than the State's, but faster than Los Angeles County. As shown in Table 5.25, California's population growth is about 1.0 percent per year, while Santa Monica's 0.5 percent growth rate is slightly higher than the county average of 0.4 percent. To address population growth, Santa Monica's sustainability plan employs strategies to require fewer resources for each new person than used in the past, and to improve the efficiency of resources used.

Table 5.25 Los Angeles County and Santa Monica Population and Population Change (1990 to 2012)

				1990-2000		2000-2012	
Area	1990	2000	2012	% Change	Avg. Annual Change	% Change	Avg. Annual Change
California	29,760,021	33,871,648	38,041,430	14%	1%	12%	1%
Los Angeles County	8,863,164	9,519,338	9,962,789	7%	1%	5%	0.4%
Santa Monica (City)	86,905	84,084	89,153	-3%	-0.3%	6%	0.5%

Sources: U.S. Census Bureau Census 1990, Census 2000 and American Community Survey 2012.

Santa Monica's population age profile, as shown in Figure 5.28, demonstrates that the 18- to 34-year old cohort, which represents a potential emerging market for both housing and jobs, makes up 25 percent of the city population. This is on par with Los Angeles County and California. The 35- to 64-year old cohort makes up 45 percent of the Santa Monica population, which is higher than both the county and California averages. This suggests an above-average Generation X and baby-boomer population.

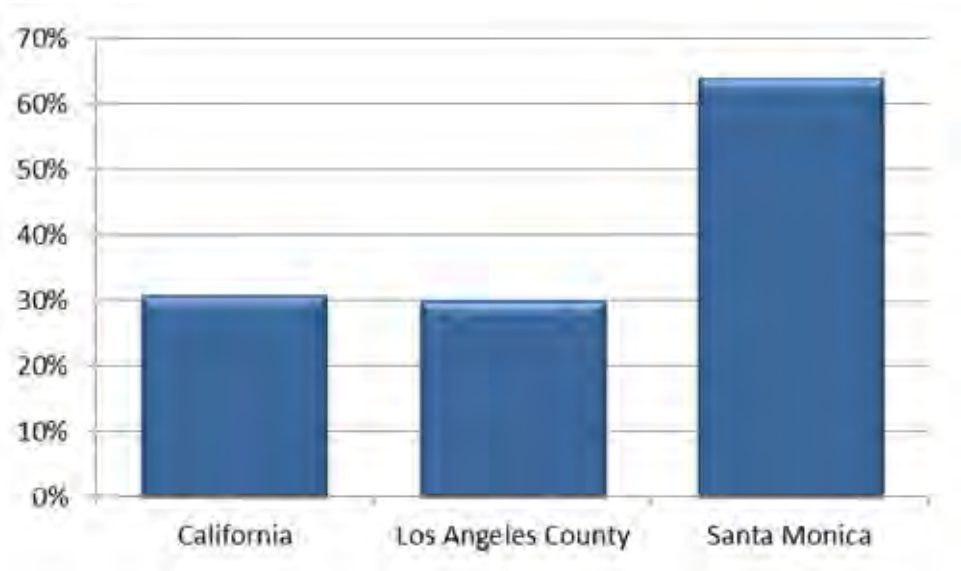
Figure 5.28 Los Angeles County and Santa Monica Population Age Profile (2012)

Source: U.S. Census Bureau American Community Survey 2012.

Market studies suggest a greater demand from this cohort for smaller residential units and mixed-use neighborhoods as they near retirement and adult children move out of single family homes. These residential preferences manifest as less driving by Americans as a whole.

Figure 5.29 shows that the educational attainment of the Santa Monica population over age 25 is nearly double the rate in both California and the County. This would suggest that residents hold a higher number of professional jobs than people do in the County and across the State.

Figure 5.29 Los Angeles County and Santa Monica Share of Population with a Bachelor's Degree or Higher (2012)



Source: U.S. Census Bureau American Community Survey 2012.

Employment

Santa Monica's employment rate from 1990 to present suggests that Santa Monica residents continue to perform well in securing and maintaining jobs when compared to their county and California counterparts. While the unemployment rate in the City increased 4.6 percentage points from 2000 to 2012, this increase was less than the increase in unemployment in Los Angeles County and across the State. Data for 2013 demonstrates that the effects of the Great Recession on employment are lessening and that more Californians are again gaining employment. Table 5.26 presents the unemployment rates by decade from 1990 to 2013.

Table 5.26 Los Angeles County and Santa Monica Unemployment Rate (1990 to 2013)

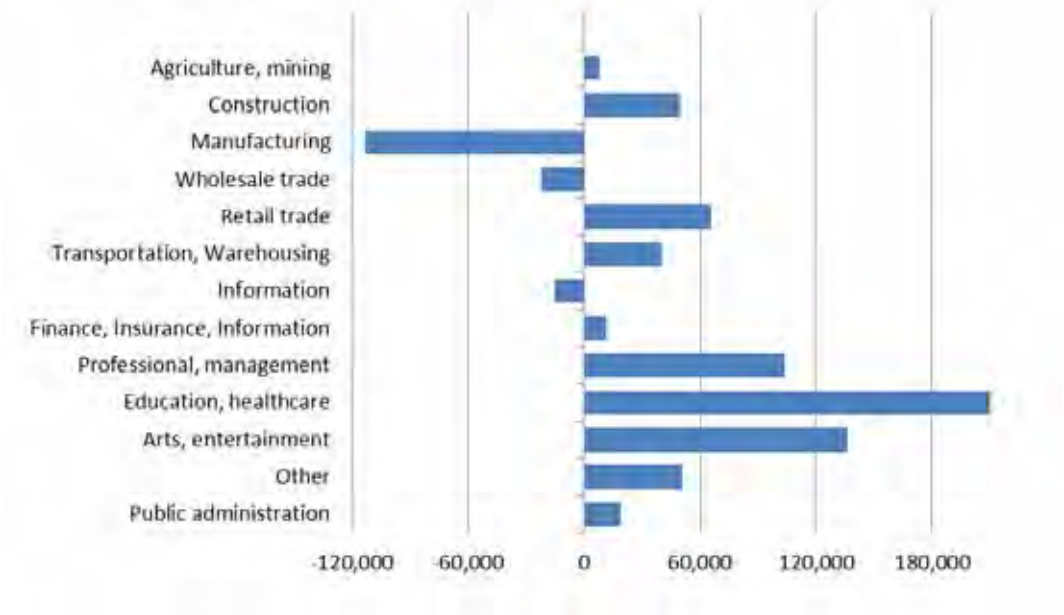
Area	1990	2000	2012	2013 (Nov)
California	5.8%	4.9%	10.5%	8.3%
Los Angeles County	5.8%	5.4%	10.9%	9.4%
Santa Monica City	3.8%	4.4%	9.0%	7.8%[a]

Source: U.S. Census Bureau, Census 1990, Census 2000 and American Community Survey 2012.

[a] 2013 data for the City of Santa Monica is preliminary data for the month of October 2013.

Los Angeles County employment grew approximately 14 percent from 2000 to 2012. Figure 5.30 illustrates industry-level change in employment in Los Angeles County from 2000 to 2012. County manufacturing employment declined 19 percent from 2000 to 2012. Major service-providing industry sectors increased employment over the same period. The professional, scientific and management sector increased 23 percent, education and health care services increased 29 percent, and the arts, entertainment, accommodation and food services sector experienced 41 percent employment growth. California employment grew 15 percent, 35 percent, and 22 percent in those sectors, respectively. Conversations with local economic development planners indicated that occupations anticipated to experience significant growth in Los Angeles County include biomedicine, home health, and construction.

Figure 5.30 Los Angeles County Change in Employment by Industry (2000 to 2012)



Source: U.S. Census Bureau American Community Survey 2012.

Land Use

SMO abuts the City of Los Angeles, and is therefore located in an urban area with relatively little available vacant land. The area near the airport is largely occupied by single- and multifamily residential housing. The area also includes a business park directly abutting airport property, and a variety of service and retail uses located along major access roads.

The SMO study area covers an area approximately one-half mile from the airport borders. Four distinct development areas typologies emerged from the economic analysis. These areas are shown in Figure 5.31 and described below.

- **Area** A is a park zoned as open space. This does not have development potential in this study.
- **Area B** is largely occupied by the Santa Monica Business Park. The office park contains over 1 million square feet of low-rise commercial office and retail facilities. The area includes indoor and outdoor common areas, landscaped spaces and walkways. The office park is managed by a commercial real estate firm. The airport manager noted that additional corporate and industrial park development is planned for the area in the future.
- **Area C** represents a residential area. This does not have development potential in this study.
- **Area D** is an on-airport business and commercial park with some public uses. The primary tenant is Santa Monica College, an accredited two-year community college with approximately 34,000 students. There is also a public park in the area. On-airport property in Area D is constrained by surrounding medium- to high-density development and existing aviation uses.

Downtown Santa Monica, located about two miles northwest of the airport, hosts the majority of development activity reported by the Santa Monica planning department. There were 20 development projects planned or underway in downtown as of December 2013. Approximately one-quarter of the approved projects were commercial and residential mixed-use development types.

Figure 5.31 SMO Area Land Use Assessment Map

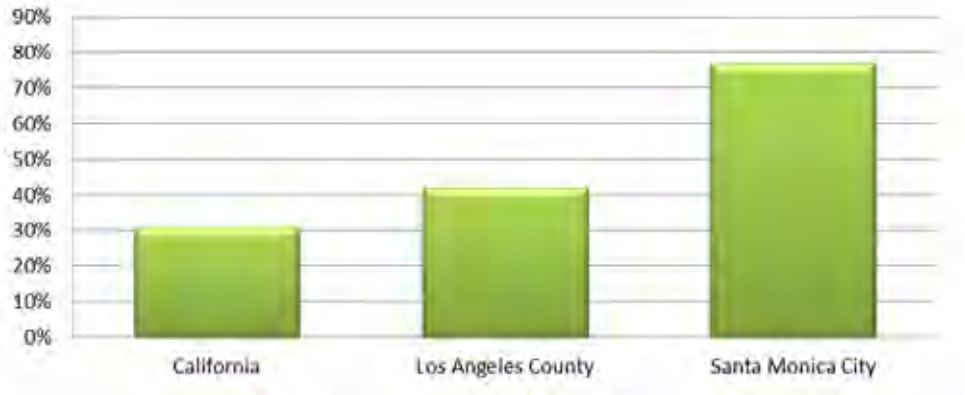
Source: ESRI.

Housing

The presence and growth of residential development near but outside the airport area provides potential workers and shoppers for the nonresidential airport-area development. Nearly 80 percent of housing units in Santa Monica are multifamily, as shown in Figure 5.32. Two-thirds of all housing units are buildings of five or more units. Though not specific to the airport study area, these figures suggest that the market is reasonably strong in the region for multifamily housing types.

In summary, the market conditions as captured in the population, employment, and land use trends described above support the designation of the SMO as a smart growth area. This strong demand is the first and most critical of three elements that are needed to justify SMO's smart growth area designation. The other two are the airport area's land use and regulatory environment and access to infrastructure and transit service. Each of these is described below.

Figure 5.32 Los Angeles County and Santa Monica Share of Housing (2012)



Source: U.S. Census Bureau American Community Survey 2012.

Regulatory Environment and Community Perspective

This section describes the regulations, such as zoning, floor area ratio (FAR), height restrictions, historical preservation, noise abatement, toxic or chemical restriction, recreational uses, open space or park preservation, agricultural preservation (i.e., Williamson Act), etc. These regulations control the future use of land near SMO. In addition, it describes the community support or lack of it for development.

Zoning and Other Regulations

The City of Santa Monica is the only jurisdiction with land use authority over Santa Monica Municipal Airport. The City also regulates land use in Santa Monica located to the north and west of the airport. The City of Los Angeles has land use authority for land located east and south of the airport. Other regulations and policies examined for this study include zoning codes, airport-specific plans, and special district regulations.

Santa Monica zones abutting the airport include open space (OS) and office campus (OC). The OS district represents Clover Park, a city-operated park. The OC district encompasses what is now the Santa Monica Business Park. The zone is designed for office and technology uses that require "large expanses of floor area on large parcels."[39] The office park provides relatively walkable urban design, due to permitted 45 feet height allowance if the developer provides additional open spaces, pays a transportation impact fee, or designs for on-site child care services. The City also conditionally permits retail and service uses in the district, so long as these uses are designed to serve office park employees.

[39] City of Santa Monica, Zoning Ordinance Update – Public Review Draft November 2013, accessed December 2013 at http://www.smgov.net/Departments/PCD/Zoning/Zoning-Update/.

Neighborhood Commercial (NC) districts surround Ocean Park Boulevard, a major access roadway to the airport and the business park. This district allows for small-scale developments, offering primarily locally-oriented commercial retail, service and office uses. Figure 5.33 illustrates the location of Santa Monica zoning districts surrounding the airport.

Figure 5.33 Santa Monica Zoning Districts

Source: City of Santa Monica, *Zoning Ordinance Update – Public Review Draft*, 2013. Accessed December 2013 at http://www.smgov.net/Departments/PCD/Zoning/Zoning-Update/.

Community Perspectives

Community opposition to growth in Santa Monica could impact future development near the airport. Opposition has been lead by city officials, residents and community organizations.

- The City of Santa Monica sued the FAA in 2013 to regain full control over SMO property and operations. City officials have expressed interest in

closing the airport to make way for future development[40]. The City initially leased the airport to the FAA during World War II, which included a clause that SMO would remain open as an airport even after the contract expires. The agreement expires in July 2015 after which point the City contends it has full authority over the airport property. The City is conducting its airport visioning process in relation to possible future closing of the airport.

- The airport manager reported tension between airport users and local residents. The high-density residential uses surrounding SMO have created controversy regarding safety, compatibility, noise, environmental issues. The airport has very strict noise abatement procedures which limits large aircraft operations. The airport visioning process is exploring these issues.
- An organization called Airport2Park.org is a coalition of community groups and residents whose mission is to advocate for a new park in place of the airport[41]. The group recommends the conversion of existing buildings into public arts and cultural facilities.

Access to Infrastructure and Transit Service

There is very good development and transportation infrastructure serving the area of the airport. Given the location in a metropolitan area, all land surrounding the airport electric, water and sewer access. Transportation infrastructure near the airport includes the Santa Monica Freeway (I-10) north of the airport and the San Diego Freeway (I-405) to the east. Ocean Park Boulevard and South Bundy Drive are four- to five-lane arterials serving the airport area. Good-quality pedestrian infrastructure serves the study area, and there are bicycle-friendly routes and trails.

SMO is served by modest transit service levels. The Big Blue Bus is provided by the City of Santa Monica, and operates 15- to 30-minute headways on Ocean Park Boulevard, on average. The route serves nearby destinations such as Santa Monica College and the Santa Monica Business Park. The route provides connections to city routes serving other activity centers. The route also connects to Metro Express and Rapid routes that link downtown Santa Monica with major activity centers around Los Angeles. The SCAG RTP includes a near-term project to extend the Metro light-rail network to downtown Santa Monica via the Exposition Line, which terminates in Culver City.

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[40] City of Santa Monica Press Release accessed at: http://www.smgov.net/departments/cao/Content.aspx?id=44727.

[41] Information retrieved from: http://smdp.com/my-write-smo-airport-wont-fly/127521; See more at: http://smdp.com/my-write-smo-airport-wont-fly/127521#sthash.TgP4UH9o.dpuf.

SCAG's SCS identified high quality transit areas (HQTA), which includes the area around SMO. HQTAs are areas within one-half mile of transit services offering at least 15-minute service frequency during peak periods, and indicate where local jurisdictions are encouraged to develop transit supportive land uses. The HQTAs include development typologies such as transit villages, downtowns, main streets, and commercial corridors, all of which include provisions to encourage pedestrian and transit access.

The City of Santa Monica has a number of parking policies that could be applied to the airport area to support smart growth, including the Downtown Mall Assessment District and the Parking Developer Fee. The Assessment District encourages facilities allowing drivers to park at a centrally-located facility and walk to multiple destinations. The in-lieu program allows developers to pay a fee instead of providing the required amount of parking, which allows developers to reduce parking area while still maintaining financial participation in maintaining multimodal transportation infrastructure.

Economic Analysis

The following section summarizes the results of the economic analysis, which show that the agglomeration of the employees into a more compact space around the airport generates significant additional economic growth because the agglomeration improves the productivity of these businesses. The detailed methodology used to measure the economic agglomeration benefits is described in Appendix E. This section provides the SMO study area results.

Projecting Land Use and Employment

The SMO study area contains 120 acres of land. The Santa Monica Business Park, which was developed around 1980, includes approximately 618,000 square feet of general commercial and office space, a hotel, and 50,000 square feet of commercial retail. The 178 private firms that have established business operations within the project area employ about 1,675 workers. Table 5.27 presents the 2012 employment in the SMO study area.

The consultant team traveled to every subarea of Santa Monica Municipal Airport and spoke with City of Santa Monica planning staff to assess existing conditions and future development potential[42]. Site visits included visual assessments of key businesses, vacant lots, infill sites, roadways, open space, and potential environmental constraints in the project area. This information was used to categorize developed areas by land use type. The detailed methodology used to measure the economic agglomeration benefits is described in Appendix E.

[42] Interviews with Carol Johnson (Planning Manager) and John Montagh (Economic Development and Housing Manager) for the City of Concord.

Table 5.27 SMO Area Employment by Industry (2012)

Industry Sector	Jobs	Industry Sector	Jobs
Agriculture	8	Finance, Insurance, real estate	51
Mining	0	Professional & tech services	0
Utilities	29	Management & administration	335
Construction	29	Education & health care	136
Manufacturing	93	Arts, Entertainment & recreation	114
Wholesale	70	Accommodations	23
Retail	96	Food service & drinking	18
Transportation & Warehousing	0	Other services	491
Information	150	Public administration	34
		Total	1,677

Source: ESRI Project Area Employment Estimate, 2012.

The results of the existing conditions analysis were indicative of the relatively high density office park settings near the study area, suggesting the surrounding area was already a successful smart growth development area. The office and business park areas had a 2.0 FAR., commercial retail FAR was 0.3, light industrial FAR was 0.4, and warehouse FAR was 0.4.

Next, the study team estimated future growth assuming a strong future market for office, business park, and general commercial building types. The team assumed that sufficient market demand would emerge during the next 30 years to convert the light industrial and warehouse space into business park, office or research, and development space. These assumptions were based on existing conditions and discussions with local planners about probable trends in land uses and city regulations[43].

Table 5.28 presents the results of the future land use estimates. The SMO area has the capacity to add 5.5 million square feet of new business space and 10,200 new jobs from elsewhere in California by the year 2040. Overall by 2040 the smart growth area could hold 1.9 million square feet of business space accommodating approximately 8,830 employees. It is important to note that these are jobs projected to be added to the statewide economy between 2013 and 2040. As such, jobs forecast to locate in this area cannot be described as "new" to California as a consequence of smart growth. However, the study team then used this projected reallocation as inputs to the economic model in order to estimate additional economic activity in California that can be generated by the agglomeration induced by smart growth.

[43] Interview with David Martin, City of Santa Monica Planning Director, December 2013.

Table 5.28 SMO Area Employment by Industry (2040)

Building type	Acres	Jobs	Floor Area per Employee	Total Floor Area	FAR
Commercial Retail	4	110	450	51,000	0.31
Light Industrial & General Commercial	0	0	900	0	0.4
Office and Business Parks & General Commercial	24	8,610	215	1,853,500	2
Hotel	20	110	0	0	0
Warehouse	0	0	900	0	0.4
Residential	24				
Golf Course	24				
Roadways and Public Spaces	24				
Total	120	8,830		1,905,000	
30-year gain		7,150		1,287,000	

Source: EDR Group.

Estimating Economic Impacts

The effect of greater smart growth development near SMO is forecast to result in 855 additional jobs, $295 million in additional value added, and $78 million in additional income to the California economy by the year 2040 (Table 5.29). These are the potential economic impacts of smart growth/business attraction policies are due to agglomeration in the smart growth area above the baseline forecast.

The leading industrial sectors include manufacturing; transportation and warehousing; professional, scientific and technical services; and wholesale trade. Manufacturing accounts for 40 percent of the increase in value added, and 32 percent of income growth to the State. Transportation and warehousing accounts for 11 percent of value added growth, and 14 percent of income growth. The professional, scientific and technical services sector accounts for 9 percent of value added growth, and 13 percent of income change. The results by industry sector are presented in Table 5.29 below.

Table 5.29 SMO Economic Analysis Results (2040)
(In Millions of Current 2013 U.S. Dollars)

	Total Impacts to California			
NAICS Sector	Jobs	Output	Value Added	Income
11 Agriculture, Forestry, Fishing and Hunting	16	2.22	1.08	0.82
21 Mining, Quarrying, and Oil and Gas Extraction	5	2.05	1.11	0.34
22 Utilities	2	1.78	0.85	0.28
23 Construction	20	4.02	2.39	2.10
31-33 Manufacturing	157	173.54	52.40	24.76
42 Wholesale Trade	67	19.23	14.16	8.16
44-45 Retail Trade	63	5.95	4.45	2.83
48-49 Transportation and Warehousing	113	25.86	14.12	11.14
51 Information	13	5.06	2.98	1.66
52 Finance and Insurance	33	7.68	4.39	2.26
53 Real Estate and Rental and Leasing	26	5.03	3.84	0.58
54 Professional, Scientific, and Technical Services	85	16.82	12.26	9.95
55 Management of Companies and Enterprises	16	3.39	2.11	1.83
56 Administrative and Support and Waste Management and Remediation Services	71	6.05	4.14	3.50
61 Educational Services	10	0.67	0.44	0.39
62 Health Care and Social Assistance	46	4.69	3.15	2.77
71 Arts, Entertainment, and Recreation	10	0.87	0.59	0.37
72 Accommodation and Food Services	68	6.72	3.89	2.62
81 Other Services [except Public Administration]	28	2.12	1.40	1.23
92 Public Administration	6	0.75	0.72	0.62
Total	855	294.49	130.48	78.22

Source: EDR Group.

Regional Growth Potential

The region and neighborhoods around SMO expect continued growth in population and employment. The Southern California Association of Governments (SCAG) expects the Los Angeles mega-region, which includes Santa Monica, to add 4 million people and over 2 million jobs by the year 2035. While supporting positive growth in the regional economy, SCAG's RTP/SCS

noted the challenges inherent in accommodating growth in an already highly-developed metropolitan area. Notable challenges included air quality, greenhouse gas emissions, traffic congestion, deteriorating state of good repair in the transportation network, and ensuring a socially equitable distribution of economic growth.

Several plans are guiding growth in Santa Monica, including the following:

- **Santa Monica Municipal Airport Visioning Process**. The airport is hosting a visioning process to plan for use of airport property if the City of Santa Monica is successful in closing SMO. The plan address concerns about airport operations, procedural and data transparency, public communications, airport environmental policies and strategies, land use compatibility, site design improvements. The process will result in a long-range plan in 2014.
- **Santa Monica Sustainable Communities Plan**. The City of Santa Monica developed an award-winning Sustainable Communities Plan in 2006. The city vision included nurturing the local economy, and adopting sustainable business practices. The plan also set goals to create a multimodal transportation system to reduce congestion and promote mobility, and implement land use and transportation policies that support compact and mixed-use local development patterns.[44]
- **SCAG Sustainable Communities Strategy**. SCAG's 2012 SCS was a collaborative regional effort to visualize and plan for growth in the Los Angeles region. The vision is based on four main principles: mobility, livability, prosperity, and sustainability. To address the challenge of substantial growth, SCAG's SCS embraces focused growth around key population and transportation assets. As noted above, the SCS identifies Santa Monica as a High Quality Transit Area, which should help guide available resources to support medium and high density development within a connected, multimodal transportation network.

San Diego International Airport

San Diego International Airport (SAN) is a major metropolitan commercial air service airport located less than four miles from downtown San Diego (Figure 5.34). SAN offers a full range of aviation services, including commercial air service, air cargo facilities, general aviation facilities for corporate aircraft, and other aviation-related services.

[44] Santa Monica Sustainable City Plan, revised October 24, 2006.

Figure 5.34 SAN and Surrounding Area Map

Source: ESRI.

According to SAN's planning manager, there are no corporate or industrial parks located on-airport. The airport property encompasses 663 acres and includes three undeveloped properties – a former naval training center, a former General Dynamics site, and a former Teledyne-Ryaan site. Since SAN is highly constrained by surrounding development, all available undeveloped parcels likely will be utilized strictly for aviation related use. There are also numerous privately owned corporate and industrial parks in the vicinity of the airport.

SAN is a major economic driver in the San Diego region. The San Diego County Regional Airport Authority estimates that visitors who arrive by air to San Diego spend $2.6 billion annually.[45] Overall, the airport contributes $9.9 billion in annual economic impact to the region. Airport operations employ over 6,000

[45] SAN Plan Demand and Economic Benefits Fact Sheet, http://www.aci-na.org/sites/default/files/files/SAN-Demand_Benefits_Fact_Sheet_08Mar11.pdf.

workers directly, and 115,000 regional jobs (one of every 16 regional jobs) are related to operations at SAN.

The study team applied 11 characteristics to determine the role of the airport area in the regional SCS. The results of this screening indicated that SAN is one of the seven case study airports (out of 20 total case studies) that can play the roles of a smart growth area and a transportation hub. These roles involve the potential to attract denser, mixed-use development because of SAN's urban environment, population and employment density, and proximity to activity centers and multimodal transportation infrastructure. The following case study evaluates three different types of conditions within SAN area to determine constraints and opportunities.

Market Assessment

The market assessment describes three economic forces that drive the market feasibility for developing high density, mixed-use development within the SAN area: population growth and characteristics, employment, and land use.

Population Growth and Characteristics

The size of a region's population, as well as the employment, education, and age of the population indicates the types of consumers and workers that would be patronizing SAN retail land use and employees available to the SAN-area businesses. As shown in Tables 5.30 through 5.34, demographic trends reveal that the study area around SAN has a population and labor force to support the type of dense, mixed development desired for a smart growth area.

In 2012, the City of San Diego had close to 1.2 million people, making it the second largest city in California.[46] The City of San Diego's population grew at an average annual rate of 1.0 percent between 1990 and 2000; this was just under the state average of 1.3 percent and the county average of 1.2 percent (Table 5.30). Between 2000 and 2012, the City of San Diego's average annual population growth rate fell to 0.5 percent, nearly one-half of the state and county average of 1.0 percent. By 2050, the City of San Diego's population is projected to be 1.9 million, and the County of San Diego's population is projected to be 4.4 million.[47]

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[46] California Department of Finance, Population Estimates, 2012, http://www.dof.ca.gov/research/demographic/reports/estimates/e-1/view.php.

[47] SANDAG 2050 Regional Growth Forecast, http://www.sandag.org/uploads/projectid/projectid_355_10794.pdf.

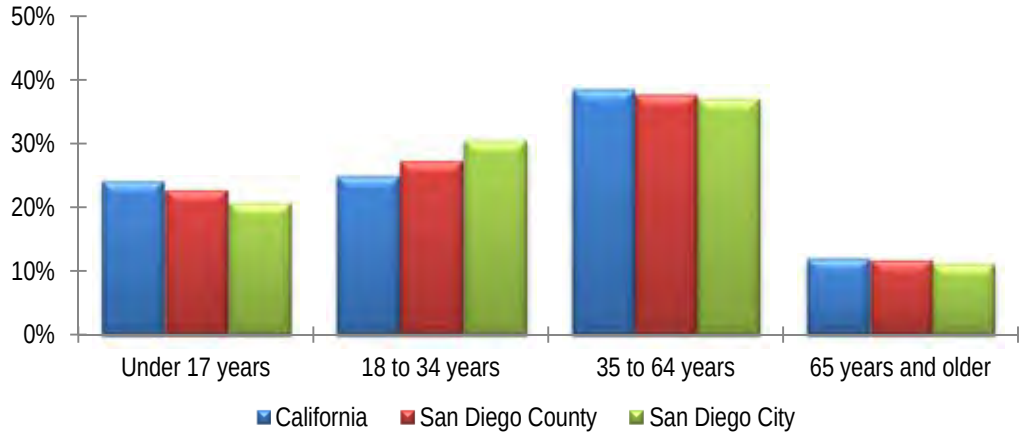
Table 5.30 San Diego County and San Diego Population and Population Change (1990 to 2012)

				1990-2000		2000-2012	
Area	1990	2000	2012	% Change	Avg. Annual Change	% Change	Avg. Annual Change
California	29,760,021	33,871,648	38,041,430	13.8%	1.3%	12.3%	1.0%
San Diego County	2,498,016	2,813,833	3,177,063	12.6%	1.2%	12.9%	1.0%
San Diego	1,110,549	1,223,400	1,296,437	10.2%	1.0%	6.0%	0.5%

Sources: U.S. Census Bureau Census 1990, Census 2000 and American Community Survey 2012.

The City and County of San Diego and California have similar population profiles with some differences among younger population cohorts. Figure 5.35 show that the City and County of San Diego have more individuals between the ages of 18 and 34, and a slightly lower share of youth under 17 years old. On average, San Diego County has fewer people per household (2.82) than the State (2.93).[48]

Figure 5.35 San Diego County and City Population Age Profile (2012)



Source: U.S. Census Bureau American Community Survey 2012.

Educational attainment in the City and County of San Diego is higher than the statewide average. Table 5.31 and Figure 5.36 show that City and County San Diego have a higher percentage of individuals with a Bachelor's degrees and above than the State of California, and a lower percentage of individuals with less than a high school diploma.

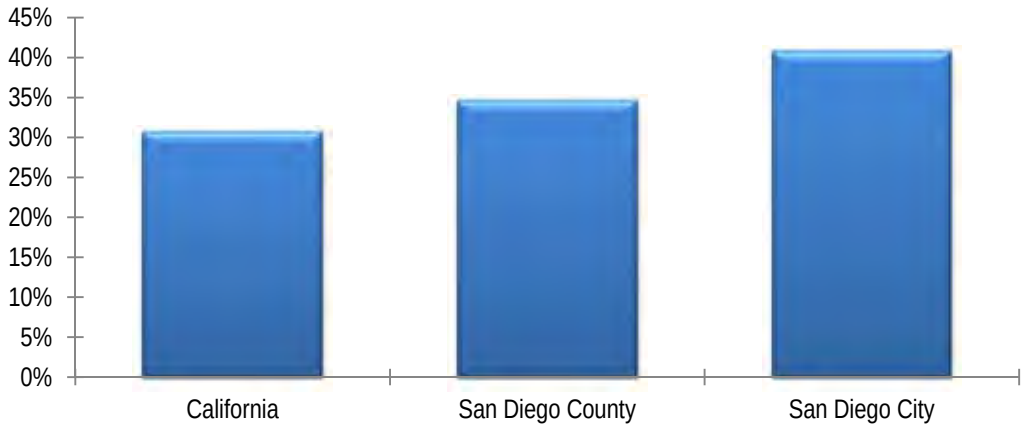
[48] http://quickfacts.census.gov/qfd/states/06/06073.html.

Table 5.31 San Diego County and City Population Educational Profile (2012)

Population 25 years and over	California	San Diego County	San Diego City
Less than high school diploma	19%	14%	14%
High school graduate (includes equivalency)	21%	19%	17%
Some college or Associate's degree	30%	32%	29%
Bachelor's degree and above	31%	35%	41%
Total	100%	100%	100%

Source: U.S. Census Bureau American Community Survey 2012.

Figure 5.36 San Diego County and City Share of Population with a Bachelor's Degree and Above (2012)



Source: U.S. Census Bureau American Community Survey 2012.

San Diego's population profile is characterized by:

- Smaller household size;
- Higher educational attainment; and
- A similar age profile to the State, with a slightly higher share of individuals between 18 and 34, and a smaller share of individuals under 18 years old.

These characteristics may suggest an increased need for multi-unit housing. In addition, the higher share of Millennial and Generation Y city residents compared to San Diego County and state residents should increase biking and walking and reduce VMT. These generations also show a preference for transit oriented developments.

Employment

Table 5.32 shows the unemployment rates for California, the City and County of San Diego. Overall, the City and County of San Diego have seen lower rates of unemployment than the state average.

Table 5.32 San Diego County and City Unemployment Rates (1990 to 2013)

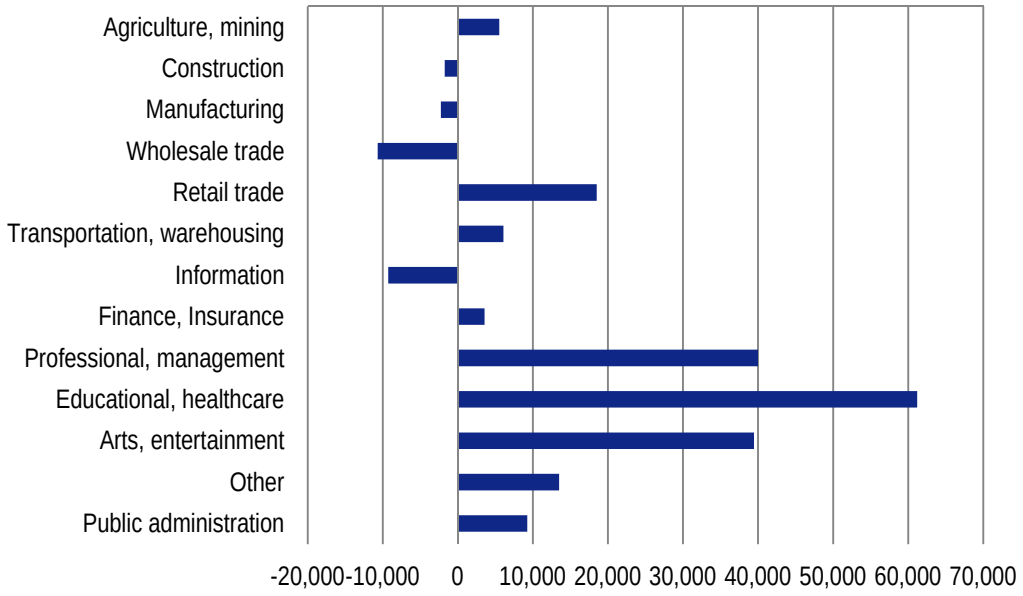
Area	1990	2000	2012	2013[a]
California	5.8%	4.9%	10.5%	8.3%
San Diego County	4.6%	3.9%	8.9%	7.0%
San Diego City	4.7%	3.9%	8.9%	7.0%

Source: U.S. Census Bureau American Community Survey 2012.

[a] 2013 data for is preliminary data for the month of October 2013.

Between 2000 and 2012, San Diego County's total employment grew by 14 percent. Figure 5.37 shows these trends by industry-level sector. Educational and healthcare employment saw the largest absolute increase (61,000 workers) during this period. Employment in professional and management, and arts and entertainment also experienced around 40,000 new jobs from 2000 to 2012. Employment in wholesale trade and information, however, decreased by 9,000 to 10,000 during this period.

Figure 5.37 San Diego County Change in Employment by Industry (2000 to 2012)



Source: U.S. Census Bureau American Community Survey 2012.

Land Use

SAN occupies a 663-acre site bordered to the east by downtown San Diego, to the south by North Harbor Drive and the harbor itself, to the west by a marine channel and residential areas, and to the north by Interstate 5, the U.S. Marine Corps Recruitment Depot, and residential and other developments.[49] The project team interviewed airport staff to learn about activities and land uses on and off airport property. Airport staff report that there are no corporate or industrial parks located on SAN property, nor are there any planned for the future. SAN's functional capacity is limited by the single runway, the lack of available property for expansion, and the strictly-enforced overnight noise curfew. As such, airport property is highly constrained by surrounding development and likely will be utilized strictly for aviation-related uses. All of the off-airport industrial parks are privately-owned by nonairport entities. These parks accommodate a variety of commercial, corporate, industrial and military uses.[50]

Table 5.33 shows the City of San Diego has smaller share of single family homes and a larger share of multifamily homes than the State and San Diego County. Approximately 44 percent of housing units in the City of San Diego are multifamily (with more than two units in the structure), compared to about 35 percent in San Diego County and 32 percent in the State of California.

Table 5.33 San Diego County and San Diego Housing Type and Vacancy Rate (2012)

Housing Type and Occupancy Rate	California		San Diego County		San Diego City	
	Number	Percent	Number	Percent	Number	Percent
Single Family	8,983,275	65%	713,225	61%	283,908	55%
Multifamily 2+ units	4,243,133	31%	415,761	35%	228,527	44%
Mobile Homes	559,389	4%	45,880	4%	6,746	1%
Total	13,785,797	100%	1,174,866	100%	519,181	100%
Vacancy Rate	–	8.1%	–	6.7%	–	6.4%

Source: U.S. Census Bureau American Community Survey 2012.

Regulatory Environment and Community Perspective

This section describes the San Diego County regulations, such as zoning, floor area ratio (FAR), height restrictions, historical preservation, noise abatement, toxic or chemical restriction, recreational uses, open space, or agricultural

[49] Jacobs Consultancy, prepared for San Diego County Regional Airport Authority and the City of San Diego, *Destination Lindbergh: The Ultimate Built-Out*, March 2009.

[50] Telephone interview with Angela Jamison – Planning Manager for San Diego International Airport (619-400-2464), March 6, 2013.

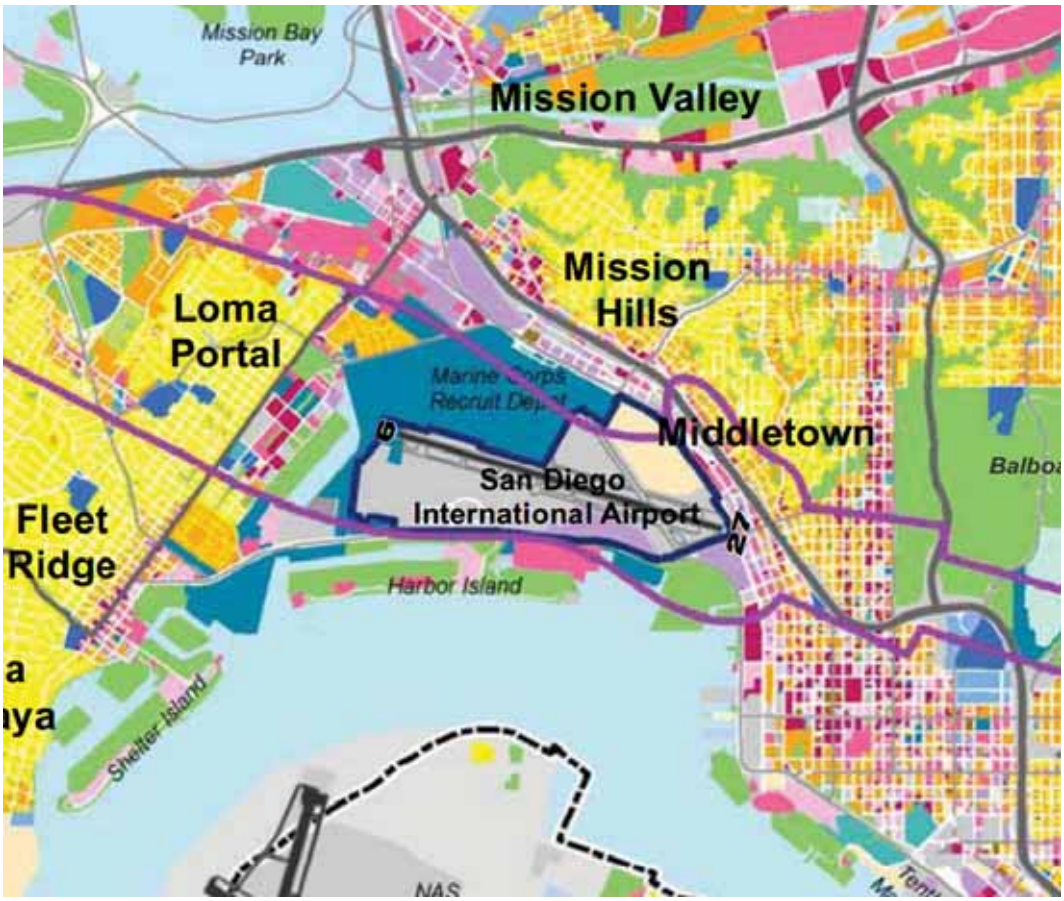
preservation that could affect future growth development in the vicinity of SAN. These regulations control different aspects of future use of land near the airport, and also inform the community's support or lack thereof for future development in the region.

Zoning and Area Planning Policies

The City of San Diego has existing plans and regulations that govern development capacity near the airport. Plans and policies most relevant to this study include the following: City of San Diego Municipal Zoning Code, the San Diego International Airport Land Use Compatibility Plan, the San Diego Association of Government's 2050 RTP and Smart Growth Concept Map.

Figure 5.38 shows zoning districts around SAN. The City of San Diego has developed Municipal Code (Section 132.02 Airport Approach Overlay Zone) to prevent hazards that might result from conflicts between the Airport and other uses; these special Airport zoning regulations control height limits and regulate land use near SAN.

Figure 5.38 San Diego Zoning Map Excerpt

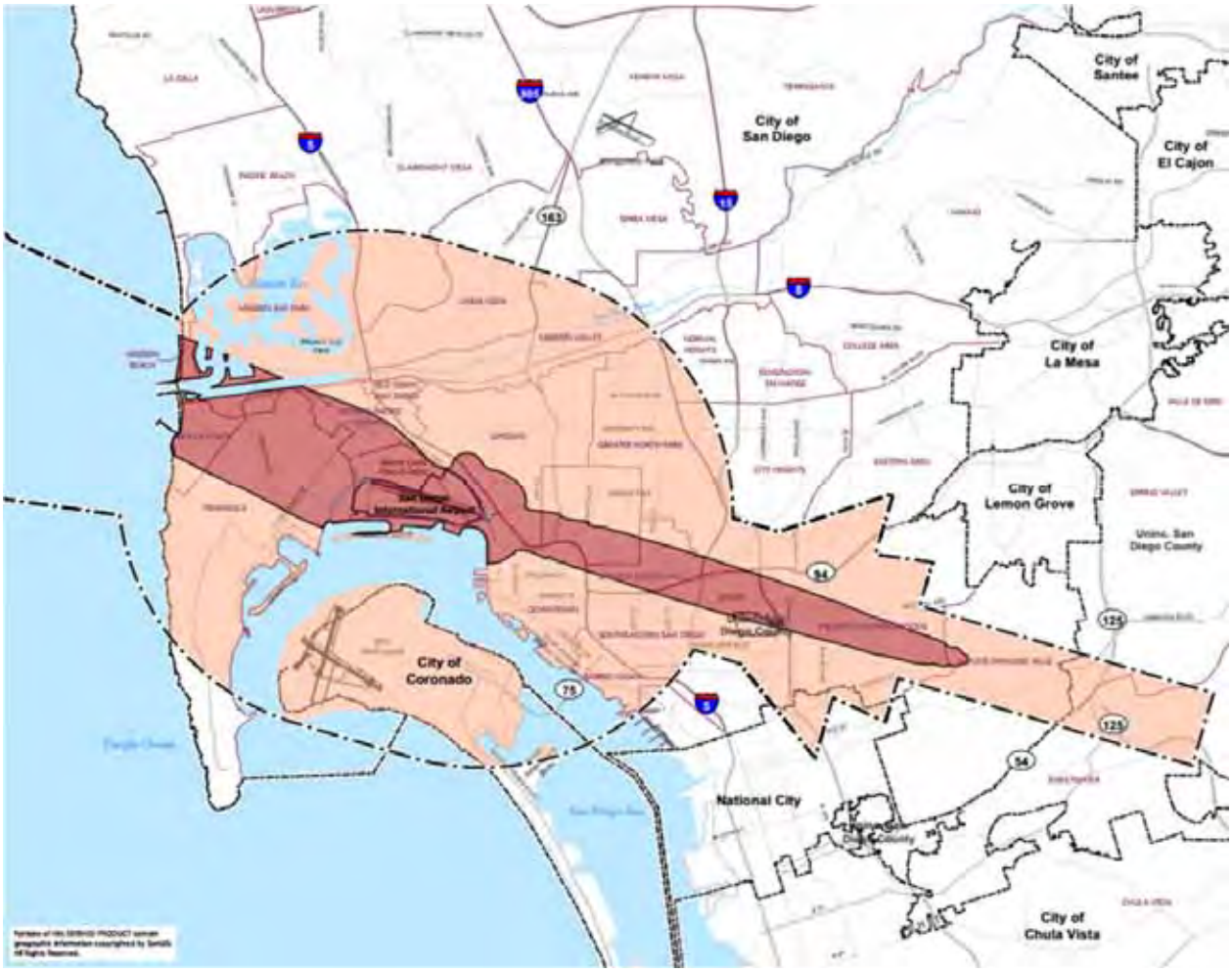


Source: Final Environmental Impact Report for the San Diego International Airport Land Use Compatibility Plan, 2014.

San Diego International Airport Land Use Compatibility Plan (ALUCP)

The ALUCP identifies policies and requirements applicable to developments within SAN's Airport Influence Area (AIA), pursuant to the California State Aeronautics Act. As shown in Figure 5.39, the San Diego County Regional Airport Authority defines AIA as the area within which airport-related effects necessitate restrictions or conditions on future development to ensure airport compatibility. The ALUCP applies four compatibility factors to future developments: noise compatibility, safety compatibility, airspace protection, and overflight.

Figure 5.39 SAN Influence Area



Source: Final Environmental Impact Report for the San Diego International Airport Land Use Compatibility Plan, 2014.

2050 RTP

The San Diego Association of Governments (SANDAG) is developing its Urban Area Transit Strategy (UATS), as a part of its 2050 RTP. SANDAG envisions that the UATS will start the long-range transit planning process for the region, with a focus on the region's most urbanized areas. The UATS' overarching goal is to create a world-class transit system for the San Diego region in 2050, and significantly increase the attractiveness of transit, walking, and biking in the region's most urbanized areas. The UATS developed three alternative transit networks:

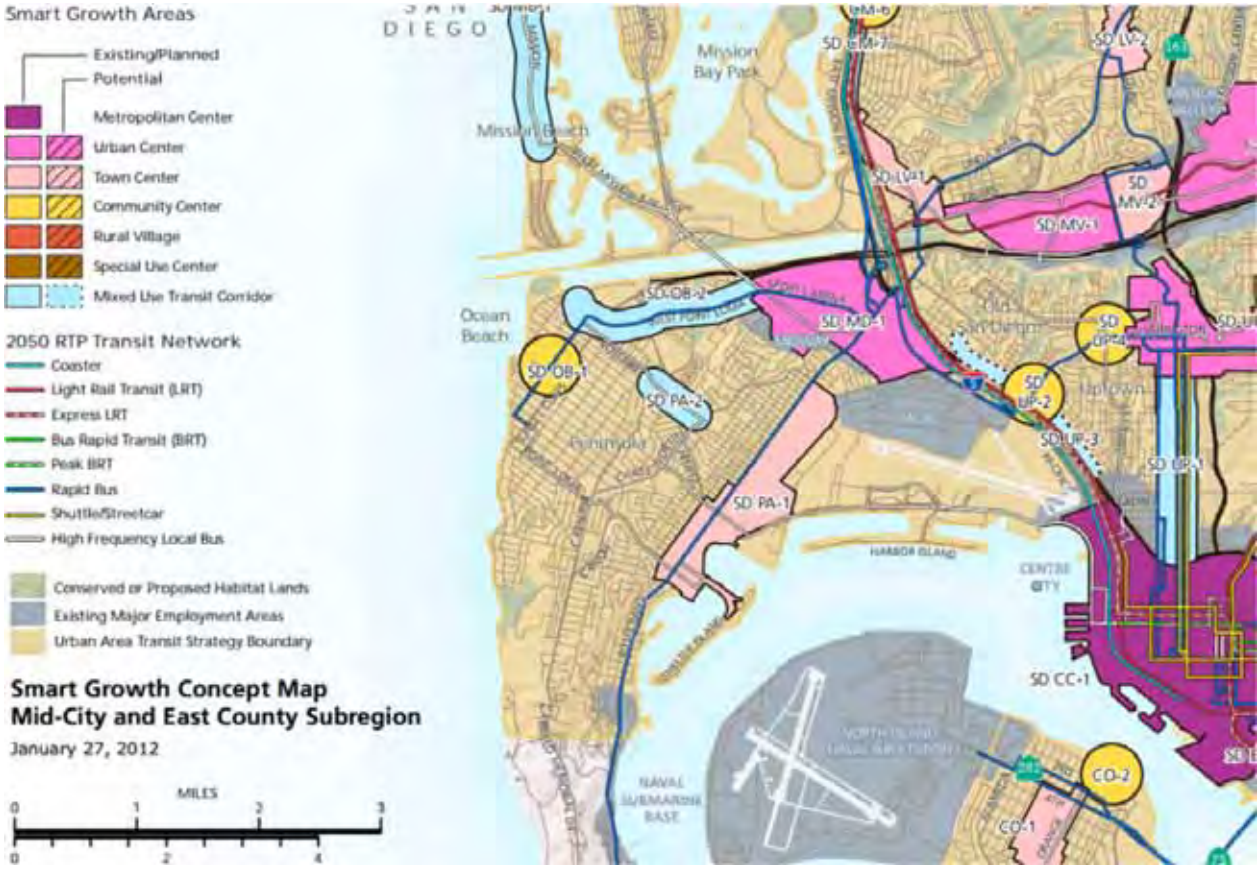
- The Transit Propensity alternative focused on providing new transit services within the downtown and inner-ring suburbs of San Diego where higher intensity, mixed land uses enhance access to transit and support transit use;
- The Commuter Point-to-Point alternative focused on providing new transit services to major employment centers within the region, primarily in peak commute hours, using a variety of bus-based transit services; and
- The Many Centers alternative focused on creating a network of new transit services, linked by regional transit to connect designated smart growth areas, major activity centers, and major employment and residential areas.

All three alternatives included High-Speed Rail (HSR) that linked to an intermodal transit center and indicated the airport as a smart growth area.

Smart Growth Concept Map

In 2004, SANDAG adopted a regional comprehensive map that outlined the location of existing, planned, and potential smart growth areas. Figure 5.40 shows the four potential growth areas around SAN.

Figure 5.40 San Diego Smart Growth Concept Map Excerpt



Source: SANDAG Smart Growth Concept Map.

The characteristics of the four existing / planned centers included in the regional comprehensive map are as follows:

- **Along Rosecrans, existing/planned town center (SD-PA-1).** This town center contains existing community-serving retail and multifamily uses. The Peninsula Community Plan designates this for multifamily (30 to 44 dwelling units per acre) and commercial. The town center also includes Liberty Station which is a mixed-use residential, retail, business, recreational, cultural, and educational center at the former Naval Training Center.
- **I-8, Midway Drive, and I-5, existing/planned urban center (SD-MD-1).** This area contains commercial and light industrial uses as well as the Sports Center. The Mid-Pacific Highway community plan designates this area for community and office commercial, light industrial, multiple use, and residential up to 43 dwelling units per acre.
- **West Washington Street and India Street, existing/planned community center (SD-UP-2).** The Uptown Community Plan designates the area for mixed-use allowing medium-density residential at 29 to 44 dwelling units per acre. According to the plan, areas designated for mixed-use development

are the higher-intensity neighborhood and specialized commercial nodes. These are the areas of focused retail and pedestrian activity, located at major street intersections. These areas are recommended to be higher intensity use areas, acting as both visual and activity focal points. Specific recommendations found in the plan include promoting commercial use along India Street, since it is visually and physically accessible to I-5 and aids in buffering the residential units from freeway noise. The area is located in close proximity to the Washington Street and Old Town Trolley Stations.

- **San Diego Downtown (SD-CC-1), Downtown Community Plan Area, existing/planned metropolitan center.** As a regional center, downtown San Diego contains the administrative, legal, government, business, entertainment, and cultural center, with the largest centralized, high-density housing in the region. The Downtown Community Plan contains designated land uses that will allow people to live and work near transit in pedestrian-friendly neighborhoods and will support up to 165,000 jobs and a residential population of 90,000 people.[51]

Community Perspectives

This section provides an overview of the surrounding communities' perspectives on growth and development near the airport. Since SAN's surrounding land use constrains its physical layout, facilities expansion in recent years has been limited within the airport's existing footprint. In 2009, SAN began expanding its second terminal by adding 10 new gates and a dual-level roadway to separate curb traffic for arriving and departing passengers. SAN completed this expansion in August 2013. During the planning and construction phase of the terminal expansion, an organization of residents west of SAN opposed the expansion, citing safety, noise, traffic and environmental impact.[52]

To address neighborhoods surrounding SAN that are affected by aircraft operations noises, the San Diego County Regional Airport Authority community has formed an airport noise advisory committee. The committee, composed of 14 voting members from various organizations, residential areas, and professional association, and makes recommendations to the airport authority board regarding:

- The Residential Sound Attenuation Program;
- Airport Noise and Land Use Compatibility Program;
- Airport Noise Monitoring and Mitigation Efforts; and
- Other airport noise related issues.

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[51] http://www.sandag.org/uploads/projectid/projectid_296_14002.pdf.

[52] http://www.examiner.com/article/peninsula-community-planning-board-voices-san-diego-airport-concerns-to-congresswoman-susan-davis.

In the past, the San Diego County Regional Airport Authority had proposed relocating the region's international airport to other sites in San Diego County. San Diego voters, however, overwhelmingly opposed relocating the region's international airport to the Marine Corps Air Station Miramar site in 2006.[53]

Access to Infrastructure and Transit Service

Infrastructure

The City of San Diego is a major metropolitan area with well-connected with destinations around the Southern California and across the State by road and rail service. SAN is located near Interstate 5, one of the main north-south highways on the West Coast. SAN is also located near Interstate 8, which serves as a major east-west highways connecting San Diego with Imperial County and southern Arizona. The SAN project area is characterized by aviation and military uses to the north and west. The area south of the airport includes the main access route. Multi-lane arterials run through the SAN project area. While most arterials have sidewalks, generally the environments are not particularly pedestrian or bike-friendly. The airport project area has bike lanes and bike path that connect the airport with downtown San Diego.

Transit Service

Transit service in the San Diego region is well developed and connects the region with other major Californian cities. Amtrak's Pacific Surfliner provides passenger service in downtown San Diego, approximately one mile southeast of the airport. The Pacific Surfliner route provides service from Santa Barbara through Ventura, Los Angeles, and Orange County to San Diego. San Diego County is also served by two commuter rail services – Coaster and Metrolink. Coaster provides more than 20 weekday trains between Oceanside and San Diego Union Station. Two Metrolink routes end and begin in Oceanside. The Metrolink Inland-Orange County line provides daily service between San Bernardino and Oceanside, via Orange County and Riverside. The Metrolink Orange County line provides daily service between Los Angeles and Oceanside, via Orange County.

The San Diego Metropolitan Transit System (MTS) also operates three light-rail lines (trolleys) and 93 bus routes throughout San Diego County. The three light-rail lines are:

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[53] San Diego County Proposition A Results, 2006, http://www.smartvoter.org/2006/11/07/ca/sd/prop/A/.

- The Blue line between San Ysidro and Downtown San Diego;
- The Orange Line between the eastern suburbs of El Cajon and La Mesa to Downtown San Diego; and
- The Green line between Santee and Downtown San Diego via Mission Valley.

MTS also operates various commuter, express, and fixed bus routes throughout the County. MTS contracts with the San Diego and Imperial Valley (SD&IV) Railroad and the Pacific Imperial Railroad (PIR), to provide freight service to San Diego shippers over SD&AE right-of-way. SD&IV shares certain tracks with the trolleys and operates during nonservice Trolley hours.

MTS has planned the following future transit services:

- Express LRT (Trolley – Blue and orange lines, to be phased in by 2040);
- LRT (Trolley- Green Line extension to downtown, to be phased in by 2018);
- LRT (Trolley – I-15 to downtown, to be phased in by 2035);
- LRT (Trolley – SDSU to downtown via El Cajon Boulevard / Park Avenue, to be phased in by 2050);
- BRT to be phased in by 2035;
- Peak period BRT to be phased in by 2018;
- Rapid bus to be phased in by 2030; and
- Two streetcar routes to be phased in by 2030 and 2035.

Van Nuys Airport

Van Nuys Airport (VNY) is a metropolitan, general aviation airport located in Los Angeles' San Fernando Valley. VNY is marketed as "LA's #1 Business Airport" by its owner Los Angeles World Airports (LAWA). VNY does not offer commercial scheduled air passenger service, but an estimated 320,000 visitors utilize the airport annually, flying on corporate, private and charter aircraft. Five Fixed Base Operators (FBOs) and other aviation services at VNY offer a full range of general aviation services such as aircraft tours, charters, sales, rentals, flight schools / training, and corporate flight services.

A 2007 economic impact study found that the Airport contributes more than $1.3 billion to the Southern California economy, supports over 12,300 jobs and generates earnings of $707 million annually. The study reports that airport visitors spend approximately $176 million annually in the area and are responsible for generating 3,142 direct, induced and indirect visitor industry jobs, which in turn generate almost $93 million in personal income, wages and salaries. The facility does not receive local tax dollars toward its operation, but is financed entirely by revenues from leases, rentals and user fees. LAWA leases space to a variety of tenants that provide aviation- and nonaviation-related

services. These activities generate nearly $80 million in state and local taxes annually.[54]

The study team applied 11 characteristics to determine the role of the airport area in the regional SCS. The results of this screening indicated that VNY is one of the eight case study airport (out of 20 total case studies) that can play the roles of a smart growth area and a transportation hub. These roles involve potential attraction of more dense, mixed-use development, proximity to activity centers, land that is potentially suitable for high density mixed-use future development, and proximity to multimodal transportation infrastructure. As a prime location for future smart growth development types, the area also has opportunities for improvement for walking, biking, transit, and auto connections. The following case study evaluates three different types of conditions within VNY area to determine constraints and opportunities for this role.

Market Assessment

The market assessment describes three economic forces that drive the market feasibility for developing high density, mixed-use development with in the VNY area: population, employment, and land use.

Population

The size of a region's population, as well as the employment, education, and age of the population indicate the types of consumers and workers that would be patronizing VNY retail land use and employees available to the VNY-area businesses. As shown in Tables 5.39 through 5.43, demographic trends reveal that the study area around VNY has adequate population, population growth expectancy, density, and a labor force to potentially support the type of dense, active development that would be desired for a smart growth area.

Table 5.34 shows the population growth in the City of Los Angeles and the County of Los Angeles has been slightly lower than growth at the state level between 2000 and 2012. Nevertheless, the area faces the challenge of accommodating 4 million more people in the region by 2035.[55] SCAG's SCS vision describes how land use changes will accommodate this growth. This vision embraces focused rather than dispersed development, walkable and transit-friendly neighborhoods and an increase in the density of housing.

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[54] Van Nuys Airport Economic Impact Study, 2007 http://www.lawa.org/welcome_VNY.aspx?id=1184.

[55] SCAG RTP 2012 to 2035, SCS.

Table 5.34 Los Angeles County and City Population and Population Change (1990 to 2000)

				1990-2000		2000-2012	
Area	1990	2000	2012	% Change	Avg Annual Change	% Change	Avg Annual Change
California	29,760,021	33,871,648	38,041,430	13.8%	1.3%	12.3%	1.0%
Los Angeles County	8,863,164	9519338	9,962,789	7.4%	0.7%	4.6%	0.4%
Los Angeles City	3,485,398	3,694,820	3,782,544	6.0%	0.6%	2.3%	0.2%

Sources: U.S. Census Bureau Census 1990, Census 2000, and American Community Survey 2012.

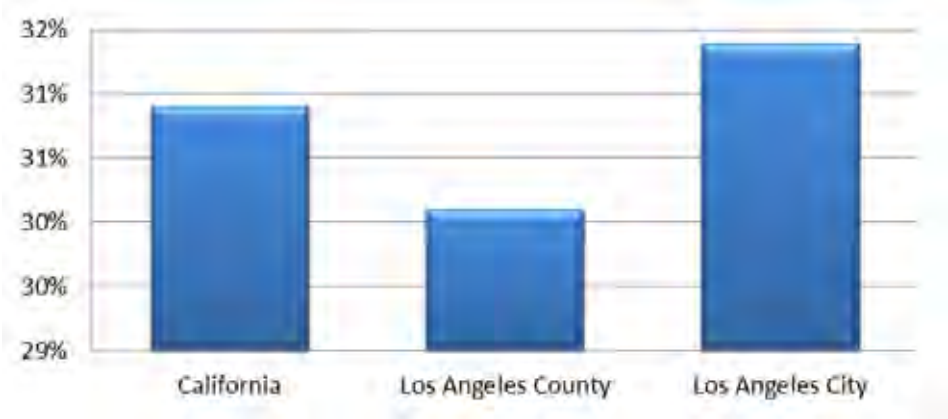
The City of Los Angeles age distribution is very similar to both Los Angeles County and the State, thus the market for smart growth development among working age professionals is on par with the rest of the region and State, as shown in Figure 5.41.

Figure 5.41 Los Angeles County and City Population by Age (2012)

Source: U.S. Census Bureau American Community Survey 2012.

The education profile around VNY suggests the area is as suitable as the State and County for attracting professional occupations (e.g., finance, management) that are typical of smart growth development areas. As shown in Figure 5.42, the City of Los Angeles has a slightly higher share of residents with a Bachelor's degree or graduate degree.

Figure 5.42 Los Angeles County and City Share of Population with a Bachelor's Degree or Higher (2012)



Source: U.S. Census Bureau American Community Survey 2012.

Employment

As shown in Table 5.35, the City of Los Angeles unemployment rate is approximately one percent higher than the County, and two percent higher than the State. As a result of the Great Recession, the City of Los Angeles unemployment rate more than doubled from 2000 to 2012 on par with the county and state increase in unemployment. More recently, the level of employment is starting to recover and the unemployment rate is decreasing – the rate dropped about two percentage points from 2012 to 2013 for the City, County, and State.

Table 5.35 Los Angeles County and City Unemployment Rate (1990 to 2013)

Area	1990	2000	2012	2013
California	5.8%	4.9%	10.5%	8.3%
Los Angeles County	5.8%	5.4%	10.9%	9.4%
Los Angeles City	6.6%	6.0%	12.1%	10.5%[a]

Sources: U.S. Census Bureau Census 1990, Census 2000 and American Community Survey 2012.
[a] 2013 data for the City of Los Angeles is preliminary data for the month of October 2013.

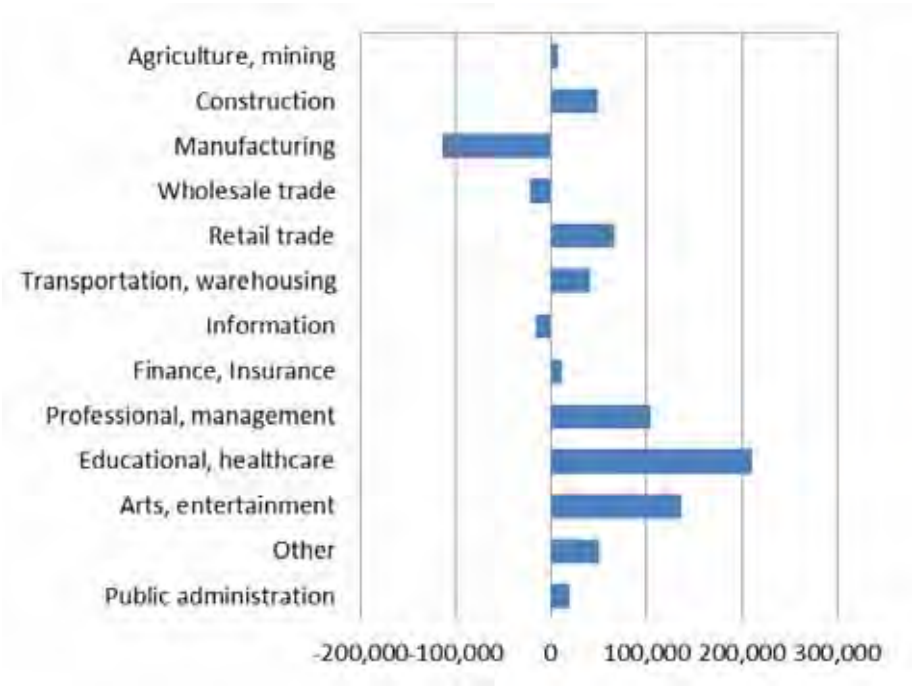
As shown in Table 5.35, Los Angeles County's 10-year employment grew approximately 12 percent from 2000 to 2012, with industry-level shifts that are in the same direction, but of different magnitudes as trend for the U.S. and California:

- County manufacturing employment declined 19 percent from 2000 to 2012, compared to a 33 percent decline in California overall;
- Major service-providing industry sectors increased employment over the same period;

- The professional, scientific and management sector increased 23 percent compared to 15 percent for the State, 35 percent, and 22 percent in those sectors, respectively;
- Education and health care services increased 29 percent compared to 35 percent for the State; and
- Arts, entertainment, accommodation, and food services sector experienced 41 percent employment growth compared to 22 percent for the State.

Figure 5.43 presents year 2000 and 2012 employment by industry sector in Los Angeles County.

Figure 5.43 Los Angeles County Change in Employment by Industry (2000 to 2012)



Source: U.S. Census Bureau Census 2000 and American Community Survey 2012.

Land Use

VNY's land use setting is a large urban area with a dominantly built-out environment. Figure 5.44 displays the VNY airport and surrounding study area.

The study area surrounding VNY, which extends approximately one-half mile from the Airport borders, includes land uses that are dominated by single family and multifamily residential housing. Light industrial land uses are adjacent to the northern most half of the Airport. To the west and south of the Airport the land uses are primarily low-density residential and neighborhood-serving commercial uses. To the northwest, land use is primarily comprised of low-

density residential, neighborhood-serving commercial, and public open space uses. The area also has a golf course and public open spaces.

Facilities located inside the Airport's security fence are almost exclusively aviation specific. A few nonaviation-related businesses also are located on Airport property, including a hotel, a major home improvement store, a golf course complex and restaurants. The hotel located on Airport property beyond the security fence features an aircraft parking apron that enables air passengers and crews direct access from aircraft to the hotel.

Figure 5.44 VNY Area Land Use Assessment Map

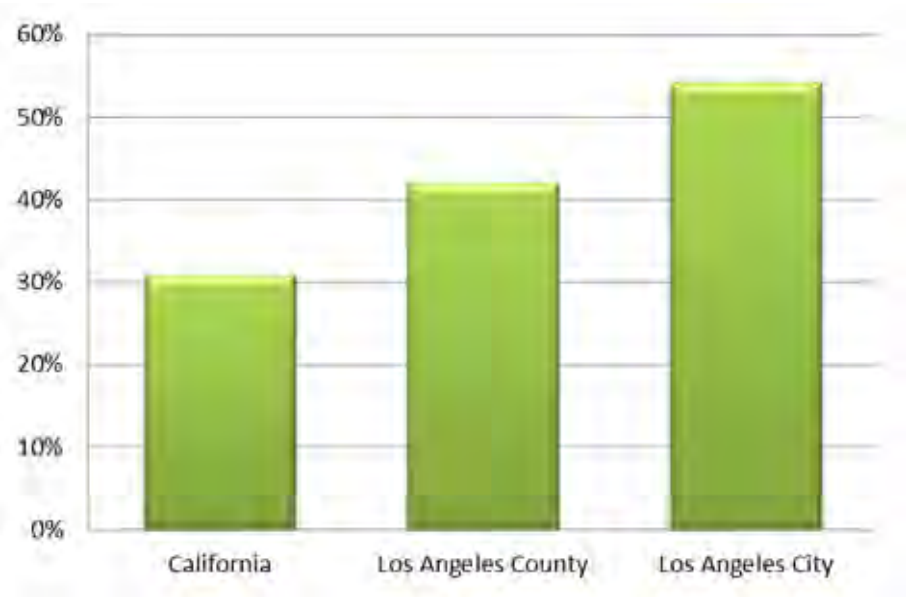
Source: ESRI.

On-Airport property is planned to be available strictly for aviation-related uses according to the Airport Chief Operations Director. For example, the Airport is developing a "propeller park" in the northwest corner of the Airport on 30 acres of land that is has pavement but is not built out. The 2006 Van Nuys Airport Master Plan directed the "propeller park" to be for the exclusive use of piston aircraft and military aircraft built prior to 1950. The project will construct 350,000 square feet of new hangars and offices along the west and south

boundaries of the Airport. The facilities will include space for propeller aviation-related businesses, such as aircraft repair and maintenance facilities and flight schools. There will also be approximately 150 off-street parking spaces to accommodate tenants and visitors. The Chief Operations Director noted that this development will serve to balance the sometimes conflicting demand for space and services between small (i.e., propeller) and large (i.e., business/corporate jets) aircraft at the Airport.

The City of Los Angeles' housing stock profile suggests continued demand for multifamily housing typically associated with smart growth development types. The City has a higher share of multifamily housing units than California and Los Angeles County, not unexpected for a densely developed urban area. Multifamily facilities with five or more units make up 45 percent of the City's housing stock. The City has a higher-than-average occupancy rate. Figure 5.45 presents the 2012 housing types for the City of Los Angeles, Los Angeles County, and the State.

Figure 5.45 Los Angeles County and City Share of Multifamily Housing (2012)



Source: U.S. Census Bureau American Community Survey 2012.

In summary, the market conditions as captured in the population, employment, and land use trends described above support the designation of the VNY as a smart growth area. These favorable market conditions are the first and most critical of three elements that are needed to justify VNY's smart growth area designation. The other two are the airport area's 1) regulatory environment and community perspectives and 2) access to infrastructure and transit service. Each of these is described below.

Regulatory Environment and Community Perspective

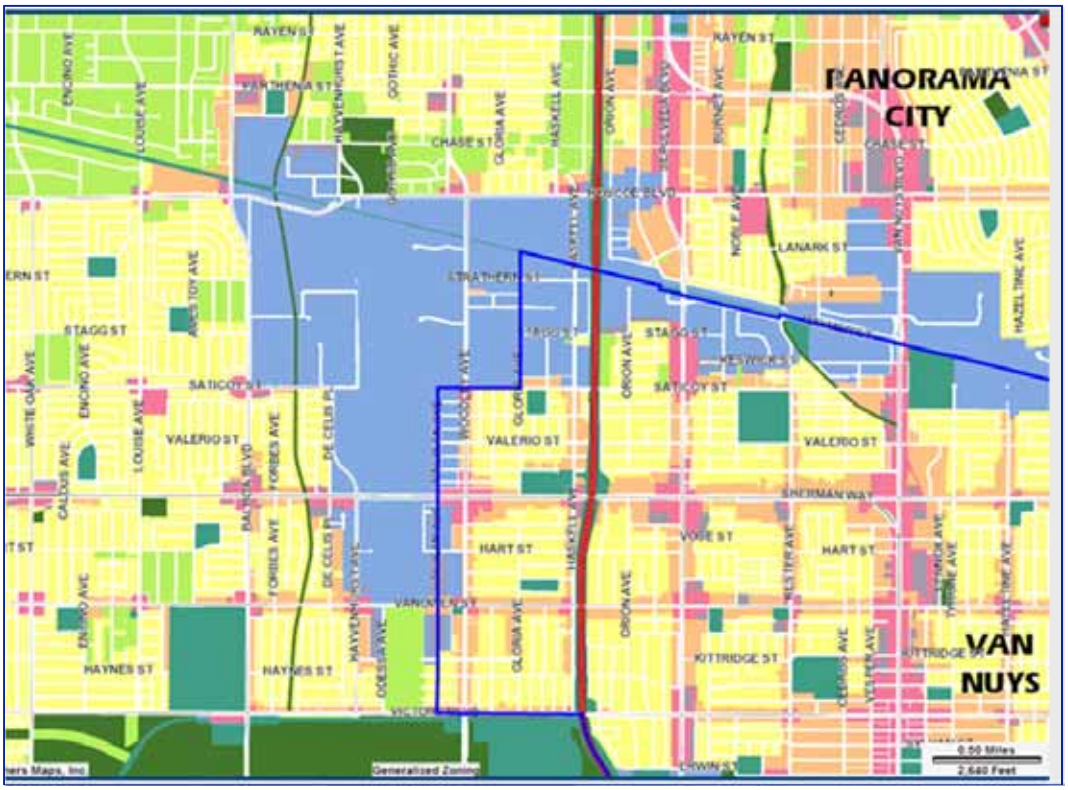
This section discusses existing regulations and other constraints to development, such as zoning, floor area ratio (FAR), height restrictions, historical preservation, noise abatement, toxic or chemical restriction, recreational uses, open space or park preservation, agricultural preservation (i.e., Williamson Act), etc. These regulations control the future use of land near VNY. In addition, it describes the community support or lack of it for development. The market conditions described in the section above provides a rough projection of future demand for development in the study area. This section looks at the supply of land and the potential for developing the available parcels to meet that demand. Analysis of existing regulations and community perspectives provide an assessment of what constraints and opportunities there might be for future growth and development.

Zoning and Other Regulations

A city or county's zoning code sets forth where and what type of new development or redevelopment can occur. A municipal zoning code will describe not only the type of use (such as commercial, residential, industrial, or mixed-use) but will also specify qualities such as height and density limits and parking requirements. The City of Los Angeles has land use authority over the Airport property, and land use authority over the surrounding community which is part of the City. The City of Los Angeles has existing plans and regulations that govern development capacity near the Airport. The plans and policies most relevant to this study include the municipality's zoning code, Airport-related plans and Sustainable Communities plans and related policies.

Figure 5.46 shows zoning districts around VNY. The City of Los Angeles has developed Municipal Code (Section 12.50, Airport Approach Zoning) to prevent hazards that might result of conflicts of use between the Airport and other uses; these special Airport zoning regulations control height limits and regulate the use of the land.

Figure 5.46 City of Los Angeles Zoning Map Excerpt



Source: City of Los Angeles.

Community Perspectives

This section provides an overview of the surrounding communities' perspective on growth and development near the Airport. The 2005 Reseda-West Van Nuys Community Plan identified a number of community issues and opportunities, including several which address the area near the Airport. Issues regarding industrial uses included: 1) the intrusion of commercial uses within the industrial base and in particular those properties surrounding the north side of the Van Nuys Airport; 2) the need to reduce the impact of industrial in proximity to nearby residential uses; and 3) the removal of industrial designation creates a loss of industrial areas in the Reseda – West Van Nuys Community.

The Community plan also identified opportunities, including the following:

- The encouragement of continued use of Van Nuys Airport as a hub of general aviation activities in the Southern California area, in conjunction with the surrounding neighbors' environmental concerns, such as related noise and traffic. General aviation activities include both private flying and corporate aircraft use of the field. In addition, loss of acreage from within this area to nonindustrial uses should be prevented.
- Attract desirable (i.e., clean) industrial uses, thus generating less harmful pollutants and lower noise levels.

- (Increase) availability of incubator type business that allows small business owners to relocate to larger sites as business improves.
- (Create) economic development opportunities surrounding the northern sections of the Van Nuys Airport.[56]

Although the regulations place a priority on aviation-related land uses, constraints on new development adjacent the airport property are not sever and should not inhibit dense, mixed-use development consistent with smart growth objectives. Nevertheless, given the agglomeration of aviation activities on the airport property, new development on adjacent parcels may be built to house aviation-dependent industries. These industries often lack a need for the high-rise office space compared to the densest employment per square foot: information, finance and insurance, professional management, educational, healthcare, arts, and entertainment.

Access to Infrastructure and Transit Service

The infrastructure in the area of the VNY Airport includes roads, rail and some pedestrian and bicycle infrastructure. Immediately to the easy of VNY I-405 runs north-south, parallel to the western edge of the Airport. To the north is I-5 and I-210, U.S. 170 is to the east, and U.S. 101 to the south. The Metrolink rail line runs across the northern edge of the Airport. The area has a moderate level of bicycle facilities and as the surrounding area is dominated by residential housing, most residential streets have sidewalks.

As noted above, the Metrolink rail line runs across the northern edge of the Airport. Additionally, transit service includes a number of bus lines that service the Van Nuys study area and surrounding neighborhoods – the Airport is about one mile and one-half from LA Metro's Orange Line Bus Rapid Transit, and there is also a FlyAway bus service that takes travelers from Van Nuys to Los Angeles Airport (LAX).

According to SCAG's SCS, Van Nuys Airport is located in a High-Quality Transit Area (HQTA). HQTAs are areas targeted for growth and development that are defined as "transit villages" and other developed areas such as downtowns, main streets, and commercial corridors that are walkable and located near transit.

Regional Growth Potential

Two planning documents guide growth near VNY. They both support continued smart growth development near the Airport while maintaining the Airport's strong role in regional transportation.

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[56] City of Los Angeles, *Reseda – West Van Nuys Community Plan*, 2005. Accessed January 2014 at http://cityplanning.lacity.org/complan/pdf/rescptxt.pdf.

- **Van Nuys Airport Redevelopment Plan.** As described in the Land Use Section above, the 2006 Van Nuys Airport Master Plan designated land use in the 30 acres contained in "Propeller Park" to be restricted to aviation-related businesses, such as hangers, aircraft repair and maintenance facilities and flight schools. Outside of the Propeller Park development area, the trend at VNY is for the consolidation of small, on-Airport parcels into larger parcels that can be more cost-effectively and more profitably developed for business/corporate aircraft operations. The "Van Nuys Airport Redevelopment Plan" is in place to oversee this development. According the Chief Operations Director future development and use of the Airport will likely center on business/corporate operations with a continuing provision for the full-range of general aviation access.
- **The Van Nuys Airport Plan.** The Van Nuys Airport Plan is an element of the Los Angeles City General Plan. The Van Nuys Airport Plan includes only the land within the boundaries of the Airport, serving as a reference and a guide for Airport development, the zoning described in the map does not imply any implicit right to a particular zone or to the land uses permitted therein. Changes of zone are subject to the Los Angeles City Municipal Code. The plans identify and limit potential hazards, and set limitations on height and type of development so to limit the conflict of uses that might occur near the Airport, and most specifically in the Airport approach zone.

5.2 AIRPORTS SUPPORTING SMART GROWTH AREAS

The eight non-smart growth area case study airports are Charles M. Schultz, Santa Maria Public, Castle, Yuba County, Auburn, Livermore Municipal, Napa, and Redding Municipal. The land within and adjacent to these airports provides locations for industrial, warehousing and other commercial land uses to relocate and expand as low-density, auto and truck oriented development which would not conform with smart growth land use policies. Nevertheless, such commercial and industrial activities generate employment and tax revenues (i.e., fiscal benefits) which regions compete aggressively to retain, expand and attract.

The role as a non-smart growth area, therefore, provides the region with the opportunity to retain the development that may be pushed out of the region where smart growth strategies constrain their activities, or expansion within smart growth areas. By providing land for businesses that require low-density, auto and truck oriented development, regions can pursue more aggressive smart growth development in within designated nodes and still retain the employment that is not smart growth compatible. Furthermore, airports often offer land with attributes the readily accommodate non-smart growth land uses such as warehousing and manufacturing: large amounts of vacant land, single story structures do not conflict with height restrictions, lack of adjacent residential development which would conflict with industrial or trucking activities, easy access to freeways.

Auburn Municipal Airport

The City of Auburn Municipal Airport (AUN) is approximately three miles north of the City of Auburn, in Placer County. Placer County is 100 miles northeast of San Francisco; its eastern border is 20 miles west of Reno. The airport is principally used by piston-powered aircraft. About one-half of the adjacent industrial park is on airport property and taxiways extend from the airfield into the industrial park. Some private aircraft are stored in the industrial park. Businesses on airport property include several aviation services and aircraft maintenance businesses, flying schools, and a restaurant.

The Auburn Airport Business Park covers approximately 80 acres and is located directly south of the airport at the junction of I-80 and Highway 49, near I-5. The Airport Business Park hosts nearly 100 businesses representing many industries, including avionics, electronics manufacturing and bioscience research, regional distributors, solar energy developers, and motion picture producers. The business park includes a foreign trade zone with the potential for future expansion. The business park markets itself to local business owners and recreational flyers, and promotes access to the Ridge Country Club and Golf Course by golf cart and to other outdoor activities such as mountain biking.

Market Assessment

The consultant team determined the airport could play the role of a smart growth support area (Tier 2). The market conditions that drive the airports roles as a smart growth support area may be divided between demand and supply. Demand comes from households and businesses for goods and services produces by businesses that locate within the AUN area. Household demand is manifested by the number and composition of the population and measured by demographic and employment trends in the areas surrounding AUN. Business demand is generated from the AUN area firms and employees. The supply side is assessed by evaluating the competitive advantages of land located within the AUN area over the alternative land outside the AUN area. These population, employment, and land use trends are presented below.

Population

Population in Auburn grew by 27 percent from 1990 to 2000, during which time the population in Placer County grew by approximately 44 percent. Both the city and the county population growth significantly outpaced that of the State; the State's population growth rate was about that one-half that of Auburn, at 14 percent. Since 2000, growth in the City has halted, and the County continues to grow, but at a slower pace of 30 percent between 2000 and 2012. At the same time, the statewide growth maintained a 12 percent pace of growth, comparable to the previous decade (Table 5.36).

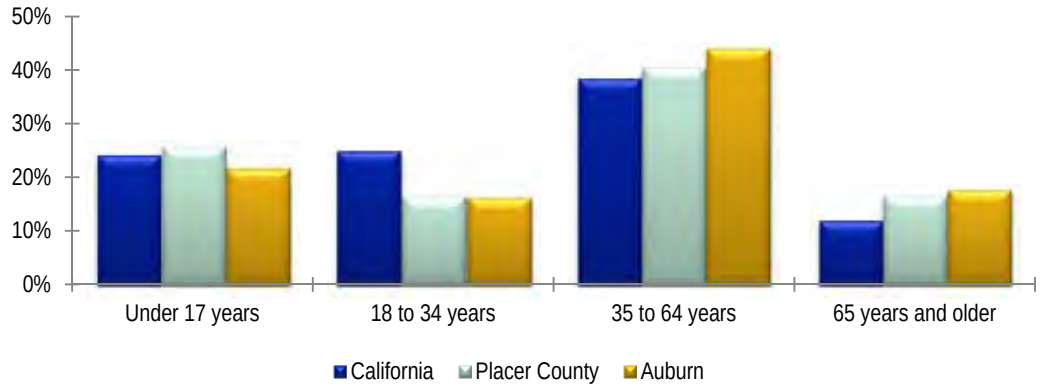
Table 5.36 Placer County and Auburn Population and Population Change (1990 to 2012)

				1990-2000		2000-2012	
Area	1990	2000	2012	% Change	Avg Annual Change	% Change	Avg Annual Change
California	29,760,021	33,871,648	38,041,430	14%	1%	12%	1%
Placer County	172,796	248,399	357,463	44%	4%	30%	3%
Auburn	10,592	13,476	13,446	27%	2%	-0.2%	0%

Sources: U.S. Census Bureau Census 1990, Census 2000 and American Community Survey 2012.

The City of Auburn and Placer County both have a Baby Boomer population – people 65 and older – that is greater than the statewide percentage (18, 17, and 12 percent, respectively). Auburn also has a population cohort of 18 to 34 (16 percent), which is noticeably less than the State (25 percent). This might suggest that future housing needs in Auburn might focus on smaller housing units to house an aging population, and that less single-family housing might be required as the population typically seeking such housing (18 to 34 years cohort) is below 20 percent of the Auburn population (Figure 5.47).

Figure 5.47 Placer County and Auburn Population Age Profile (2012)



Source: U.S. Census Bureau American Community Survey 2012.

The City of Auburn and Placer County both have a high school graduation rate that is about 13 percentage points higher than the State. The City and County also have approximately 39 percent of their population that has some college or an Associate's degree, compared to only 30 percent across the State. The percentage of the Auburn population with a Bachelor's degree or above is on par with the County and slightly higher than the State (Table 5.37).

Table 5.37 Placer County and Auburn Population Educational Profile (2012)

Population 25 years and over	California	Placer County	Auburn
Less than high school diploma	19%	6%	6%
High school graduate (includes equivalency)	21%	20%	21%
Some college or Associate's degree	30%	39%	39%
Bachelor's degree and above	31%	35%	34%
Total	100%	100%	100%

Source: U.S. Census Bureau American Community Survey 2012.

Employment

Placer County businesses have been more successful at acquiring and keeping jobs as compared to the State (Table 5.38).

Table 5.38 Placer County and Auburn Unemployment Rates (1990 to 2013)

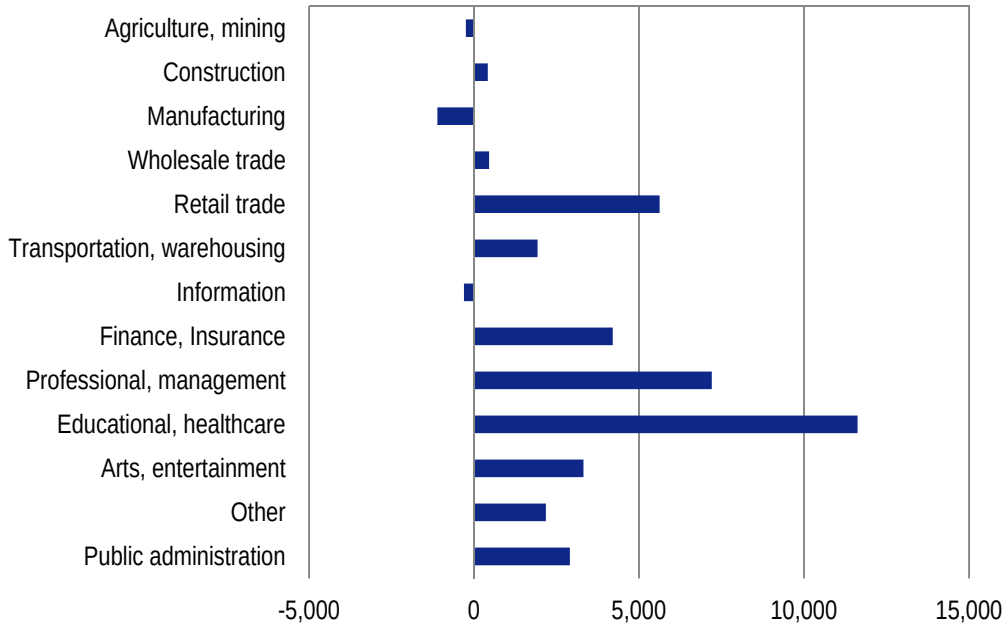
Area	1990	2000	2012[a]	2013
California	5.8%	4.9%	10.5%	8.3%
Placer County	4.2%	3.6%	9.4%	7.2%[a]

Sources: U.S. Census Bureau Census 1990, Census 2000 and American Community Survey 2012.

[a] 2013 data for Placer County is preliminary data for the month of October 2013.

The County has experienced a loss of jobs in the agriculture, forestry, fishing and hunting, and mining, manufacturing, and information sectors. Placer County has demonstrated significant growth in several sectors, including retail, transportation and warehousing, and utilities, finance and real estate, professional and educational services, and the arts and entertainment industries. It is likely that the approximate 38,000 people that entered the labor force in the County since 2000 have pursued employment in these industries (Figure 5.48).

Figure 5.48 Placer County Change in Employment by Industry (2000 to 2012)



Source: U.S. Census Bureau Census 2000 and American Community Survey 2012.

Land Use

AUN's role as a smart growth support area is focused on commercial office, retail, and some types of research and development and industrial land use that can occupy single story or low-rise buildings. The demand for this type of development comes mostly from regional household consumption and business purchasing, with the remaining demand from outside the region. The household consumption maybe gauged from the residential housing market. Auburn's housing stock has a higher portion of single family homes, 70 percent, compared to 65 percent for the state average. Placer County has an even higher percentage of single family homes than Auburn, with 80 percent of the housing stock comprised of single family homes. Multifamily units make up only 20 percent of Auburn's housing stock, which is slightly higher than the County, but less than the State which has a housing stock that includes 31 percent multifamily units. It is not likely that housing would be developed as a high density land use adjacent to the airport because of the availability of undeveloped land in the region, the noise of aircraft activity, and the concern that residents in proximity to the airport could become opponents of future aviation and commercial/industrial development (Table 5.39).

Table 5.39 Placer County and Auburn Housing Type and Vacancy Rate (2012)

Housing Type/ Occupancy Rate	California		Placer County		City of Auburn	
	Number	Percentage	Number	Percentage	Number	Percentage
Single Family	8,983,275	65%	122,357	80%	4,333	70%
Multifamily 2+ units	4,243,133	31%	25,605	17%	1,873	30%
Mobile Homes	559,389	4%	4,400	3%	16	0.3%
Total	13,785,797	100%	152,362	100%	6,222	100%
Vacancy Rate	–	8.1%	–	7.0%	–	

Source: U.S. Census Bureau American Community Survey 2012.

In summary, the market conditions as captured in the population, employment, and land use trends described above support the designation of the AUN as a smart growth support area.

The land use surrounding the airport is comprised mostly of low-density industrial uses, private homes on rural lots, and open space. Land to the north and east of the airport is zoned residential agricultural, and consists of rural residential lots. A mobile home park lies to the southwest of the airport. To the southwest and southeast of the airport, the land is zoned as an industrial park. Directly south of the airport, the land is zoned as open space, including Rock Creek Lake and golf club (Figure 5.49).

The industrial park was predominately manufacturing and warehouses, but has been changing to offices, retail and light manufacturing. The airport industrial park is the largest in the City. Portions of the park lie outside the City in unincorporated areas.

Figure 5.49 AUN Area Map

Source: ESRI.

Regulatory Environment and Community Perspectives

This section describes the regulations, such as zoning, FAR, height restrictions, historical preservation, noise abatement, toxic or chemical restriction, recreational uses, open space or park preservation, and agricultural preservation. These regulations control the future use of land near the airport. In addition, it describes the community support or lack of it for development.

Zoning and Other Regulations

The City of Auburn has zoning authority over the airport area, but the unincorporated land surrounding the airport is under the zoning authority of Placer County. Table 5.40 lists the zoning categories that apply to the land within approximately one-half mile of the airport. Figure 5.50 shows an excerpt of the Auburn Zoning map.

Table 5.40 Auburn Zoning Districts near AUN

Jurisdiction	Code Abbreviation	Zoning District	Quantity Low/Medium/High
Auburn	AI-DC	Airport Industrial – Design Control	N/A
Placer County	O	Open Space	Medium
	RA	Residential Agricultural	High
	IP	Industrial Park	High

Source: City of Auburn.

Figure 5.50 Auburn Zoning Map Excerpt

Source: City of Auburn.

Floor Area Ratio (FAR) describes the ratio of building floor area to the parcel size. The City and County maximum FARs range from 0.35 to 0.5 (Table 5.41). The City and County also regulate the height to which structures can be built; the maximum height in the study area ranges from 36 to is 50 feet.

Table 5.41 AUN Area Height and FAR Restrictions

Jurisdiction	Zoning District	Maximum Building Height	Floor-Area Ratio
Placer County	O – Open Space	25	1% lot coverage
	RA – Residential Agricultural	36	NA
	IP – Industrial Park	50	0.35
City of Auburn	AI-DC – Airport Industrial – Design Control	36	0.5

Source: City of Auburn.

The City of Auburn also has a number of airport zones where it applies specific building and operations standards. These zones include the Utility Runway Visual Approach Zone and transitional zones.[57]

Noise Abatement – While there are no ordinances preventing noise at the airport, the City has attempted to address noise concerns. In 2009, to address helicopter noise, the City proposed an ordinance that would label low-flying aircraft a public nuisance and would regulate an altitude of 1,000 feet above the highest obstacle within 2,000 feet of the aircraft. The FAA did not permit the ordinance, as the ordinance conflicted with Federal regulations governing aviation. Some airport users have voluntarily addressed noise issues such as putting mufflers on its helicopters. The airport advises pilots to make a 20-degree left turn after takeoff to alleviate noise at the mobile home park.

Historical Preservation – Although the City of Auburn does not have a historical preservation office, the State has an Office of Historic Preservation, and Placer County has a historical society. There are few historical landmarks in the region, but none are listed as being near the airport.

The following planning documents are guiding growth near the airport while maintaining the airport's role in regional transportation.

- **Auburn/Bowman Community Plan.** The Auburn/Bowman Community Plan discusses the role of the airport in the region, and evaluates challenges for attracting new industrial development to the region, including the costs for development in the City of Auburn which average much higher than other portions of the County.
- **Blueprint Growth Strategy (2004).** The Blueprint is a voluntary growth strategy that the Sacramento region's 22 cities and 6 counties are encouraged to use to guide their local land use. After a two-year community planning process the SACOG Board of Directors adopted the Blueprint Plan in 2004, embracing a vision for growth that promotes compact, mixed-use development and more transit choices as an alternative to low density development. The Blueprint Plan and scenario map provided the land use foundation for the Metropolitan Transportation Plan (MTP) 2035.
- **MTP for 2035/SCS Plan.** In 2008, the SACOG Board adopted the Metropolitan Transportation Plan for 2035, using the Preferred Blueprint Scenario as the basis for the land use on which transportation investments will be made. The MTP links land use and transportation planning, with $42 billion in transportation investments in Sacramento region over the next

[57] The transitional zones are the areas beneath the transitional surfaces, and a Conical Zone, which is the area that commences at the periphery of the Horizontal Zone and extends outward therefrom a horizontal distance of 4,000 feet. Auburn Municipal Code § 159.143 Airport Zones.

28 years. SACOG is now using Senate Bill 375, signed by the Governor in 2008, to encourage smart growth development aligned to transit investments to further encourage Blueprint implementation and reductions in GHG emissions. The plan addresses the needs of its current 2.3 million residents and accommodating future growth by increasing maintenance of existing roads and adding more sidewalks, bike lanes, and restoring, maintaining and expanding transit, making it possible for more people to live and work in the same community and live independently as they age. It also plans for roads and transit projects where new houses and jobs are added.

- **Airport Land Use Compatibility Plans (ALUCP).** State law defines the purposes of Airport Land Use Commissions (ALUC) as: 1) to protect public health, safety and welfare through the adoption of land use standards that minimize the public's exposure to safety hazards and excessive levels of noise; and 2) to prevent the encroachment of incompatible land uses around public-use airports, thereby preserving the utility of these airports into the future.[58] Placer County serves as the ALUC for AUN. The Placer County ALUCP Update of the 2000 ALUCP is currently underway. The update will reflect revised standards as contained in the California Airport Land Use Planning Handbook published in 2010. Neither the Compatibility Plan nor the ALUC have authority over existing land uses or over operation of the airport.

Community Perspectives

Auburn Municipal Airport and the Airport Business Park are seen by the Auburn business community and county economic development staff as having economic growth potential. There has been a limited amount of discord between the community and the airport. The community has expressed some concern over disturbance created by low-flying helicopters, and residents of the mobile home park to the southwest of the airport have issued complaints about noise resulting from an increase in flights out of the airport.

Access to Infrastructure and Transit Service

Auburn Municipal Airport lies between two major roadways, Interstate 80 to the East, and Golden Chain Highway (CA-49) to the West, with the local Bell Road connecting these two roadways. There are no rail or transit connections to the airport or industrial park, however, an Amtrak rail service runs through Auburn.

The City Public Works operates Auburn Transit. Auburn Transit is a deviated fixed route service that operates within the City of Auburn and portions of unincorporated Placer County. Limited service is provided, during the hours of 6:00 a.m. to 6:30 p.m. on weekdays and on Saturday from 9:00 a.m. to 5:00 p.m., but does not operate on Sundays. Auburn Transit connects with Placer County

[58] California Public Utilities Code Section 21001 et seq.

Transit, Capital Corridor Train, and Gold Country Stage at the Auburn-Conheim Multimodal Station. Transit does not service the airport directly, and the closest route runs along Route 5, approximately three miles from the airport.

Regional Growth Potential

- The area around Auburn Municipal Airport expects continued growth in population and employment. The SACOG 2035 growth forecast indicates that the population in its planning area is expected to grow by 871,000 people, an increase of about 39 percent between 2008 and 2035.[59] The housing and employment forecast for the region identifies the need to accommodate approximately 361,000 new employees and 303,000 new housing units between 2008 and 2035. The SACOG region is expected to outpace the State and nation in job growth in the latter part of the planning period. SACOG projects the development of an additional 53,266 acres of land to accommodate this projected growth. The SCS and the SACOG 2004 Blueprint plans for a nearly 40 percent increase in population with only 7-percent increase land consumption from 2008 to 2035. The SCS provides for a diversity of housing types, including the development of more compact housing in suitable corridors and downtown areas.

Castle Airport

Castle Airport (MER) is a public use airport located approximately seven miles northwest of the central business district of Merced, a city in Merced County, California. The airport serves the Cities of Atwater and Merced and a regional population of more than 310,000 people. The airport is located just outside the city limits of Atwater and three miles northeast of downtown.

The 1,580-acre single runway facility is operated by Merced County. The airport records approximately 220,000 aircraft operations per year, averaging more than 575 per day.[60] More than 99 percent of the airport's traffic is general aviation, and the remainder is military.

Although proximate to two small cities, Castle Airport is in an area dominated by agricultural use. There are a few businesses located at the airport – the few employers and jobs attracted to the Castle Airport project area occupy only 114,000 square feet of light industrial, office, and warehouse space. The Castle Airport Smart Growth project area is primarily vacant and undeveloped land. About 10 percent of the acreage was developed as a World War II military base with housing, storage, industrial, and commercial facilities. Merced County has struggled to convert the old military buildings to civilian uses since the 1995 base

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[59] Includes El Dorado, Placer, Sacramento, Sutter, Yolo, and Yuba Counties.

[60] Information accessed at: Flycastle airpot.com.

closure, and most of the existing facilities have become run down, dilapidated, and unfeasible to reuse.

Market Assessment

The market conditions that drive feasibility of MER as a non-smart growth area may be divided between demand and supply. Demand comes from households and businesses for goods and services produces by businesses that locate within the MER area. Household demand is manifested by the number and composition of the population and measured by demographic and employment trends in the areas surrounding MER. Business demand is generated from the MER area firms and employees. The supply side is assessed by evaluating the competitive advantages of land located within the MER area over the alternative land outside the MER area. These population, employment, and land use trends are presented below.

Population

Table 5.42 shows that the City of Merced population grew at the same rate as the State (14 percent) from 1990 to 2000, during which time the population in Merced County grew by approximately 18 percent. From 2000 to 2012, the city and the county population growth (26 and 25 percent, respectively) significantly outpaced that of the State; the State's population growth rate was less than one-half at 12 percent.

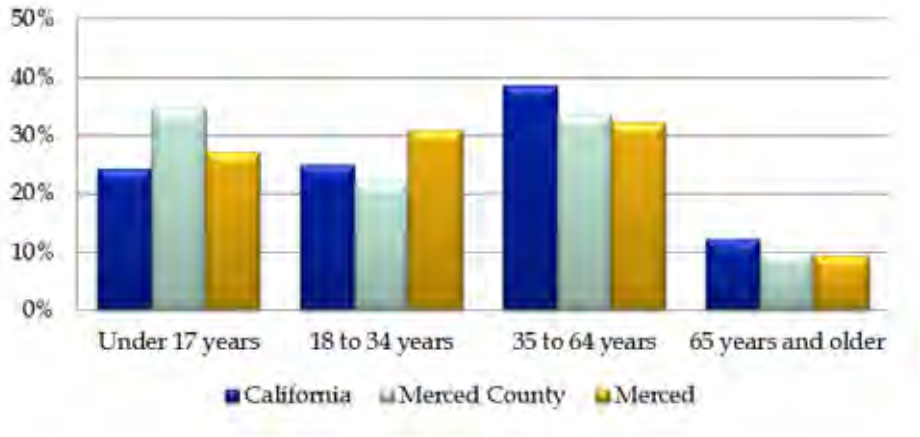
Table 5.42 Merced County and City Population and Population Change (1990 to 2012)

				1990-2000		2000-2012	
Area	1990	2000	2012	% Change	Avg. Annual Change	% Change	Avg. Annual Change
California	29,760,021	33,871,648	38,041,430	14%	1%	12%	1%
Merced County	178,403	210,554	262,478	18%	2%	25%	1.9%
Merced	56,216	63,893	80,599	14%	1.3%	26%	2.0%

Sources: U.S. Census Bureau, Census 1990, Census 2000, American Community Survey 2012.

The City of Merced's 18- to 34-year old population cohort is 31 percent, which is noticeably more than the cohort's 22 percent share of county population (Figure 5.51). The 35-to 64-year cohort is smaller in Merced than in the County and State, and the City and County both have a share of people 65 and older that is lower than the state average. The population age data indicates that the city age trends younger overall than the County and State.

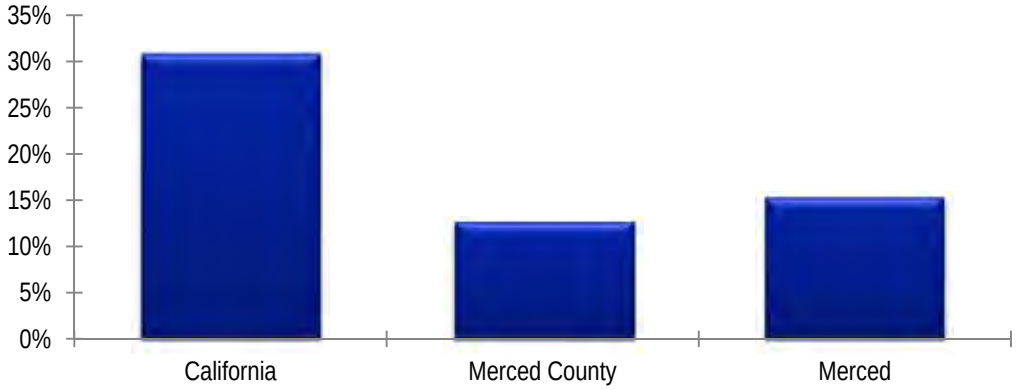
Figure 5.51 Merced County and City Population Age Profile (2012)



Source: U.S. Census Bureau American Community Survey 2012.

Figure 5.52 shows that the City and County both have a share of the population that did not graduate from high school (27 and 33 percent, respectively), which is higher than the State (19 percent). The City and County have approximately the same share of their population that has some college or an Associate's degree, but the share of the city and county population with a Bachelor's degree or above is approximately one-half that of the State.

Figure 5.52 Merced County and City Share of Residents with a Bachelor's Degree or Higher (2012)



Source: U.S. Census Bureau American Community Survey 2012.

Employment

The data shown in Table 5.43 demonstrate that people in the City and County have had more challenges in acquiring and keeping jobs as compared to the State. In 1990 and 2000, the city and county unemployment rate was approximately twice that of the State; more recently, the City and County have suffered additional unemployment after the Great Recession. Data for 2013 show

that recovery has begun, but the City and County still have an unemployment rate that is about four percentage points higher than the State.

Table 5.43 Merced County and City Unemployment Rates (1990 to 2013)

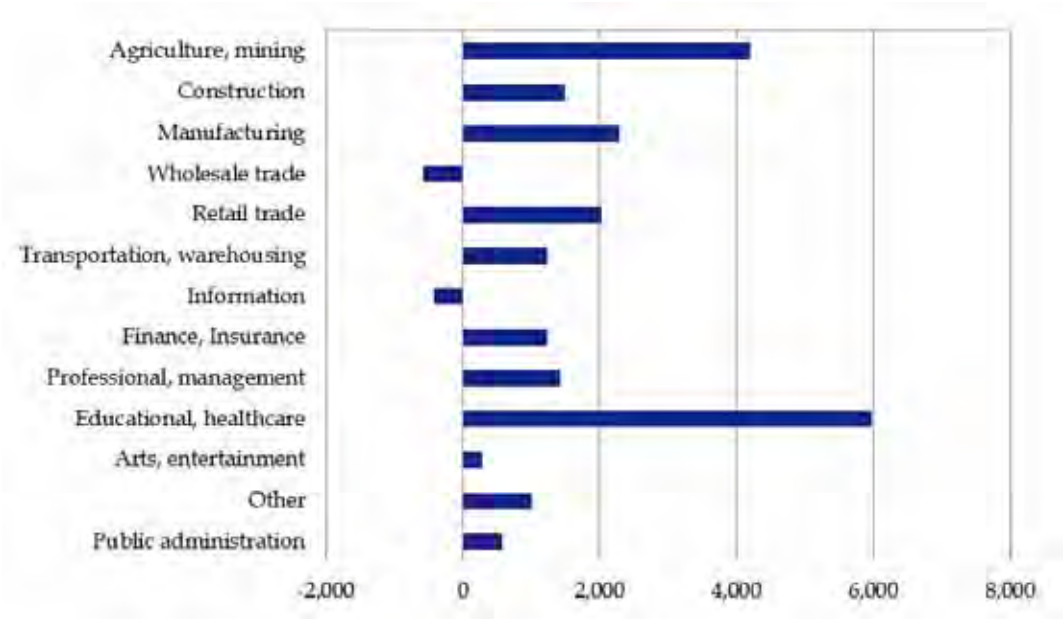
Area	1990	2000	2012	2013 [a]
California	5.8%	4.9%	10.5%	8.3%
Merced County	12.9%	9.6%	17.0%	12.1%
City of Merced	12.8%	9.5%	16.8%	12.0%

Sources: U.S. Census Bureau Census 1990, Census 2000 and American Community Survey 2012.

[a] 2013 data for Placer County is preliminary data for the month of October 2013.

The industry data reported for Merced County, shown in Figure 5.53, indicate that the County has experienced an increase in jobs across nearly all sectors. The increase in the number of employed people yet consistently high unemployment rate in the County is possible as the population growth rate was 26 percent in the County from 2000 to 2012. The largest growth sector was the field of education and health care, followed by agriculture, mining, manufacturing, and retail. The two industry sectors that reported losses were in wholesale trade and information fields.

Figure 5.53 Merced County Change in Employment by Industry (2000 to 2012)



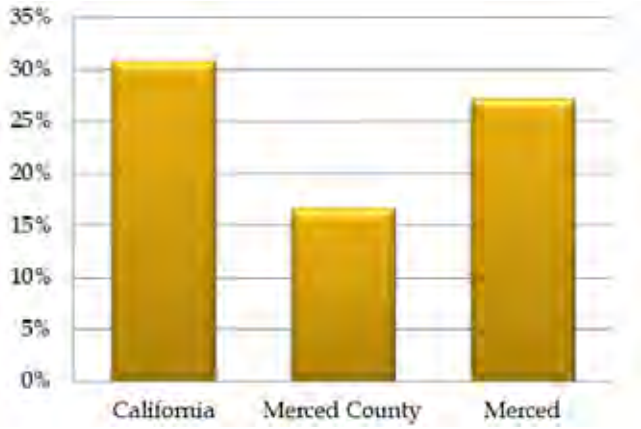
Source: U.S. Census Bureau Census 2000 and American Community Survey 2012.

Housing

MER's role as a non-smart growth area is focused on commercial office, retail, and some types of research and development and industrial land use that can occupy multi-story buildings.

The City of Merced's housing stock has a higher portion of single family homes compared to the state average. Merced County has an even higher percentage of single family homes than Auburn. Multifamily units make up 27 percent of the City's housing stock, compared to 17 percent in the County, as shown in Figure 5.54. This is less than the state share of 31 percent multifamily units.

Figure 5.54 Merced County and City Share of Housing (2012)



Source: U.S. Census Bureau American Community Survey 2012.

Land Use

This section reviews existing land uses and provides an overview of the residential, commercial, and other activities that transpire in the study area.

As shown in Figure 5.55, the majority of land within a one-half mile of the airport is currently in agricultural use. To the southwest corner of the airport, where some of the military facilities building remain, there is a small area of land that is used primary for commercial, industrial, and educational facilities. There is also a mobile home park in this area. Stretching further to the south and west, lands in the City of Atwater are used for single family residential use.

Figure 5.55 MER Area Land Use Assessment Map

Source: ESRI.

Regulations

The City of Atwater has zoning authority over the airport itself, but the land surrounding the airport, which is not incorporated into the City of Atwater or Merced, is under the jurisdiction of Merced County.

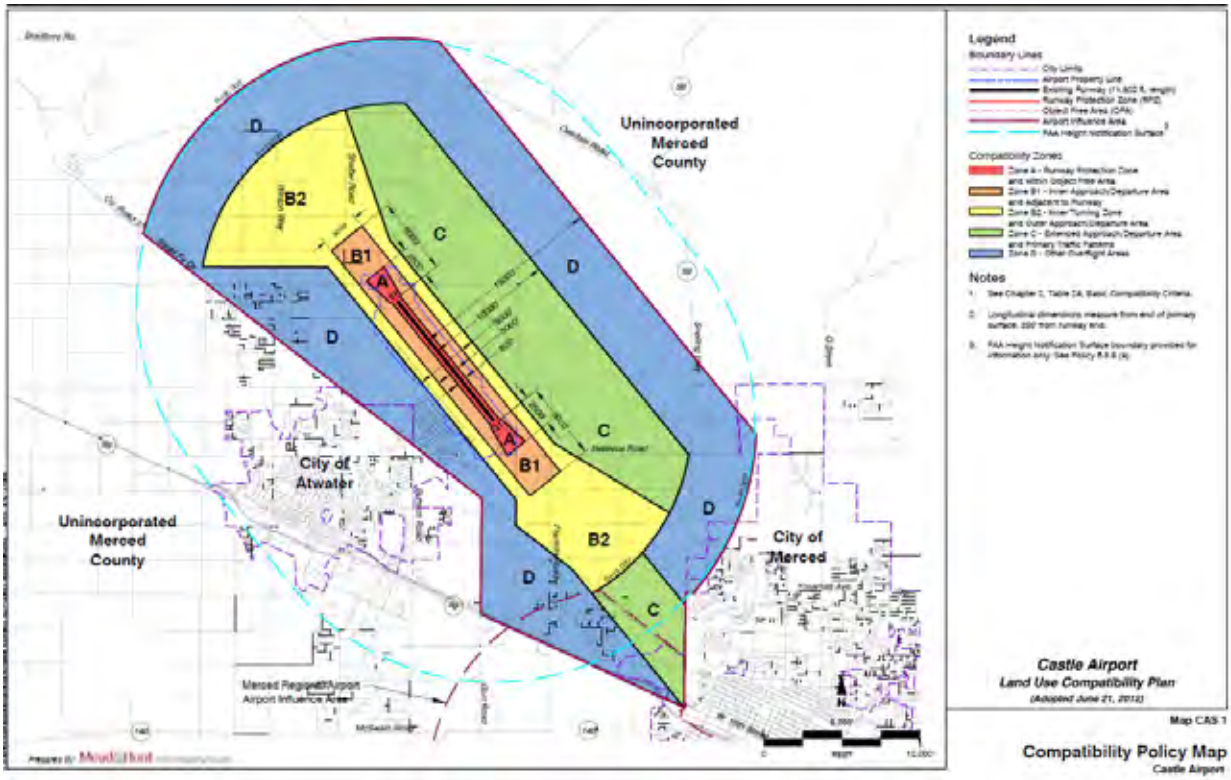
The important land use regulations near the airport include height restrictions, noise, and agricultural preservation. These issues are described below.

- **Height Restrictions.** All land within the vicinity of any airport is divided into approach zones, horizontal and conical surfaces. The zones are shown on Atwater Airport height limit zoning map which was prepared by the City. Structures of 15 feet in height or less are not impacted by the zones. Although the ALUC does not have authority over existing land uses or over operation of the airport, the Castle Airport does have an "influence area" that stretches approximately four miles from the runway ends in recognition of the airports' runway lengths, and instrument approach procedures

(Figure 5.56). These influence areas are associated with height restrictions zones.

- **Noise.** According to the Merced County Airport Land Use Compatibility Plans (adopted June 21, 2012), Castle Airport has noise regulations in place.
- **Agricultural Preservation.** Zoning is Merced County's chief regulatory tool for preserving farmland, primarily through the designation of minimum parcel sizes and allowed uses in particular zones. There are three agricultural zoning districts in the existing County General Plan, including districts for General Agricultural (Zone A-1), General Agricultural (Zone A-1-40), and Exclusive Agriculture (Zone A-2). The County adopted the California Land Conservation Act of 1965 in 2000. However, there are no lands within the study area and none within the region of the airport that are participating in program as a Williamson Act Agricultural Preserve.

Figure 5.56 MER Area of Influence Map



Source: Castle Municipal Airport.

Access to Infrastructure

Castle Airport is served by several local arterials, State Route 140 (east-west) CA-99 (passing from Merced northwest to and beyond Atwater and State Route 59, which extends south from where it meets CA-99 and SR 140 in Merced. The developed areas have access to power, sewer, and water. The agricultural

areas to the northwest do not have access to utilities, which would be developed through the subdivision and development process.

The City of Atwater offers public transportation provided by "The Bus" – which is funded through by Merced County Transit. Routes 7, 8, and 16 service the airport, connecting it to the local communities of Atwater, Merced, and Livingston. Nearby in Merced, Amtrak provides passenger service. The area does have a few bicycle facilities, and many neighborhood streets provide sidewalks.

Economic Analysis

The Castle Airport Smart Growth project area contains 880 acres that includes 704 acres of vacant and undeveloped land. About 77 acres were developed as a World War II military base with housing, storage, industrial, and commercial facilities. Merced County has struggled to convert the old military buildings to civilian uses since the 1995 base closure, and most of the existing facilities have become run down, dilapidated, and unfeasible to reuse. Only 28 private firms that employ 179 workers have been attracted to the project area after nearly 20 years of efforts to redevelop the site (see Table 5.44).

Table 5.44 MER Area Employment by Industry (2012)

Industry Sector	Jobs	Industry Sector	Jobs
Agriculture & Mining	63	Professional & technology services	0
Utilities	6	Management & administration	0
Construction	8	Education & health care	36
Manufacturing	6	Arts, Entertainment & recreation	1
Wholesale	1	Accommodations	0
Retail	5	Food service & drinking	1
Transportation & Communication	7	Automotive Services	0
Information	0	Other services	35
Finance, Insurance, real estate	8	Public administration	4
		Total	179

Source: ESRI Project Area Employment Estimate 2012.

The few employers and jobs attracted to the Castle Airport project area occupy only 114,000 square feet of light industrial, office and warehouse space (see Table 5.45). One segment of the project area includes 423 acres of vacant land located west of Hospital Road, and only 9 acres are developed with light industrial and warehouse buildings. The World War II era industrial, residential, and commercial buildings located east of Hospital Road account for 70 acres of lands that were developed with the old industrial, warehouse, and office buildings.

Table 5.45 MER Area Employment by Industry Converted to Building Type (2012)

Building type	Acres	Jobs	Floor Area per Employee	Total Occupied Floor Area	FAR
Retail Commercial	1	4	450	2,000	0.03
Light Industrial & General Commercial	59	97	900	87,000	0.04
Office, business park & R&D flex space	9	68	215	15,000	0.04
Warehouse	12	11	900	10,000	0.02
Hotel	0				
Undeveloped Land	704				
Residential	0				
Golf Course	0				
Parks	0				
Roadways and Public Spaces	97				
Total	880	180		114,000	

Source: EDR Group.

Projecting Land Use and Employment

The consultant team traveled to and completed a driving survey of the Castle Airport project area. The team compiles notes about key businesses, vacant land areas, infill sites, roadways, open space, and potential environmental constraints. The analysis to forecast economic effects is detailed in Appendix E. In general the existing FAR based on existing conditions is very low, ranging from 0.02 for warehouse uses, to 0.04 for light industrial and office uses.

The Castle Airport project area is poorly suited to attract big box retail establishments because of its rural, isolated location 5 miles west of Atwater and 10 miles north of the City of Merced. Castle Airport is located well away from and not visible to Highway 99 corridor travelers, which means that the potential customers from nearby communities would have to travel out of their way to retail stores in the project area. In addition, new stores to the project area would have to compete with the City of Merced, which is the dominant population center with a strong inventory of retail shopping centers and big box stores that includes the Merced Mall, which is anchored by Target, Sears, JC Penny's, and Kohl's.

Relatively weak market demand is the primary factor that constrains business development near Castle Airport. Although Merced County's employment base expanded by a relatively strong 1.3 percent annual rate of growth between 1990 and 2012, future job growth will be limited by the presence of only 53,000 private sector jobs and 16,000 government jobs.

However, appropriate regulation and incentives in the area may help absorb industrial uses that may be otherwise lost to the County. Projections by Moody's Analytics for Merced County to 2040 show that 11 industrial sectors will lose 10 or more jobs, totaling 1,743 jobs. Relocating these jobs to a smart growth support district by Castle Airport would result in saving $87 million of labor income for county residents and $125 million in GSP.

This relocated economic activity from elsewhere in Merced County can be accommodated if the current FAR for developed space is increased to a modest 0.30, and if 15 percent of currently undeveloped land is placed in use for economic development. The new space absorbed by firms attracted to the Castle Airport project area may revitalize and reuse the old military buildings, or some buildings may be razed, with future business tenants constructing build to suit facilities. Table 5.46 displays the land use assumptions for accommodating the potential relocated jobs.

Table 5.46 MER Area Capacity Assuming Smart Growth Scenario (2040)

Building Type	Acres	Jobs	Floor Area per Employee	Total Occupied Floor Area	FAR
Retail Commercial	3	81	450	36,561	0.30
Light Industrial & General Commercial	112	1,621	900	1,458,786	0.30
Office, business park & R&D flex space	18	1,105	215	237,647	0.30
Warehouse	24	354	900	318,995	0.30
Hotel	0	0			
Undeveloped Land	626				
Residential	0				
Golf Course	0				
Parks	0				
Roadways and Public Spaces	97				
Total	880	3,162		2,051,990	
Subtotal Light Industrial & Warehouse		1,975		1,777,782	
Projected New Capacity: Light Industrial & Warehouse		1,867		1,760,782	
Projected New Capacity All		2,982		1,938,000	

Source: EDR Group.

Table 5.47 shows the industrial sectors that are expected to lose 10 or more jobs in Merced County by 2040 and the economic activity that would be saved. Of course, the FAR and land use assumptions may change to accommodate development supporting smart growth goals (e.g., lower FAR and more land absorption, or higher FAR and less land absorption). Moreover, the land capacity is sufficient to add more jobs and business space by new business formation or if additional firms can be recruited.

Table 5.47 MER Area Economic Analysis (2040)
(In Millions of Current 2013 U.S. Dollars)

Sectors	County Impacts	Jobs	Labor Income (Millions)	Value Added (Millions)	Output (Millions)
Food manufacturing, beverage & tobacco product manufacturing, apparel manufacturing, paper manufacturing, printing & related support activities, primary metal manufacturing, fabricated metal manufacturing, electrical equipment & appliance manufacturing, transportation equipment manufacturing, miscellaneous manufacturing, and truck transportation	Direct	1,743	$87.2	$125.0	$615.4
	Total in Merced County	3.004	$139.9	$221.8	$783.9

Source: EDR Group.

Note: Total impacts include direct, indirect and induced effects (indirect and induced effects are commonly referred to as "multiplier" impacts), and represent contribution in Merced County. Direct labor income, value added and output, as well as "multiplier" impacts were calculated using the IMPLAN modeling package. All dollars are in 2013 values.

Livermore Municipal Airport

Livermore Municipal Airport (LVK) is a general aviation reliever airport in Alameda County at the western side of the Altamont Pass. It is located in the northwest corner of the City of Livermore and bordered by the City of Pleasanton to the west. The nearest major commercial airports are Oakland International Airport and San Francisco International Airport, about 30 and 40 miles away, respectively. Nearby general aviation airports include Buchanan Field, Byron, Tracy, Hayward Executive, and Stockton Airports. The airport is owned and operated by the City of Livermore.

The Airport has 392 hangars and over 200 tie-down spots with approximately 500 based aircraft. The airport has increased activity recently, and is expecting to build a new terminal and add a "jet center" fixed base operator in the next two years.

The airport serves a number of corporate clients, including Costco, Safeway, Coca Cola, and Chevron and Target. There is no regularly scheduled air cargo service at LVK. The airport has residential areas to the east and west in the Cities of Livermore, Pleasanton, Dublin, San Ramon, and Danville. The airport has good working relationships with nearby cities, and is identifying new ways to meet air transportation growth while serving local communities.

LVK is located in a moderate-density environment, surrounded primarily by office and industrial park developments, a large golf course, and open space. The mix of industrial and commercial uses, access to I-580, available land and proximity to growing suburban centers indicate potential to support smart

growth areas in the region by providing space for large footprint commercial and industrial uses. The following analysis of the airport area's growth trends, the regulatory environment, and plans for future growth suggest that the airport could play an important role in the region's long-term economic and environmental goals.

Market Assessment

This subsection presents a market assessment that evaluates population, employment and land use trends in the region and the airport area. The market conditions that position LVK as a smart growth support area are demand from households and businesses for goods and services produced by companies located in the airport area. Household demand is manifested by the number and composition of the population, which is measured by demographic trends. Firms and employees drive the local business demand. In addition, LVK's feasibility as a smart growth support area depends on the competitive advantages of land located within the LVK area over the land outside the airport area.

Population

The City of Livermore's population of just over 83,000 residents has grown faster than Alameda County as a whole. From 2000 to 2012, the city population grew 14 percent, while the county and state populations grew 8 and 12 percent, respectively (Table 5.48). The pace of growth relative to the region is expected to continue; MTC forecasted that Livermore households would increase 32 percent from 2010 to 2040, while Alameda County households will increase 25 percent.[61]

Table 5.48 Alameda County and Livermore Population and Population Change (1990 to 2012)

				1990-2000		2000-2012	
Area	1990	2000	2012	% Change	Avg. Annual Change	% Change	Avg. Annual Change
California	29,760,021	33,871,648	38,041,430	14%	1%	12%	1%
Alameda County	1,279,182	1,443,741	1,554,720	13%	1%	8%	0.6%
City of Livermore	56,741	73,345	83,325	29%	2.6%	14%	1.1%

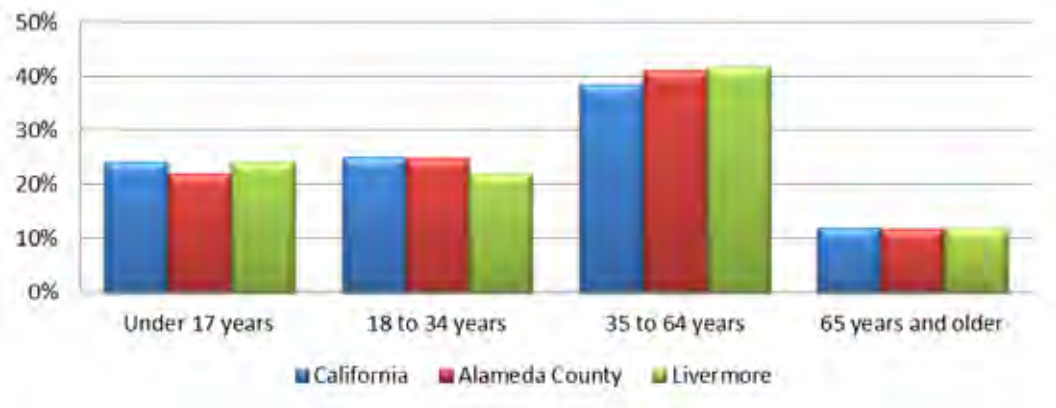
Sources: U.S. Census Bureau Census 1990, Census 2000, American Community Survey 2012.

The Livermore population is slightly older than California and Alameda County populations. The City and County's 35- to 64-year old cohorts are higher than

[61] Metropolitan Transportation Commission, *Plan Bay Area Strategy for a Sustainable Region*, 2013.

the State, suggesting an above-average Baby Boomer population. Livermore's 18- to 34-year old cohort, which includes young professionals generally known as Generation Y, is slightly higher than Alameda County, but close to the state average. Figure 5.57 illustrates the state, county, and local population by age.

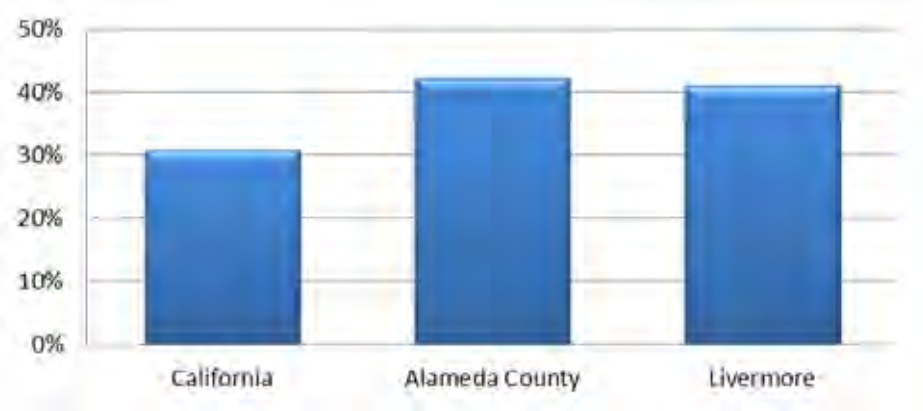
Figure 5.57 Alameda County and Livermore Population Age Profile (2012)



Source: U.S. Census Bureau American Community Survey 2012.

Alameda County and the City of Livermore have a much higher share of residents with college degrees than the California average. The surrounding county and regional education levels indicate good access to a well educated labor force, which is a critical competitive advantage in driving local employment and consumption.

Figure 5.58 Alameda County and Livermore Share of Population with a Bachelor's Degree or Higher (2012)



Source: U.S. Census Bureau American Community Survey 2012.

Employment

Livermore's employment base has shifted over the past two decades, with declining agriculture and transportation sectors, while research and development, and service and retail sectors experienced strong growth. The

Lawrence Livermore National Laboratory and Sandia National Laboratories are important economic generators in Livermore, as are several value-based retail outlets located near I-580.

The City of Livermore's unemployment rate from 2000 to 2013 shows that residents were hit by the Great Recession, though with less overall impact than other parts of the State. Employment statewide has improved in the past year at moderate rates demonstrating regional employment growth. Economists are careful to point out, that this data may suggest people are leaving the labor force altogether; however, recent employment growth has reportedly been stronger in the Bay Area than other parts of California. Table 5.49 presents the unemployment rates in 2000, 2012, and 2013.

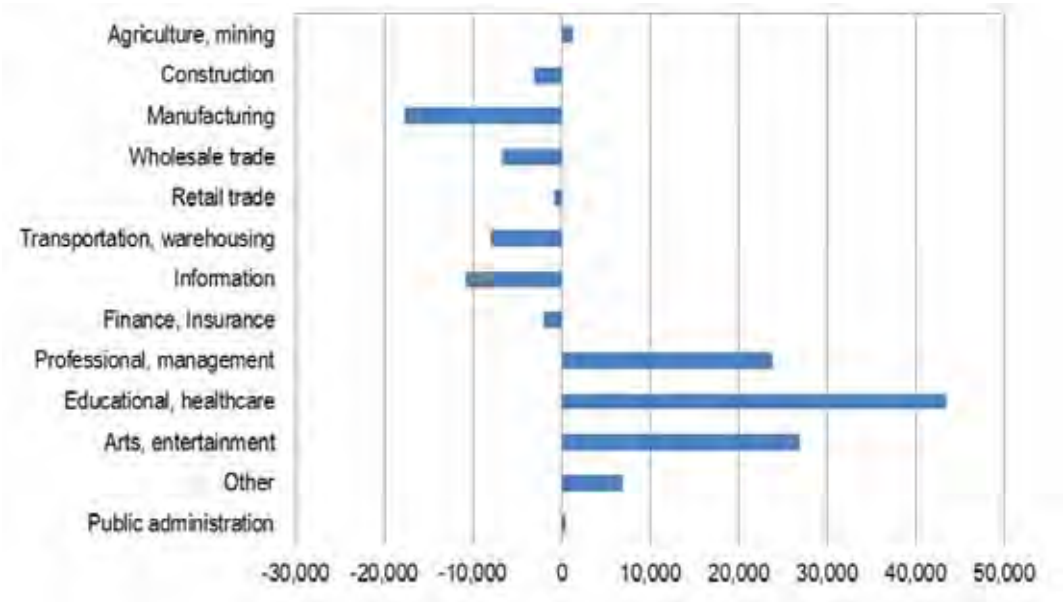
Table 5.49 Livermore Unemployment Rate (2000 to 2013)

Area	2000	2012	2013
California	4.9%	10.5%	8.8%
Alameda County	3.6%	9.0%	7.3%
City of Livermore	2.3%	5.9%	4.7%

Source: California Department of Finance.

Alameda County employment grew approximately 8 percent from 2000 to 2012. Growth by industry sector illustrates growth in management, education, healthcare, and entertainment industry sectors, which are typically associated with medium to high density office developments. County manufacturing employment declined 18 percent over this period. The education and health care services sector increased employment 34 percent; the arts, entertainment, accommodation and food services sector grew 61 percent; and the professional, scientific and management sector increased 23 percent. Figure 5.59 shows 2000 to 2012 industry-level employment change in Alameda County.

Figure 5.59 Alameda County Employment Change by Industry (2000 to 2012)



Source: U.S. Census Bureau American Community Survey 2012.

Land Use

This section reviews existing land uses and provides an overview of the residential, commercial and other activities occurring in the study area. Analysis of existing land uses can provide insight as to what constraints and opportunities may guide growth and development. Professional office uses, industrial research and development, and large-scale retail could be important to LVK's role as a smart growth support area.

LVK property encompasses 590 acres. The City acquired property surrounding the airport in the 1990s to address issues with encroachment from incompatible uses, which has contributed to the relative nearby land availability. The airport includes 392 hangars and 249 tie-downs.

This case study focused on land uses to the north and west of the airport (Figure 5.60). Nearby development contains one- to two-story office and light industrial developments, the City of Livermore Water Reclamation Plan, and large undeveloped parcels. A golf course is located at northwest side. A Cattlemen's Restaurant is also located on-airport property approximately one-third mile walk from the airport terminal, as are two commercial buildings with nonaviation activities, such as a machine shop, motorcycle dealer, and a car dealer. The airport leases a portion of its property to store automobiles.

Figure 5.60 LVK Area Map

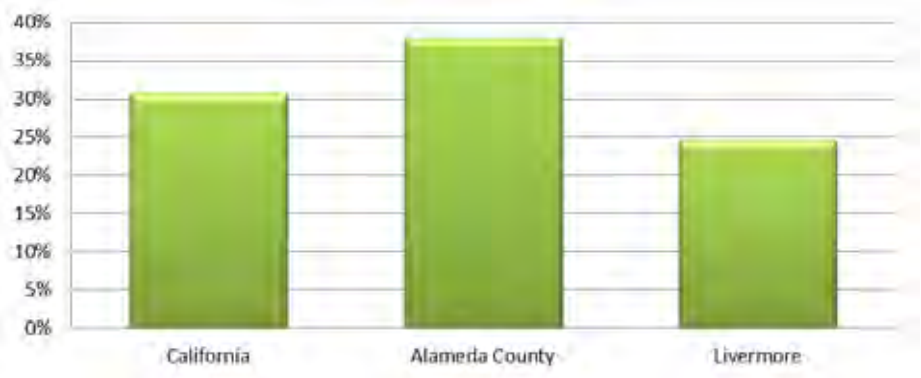
Source: ESRI.

A recent Colliers International real estate market report indicated positive growth in light industrial office leasing.[62] The general increase in the Tri-Valley industrial market, the overall vacancy was 7.4 percent, down from 7.9 percent three months before. Maintaining a competitive advantage relative to other cities by providing readily developable office and industrial flex spaces will benefit local economies as city centers continue to develop. The City of Livermore industrial space vacancy tracks the Tri-Valley average, while the City of Pleasanton had a vacancy rate of only 3.5 percent, and the City of Dublin posted a vacancy rate of nearly 16 percent.

[62] Colliers International, *Pleasanton Alameda County Research and Forecast Report – Industrial*, accessed December 2013 at http://www.colliers.com/~/media/Files/MarketResearch/UnitedStates/MARKETS/Pleasanton/pls.ind.news.Q4-13.pdf.

Less than 25 percent of Livermore housing are multifamily, reflecting the City's mostly suburban setting. The City's share of multifamily housing is lower than both the County and the State. Alameda County includes high development densities in cities such as Oakland. The relatively low share of multifamily housing types suggests overall low density development near LVK, which can indicate the opportunity to create development opportunities that maintain and grow economic growth while supporting regional smart growth goals. The share of multifamily housing is summarized below in Figure 5.61.

Figure 5.61 Alameda County and Livermore Share of Multifamily Housing (2012)



Source: U.S. Census Bureau American Community Survey 2012.

In summary, the market conditions illustrated by population, employment, and land use described above support the designation of LVK as a potential smart growth support area. This demand is the first and most critical of three elements that are needed to justify LVK's role supporting regional growth. Two other key conditions are the airport area's regulatory environment and access to infrastructure and transit service. Each of these is described below.

Regulatory Environment and Community Perspectives

This section describes the regulations, such as zoning, noise abatements and environmental controls near LVK. These regulations control different aspects of future use of land near the airport, and also inform the community's support or lack thereof for future development in the region.

Zoning and Other Regulations

The predominant zoning around LVK is open space. The airport property is bordered by the Cities of Livermore and Pleasant Hill; Livermore has the industrial and commercial zoning relevant to the airport, which is described in Table 5.50. The neighboring zones allow 35 to 45 feet building heights, and a mix of light industrial and institutional uses. The range of uses permitted and large amount of open space indicates greater capacity to support future development with little policy or regulation changes.

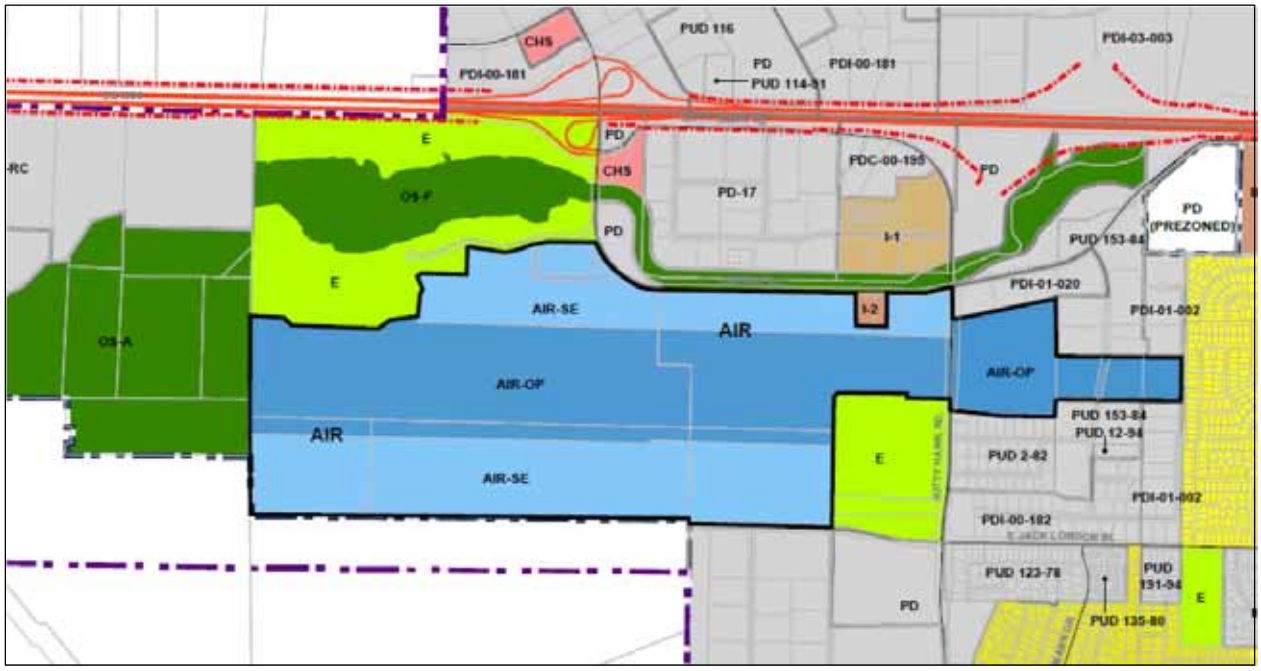
Table 5.50 Livermore Zoning Districts near LVK

Zoning Category	Description	Maximum Building Height
PD, PD-#	Planned Development: residential, commercial and industrial planned development projects that require more flexible design standards. The flexibility allows a developer to address geologic, topographical and environmental factors.	Varies
E	Education and Institution: public and private educational institutions and directly related use types, park and recreation facilities, and governmental buildings and facilities.	35 feet
I-1, I-2	Research and Development; Light Industrial: professional and administrative facilities, research institutions, manufacturing operations, and green technology facilities	45 feet

Source: City of Livermore.

Figure 5.62 illustrates the City of Livermore zoning map. The zones shown below are consistent with the land uses described in the preceding section. The light industrial and planned development zones correspond with low-density office and industrial parks located near the airport. The map also illustrates the large amount of open space available around the airport property.

Figure 5.62 Livermore Zoning Map



Source: City of Livermore.

Access to Infrastructure and Transit Service

The area surrounding LVK are served by city utilities and transit services, although at relatively low levels. The airport and surrounding developed areas (zoned PD, E, and I) have high capacity access to water, sewer and electricity. The City's General Plan reported a reservoir to serve the airport area would be completed by 2004 Open spaces such as the former quarry to the south and the golf course, would require development of city services. A fire station is located within one mile of the airport terminal.

The Livermore Amador Valley Transit Authority provides the Wheels transit service to the airport area, via Routes 12 and 12V. Bus stops with 30-minute service frequency near the airport include the Airway park-and-ride, and at Dublin Boulevard and Fallon Road. Peak hour buses stop hourly at Kittyhawk Road and Armstrong Street, which is the only stop within walking distance of the airport entrance; the route does not serve the terminal.

Regional Growth Potential

The City's objectives are presented in the Livermore General Plan and the MTC/ABAG Plan Bay Area. These plans coalesce around a plan for density and use increases in Downtown Livermore, generally located near Railroad Avenue/First Street and Livermore Avenue.

- **City of Livermore General Plan.** The General Plan was originally completed in 2003 and outlines the City's long-term development goals and objectives. The plan includes chapters specific to land use and economic development, both of which were updated in 2013. These chapters stress the importance of preserving the City's historical downtown, enhancing public open space, and encouraging high-density commercial and residential mixed-use near major transit stations. Regarding LVK, the plan called for maintaining light-industrial and transportation uses near the airport, to reduce encroachment by incompatible uses.
- **Plan Bay Area** is the RTP/SCS for the San Francisco Bay Area. The plan was prepared by the Metropolitan Transportation Commission and the Association of Bay Area Governments in 2013. The plans goals are supported by identification of Priority Development Areas (PDA). PDAs are transit-oriented neighborhoods that provide key infill development opportunities, supporting residents and workers, and contributing to pedestrian- and transit-friendly environments. Local jurisdictions help define the character of their PDAs, identifying regional centers, city centers, suburban centers, transit town centers or rural centers. The RTP requires the Contra Costa County Transportation Commission to direct at least 70 percent of its funding

to PDAs. PDAs near Concord include[63] Downtown Concord, Concord Los Medanos (Naval Weapons Station) Redevelopment Area, and Pleasant Hill: Diablo Valley College.

Plan Bay Area forecasts indicate that Livermore households will increase 32 percent from 2010 to 2040, while Alameda County households will increase 25 percent. The strong population and job growth – combined with the city and region goals to increase development in downtown areas that is sensitive to historical buildings, nonmotorized access and economic growth – support the designation of LVK as a development hub to indirectly support smart growth in the region.

Napa County Airport

Napa County Airport (APC) is a general aviation airport located in unincorporated Napa County. The airport is adjacent to the City of American Canyon, to the south. APC is a public airport offering a full range of general and charter aviation services, including flying school, charter flights, Fixed Base Operators (FBO), and a popular regional restaurant. APC is located at the southern end of Napa County, five miles south of Napa, two miles north of the City of American Canyon, and 42 miles northwest of San Francisco.

The airport was built in 1942 as an Air Force Airfield in the wake of the Pearl Harbor attack, but shortly after World War II, ownership was transferred from the military to the County of Napa. Within a 25-mile radius of Napa County, 10 other airports provide air service, 7 of which are public use facilities. The airport operates on the periphery of the San Francisco Bay Area Class B airspace environment, a significant influence in terms of aircraft operations.

APC is located at the southern entrance of Napa Valley, to the west of the intersection of State Route 29 and State Route 12. The airport property includes 747 acres of relatively flat land, with 75 acres designated for expansion. The airport operates three runways, and offers four fixed base operators: Bridgeford Flying Service, Japan Air Lines training facility, Silverado Avionics, and the California Highway Patrol (CHP) Air Operations Unit.[64] Napa County Airport tenants provide 406 jobs with a total income of $18.4 million annually. The aircraft at Napa County Airport provide around $2.3 million annually to the

[63] Geocommons, *Bay Area PDAs*, accessed January 2014 at http://geocommons.com/maps/141979.

[64] Napa County Airport Master Plan (March 2007), Page 1-14, http://www.napacountyairport.org/Uploads/Files/MasterPlan2007/APC%20Chpt%201.pdf.

County through property taxes, and the remainder of the airport's operations are funded through Federal and state grants for capital improvements.[65]

Market Assessment

The market assessment describes three economic forces that drive the market feasibility for developing high density, mixed-use development with in the Napa County Airport area: population growth and characteristics, employment, and land use.

Population

Napa County's current population is just more than 139,000; and has grown less quickly than the overall State of California between 2000 and 2012, but faster than the City of Napa. Between 1990 and 2000, the City of Napa grew at a faster rate (1.6 percent annually) than the State (1.0 percent). As shown in Table 5.51, both the City and County of Napa experienced above-average annual population growth between 1990 and 2000; however, that population growth slowed to below average between 2000 and 2012. Future population growth projections estimate by the County's population should reach 150,500 by 2015 and 158,000 by 2020, a 23-percent increase between 2012 and 2020.[66]

Table 5.51 Napa County and City Population and Population Change (1990 to 2012)

				1990-2000		2000-2012	
Area	1990	2000	2012	% Change	Avg. Annual Change	% Change	Avg. Annual Change
California	29,760,021	33,871,648	38,041,430	14%	1%	12%	1%
Napa County	110,765	124,279	139,045	12%	1%	12%	0.9%
Napa	61,842	72,585	77,881	17%	1.6%	7%	0.6%

Sources: U.S. Census Bureau, Census 1990, Census 2000, American Community Survey 2012.

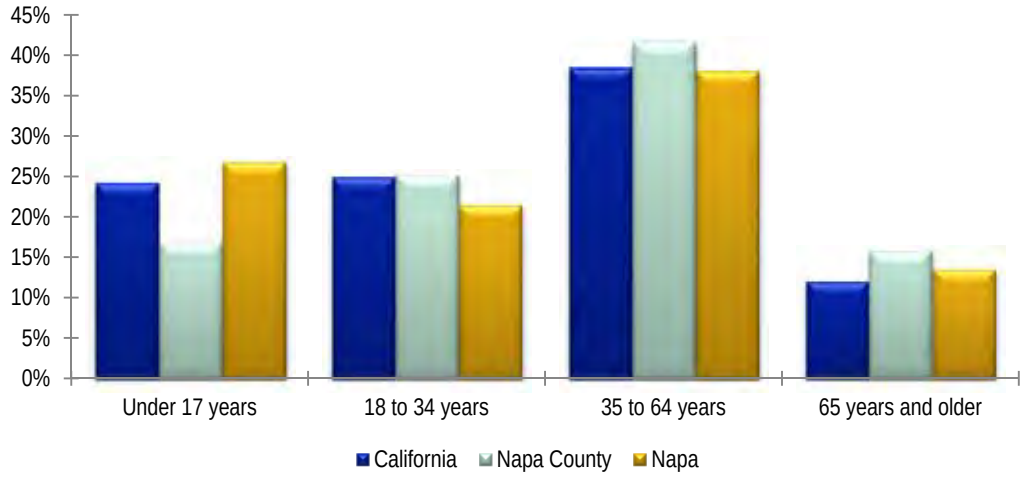
Napa County's population age profile, shown in Figure 5.63, demonstrates that both the 35- to 64-age cohort and above 65 cohort make up 42 and 16 percent of the County's population, respectively. These rates are relatively higher than the state average of 39 and 12 percent, respectively, indicating that the County is home to an above-average Generation X and baby-boomer population. This

[65] Napa County Airport, Transportation, http://www.napacountyairport.org/Site/4/0/6/MessageFromtheManager.aspx.

[66] Napa County Airport Master Plan (March 2007), page 1-4, http://www.napacountyairport.org/Uploads/Files/MasterPlan2007/APC%20Chpt%201.pdf.

aligns with other studies and demographics that indicate the Napa Valley region is a popular retirement destination.

Figure 5.63 Napa County and City Population by Age (2012)



Source: U.S. Census Bureau, American Community Survey 2012.

This retirement age cohort has a preference for single family residential units and mixed-use neighborhoods. Seniors, Baby Boomers, and Silent Generation, which move to rural regions, drive more than seniors from previous generations.

The age profile of the City and County of Napa population is different from the state average; their educational profiles are similar (Table 5.52).

Table 5.52 Napa County and City Population Educational Profile (2012)

Population 25 years and over	California	Napa County	City of Napa
Less than high school diploma	19%	18%	19%
High school graduate (includes equivalency)	21%	21%	21%
Some college or Associate's degree	30%	31%	31%
Bachelor's degree and above	31%	30%	28%
Total	100%	100%	100%

Source: U.S. Census Bureau, American Community Survey 2012.

Employment

The Napa County is best known as the premium wine-growing region in the United States, and as such, is characterized by large industry shares for agriculture, service, and tourism. The $430 million agricultural industry forms

the backbone for the local economy, which arises almost exclusively from wine crops (98 percent).[67] The city and county employment from 1990 to present shows strong job opportunities despite the recent recession. Compared to the rise of the State's unemployment rate from 4.9 to 10.5 percent between 2000 and 2012, the County experienced a 3.6- to 7.8-percent decline. In the past year, the statewide unemployment declined from 10.5 to 8.3 percent (2012 to 2013), while the County's rate dropped from 7.8 to 5.3 percent (Table 5.53).

Table 5.53 Napa County and City Unemployment Rates (1990 to 2013)

Area	1990	2000	20121	2013[a]
California	5.8%	4.9%	10.5%	8.3%
Napa County	4.1%	3.6%	7.8%	5.3%
City of Napa	4.8%	3.8%	8.2%	5.6%

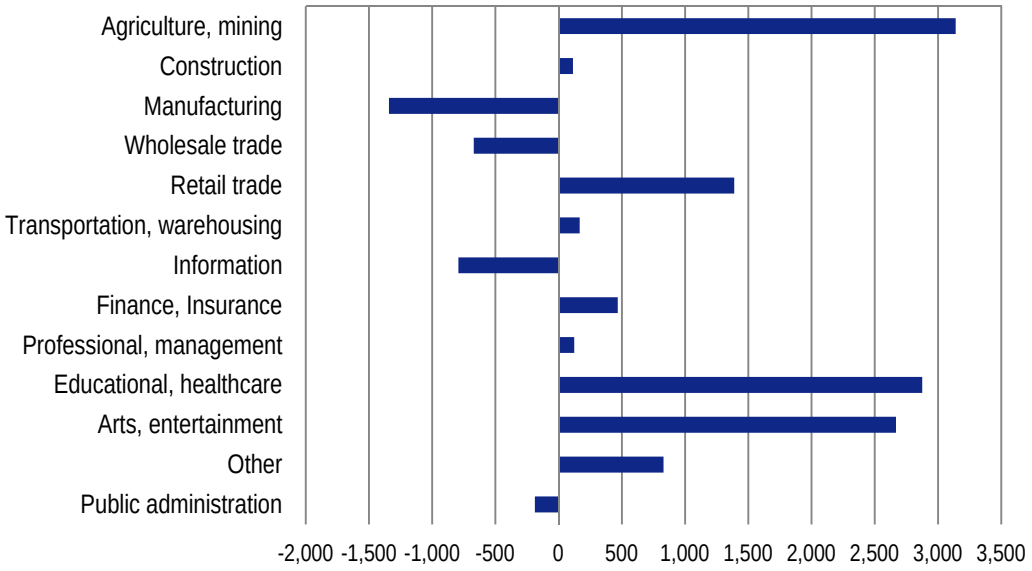
Sources: U.S. Census Bureau Census 1990, Census 2000 and American Community Survey 2012.

In 2000, the Napa County employment was primarily service (28 percent), trade (24 percent), government (19 percent), and manufacturing (12 percent).[68] Between 2000 and 2012, Napa County employment grew approximately 15 percent (Figure 5.64). Manufacturing employment saw the largest percentage decline from 2000 to 2012, decreasing 68 percent from 2000 to 2012. Nevertheless, major service-providing sectors increased over the same period. In addition, the agriculture and mining sector increased 118 percent, the arts and entertainment sector increased 43 percent, and the educational and healthcare sector increased by 24 percent. The steep decline of manufacturing was also echoed across the State, while education and healthcare, professional services, retail and arts and entertainment increased over the decade.

[67] Napa Farmworker Report, page iv, http://www.countyofnapa.org/WorkArea/DownloadAsset.aspx?id=4294980838.

[68] Napa County Airport Master Plan, March 2007, page 1-3, http://www.napacountyairport.org/Uploads/Files/MasterPlan2007/APC%20Chpt%201.pdf.

Figure 5.64 Napa County Change in Employment by Industry (2000 to 2012)



Source: U.S. Census Bureau, American Community Survey 2012.

Land Use

The Napa County Airport is located in the southwestern unincorporated portion of Napa County, bounded to the west by marshland, to the east by the Southern Pacific Railroad, and to the south by the American Canyon city limits (Figure 5.65).[69]

Land north and west of the airport is zoned agriculture and open space, including salt evaporation ponds and sanitation sewer ponds. To the east and south of the airport are business, industrial, and general industrial parcels along State Road 29, Airport Boulevard, Tower Road, and Green Island Road.

[69] Napa County Airport Master Plan (March 2007), page 1-10, http://www.napacountyairport.org/Uploads/Files/MasterPlan2007/APC%20Chpt%201.pdf.

Figure 5.65 APC Area Land Use Assessment Map

Source: ESRI.

The City and County of Napa's share of single family housing in the region follows the pattern of the State as seen in Table 5.54 below. The County's share of multifamily housing compared to single (21 percent) is significantly below the statewide average (31 percent) but the City of Napa lies in between (27 percent). Given the dominance of wine growing, the County has a larger share of migrant or seasonal workers than the average area in the State of California. As a result, there is an associated higher rate of mobile homes and other farm worker centers in Napa County than the statewide average. The Napa County Housing Authority released a report in March 2013 detailing housing needs.[70]

[70] Napa County Housing Authority. (2013, March). 2012 Napa County Farmworker Housing Needs Assessment, http://www.countyofnapa.org/WorkArea/DownloadAsset.aspx?id=4294980838.

Table 5.54 Napa County and City Housing Type and Vacancy Rate (2012)

Housing Type/ Occupancy Rate	California		Napa County		City of Napa	
	Number	Percentage	Number	Percentage	Number	Percentage
Single Family	8,983,275	65%	39,684	73%	20,144	67%
Multifamily 2+ units	4,243,133	31%	11,221	21%	8,152	27%
Mobile Homes	559,389	4%	3,777	7%	1,786	5.9%
Total	13,785,797	100%	54,682	100%	30,082	100%
Vacancy Rate	–	8.1%				

Source: U.S. Census Bureau, American Community Survey 2012.

In the airport vicinity, the County has limited residential development and emphasized industrial and commercial development. As of 2012, there were only 32 low-density rural residences scattered throughout the airport area.[71] In 1970, the County rezoned residential districts to avoid housing near the airport, and in 1976, the adoption of the Airport Master Plan was used to promote the use of the open space in the airport vicinity for industrial uses.

Northeast of the airport, the 386-acre Napa Valley Gateway Business Park accommodates research and development, office, light assembly and warehouse facilities. The business park is subject to special requirements for site and building design, landscaping, roads, signage, parking, noise, and outdoor storage. The nearest residential land uses are located in the City of American Canyon, two miles to the south of the airport.

The majority of airport property is on the eastern side, along Airport Boulevard and Runway 6-24. IASCO accommodates an aviation training facility, the Napa Flight Center, since 1971, for students and professional pilots to receive flight training. Other aviation facilities are also located on the south side of the property, including the CHP operation facility, two hangars, and the control tower.

The market conditions demonstrate the County's economic strength. The demand for industrial and warehousing space from the well established wine producing industry support the role of Napa County Airport as a node for non-smart growth) development. The airport's role as an area that can accommodate more sprawling industrial space and warehousing is essential to the County's overall job retention because the smart growth policies within the County's five cities create constraints for low-density commercial and industrial land use. The parcels in and around the Napa County airport provide such sites for this type of

[71] Napa County Airport Area Specific Plan & EIR, page 27, http://www.countyofnapa.org/AIASP/.

development, which provide employment to less educated workers and generates taxes for local government.

Regulatory Perspective and Community Perspective

Zoning and Other Regulations

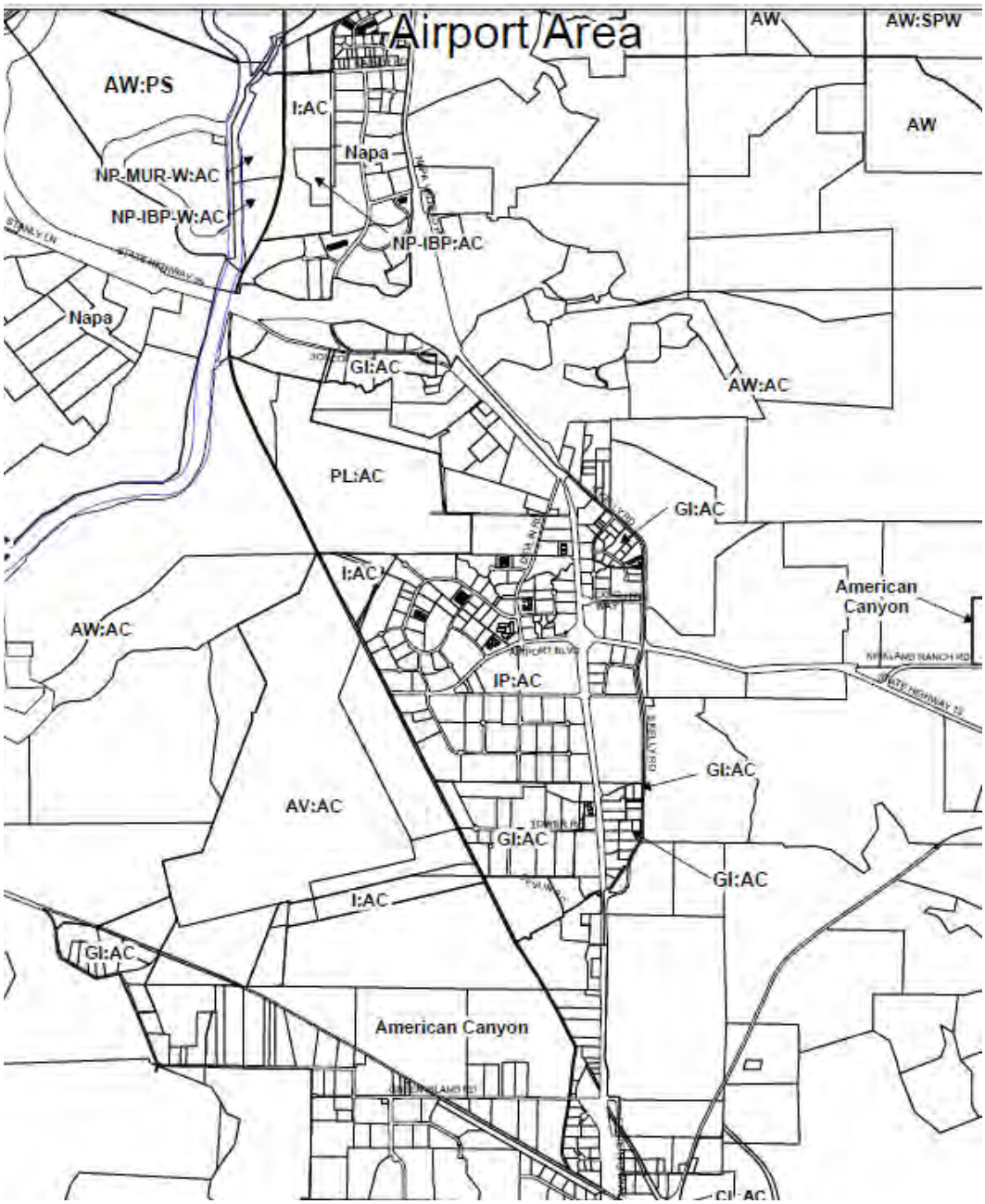
The Napa County Airport property is owned by the Napa County Department of Public Works, who partners with the Planning and Zoning office to oversee all land use, operations, and future development projects

In the unincorporated areas of Napa County, the County Growth Management System allocates a fixed amount of new residential building permits per year, as well as a floor area ratio (FAR) and parking requirements. Employment intensity per acre in the unincorporated area of Napa County is limited by a FAR of 0.35 for most industrial uses, and 0.50 for warehousing.[72] Intensity for employment is also limited by parking minimum and maximum ratio requirements.

The zoning around the airport includes a relatively large amount of open space and agricultural watershed zones to the north and west of the airport property and mainly industrial to the south and east (Figure 5.66). The open space is zoned an agricultural watershed, so the City Municipal Code would need to be changed to allow development.

[72] Napa County Airport Area Specific Plan and Environmental Impact Report, page 11, http://www.countyofnapa.org/AIASP/.

Figure 5.66 APC Area Zoning Map



Source: Napa County, accessed January 2014, at http://www.countyofnapa.org/planning/.

The land in the vicinity of the airport is zoned as industrial park, agricultural watershed, industrial, and open space (Table 5.55).

Table 5.55 Napa Zoning Districts near APC

Code Abbreviation	Zoning District	Quantity Low/Medium/High
AV:AC	Airport: Airport Compatibility	High
GI:AC	General Industrial: Airport Compatibility	High
AW:AC	Agricultural Watershed: Airport Compatibility. Provide review of the Napa County airport master plan and revisions thereto in conformance with the requirements of state law.	High
IP:AC	Industrial Park: Airport Compatibility	Medium
PL:AC	Public Lands: Airport Compatibility	Medium
I:AC	Industrial: Airport Compatibility	Medium
CL:AC	Commercial Limited: Airport Compatibility	Low
NP-IBP:AC	Napa Pipe Industrial/Business Park – Waterfront: Airport Compatibility	Low
NP-MUR-W:AC	Napa Pipe Mixed-Use Residential – Waterfront: Airport Compatibility	Low
AW	Agricultural Watershed:	Low

Source: Napa County Planning Division, accessed January 2014 at: http://library.municode.com/HTML/16513/level1/TIT18ZO.html.

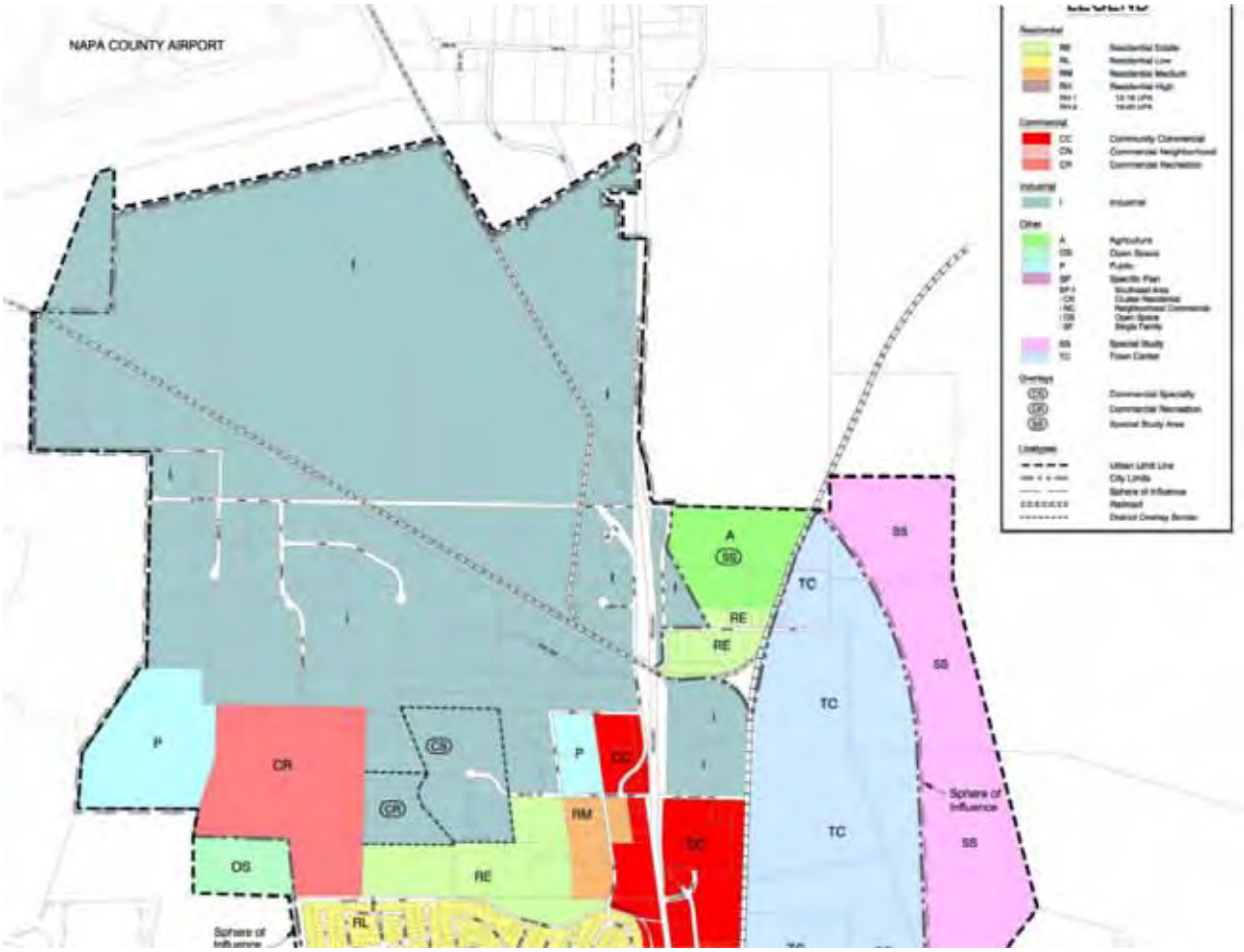
The Public Lands and Agricultural Watershed land parcels to the north and northwest of the airport have the greatest potential to accommodate industrial and warehousing development. According to the Municipal Code, parcels zoned as Public Lands are required to have readily available water and sewer services, be a minimum of 10 acres in size, and have a 45-foot setback.[73] General Industrial land parcels near the airport must follow a maximum building height of 35 feet, a 1.5 FAR, and parking requirements of 1 space per 500 to 2,000 square feet.

There are restrictions to the land parcels to the south of the airport, in the City of American Canyon. The city limits of American Canyon are adjacent to the airport's southern boundary (Figure 5.67). The land uses within American Canyon that the airport is adjacent to are all industrial land uses, according to the zoning map. Within the Industrial (I) land use, the City allows light manufacturing, aviation-related, agribusiness-related, industrial sector clusters, thematic industries, business park, warehouses, professional offices, supporting

[73] Napa County Municipal Code, http://library.municode.com/HTML/16513/level2/TIT18ZO_CH18.50PULADI.html.

retail, restaurant, and financial, and similar uses. For labor intensive industries and supporting uses, the maximum floor area ratio is 0.5, and for low labor uses, the maximum FAR is 0.7.[74]

Figure 5.67 American Canyon Zoning Map (2010)



Source: City of American Canyon, *General Plan,* accessed January 2014 at http://cityofamericancanyon.org/Modules/ShowDocument.aspx?documentid=940.

Community Support

No specific proposals for development around the airport have been presented to the Napa Valley community. Efforts to attract industrial and economic development go as far back as the 1960s. In fact, the Airport Industrial Area was developed by the Napa County to restrict commercial development around the airport.

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[74] City of American Canyon, General Plan, page 1-10, http://cityofamericancanyon.org/Modules/ShowDocument.aspx?documentid=940.

Public and municipal responses to development projects in nearby cities have illustrated general community support towards development that would likely match those of Napa County residents. On one hand, many of the residents in the region place a very high value on the environment and fighting development, evidenced by the opposition to the proposed expansion of the Pacific Union College in nearby rural Angwin. Conversely, there has been general community support in the City of American Canyon for a massive town center project, which is located to the immediate south of the airport along State Road 29, less than five miles from the airport. The 304-acre multiuse American Canyon Town Center project is proposed to include 200,000 square feet of commercial space, a 200-room hotel, 1,500 housing units, 36 acres of open space, and a school.

The Napa County Board of County Commissioners voted in October 2013 to rename the 2,000 acre Airport Industrial Area the Napa Valley Business Park. Other potential names included "wine" in the title, which were ultimately scratched to promote other types of industrial and commercial tenants who may not be involved in the wine industry. In 2013, the Business Park had around 10.3 million square feet of industrial space in southern Napa County.

Access to Infrastructure and Transit Service

Airport Road provides direct access between the airport and both State Road 29 and State Road 12. State Road 29 extends northward up Napa Valley, through the City of Napa connecting to Interstate 80. State Highway 12 extends to the east, connecting to Sonoma and Solano Counties. The airport is located five miles from downtown Napa to the south, easily accessible by vehicle on State Road 29.

The Napa Valley region is served by a variety of public transit services; however none of these connect to the airport. Napa County operates VINE Transit, which runs buses along State Road 29 connecting the Cities of Napa, American Canyon, St. Helena, and Calistoga and providing stops in between.[75] VINE Transit also connects with the San Francisco ferry in Vallejo and Bay Area Rapid Transit (BART) in Richmond.[76] Other regional transit services include Benicia Transit, Vallejo Transit, and Van Go. The Southern Pacific Railroad tracks adjoin the airport on the east side, connecting Napa Valley with the railroad's lines to the south. Though none of the Napa County transit options connect to the Napa County Airport, various rental and private bus agencies serve the airport from their facilities in the City of Napa. The Napa Jet Center, one of the Fixed Base

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[75] VINE Transit, 2013, http://www.ridethevine.com/frequently-asked-questions.

[76] Napa County Airport Master Plan, March 2007, page 1-4, http://www.napacountyairport.org/Uploads/Files/MasterPlan2007/APC%20Chpt%201.pdf.

Operators at the airport, can schedule ground transportation and aircraft charters upon request as well.

Regional Growth Potential

Two conditions support non-smart growth development around the Napa County Airport in the future. First, the significant amount of predominantly vacant, flat, developable land to the northwest, west, and south of the airport. These parcels offer transportation access to the region's major north-south and east-west highway routes, access to rail and ferry options to the Bay Area, and natural features to the north and west. The parcels have access to common sewer and water systems.

Second, the Napa County region expects continued growth in population and employment. By 2020, the Association of Bay Area Governments projects that over 28,000 new jobs will be created in Napa County. This equates to increase in jobs of 42 percent in the next decade alone, compared with the 15 percent expansion experienced between 2000 and 2012. While the majority of this job growth is projected in the service sector, industrial and commercial job growth related to the wine industry makes up a bulk of the remainder. The Napa County Airport Master Plan projects over 6,700 new jobs in the Airport Industrial Area by 2020; a 286-percent growth rate from current job levels.[77] The 1986 Airport Area Specific Plan proposed 1,923 acres of industrial development, including 1,354 of Business/Industrial Park and 569 of General Industrial, and projected the area to employ 6,000 jobs by 2000 and 13,000 by 2015.[78]

Redding Municipal Airport

Redding Municipal Airport (RDD) is a primary commercial airport located six miles southeast of Redding in Shasta County. Shasta is a rural county at the northern end of the Sacramento Valley. The airport is the only airport serving scheduled flights in the County. Shasta County region has two additional general aviation airports: Benton Airport is approximately 10 miles from RDD, and Fall River Mills Airport is a remote access general aviation airport about 70 miles away from RDD.

RDD is owned by the City of Redding. RDD offers both general aviation service and commercial scheduled air passenger service on United Express (operated by SkyWest Airlines) to and from San Francisco International Airport (SFO) and Horizon Air (partner of Alaskan Airlines). Two air freight airlines also operate out of RDD – FedEx out of the south end of the airfield and Airborne Express out of the north. The airport covers 1,584 acres and has two asphalt runways, used

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[77] Napa County Airport Master Plan (March 2007), page 1-1.

[78] Napa County Airport Area Specific Plan and Environmental Impact Report, page 4, http://www.countyofnapa.org/AIASP/.

for an estimated 74,000 operations in 2008.[79] Air Shasta Rotor and Wing, and Redding Jet Center are the only full-service fixed base operators located at RDD.

The following sections describe RDD's potential as a node for supporting regional smart growth areas (i.e., Role 2 Airport). This analysis presents four elements which describe the critical conditions area surrounding RDD that attract industrial and warehousing development: market assessment, regulatory perspective environment and community perspective, transportation Infrastructure, and economic development.

Market Assessment

The size and characteristics of a region's population, as well as regional employment trends, educational profile, and demographics indicate the amount and types of housing and nonresidential development that would be retained and attracted to the Shasta County. As shown in the data presented in Tables 5.57 through 5.61, socioeconomic trends reveal that the study area around Redding Municipal Airport has the population and employment density best suited to potentially support smart growth development.

Population

The City of Redding and Shasta County have had a slightly lower average annual population growth between 2000 and 2012 than growth at the state level (Table 5.56). Nevertheless, the City of Redding's population is estimated to maintain its past rate of growth, growing from 90,000 in 2012 to 113,500 in 2020, and increase of 26.5 percent (Table 5.57).[80] Shasta County's long-range general plan expects the County to accommodate the demands for housing and employment using vacant or underutilized lands.

Table 5.56 Shasta County and Redding Population and Population Change (1990 to 2012)

				1990-2000		2000-2012	
Area	1990	2000	2012	% Change	Avg Annual Change	% Change	Avg Annual Change
California	29,760,021	33,871,648	38,041,430	14%	1%	12%	1%
Shasta County	147,036	163,256	178,586	11%	1%	9%	0.8%
City of Redding	66,462	80,865	89,674	22%	2%	11%	0.9%

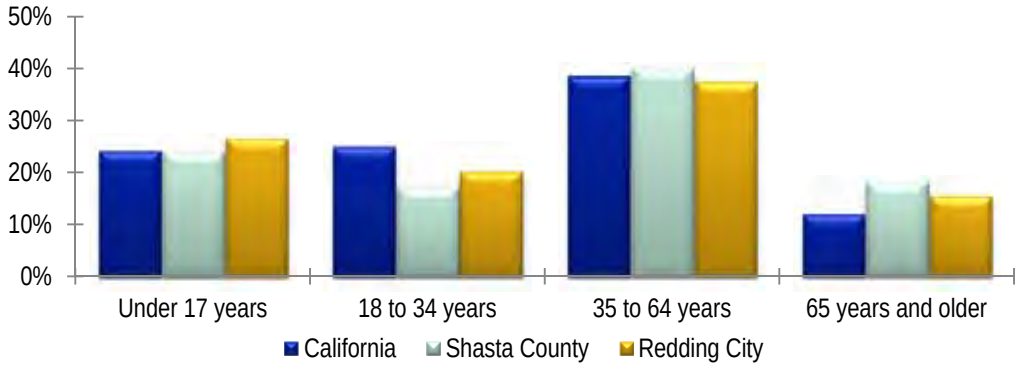
Sources: U.S. Census Bureau, Census 1990, Census 2000, American Community Survey 2012.

[79] Shasta County, *Regional Transportation Plan*, 2010.

[80] City of Redding 2000 to 2020 General Plan, Housing Element, accessed January 2014 at http://www.ci.redding.ca.us/documents/HOUSING_000.pdf.

The Shasta County and City of Redding population age profile shows the above 65 cohort makes up 18 percent. In fact, both Shasta County and the City of Redding have a significantly higher share of residents 65 and older than the State as a whole (Figure 5.68). According to the Shasta County RTP, the Shasta County region is a popular retirement destination because of recreational opportunities, lower cost of housing, and an overall lower cost of living.[81] As a result, the Shasta County Coordinated Transportation Plan considers mobility needs for the elderly population and prescribed policies that foster future development that adapts land use for the needs of recreational visitors and residents, and particularly those in the 65 and older cohort.

Figure 5.68 Shasta County and Redding Population Age Profile (2012)



Source: U.S. Census Bureau, American Community Survey 2012.

The Shasta region's educational profile suggests that the area is a suitable region for attracting professional occupations such as finance and management (Table 5.57). Shasta County has a significantly higher share of residents with some college or an Associate's degree (44 percent) than both the City of Redding and the State as a whole, but a lesser share of residents with a Bachelor's degree or graduate degree. The City of Redding has a relatively low share of residents who have not attained a high school diploma, inferring that a majority of the residents have at least some college or high school completion.

[81] Regional Transportation Plan for Shasta County. (2010), page 13, http://www.srta.ca.gov/pastel/Adobe%20Files/Public%20Transportation/Transit%20and%20Transit%20Needs/COORDINATED%20PUBLIC%20TRANSIT%20AND%20HUMAN%20SERVICE%20TRANSPORTATION%20PLAN.pdf.

Table 5.57 Shasta County and Redding Population Educational Profile (2012)

Population 25 years and over	California	Shasta County	City of Redding
Less than high school diploma	19%	11%	9%
High school graduate (includes equivalency)	21%	26%	28%
Some college or Associate's degree	30%	44%	41%
Bachelor's degree and above	31%	18%	23%
Total	100%	100%	100%

Source: U.S. Census Bureau, American Community Survey 2012.

Employment

As a major recreation destination in Northern California, the primary source of employment and economic activity in the region is related to the service and recreation industries. Shasta Lake and Lassen Peak are major visitor attractions in the area, as well as proximity to Mount Shasta. The area captures tourism traveling on Interstate 5 between Sacramento and Crater Lake, Oregon. According to the City of Redding General Plan, employment opportunities in the region are greatest in the lower-wage occupations, which provide many jobs that are only part-time or seasonal.[82]

The unemployment rate in both the County and City of Redding has followed the overall statewide trend, peaking in 2012 (Table 5.58). The City of Redding has slightly higher unemployment rates than both the Shasta County and State of California as a whole. The unemployment rates for the County are projected to continue on the decline and by 2020 should reach 8 percent and 7 percent by 2040.[83]

[82] City of Redding 2000 to 2020 General Plan, Housing Element, page 5, http://www.ci.redding.ca.us/documents/HOUSING_000.pdf,

[83] California Economic Forecast, 2012, California County-Level Economic Forecast 2012 to 2040, page 177, http://www.dot.ca.gov/hq/tpp/offices/eab/socio_economic_files/2012/2012_Socio-Eco_County_Forecasts_Full_Report.pdf.

Table 5.58 Shasta County and Redding Unemployment Rate (1990 to 2013)

Area	1990	2000	2012[a]	2013
California	5.8%	4.9%	10.5%	8.3%
Shasta County	4.6%	4.3%	10.6%	8.4%[a]
City of Redding	8.6%	5.2%	11.7%	8.3%[a]

Sources: U.S. Census Bureau Census 1990, Census 2000 and American Community Survey 2012.

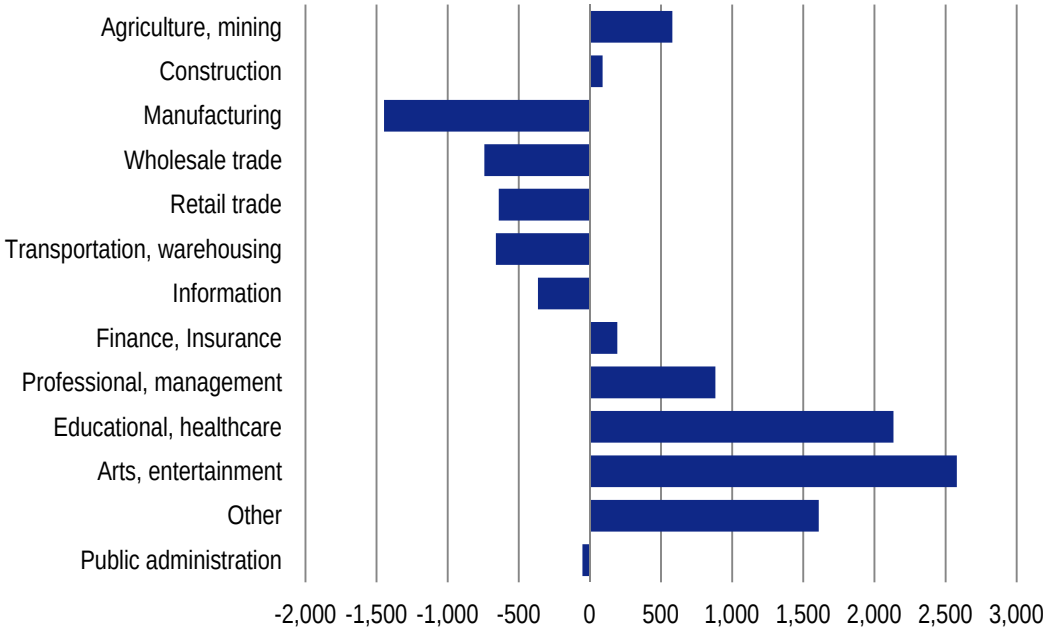
[a] 2013 data is preliminary data for the month of October 2013.

Employment in Shasta County grew approximately 6.3 percent between 2000 and 2012, with notable industry-level shifts that reflect trends witnessed across the State of California and the nation as a whole. Between 2012 and 2017, employment in Shasta County is projected to retain the same relative spread across industry sectors, with the largest current industry sectors being education and healthcare (26 percent), arts and entertainment (13 percent), and retail trade (12 percent).[84] From 2000 to 2012, countywide employment in manufacturing declined 35 percent, compared to a 33 percent decline in the State overall.

Major service-providing industry sectors increased employment over the same period. The professional, scientific and management sector increased 17 percent, education and health care services increased 13 percent, and the arts, entertainment, accommodation and food services sector experienced a 41 percent growth. Employment across the State of California grew 15 percent, 35 percent, and 22 percent in those sectors, respectively. Figure 5.69 presents the change in county industry share between 2000 and 2012 for Shasta County.

[84] California Economic Forecast, 2012, California County-Level Economic Forecast 2012 to 2040, page 177, retrieved from http://www.dot.ca.gov/hq/tpp/offices/eab/socio_economic_files/2012/2012_Socio-Eco_County_Forecasts_Full_Report.pdf.

Figure 5.69 Shasta County Change in Employment by Industry (2000 to 2012)



Source: U.S. Census Bureau, American Community Survey 2012.

Land Use

As a destination for recreation and retirees, the city and county housing stock shows continued demand primarily for single-family housing. Shasta County has a higher share of single-family housing units than the state average at around 72 percent of the County's housing stock in 2012. New housing units constructed in the City between 2007 and 2008 overwhelmingly favored single-family housing units (83 percent) over multiple-family units (17 percent).[85] Only one-third of the City's housing stock is less than 20 years old. Occupancy rates in both the City of Redding and Shasta County area are higher than state average (Table 5.59).

[85] City of Redding 2000-2020 General Plan, Housing Element, page 6, http://www.ci.redding.ca.us/documents/HOUSING_000.pdf.

Table 5.59 Shasta County and Redding Housing Type and Vacancy Rate (2012)

Housing Type/ Occupancy Rate	California		Shasta County		City of Redding	
	#	%	#	%	#	%
Single Family	8,983,275	65%	55,372	72%	26,780	69%
Multifamily 2+ units	4,243,133	31%	12,193	16%	9,990	26%
Mobile Homes	559,389	4%	9,685	13%	2,144	6%
Total	13,785,797	100%	77,250	100%	38,914	100%
Vacancy Rate	–	8.1%	–	7.0%	–	

Source: U.S. Census Bureau, American Community Survey 2012.

The future land use near Redding Municipal Airport is determined by the City of Redding and Shasta County, and plans a large role in existing land use and zoning decisions. The City of Redding and the County are primarily made up of low residential density land uses in a predominantly rural environment. The study area surrounding the airport, which extends approximately one-half mile from the airport borders, includes single family and residential estate housing, open space, and commercial and industrial.

Single family residential land uses largely dominate the landscape to the northern and western sides of the airport, interspersed with some general commercial uses. To the east of the Airport, an open spaced parcel adjoins to a creek behind the airport. On the other side of the creek, several general industrial parcels exist. To the south, there are general and heavy industrial land uses near the airport. Further to the south, the land use is primarily single family residences.

Figure 5.70 provides a general map of the airport's location and neighborhoods.

Several businesses operate on the airport property, almost all aviation specific, including a restaurant in the airport building, and parking lots. The airport is also home to flight training through an international flight training school – IASCO Global, Ltd.[86] – located in the business park across Airport Road to the west of the Airport. IASCO's facilities at RDD have expressed interest in building a stand-along facility on the RDD property in the future, but the rate of return is not currently high enough to support this type of investment. Other land uses on the airport property include a three-acre solar farm funded by the American Recovery Act ($1 million grant) and a local utility rebate of $2.1 million. The airport property is also home to a drag racing area and go-kart racing course, a small revenue generator for the airport. When the new runway is constructed, both the drag strip and go-kart course will be removed.

[86] IASCO Global, Ltd, http://www.iasco.com/home.aspx.

Figure 5.70 RDD Land Use Assessment Area

Source: ESRI.

To the west of Airport Road, there is a 40 acre business park that dates back to the 1980s, when the City of Redding received a grant from the County Economic Development Authority (EDA) to develop streets and utilities to the business park. Due to a lease only policy, however, no parcels were developed, and the City obtained permission from the FAA to release the land for sale in the 1990s. Parcels were initially sold to businesses that would immediately create jobs; however, speculative development was allowed after a few years. The business park is currently 50 percent built out, and the Airport has recouped their initial investment into the site.

Stillwater Industrial Park sits on 200 acres to the east of the airport, across the creek. The City contributed 200 acres of the Airport property to the Industrial Park, land which was east of the creek and not readably accessible from the Airport itself. The industrial park used to be tied to the timber industry, which has been on the decline and has been replaced by lower-paying service industry jobs including distribution for Coors and Pepsi. Other tenants include IASCO, a

medical equipment manufacturer, Captive Air, Cross Petroleum, and Curry Group (Electrical Contractors).

The industrial park land is approximately 50 percent utilized. As such, the City has partnered with the Shasta County Economic Development Corporation to ready the park for additional development. The City and County acquired a $70 million grant to build two bridges to access the site across the creek, install a sewage lift station, and extend water infrastructure across the creek. No development has occurred yet.

Regulatory Environment and Community Perspective

This section describes the City of Redding and Shasta County regulations, such as zoning, floor area ratio (FAR), height restrictions, historical preservation, noise abatement, toxic or chemical restriction, recreational uses, open space, or agricultural preservation that could affect future smart growth support development in the vicinity of Redding Municipal Airport. These regulations control different aspects of future use of land near the airport, and also inform the community's support or lack thereof for future development in the region.

Zoning and Other Regulations

The Redding Airport is owned by the City of Redding, who is responsible for plans and other regulations that govern development capacity for the region and land uses neighboring the airport. Since the airport abuts the city limits but is located in the County, the County controls zoning for the unincorporated parcels. Within the City of Redding limits, adjacent parcels are zoned low-density residential (RS-2) to the north, west, and southwest, while higher density residential parcels (RS-3.5-PD) are zoned to the west and northwest. Figure 5.71 illustrates the City of Redding zoning districts near the airport.

The unincorporated area adjacent to the airport property includes the following parcels, which have smart growth supportive development potential in the future: Rural Residential (R-R), Limited Agriculture (A-1), Interim Rural Residential (I-R), and Planned Development (PD) (Table 5.60). Of the county zoning designations, one of the most applicable to future development is the Interim Rural Residential zoning. This designation is applied to urban residential or suburban residential areas…where it is apparent that more intensive urban or suburban development is imminent, or will occur when urban services become available.[87] These districts are consistent with the County's urban residential (UR) and suburban residential (SR) land use designations, and are likely places for development to be focused by the City and County.

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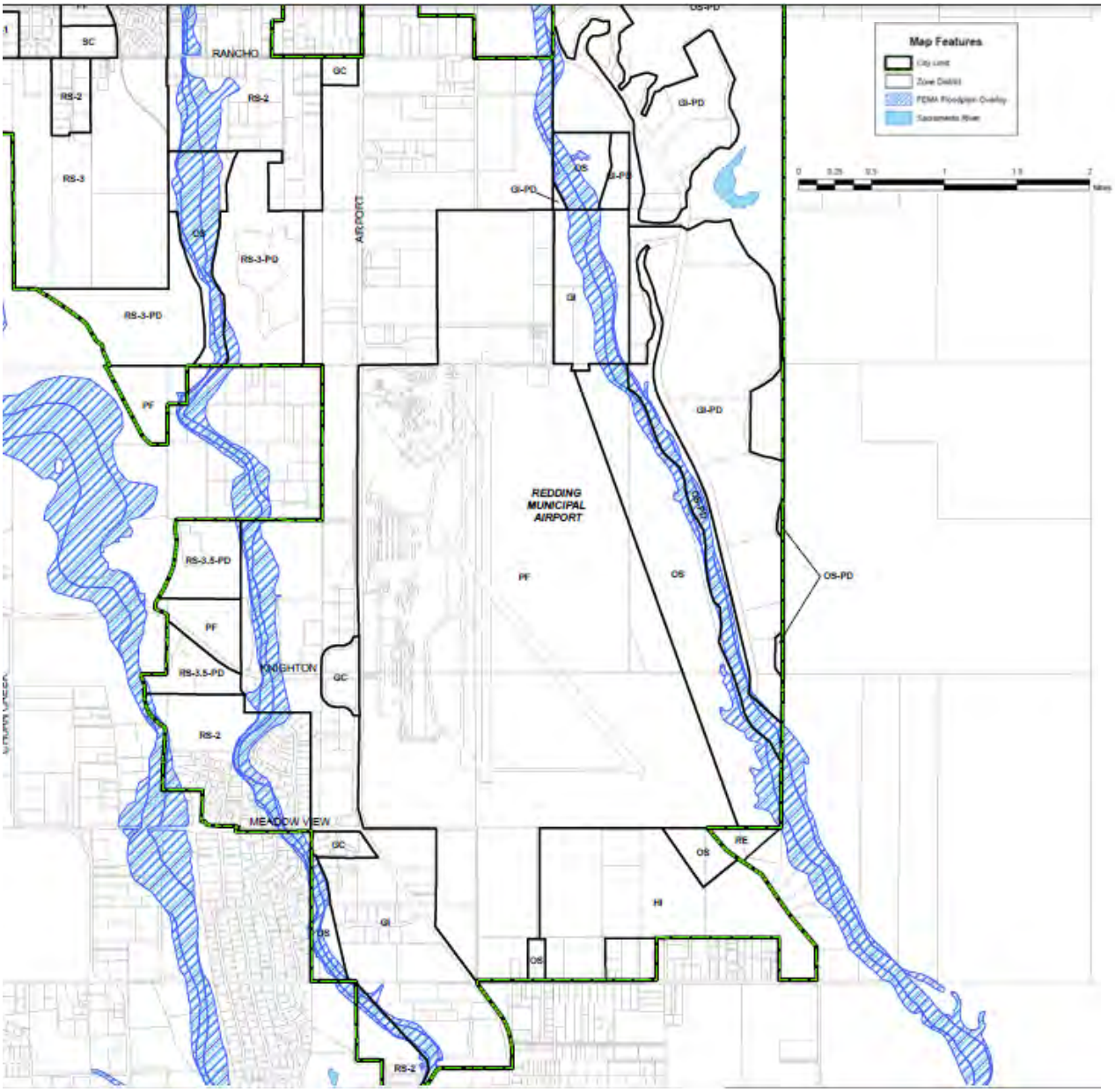
[87] Shasta County Zoning Plan, Interim Rural Residential District. http://www.co.shasta.ca.us/Resource_Management/zoning_plan/1728.sflb.ashx.

Figure 5.71 Redding Zoning Map Excerpt



Source: City of Redding.

Table 5.60 Redding Zoning Districts near RDD

Jurisdiction	Code Abbreviation	Zoning District	Quantity Low/Medium/High
City of Redding	RS-2, RS-3-PD	Residential Single Family	Low
	RE	Residential Estate	Low
	OS, OS-PD	Open Space	Medium
	GI, GI-PD	General Industry	Medium-High
	HI	Heavy Industry	Medium
	CR	General Commercial	Low
	PF	Public Facility	Low
Shasta County	I-R	Interim Rural Residential	Medium
	R-R	Rural Residential	Medium
	PD	Planned Development	Low
	M-L	Light Industrial	Medium
	B	Building Site	Low
	C-2	Community Commercial	Low
	C-M	Commercial Light Industrial	Low
	M	General Industrial	Medium
	PF	Public Facilities	Low

Source: City of Redding Municipal Code.

Community Perspectives

In addition to regulation, the support or opposition from surrounding communities toward development control business attraction in and near Redding Municipal Airport. In 2011, the Redding News published an article examining the projected expansion of the airport from 20,000 to 30,000 square feet. In 2010, Horizon Air eliminated flights to Seattle, and dropped one of its two daily flights to Los Angeles, by Sky West added one flight to San Francisco. The net effect dropped daily flights from nine in 1999 five daily flights presently.[88] Despite the contraction in service since 2009, the Airport proposed major terminal improvements in 2011.

Access to Infrastructure and Transit Service

Redding Municipal Airport has adequate roadway access, relying upon roadway infrastructure along Airport Road, which runs north-south, parallel to the western edge of the airport. The surrounding area is dominated by residential

[88] http://www.redding.com/news/2011/feb/18/airport-seeks-6m-face-lift/.

housing and light commercial activities, and most streets have sidewalks. Ground access to RDD was enhanced in 2003 by extending Knighton Road from Interstate 5 east to the airport property. The Shasta County Regional Transportation Plan proposes an expansion of Airport Road in the future that will expand the road from two to four lanes with dedicated turn lanes, bike paths, and signals, to forestall any ground access problems that could arise with future development.

The City of Redding is making downtown Redding more bicycle and pedestrian friendly for residents and visitors. The City developed their first Bikeways Action Plan in 2011, and has also been focusing on improvements to their Complete Streets Policy and Pedestrian Master Plan to encourage safe alternative transportation. Though it is unlikely at this time that the Airport will be a strong focus of these bicycle and pedestrian-aimed policies, they could be in the future.

The Redding Area Bus Authority (RABA) is the primary public transportation provider within the County, providing fixed-route and demand-response services within the City of Redding and in parts of the County. RABA is operated by the City of Redding, and traverses the majority of the City and nearby Shasta Lake and Anderson communities with 14 bus routes. Other small agencies in the region provide special needs transportation. . The City of Redding itself is also served by Amtrak's Coast Starlight train, Greyhound bus, and by Trinity Transit bus service between Weaverville, Redding, and Willow Creek. There is no existing bus route or shuttle service that currently connects to RDD. There were services available in previous years, which were discontinued due to a lack of adequate ridership; however, some interest has been expressed recently for bus service to the airport.[89] Shasta County plans to expand land-use projects that connect to transit, promote pedestrian-friendly communities, promote transit-ready development, and other initiatives aimed at preparing the region for additional residents and a need for mobility.[90]

Regional Growth Potential

The county population growth is projected to grow rapidly from about 180,000 residents to 220,000 by 2030 and 265,000 by 2060.[91] Several characteristics support future smart growth within the area surrounding Redding Municipal Airport, especially on large flat, developable land to the west of the airport in unincorporated Shasta County. The airport area offers a considerable amount of land to both the west and east, and is far enough away from other development

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[89] Shasta County Regional Transportation Plan, 2010.

[90] Shasta County, 2007, Shasta County Coordinated Human Transportation Plan.

[91] California Department of Finance, accessed December 2013 from http://www.dof.ca.gov/research/demographic/reports/projections/p-1/documents/Projections_Press_Release_2010-2060.pdf.

in the Shasta County region to be able to retain expanding businesses and attract new business.

- **Redding Municipal Airport Master Plan (2005)**. The City of Redding's Airport Master Plan (AMP) addresses recent and projected growth of air traffic at the airport and proposes development projects to meet this projected demand. Since the plan's release in 2005, completed projects have included the reconstruction of both runways, the second phase of the passenger terminal, security enhancements, taxiway refurbishment, construction of a new Aircraft Rescue and Firefighting (ARFF) facility, and taxiway reconstruction. Projects that have not been completed include the environmental review and construction of a new 4,000' parallel runway on the east side of the Airport property. The new runway will primarily serve flight training activities from IASCO and small aircraft, allowing the main runway to be used for larger aircraft. The AMP also proposes the existing crosswind runway be closed for the purposes of opening up additional areas for development and taking student pilots off the main runway.
- **Shasta County Regional Transportation Authority (SRTA) Regional Transportation Plan (2010.** The most recent Shasta County RTA Regional Transportation Plan describes transportation development plans for both the City of Redding and the unincorporated areas of the County. One of the key development plans relevant to the Airport is the Shastec Redevelopment Project, a long-range development project (2020 to 2030) aimed to improve ground access to the airport and increase options for air/goods movement. This plan is a partnership between the City of Redding, Shasta County, and the City of Anderson, and will include road and bridge improvements near RDD: Airport Road; Rancho Road; Hartnell Avenue; State Route 44; North Street; Riverside Drive; North Street Bridge across the Sacramento River; Rancho Road across Stillwater Creek; Sylvia Lane Bridge across Clover Creek; Freeman Way Bridge across Clover Creek; and Riverside Drive overcrossing of Interstate 5.

  Other development plans and objectives listed in the Shasta County RTP include the City's acquisition of property north and south of RDD to enhance run way approach protection and to provide land for future expansion. In 2003, the City of Redding acquired over 140 acres, but would like to acquire more for planned expansion of the airport.

Santa Maria Public Airport

Santa Maria Public Airport (SMX) is a public airport located in the heart of California's Central Coast in northern unincorporated Santa Barbara County, approximately 3 miles south of the City of Santa Maria. The airport is owned by Santa Barbara County. The City of Santa Maria is located 250 miles south of San Francisco and 170 miles north of Los Angeles in the Santa Maria Valley. The Santa Maria Public Airport falls between the City of Santa Maria to the north and the unincorporated community of Orcutt to the immediate south. The area is

primarily rural, used for agriculture, grazing, crude oil production, and open space.

The airport operates two active runways, and the property encompasses around 2,600 acres in the heart of Central California. Skywest Airlines and Allegiant Air operate out of SMX, with United operating between Los Angeles and Allegiant operating between Las Vegas and Honolulu, is one of the fixed base operators at SMX, along with home base facilities for over 200 other aircraft. In 2007, operations at SMX totaled just over 62,500 operations. The airport recently extended one of the runways from around 6,300 to 8,000 feet, with hopes to attract new airlines and new destinations. The unincorporated community of Orcutt is located immediately south of Santa Maria, containing around 15,000 acres with land areas set aside for future urbanization. The region is served by U.S. Highway 101, State Road 1, and State Road 135.

The area around SMX indicates potential to be a smart growth support area. The area does not have sufficient population and employment density to be considered a smart growth area, but it does have suitable land for development and proximity to roadway and service infrastructure, particularly U.S. 101. SMX is located in a built-out environment. The mix of commercial uses, accessible location, and proximity to nearby urban development typologies indicate the area's potential as a smart growth area. Quantitative economic analysis presented in this case study suggests that smart growth consisting of higher density, walkable development could lead to $152 million in additional value added, and $105 million in increased income. Figure 5.73 presents the 2012 employment by industry sector in the STS study area.

Market Assessment

This subsection presents a market assessment that evaluates the current conditions and future trends for the population, employment, and land use of the Santa Maria Valley region and the airport area. The market conditions that position SMX as a non-smart growth area involve the strength of demand from households and businesses for goods and services produced by companies located in the airport area. Household demand is manifested by the number and composition of the population, which is measured by demographic trends. Firms and employees drive the local business demand. SMX's feasibility as a non-smart growth area depends on the competitive advantages of land located within the airport area over the land outside the airport area.

Population

Rates of population growth in Santa Barbara County have been around the same as the State of California average, while the growth in the City of Santa Maria has been significantly higher, averaging around 2.4 percentage points annually since 1990. This growth is listed in Table 5.61, illustrating the growth of the County and the region.

Table 5.61 Santa Barbara County and Santa Maria Population and Population Change (1990 to 2012)

				1990-2000		2000-2012	
Area	1990	2000	2012	% Change	Avg. Annual Change	% Change	Avg. Annual Change
California	29,760,021	33,871,648	38,041,430	14%	1%	12%	1%
Santa Barbara County	369,608	399,347	431,249	8%	1%	8%	0.6%
Santa Maria	61,284	77,423	101,469	26%	2.4%	31%	2.3%

Sources: U.S. Census Bureau, Census 1990, Census 2000, American Community Survey 2012.

According to the Santa Barbara Association of Government's (SBAG) Regional Growth Forecast, the County's population is projected to grow to around 493,000 by 2040, a 1.1-percent annual growth rate.[92] Following the trend of rapid population growth since 1990, the City of Santa Maria population is projected to reach 119,400 residents by 2040, a 1.4-percent annual growth rate. The unincorporated community of Orcutt, to the south of the airport and Santa Maria, is projected to continue experiencing population growth at a rapid rate – a 1.9-percent annual growth rate between 2005 and 2040.[93]

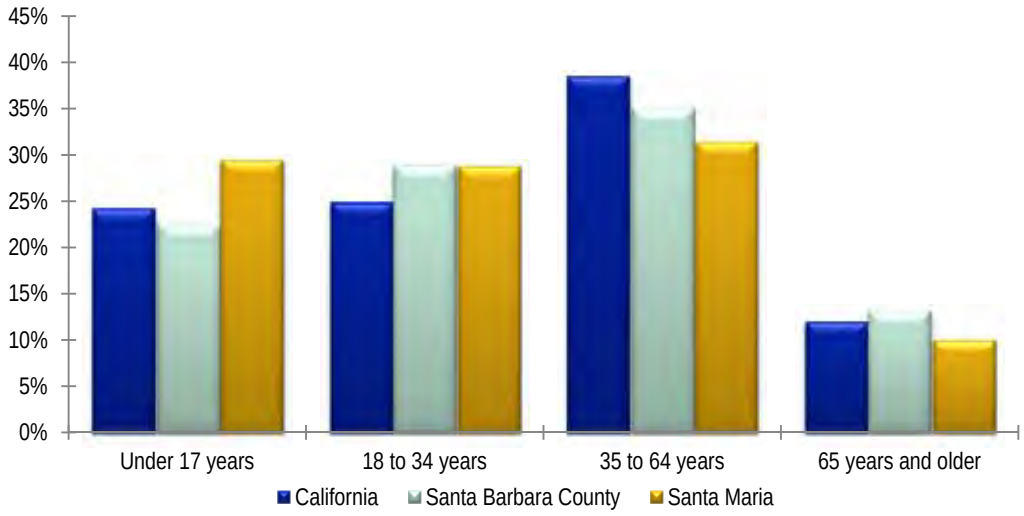
The demographics of the Santa Maria Valley region are similar to that of the State of California. As of 2012, the City of Santa Maria has a greater percentage of younger residents (below 34 years old) than both the county and state average, however, that is projected to reverse in coming years (Figure 5.72). SBAG projects that countywide, the share of older residents (60 and above) will increase from 13 to 27 percent between 2012 and 2040. During the same time, the share of younger residents (age 44 and below) will decrease from 36 to 29 percent.[94] This demographic change in the region will have implications for development types and transportation mode preferences.

[92] Santa Barbara Association of Governments, 2007, Regional Growth Forecast, page 3, http://www.cityofsantamaria.org/207-AdoptedRegionalGrowthForecast_SBCAG.pdf.

[93] Santa Barbara Association of Governments, 2007, Regional Growth Forecast, page 3, http://www.cityofsantamaria.org/207-AdoptedRegionalGrowthForecast_SBCAG.pdf.

[94] Santa Barbara Association of Governments, 2007, Regional Growth Forecast, page 16, http://www.cityofsantamaria.org/207-AdoptedRegionalGrowthForecast_SBCAG.pdf.

Figure 5.72 Santa Barbara and Santa Maria Population Age Profile (2012)



Source: U.S. Census Bureau, American Community Survey 2012.

The City of Santa Maria has a relatively low share of residents with some college or any college education, at only 12 percent of the population compared with 30 percent of Santa Barbara County and 31 percent of the State of California population (Table 5.62). Both the City and County have a higher share of residents who never completed high school than the state average – almost one-half of the City's residents do not hold a high school diploma or equivalent.

Table 5.62 Santa Barbara County and Santa Maria Educational Profile (2012)

Population 25 years and over	California	Santa Barbara County	Santa Maria
Less than high school diploma	19%	21%	44%
High school graduate (includes equivalency)	21%	20%	21%
Some college or Associate's degree	30%	29%	24%
Bachelor's degree and above	31%	30%	12%
Total	100%	100%	100%

Source: U.S. Census Bureau, American Community Survey 2012.

Employment

Santa Maria Valley's economy is dominated by industries related to the wine and agriculture industry. Other important growing sectors include aerospace, communications, high-technology research and development, energy

production, military operations, and manufacturing. Two-thirds of the City's jobs are in the three lowest income sectors – agriculture, retail, and service.

In Table 5.63, Santa Barbara County's unemployment rates from 1990 to present indicate that on average, county residents have been able to secure employment despite the recession and declines at the state levels, consistently lower than the state averages. On the other hand, however, the unemployment rates in the City of Santa Maria have been significantly higher than both the county and state rates since 1990, spiking to 12.4 percent in 2012. This could indicate a high percentage of seasonal or temporary employees, or agricultural industries highly susceptible to market trends.

Table 5.63 Santa Barbara County and Santa Maria Unemployment Rate (1990 to 2013)

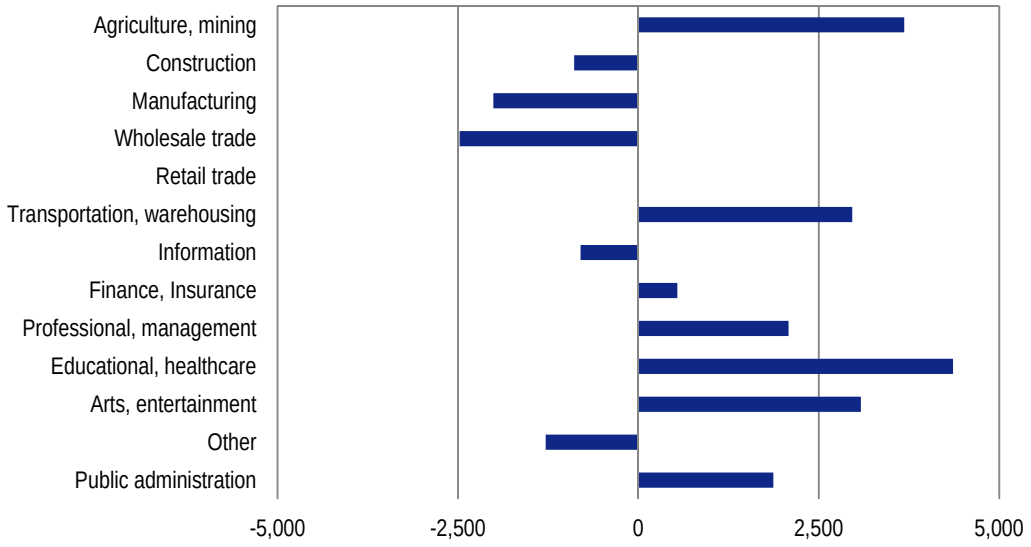
Area	1990	2000	2012	2013[a]
California	5.8%	4.9%	10.5%	8.3%
Santa Barbara County	4.9%	4.4%	8.0%	6.1%
Santa Maria	7.1%	7.0%	12.4%	9.6%

Sources: U.S. Census Bureau Census 1990, Census 2000 and American Community Survey 2012.

[a] 2013 data is preliminary data for the month of October 2013.

Santa Barbara County's workforce has grown in the last decade, with around 11,000 jobs added between 2000 and 2012 (6 percent growth rate). The largest county industry sectors in 2012 included educational services (22 percent), retail trade (11 percent), professional, scientific, management (11 percent), and arts and entertainments sector (11 percent). Between 2000 and 2012, the industries that experienced the most growth were warehousing (57 percent growth), agriculture (30 percent growth), and public administration (24 percent growth), illustrated in Figure 5.73.

Figure 5.73 Santa Barbara County Change in Employment by Industry (2000 to 2012)



Source: U.S. Census Bureau, American Community Survey, 2012.

According to the SBAG Regional Growth Forecast, Santa Barbara County's employment is projected to grow to 250,000 by 2040, a 30 percent growth rate from 192,000 in 2012. Mining, once a large industry in the region, has continued to lessen in regional importance, while retail and wholesale trade have increased in importance in the region. The Santa Maria Valley is projected to experience a relatively higher share of employment growth than the Santa Barbara County as a whole, with projected 74 percent growth between 2005 and 2040 compared to a 32 percent county growth rate. The Santa Maria region is projected to retain its importance as a regional retail-service center and increase its share of total county employment as the Santa Maria Research Park and other projects are completed.

Land Use

This section reviews existing land uses and provides an overview of the residential, commercial, and other activities occurring in the study area. Analysis of existing land uses can provide insight as to what constraints and opportunities may guide growth and development.

SMX is located in the northern unincorporated portion of a mid-sized community, bounded to the east by development and to the south by the unincorporated community of Orcutt. The area to the north of the airport is occupied by a variety of industrial and commercial uses. A golf course is located to the north of the airport. Developed industrial and airport service land uses occupy around 1,620 acres in the City of Santa Maria, around 11 percent of the City's total land area. An additional 1,800 acres of industrial/airport service zoned land are available for future development in the city limits. Major

industrial areas in the region are not concentrated in one region, but are scattered throughout, with many located long Skyway Drive.

The airport's potential non-smart growth project area contains 1,750 acres that includes 723 acres of vacant and undeveloped land, 92 acres of housing, 140 acres of public parks, a golf course, a hotel, 150,000 square feet of retail commercial, and 4.6 million square feet of built light industrial, warehouse, general commercial and retail business space. The study areas are shown in Figure 5.74 and described below:

- With the exception of a few infill sites, the Area A corridor between Betteravia Road and McCoy Lane is built out and not available for more intensive uses. However, one large vacant land area of about 240 acres located in the northeast section of the Project Area is currently farmed and lacks the infrastructure needed to support urban uses.
- Area B forms the central portion of the Santa Maria Public study area and includes 70 acres of housing, the Santa Maria Country Club, and Waller Park (a regional recreation and open space destination). The urbanized area of 276 acres is fully built out with a mix of light industrial and general commercial business uses, with the exception of a few available infill sites.
- Area C forms the lower portion of the project area, and includes 420 acres of undeveloped land and 22 acres of housing. It can be assumed that Area C lacks the infrastructure needed to support urbanization, and a large portion of Area C is actively farmed.

The presence and growth of residential development in the City and County can support employment and consumer opportunities near the airport. Housing type share is relatively similar across the state, county, and city averages in the Santa Maria Valley. The Santa Maria and Santa Barbara County's share of single family housing in the region is relatively similar to that of the State of California, as evidenced in Table 5.64.

Figure 5.74 SMX Area Land Use Assessment Map

Source: ESRI.

Table 5.64 Santa Barbara County and Santa Maria Housing Type and Vacancy Rate (2012)

Housing Type/ Occupancy Rate	California		Santa Barbara County		Santa Maria	
	Number	Percentage	Number	Percentage	Number	Percentage
Single Family	8,983,275	65%	98,495	65%	18,528	66%
Multifamily 2+ units	4,243,133	31%	46,035	30%	8,351	30%
Mobile Homes	559,389	4%	8,089	5%	1,342	5%
Total	13,785,797	100%	152,619	100%	28,221	100%
Vacancy Rate	–	8.1%	–		–	

Source: U.S. Census Bureau, American Community Survey 2012.

In summary, the market conditions illustrated by population, employment, and land use described above support the designation of SMX as a potential non-smart growth area. This demand is the first and most critical of three elements

that are needed to justify SMX's non-smart growth area designation. The other two are the airport area's land use and regulatory environment and access to infrastructure and transit service. Each of these is described below.

Regulatory Environment and Community Perspectives

This section describes the Santa Barbara County and City of Santa Maria regulations, such as zoning, FAR, height restrictions, historical preservation, noise abatement, toxic or chemical restriction, recreational uses, open space, or agricultural preservation that could affect future non-smart growth development in the vicinity of the Santa Maria Public airport. These regulations control different aspects of future use of land near the airport, and also inform the community's support or lack thereof for future development in the region.

Zoning and Other Regulations

Santa Barbara County is responsible for plans and regulations that govern development capacity for the region and land uses neighboring the airport. Since the airport falls on the border of the city limits and Town of Orcutt limits, it is essential to also examine the zoning for the unincorporated parcels that fall in each jurisdiction for future development (Figure 5.75). Key land use planning documents include the following:

- **City of Santa Maria General Land Use Plan (2011).** The Land Use Plan includes the future of the region, including discussion of Noise Impact Areas and Air Traffic Impact Areas. The Plan states that the City "should not permit residential uses in close proximity to the airport, allowing the airport to exist and expand as a strong economic factor in the region's economic growth." In addition, the Plan states that any developments near the airport "should be consistent with the Santa Barbara County Airport Land Use Commission Areas I, II, and III, where applicable."[95]
- **Santa Maria Airport Land Use Plan (currently being updated).** The Santa Maria Public Airport Land Use Plan (SMALUP) is currently being developed by the regional Airport Land Use Commission (ALUC), with the primary goal of preserving "navigable airspace around the airport, putting general safety of people and property as first place."[96] The plan was last updated in 1993, and requires significant changes to meet current state and Federal regulations. Purpose of this plan is to address noise and safety issues against airport noise, but also to address consistency with other regional plans.

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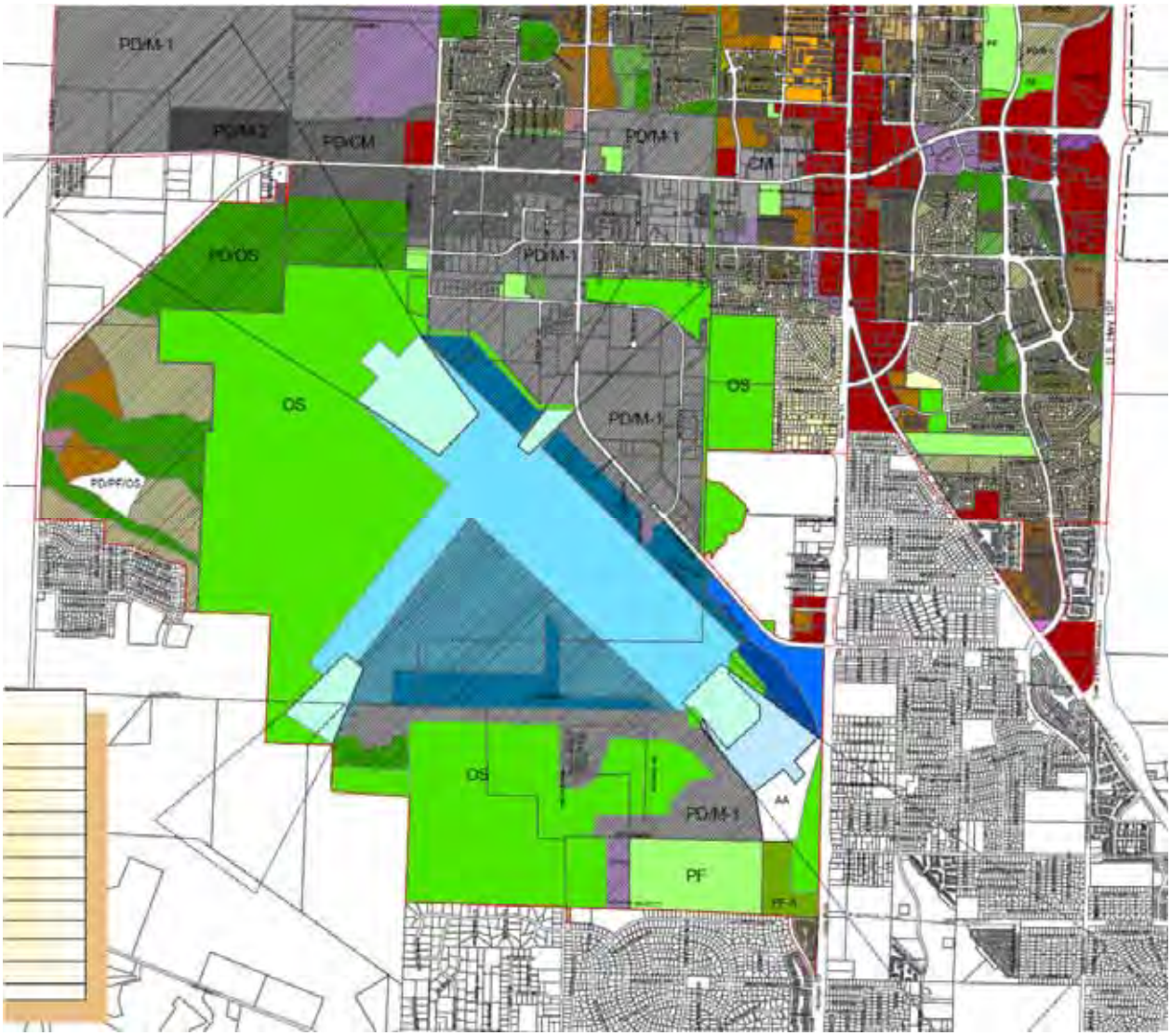
[95] City of Santa Maria General Plan. (2011), page LU-11, http://www.cityofsantamariaonline.org/GeneralPlan/LandUseElement/Full_Land_Use_Element.pdf.

[96] Santa Barbara County Association of Governments, *Airport Land Use Commission - What We Do*, accessed January 2014 at http://www.sbcag.org/What_We_Do/ALUC/aluc.html.

A summary of the related city and county zoning designations within approximately one mile of the airport are summarized in Table 5.65. The airport area is zoned for a mixture of uses including light and commercial manufacturing, open space, residential, and planned development overlay. A small portion of the study area – open space to the south and east of the airport – is outside Santa Maria's city limits. The SBCAG SCS scenario in, which was adopted August 2013, calls for future development to be concentrated in the City's central core, along Broadway and Main Street, which are served by transit. The central core is approximately five miles from the airport.

Figure 5.75 Santa Maria Zoning Map



Source: City of Santa Maria Municipal Code.

Table 5.65 Santa Maria Zoning Districts near SMX

Jurisdiction	Code Abbreviation	Zoning District	Quantity Low/Medium/ High
City of Santa Maria	AA	Airport Approach Zone	Medium
	AS-I, AS-II, AS-III	Airport Service I, II, or III	Medium
	RPZ	Runway Protection Zone	Low
	OS	Open Space	High
	PD/M-1	Planned Development Light Manufacturing	High
	PF	Public Facilities	Medium
	PD/PF/OS	Planned Development Public Facilities, Open Space	Low
	PD/OS	Planned Development Open Space	Medium
City of Orcutt	RR-20	Residential Ranch 20/Acre	Medium
	PD 1.0	Planned Development – 1.0/Acre	
	AC	Agriculture	

Source: City of Santa Maria and City of Orcutt Municipal Codes.

Community Perspectives

Santa Maria residents generally support development that will bring economic development and job growth. In May 2012, a runway extension was added that extended the primary runway by 1,700 feet, to a total of around 8,000 feet.[97] The runway extension project cost $12.3 million, funded by grants through the FAA's Airport Improvement Program. The extension has given Santa Maria a competitive advantage over San Lois Obispo County Regional Airport and Santa Barbara Municipal Airport, who have runway lengths of 6,100 feet and 6,050 feet respectively.[98] California Representative Lois Capps noted that extending the runway would allow the airport to accommodate larger planes, bringing in travelers and business leaders from all over the world. In July 2013, Santa Maria Public implemented a program providing approximately $1.1 million in incentives to attract commercial airlines to provide service from Santa Maria to a

[97] Bullock, B., Santa Maria Times, March 22, 2012, http://santamariatimes.com/news/local/airport-runway-extension-project-extended/article_520868d4-73e9-11e1-b6a8-0019bb2963f4.html.

[98] Daniel, S., *The Tribune.* "Santa Maria airport runway extension could bring flights to Hawaii," February 24, 2012, http://www.sanluisobispo.com/2012/02/24/1962544/santa-maria-airport-hawaii-flights.html.

Midwest hub.[99] The Santa Maria Valley Chamber of Commerce and the Economic Development Commission are working to attract airlines.

Access to Infrastructure and Transit Service

Santa Maria Public has good access to roadway infrastructure. It is within a mile of Orcutt Expressway (State Road 135), and is within two miles of State Highway 101 to the east. State Road 135 and SR 101 connect the airport directly with downtown Santa Maria to the north, and to downtown Orcutt to the south. SR 166 connects with SR 135 to offer a route to the nearby City of Guadalupe. The airport is serviced by Santa Maria Area Transit (SMAT) and the BREEZE Bus, offering local and weekday commuter service, respectively. SMAT is a regional bus service which connects the communities of Santa Maria, Orcutt, and Guadalupe,[100] while the BREEZE provides commuter bus service during weekdays between Santa Maria, Los Alamos, and Lompoc.[101] There is no current evidence of plans by SMAT or BREEZE to increase transit service to the SMX area. Key routes include:

- SMAT Route 4 provides service between Downtown, the College, the Edwards Community Center, the Town Center Mall, and Santa Maria Public. The Airport stop locations include one directly at the airport terminal, two along Skyway Drive, and three along Industrial Parkway abutting Waller Park and the Santa Maria Country Club.[102]
- The Breeze Bus Route 100 provides weekday commuter service from Lompoc to downtown Santa Maria to the north, with two stops in the vicinity of Santa Maria Public. One stop is located directly at the airport terminal, with the other at the intersection of McCoy Lane and Skyway Drive.

Economic Analysis

The following section summarizes the results of the economic analysis, which show that attracting large-footprint and other large-scale land uses to the airport can yield significant additional economic growth as the available land allows the region to retain businesses that may otherwise leave the region to find competitive land prices. The detailed methodology used to measure the economic agglomeration benefits is described in Appendix E. This section provides an approach overview and the SMX study area results.

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[99] Bullock, B., *Santa Maria Times*, July 14, 2013, "SM Airport Sweetens Incentives for Carrier." http://santamariaairport.com/news/?p=365.

[100] http://www.cityofsantamaria.org/3075.html.

[101] http://www.breezebus.com/.

[102] http://www.cityofsantamaria.org/3075-SMAT_MAP-070113.pdf.

The economic analysis first forecasted the future change in employment in Santa Barbara County. The consultant team then focused on manufacturing and industrial service sectors that are projected to be lost to the County without applying non-smart growth policies to the airport. Third, the consultant team estimates the differences in the county economy (measures in employment, income, and output) between scenarios with and without the non-smart growth policies. A key part of this methodology is based on assumptions about the projected increase in employment space given modest to high increases in development density.

Projecting Land Use and Employment

As noted above, the SMX non-smart growth project area contains 1,750 acres of land that is around halfway built-out, with 723 acres of vacant land available to be developed. The area includes approximately 415 private firms and five government agency tenants that employ 5,120 workers are located in the project area (see Table 5.66).

Table 5.66 SMX Area Employment Growth by Industry (2012)

Industry Sector	Jobs	Industry Sector	Jobs
Agriculture	410	Finance, Insurance, real estate	0
Mining	120	Professional & technical services	0
Utilities	440	Management & administration	90
Construction	1,400	Education & health care	40
Manufacturing	600	Arts, Entertainment & recreation	50
Wholesale	460	Accommodations	0
Retail	420	Food service & drinking	70
Transportation & Warehousing	0	Other services	910
Information	60	Public administration	50
		Total	5,120

Source: ESRI Project Area Employment Estimate, 2012.

The consultant team completed a driving survey of the Santa Maria Public study area. Site visits included visual assessments of key businesses, vacant land areas, infill sites, roadways, open space, and potential environmental constraints. The full methodology is presented in Appendix E.

The analysis resulted in office and business park uses with the highest FAR at 0.51, retail commercial, light industrial, and general commercial FAR was 0.25, and warehouse FAR was approximately 0.16.

On basis of the methodology and findings presented in the earlier part of this section, the Santa Maria Public study area appears to not be well suited to attract big box retail establishments because of its location within the City of Santa Maria for the following reasons:

- Any big box retail that locates in the project area would have to compete with the Santa Maria Commerce Center and the downtown mall; both are located a short distance from the Airport project area.
- Betteravia Road, which forms a project area boundary, is already built out with other urban uses. Big box retail along this road would require the assembly and redevelopment of key sites.
- The retail synergies in Santa Maria are centered on other shopping locations.

The primary factor that looks to constrain business development around the project area is relatively weak market demand. Projections for Santa Barbara County to 2040 show that 20 industrial sectors will lose 10 or more jobs, totaling almost 4,200 jobs in these sectors.

Assuming that FAR in the non-smart growth area increases 50 percent (from ranges of 0.16 to 0.51 to 0.24 to 0.76, as shown in Table 5.67), and that 25 percent of the now vacant land are developed, these jobs could be accommodated in the Santa Maria Public Airport non-smart growth area. This would result in a total of 19.1 million square feet of business space accommodating approximately 10,500 employees, an increase of 14.3 million square feet of overall business space, 4.9 million of that being light industrial and warehouse. Table 5.68 presents the results of the future land use estimates, which are then used as inputs to the economic model.

Table 5.67 SMX Area Land Use Capacity Assuming Smart Growth Scenario (2040)

Building Type	Employment by Building Type	Building SF per Employee	Total Occupied SF	FAR	Acreage
Retail Commercial	540	450	243,000	0.38	15
Light Industrial	7,340	1,000	7,343,000	0.37	452
Office, business park & General Commercial	1,990	400	796,000	0.76	24
Warehouse	560	3,000	1,691,000	0.24	162
Hotel	54	n/a			4
Undeveloped Land	N/A				542
Residential	N/A				92
Golf Course	N/A				201
Parks	N/A				140
Roadways and Public Spaces	N/A				119
Subtotal Light Industrial & Warehouse	7,900		9,034,000		
Total	10,484		19,107,000		1,750
30-Year Gain	5,377		14,319,000		

Source: EDR Group.

Estimating Economic Impacts

The effect of retaining commercial and industrial development near SMX is forecast to result in 4,156 direct additional jobs, $548 million in additional value added, and nearly $326 million in additional income to the local economy by the year 2040. Benefits to the entire County are forecasted at 8,447 jobs, $919 million in additional value added, and $556 million in additional income to the county economy by 2040. The leading industrial sectors in the airport project area include light industrial and warehouse manufacturing. The results by industry sector are presented in Table 5.68 below.

Table 5.68 SMX Area Economic Analysis (2040)
(In Millions of Current 2013 U.S. Dollars)

Sectors	County Impacts	Jobs	Labor Income (Millions)	Value Added (Millions)	Output (Millions)
Food manufacturing, beverage & tobacco product manufacturing, textile products manufacturing, apparel manufacturing wood product manufacturing, printing & related support activities, petroleum and coal products manufacturing, chemical manufacturing, plastics & rubber products manufacturing,, primary metal manufacturing, fabricated metal manufacturing, machinery manufacturing, computer and electronic manufacturing, transportation equipment manufacturing, furniture and home furnishings manufacturing, miscellaneous manufacturing, wholesale trade and truck transportation	Direct	4,156	$325.8	$548.8	$1,541.2
	Total in Santa Barbara County	8,447	$556.3	$918.6	$2,119.4

Source: EDR Group.

Note: Total impacts include direct, indirect and induced effects (indirect and induced effects are commonly referred to as "multiplier" impacts), and represent contribution in Santa Barbara County. Direct labor income, value added and output, as well as "multiplier" impacts were calculated using the IMPLAN modeling package. All dollars are in 2013 values.

Charles M. Schultz Airport

The Charles M. Schulz Airport (STS) is a public airport located in unincorporated Sonoma County, approximately eight miles northwest of the City of Santa Rosa and one mile southwest of the Town of Windsor (Figure 5.76). STS is owned by Sonoma County, and operated by the Sonoma County Department of Transportation (DOT) and Public Works. STS is the only airport that offers scheduled air service in the North Bay Area region, and is located in Northern California's wine country. Alaska Airlines offers four daily nonstop flights to and from Los Angeles, Portland, San Diego, and Seattle. Sonoma is one of the most famous California wine regions, and leads the region in wine and agricultural production. Residents and visitors to the wine region frequently use

STS to connect with other counties in the Northern California region, including Lake, Marin, Mendocino, and Napa Counties.

Figure 5.76 STS Area Land Use Assessment Map

Source: ESRI.

Other aviation operations at STS include air cargo, private and corporate flights, military, search and rescue, fire fighting, law enforcement, and pilot training. STS serves many different types of aircraft including propeller aircraft, turbine aircraft, helicopters, and hot air balloons. Jet aircraft are allowed and do operate out of STS. There are two fixed base operators (FBO) at the airport – KaiserAir and Sonoma Jet Center. Both offer a variety of services, including fuel and aircraft maintenance. The Sonoma County Aviation Commission is responsible for aviation matters related to the operation of STS, and makes recommendations to the county Board of Supervisors. Development at and near STS is guided by an ongoing county airport plan, and will be greatly affected by the SMART Train extension that was recently approved by Sonoma County.

The Sonoma County Airport was designated as a smart growth support area; meaning it can help retain business that might otherwise be pushed out of the

County or region by higher density, smart growth development. The study evaluation also identified opportunities for Sonoma County to serve as a multimodal transportation hub. The area nearby STS does not have sufficient population and employment density to be considered a smart growth area, but it does have suitable land for development, and proximity to roadway and service infrastructure, particularly U.S.-101.

Market Assessment

This subsection presents a market assessment that evaluates the trends current conditions and future trends for the population, employment, and land use of the region and the airport area.

Population

While the nearby City of Santa Rosa has been experiencing significant population growth since 1990, Sonoma County has seen more moderate rates of growth, falling behind the State of California average from 2000 to 2012. Table 5.69 shows the population growth in Santa Rosa, as compared to Sonoma County and the State. The annual average population growth in the most recent decade was twice as high in Santa Rosa as of the County as a whole, a slightly higher rate than the State. The City's continued high growth rate provides it with the labor force and consumer demand to support higher density, transit and pedestrian friendly commercial development.

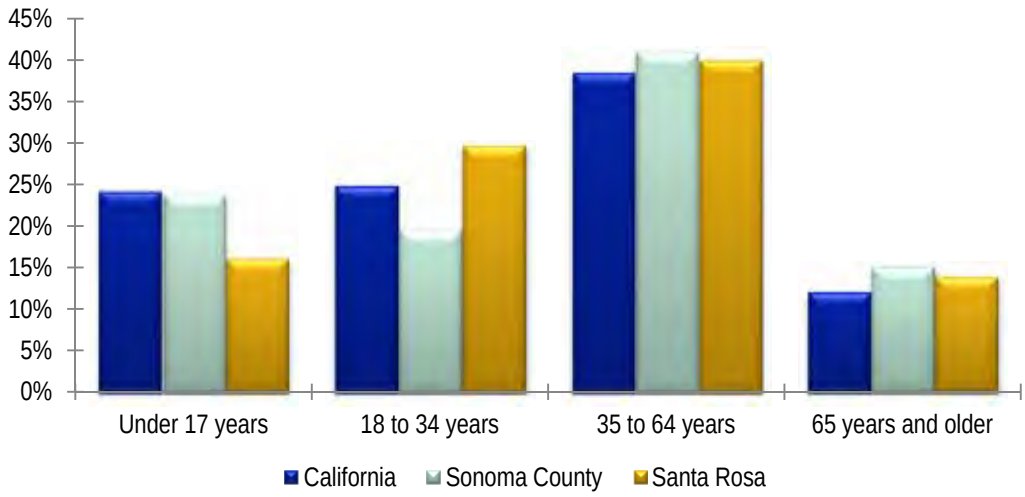
Table 5.69 Sonoma County and Santa Rosa Population and Population Change (1990 to 2012)

				1990-2000		2000-2012	
Area	1990	2000	2012	% Change	Avg. Annual Change	% Change	Avg. Annual Change
California	29,760,021	33,871,648	38,041,430	14%	1%	12%	1%
Sonoma County	388,222	458,614	490,423	18%	2%	7%	0.6%
Santa Rosa	113,313	147,595	170,684	30%	2.7%	16%	1.2%

Sources: U.S. Census Bureau, Census 1990, Census 2000, American Community Survey 2012.

Figure 5.77 illustrates that Santa Rosa has a significantly lower share of residents (16 percent) under the age of 17 than the County or State (24 percent for each). However, the City's 18- to 34-age cohort is 30 percent, which is significantly larger than both Sonoma County (20 percent) and the State of California (25 percent). Other shares of residents are similar between the regions.

Figure 5.77 Sonoma County and Santa Rosa Population Age Profile (2012)



Source: U.S. Census Bureau American Community Survey 2012.

Compared with the state and city average, Sonoma County has the highest share of residents with Bachelor's degrees and above (32 percent compared to the State's 31 percent and City's 30 percent). As shown in Table 5.70, the City of Santa Rosa has a smaller share of residents that have not finished high school (15 percent) compared to the state average of 19 percent. The City also has a higher share of residents that obtained some college education or an Associate's degree (34 percent) than the state average of 30 percent.

Table 5.70 Sonoma County and Santa Rosa Population Educational Profile (2012)

Population 25 years and over	California	Sonoma County	Santa Rosa
Less than high school diploma	19%	13%	15%
High school graduate (includes equivalency)	21%	21%	21%
Some college or Associate's degree	30%	34%	35%
Bachelor's degree and above	31%	32%	30%
Total	100%	100%	100%

Source: U.S. Census Bureau American Community Survey 2012.

Employment

Along with Napa County, Sonoma County is well known throughout the County as a major wine producing region. In fact, Sonoma County is the largest producer of wine in the region, and its economy is dominated by agriculture, service, and tourism industries related to the wine industry. The City of Santa

Rosa and Sonoma County's employment rates from 1990 to present indicates low unemployment despite the recession at the state level (Table 5.71). Compared to the rise of the State's unemployment rate from 5.8 to 10.5 percent between 2000 and 2012, Sonoma County increased from 3.4 percent to 8.6 percent. From the peak in 2012 to the third quarter of 2013, statewide unemployment declined from 10.5 to 8.3 percent compared to an 8.6 to 6.1 percent decline for Sonoma County and the City of Santa Rosa.

Table 5.71 Sonoma County and Santa Rosa Unemployment Rate (1990 to 2013)

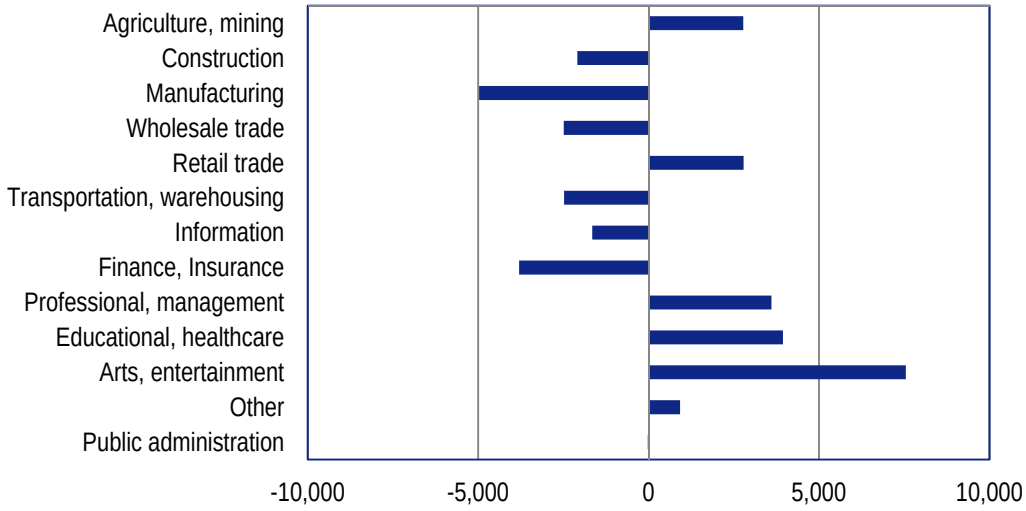
Area	1990	2000	2012	2013[a]
California	5.8%	4.9%	10.5%	8.3%
Sonoma County	3.9%	3.4%	8.6%	6.1%
Santa Rosa	3.8%	3.3%	8.5%	6.1%

Sources: U.S. Census Bureau Census 1990, Census 2000 and American Community Survey 2012.

[a] 2013 data is preliminary data for the month of October 2013.

The County's workforce has seen virtually no change in the last decade or so despite population growth. The largest industry sectors in 2012 included educational services (20 percent), retail trade (13 percent), and professional, scientific, management (12 percent). The industries that saw the most growth between 2000 and 2012 include agriculture, forestry, and fishing (47 percent growth rate), and the arts, entertainment, and recreation industry (41 percent growth). Nevertheless, industries that have declined in the last decade include wholesale trade (35 percent decline), information (27 percent decline), and transportation / warehousing (26 percent decline). The change in county industry share between 2000 and 2012 for Sonoma County is presented in Figure 5.78.

Figure 5.78 Sonoma County Change in Employment by Industry (2000 to 2012)



Source: U.S. Census Bureau American Community Survey 2012.

Land Use

The Sonoma County Airport is located in the northwestern unincorporated portion of Sonoma County, bounded to the east by agricultural land in the County and to the north by the Town of Windsor limits. Directly to the north of the airport, the airport is abutted by public facility lands owned by the Town of Windsor and a golf course.

The area northeast of the airport include light and heavy manufacturing uses, wholesale and distribution businesses, and business parks. Along Shiloh Road, the Airport Business Center is a 37-acre industrial park that is home to the Town of Windsor's largest employer, Standard Structures. The Windsor Golf Club occupies 167 acres of land north of the airport.

Sonoma County's share of single family housing in the region is significantly higher than both the State of California average and the City of Santa Rosa (Table 5.72). At the same time, the County's share of multifamily housing is significantly below the statewide average by seven percentage points. The majority of housing near the airport is within the Town of Windsor to the north or within the unincorporated portion of Sonoma County to the east of the airport. These are typically older, rural single family residences in low-density neighborhoods.

Table 5.72 Sonoma County and Santa Rosa Housing Type and Vacancy Rate (2012)

Housing Type/ Occupancy Rate	California		Sonoma County		Santa Rosa	
	Number	Percentage	Number	Percentage	Number	Percentage
Single Family	8,983,275	65%	152,751	75%	44,888	69%
Multifamily 2+ units	4,243,133	31%	48,119	24%	20,407	31%
Mobile Homes	559,389	4%	3,890	2%	148	0.2%
Total	13,785,797	100%	204,760	100%	65,443	100%
Vacancy Rate	–	8.1%	–		–	

Source: U.S. Census Bureau American Community Survey 2012.

Regulatory and Community Perspective

This section describes the Sonoma County and City of Santa Rosa land use regulations, such as zoning, FAR, height restrictions, historical preservation, noise abatement, toxic or chemical restriction, recreational uses, open space, or agricultural preservation that could affect future smart growth development in the vicinity of the Charles M. Schultz Airport. These regulations control different aspects of future use of land near the airport, and also inform the community's support or lack thereof for future development in the region.

Zoning and Other Regulations

The Charles M. Schultz Airport is owned by Sonoma County and is responsible for plans and regulations that govern development and land uses neighboring the airport. The Cities of Santa Rosa and Windsor cover land uses neighboring the airport.

It is important to examine and evaluate land uses adjacent to the airport for future development potential and existing regulations governing development of a non-smart growth area. A summary of the related city and county zoning designations within approximately one mile of the airport are summarized in Table 5.73.

Table 5.73 Santa Rosa Zoning Districts near STS

Jurisdiction	Code Abbreviation	Zoning District
Sonoma County		Diverse Agriculture
		Public/Quasi-Public
		Land Intensive Agriculture
		General Industrial
		Limited Industrial
		Rural Residential
		Urban Residential
		Land Extensive Agriculture
Town of Windsor	P/I	Public/Institutional
	LI	Light Industrial
	HI	Heavy Industrial
	GB	General Business
	OS	Open Space
	VR	Village Residential/Medium Density Residential

Source: Sonoma County.

Community Perspectives

In the Sonoma County region, the community seems to support for development that will bring economic development and job growth. Most recently, the community has shown their support for transit and transit oriented development through their votes in support of the SMART Rail Line. The recent recession imposed economic hardship in a region that has enjoyed decades of expanding employment sustained by the wine and tourism industries, so county residents and businesses are generally supportive of development that will retain jobs in the region.

The recent extensions of the airport runways have been strongly supported by the business communities in both Santa Rosa and Windsor, as well as many residents who would like better commercial service given their closest commercial airport is Oakland, which over 75 miles (1 hour and 20 minutes) away. Though the community remains dedicated to curbing urban sprawl on the boundaries of their cities, they do not take a position of anti-growth, as they look to infill and revitalize many of the areas within their cities.

Access to Infrastructure and Transit Service

The Charles M. Schultz Airport has excellent access to roadway infrastructure, and is within a mile of Highway 101 to the east. The airport is serviced by

Sonoma County Transit, a regional bus service,[103] and Sonoma Airport Express, an intercity bus service that connects with the neighboring Cities of Santa Rosa, Rohnert Park, Petaluma, and with Oakland and SFO Airports.[104]

The recently approved regional Sonoma-Marin Area Rail Transit (SMART) Rail service will be constructing a station just 500 feet from the airport. The line will offer passenger rail service and a bicycle-pedestrian pathway from Cloverdale to Larkspur, with the first phase beginning in Larkspur, and ending at the airport. The SMART Train station at Charles M. Schultz is planned to include an operations and maintenance facility and connections to local transit. The Bay Area Metropolitan Transportation Commission (MTC) recently approved the $16.7 million needed to extend the rail line from the City of Santa Rosa to the airport.

Economic Analysis and Regional Growth Potential

STS is located 7 miles north of downtown Santa Rosa, a city surrounded by valuable vineyards and wine production facilities. Although the Airport is only 60 miles north of downtown San Francisco, travel there can be very time consuming due to highway congestion. Approximately 240 private firms and 8 government agency tenants that employ 3,430 workers are located in the airport study area.

Table 5.74 STS Area Employment by Industry (2012)

Industry Sector	Jobs	Industry Sector	Jobs
Agriculture & Mining	110	Professional & technology services	20
Utilities	40	Management & administration	0
Construction	220	Education & health care	230
Manufacturing	1,100	Arts, Entertainment & recreation	130
Wholesale	410	Accommodations	70
Retail	160	Food service & drinking	10
Transportation & Communication	160	Automotive Services	0
Information	0	Other services	20
Finance, Insurance, real estate	160	Public administration	360
		Total	

Source: ESRI Project Area Employment Estimate 2012.

[103] Sonoma County Transit, http://sctransit.com/Home.aspx.

[104] Airport Express, http://www.airportexpressinc.com/about.php#who.

Projecting Land Use and Employment

The consultant team traveled to and completed a driving survey of the Castle Airport project area. The team compiles notes about key businesses, vacant land areas, infill sites, roadways, open space, and potential environmental constraints. The analysis to forecast economic effects is detailed in Appendix E.

The project area can be sorted into three subareas. The four-mile long Airport Boulevard corridor that connects the terminal with the Highway 101 freeway is fully developed with light industrial, office and warehouse uses. The area south of Airport Boulevard includes 136 acres of infill industrial sites located within one mile of the terminal. The Skylane Boulevard corridor that connects Airport Boulevard with Shiloh Road has 273 acres of vacant land and less than 100 acres of land developed for business uses. However, portions of the vacant land along the Skylane Boulevard corridor are irrigation or wastewater treatment ponds that are unavailable for business uses. Table 5.75 presents the relationship between employment and developed area.

Table 5.75 STS Area Employment by Industry Converted to Building Type (2012)

Building type	Acres	Jobs	Floor Area per Employee	Total Occupied Floor Area	FAR
Retail Commercial	5	120	450	54,000	0.25
Light Industrial & General Commercial	232	2,070	1,000	2,070,000	0.20
Office, business park & R&D flex space	37	1,030	400	412,000	0.26
Warehouse	67	200	3,000	600,000	0.21
Hotel	4	10			
Undeveloped Land	409	N/A			
Residential	0	N/A			
Golf Course	0	N/A			
Parks	0	N/A			
Roadways and Public Spaces	119	N/A			
Total	870	3,430		3,136,000	

Source: EDR Group.

Sonoma County's wine industry forms the core of the regional economy, and wine industry cluster establishments occupy much of the project area's business space. A significant amount of vacant land within the project area should slowly be absorbed assuming at least a continuation of employment growth. However, the area has been unable to attract the types of technology businesses that are a critical component of the Bay Area economy.

The project area is not well suited to attract big box retail establishments due to the lack of buildable sites along Airport Boulevard, which connects Highway 101 to the terminal. Some possibility exists for retail along the Shiloh Road corridor, which falls within the Windsor market area influence. However, very few sites within the project area are located along Shiloh Road, which lacks retail synergy.

Projections for Sonoma County to 2040 show that 17 industrial sectors will lose ten or more jobs, totaling 4,280 jobs lost in these sectors. Assuming that the Floor Area Ratios in the Smart Growth area increases 50 percent (from ranges of 0.20 to 0.26 and 0.31 to 0.38), and that 38 percent of the now vacant land is developed, more than 3,000 of these projected lost jobs could be accommodated in the Charles M. Schultz study area (Table 5.76).

Table 5.76 STS Area Capacity Assuming Smart Growth Scenario (2040)

Building Type	Acres	Jobs	Floor Area per Employee	Total Occupied Floor Area	FAR
Retail Commercial	5	180	450	81,000	0.37
Light Industrial & General Commercial	372	5,000	1000	4,995,000	0.31
Office, business park & R&D flex space	48	2,000	400	798,000	0.38
Warehouse	72	330	3,000	990,000	0.32
Hotel	1	9			
Undeveloped Land	252	N/A			
Residential	0	N/A			
Golf Course	0	N/A			
Parks	0	N/A			
Roadways and Public Spaces	119	N/A			
Subtotal Light Industrial and Warehouse	445	5,330		5,985,000	
Total	499	7,519		6,864,000	
Projected New Capacity: Light Industrial & Warehouse	146	3,052		3,298,000	
Projected New Capacity All	870	4,087		3,713,000	

Source: EDR Group.

For Sonoma County, demand to relocate industrial jobs may be greater than the capacity assumed by these implementing smart growth incentives implicit to driving these aggressive land use assumptions. Should that prove to be the case, county and state officials will be able to decide if policies for even further increases in densities are desirable. The assumptions above would still leave more than 250 acres of vacant and undeveloped land that provides sufficient land capacity to add more jobs and business space.

Should smart growth policies be successfully implemented adjacent to the Charles M. Schultz Airport, and if jobs projected to be lost to the County can be relocated to the Smart Growth District, the 3,000 jobs would result in saving $236 million of labor income for county residents and $363 million in gross state product (see Table 5.77). Moreover, increased density in the District by higher FARs or more vacant land being turned to productive use could accommodate more economic activity than put forward in this review.

Table 5.77 Charles M. Schultz Economic Analysis Results
(In Millions of Current 2013 U.S. Dollars)

Sectors	County Impacts	Jobs	Labor Income (Million Dollars)	Value Added (Million Dollars)	Output (Million Dollars)
Food manufacturing, beverage and tobacco products, printing and related products, plastics and rubber manufacturing, fabricated metal manufacturing, machinery manufacturing, furniture manufacturing, miscellaneous manufacturing, and wholesale trade	Direct	3,026	$235.6	$363.0	$1,114.3
	Sonoma County Total	6,934	$426.6	$689.4	$1,688.1

Source: EDR Group. Total impacts include direct, indirect and induced effects (indirect and induced effects are commonly referred to as "multiplier" impacts), and represent contribution in Sonoma County. Direct labor income, value added and output, as well as "multiplier" impacts were calculated using the IMPLAN modeling package. All dollars are in 2013 values.

Regional Growth Potential

The following three planning documents apply to future land use and development within the airport area:

1. **Charles M. Schultz Airport Master Plan (2012)**. The Airport Master Plan (AMP) provides an overall view of the proposed use and development of the Airport. The proposed project is the implementation of the 2030 AMP. The AMP includes a variety of project elements related to maintaining and improving Airport safety, and maintaining and upgrading Airport facilities. These project elements would be implemented at the Airport over the next 20 years. The AMP recommends that the airport develop a number of project elements, as the implementation of the 2030 Master Plan. This includes a variety of project elements that would be implemented at the Airport over the course of the next 20 years. The individual project elements included in the Airport Master Plan are organized by those that would occur within the first five years (short-term project elements), and those that are planned to occur after the first 5 years, but within a 20-year timeframe (long-term project elements).

   The short-term (5 year) project elements include extending the main runway (Runway 14/32) from 5,115 to 6,000 feet, and improving the airfield to

support the extension through extending the crosswind taxiway (Runway 1/19) 200 feet to the north, constructing connecting taxiways, and building 650 feet of airport Creek into a culvert. Long-term (within 20 years) project elements recommended by the plan include the construction of a replacement airline passenger terminal, the relocation of the aircraft rescue and firefighting building, the relocation of the air traffic control tower. Other ongoing activities expected at the airport include pavement maintenance, construction of new aircraft storage hangars, and the acquisition of property to protect the runway approaches.

2. **Plan Bay Area Priority Development Areas (2013)**. These nodes for smart growth are specified in Plan Bay Area, which is the adopted RTP/SCS for Sonoma County. The Plan designated five PDAs relevant to Sonoma County, including:

   a. City of Santa Rosa, Downtown Station Area;

   b. City of Santa Rosa, Mendocino/Santa Rosa Avenue Corridor;

   c. City of Santa Rosa, Sebastopol Road Corridor;

   d. City of Sebastopol, Nexus Area; and

   e. Town of Windsor, Town Center.

   These areas are expected to develop higher density development areas characteristic of suburban town and community centers. PDA's are important to STS' relationship to smart growth supportive land uses, for they currently include some uses that may not be compatible with community visions of future development and economic development. The proximity of the airport to these areas, and the availability of land and multimodal transportation assets, positions STS well to support regional goals related to the RTP/SCS.

3. **Town of Windsor General Plan (2013)**. The Town's General Plan addresses the current status of the town and future goals and visions for the area. Several of the goals include economic development, the preservation of land to accommodate commercial and future light industrial development for job creation. None mention the growth of the airport or development adjacent to the airport.[105]

Yuba County Airport

Yuba County Airport (MYV) is a general aviation airport located in Olivehurst, an unincorporated community of 11,000 people (Figure 5.79). The airport serves Yuba, Butte, Nevada, Placer, Sacramento, and Sutter Counties. The Airport is

[105] Town of Windsor General Plan – 2015, revised Jan 2013, http://www.ci.windsor.ca.us/DocumentCenter/Home/View/1824.

approximately three miles south of the City of Marysville (12,000 residents) and one and one-half miles from Beale Air Force Base. The Airport is only 40 miles from downtown Sacramento, which functions as an employment center for residents of the Yuba-Sutter Metropolitan Area, which includes Olivehurst, Marysville, and Yuba City. Yuba County is located in the north central part of California, 125 miles northeast of San Francisco and 125 miles west of Reno, Nevada. The airport includes approximately 1,000 acres of which 265 acres are available for industrial development. Improved sites range from 2.5 acres to 30 acres. Yuba County Airport is located within four miles of two employment centers: the City of Yuba and the City of Marysville. Businesses within one-half mile of the airport include mostly neighborhood commercial services, such as pharmacies, grocery stores, restaurants, and automotive services.

Figure 5.79 MYV Area Land Use Assessment Map

Source: ESRI.

On-airport aviation businesses include A and P Helicopters, Krueger Aviation, Honeycutt Aviation, Yuba-Sutter Aviation, INC., Rice Aircraft Services, G.N. Dibble Crop Dusting, and Beale Air Club and Flight Training Center. Other

businesses on the airport property include Hasties Sand and Gravel; Builtware Fabrication; Mechanical & Irrigation Services, Inc.; Ace Composites; Kinner Manufacturing; Aroma Catering; M & M Home Resort Products; and Hertz Rent A Car.

The availability and suitability of land for development (or redevelopment) were the most important characteristics in designating MYV a Role 2 smart growth support area. Surrounding population and employment density play a role, but were not as critical as for Role 1 airports.

Market Assessment

The consultant team determines the airport could play the role of a smart growth support area (Tier 2). The market conditions that drive this designation may be divided between demand and supply. Demand comes from households and businesses for goods and services located in the region that could be produced by businesses that locate within the MYV area. Household demand is manifested by the number and composition of the population and measured by demographic and employment trends in the areas surrounding MYV. Business demand is generated from the MYV area firms and employees. The supply side is assessed by evaluating the competitive advantages of land located within the MYV area over the alternative land outside the MYV area. These population, employment, and land use trends are presented below.

Population

Population growth for the City of Marysville and Yuba County was stagnant from 1990 to 2000. Growth remained stagnant in Marysville, but Yuba County experienced a 22-percent growth, an average annual change of 1.7 percent, which is nearly double that of 1.0 percent for the State. According to the Yuba County 2008-2013 Housing Element, most of the demographic changes in Yuba County since 1990 have occurred through new residential development in the unincorporated area, which contains the majority of the County's population (Table 5.78).

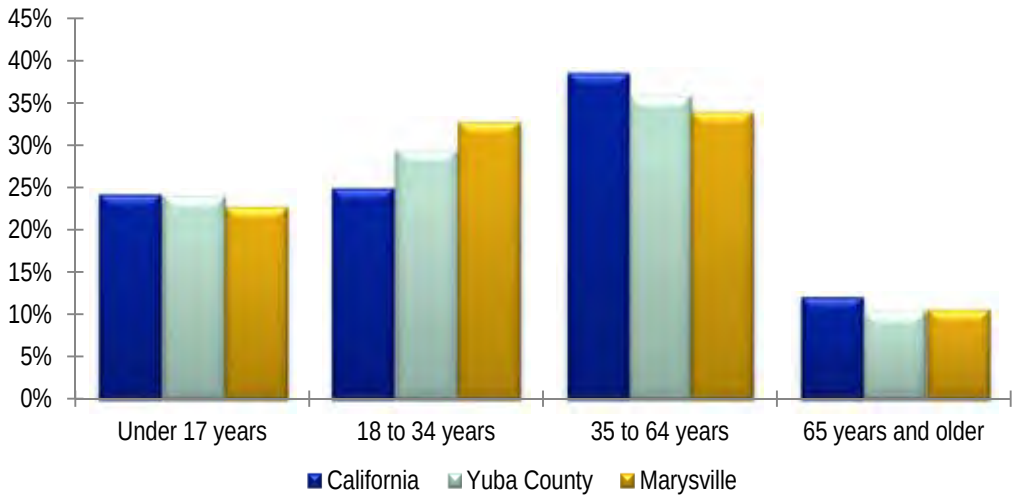
Table 5.78 Yuba County and Marysville Population and Population Change (1990 to 2012)

				1990-2000		2000-2012	
Area	1990	2000	2012	% Change	Avg. Annual Change	% Change	Avg. Annual Change
California	29,760,021	33,871,648	38,041,430	14%	1%	12%	1%
Yuba County	58,228	60,219	73,439	3%	0%	22%	1.7%
Marysville	12,324	12,268	12,250	0%	0.0%	0%	0.0%

Sources: U.S. Census Bureau, Census 1990, Census 2000, American Community Survey 2012.

The age distribution in the City of Marysville shows higher concentration of residents aged 18 to 34 than the County or the State. The share of residents less than 17 years old and between 35 and 64 years old is lower than both the County and State. The City and County have a slightly lower percentage of people 65 years and over than the State (Figure 5.80).

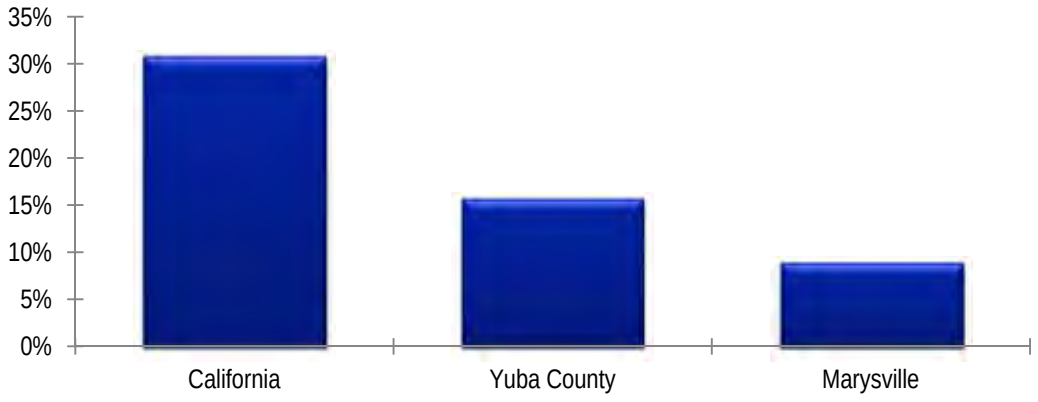
Figure 5.80 Yuba County and Marysville Population Age Profile (2012)



Source: U.S. Census Bureau American Community Survey 2012.

Educational attainment data shows that the high school graduation rate of the County and State is the same while Marysville's graduation rate is three percentage points lower. Forty percent of city and county residents do have some college or an Associate's degree. The percentage of the state population with a Bachelor's degree or above is twice that of the County, and more than three times that of Marysville (Figure 5.82).

Figure 5.81 Yuba County and Marysville Share of Residents with a Bachelor's Degree or Higher (2012)



Source: U.S. Census Bureau American Community Survey 2012.

Employment

Yuba County has historically had a higher unemployment rate than the State, and while the Yuba County unemployment rate for 2013 shows it is beginning to recover from the Great recession, it remains higher than rates in the past two decades (Table 5.79).

Table 5.79 Yuba County and Marysville Unemployment Rates (1990 to 2012)

Area	1990	2000	2012[a]	2013
California	5.8%	4.9%	10.5%	8.3%
Yuba County	10.7%	7.9%	16.9%	12.1%

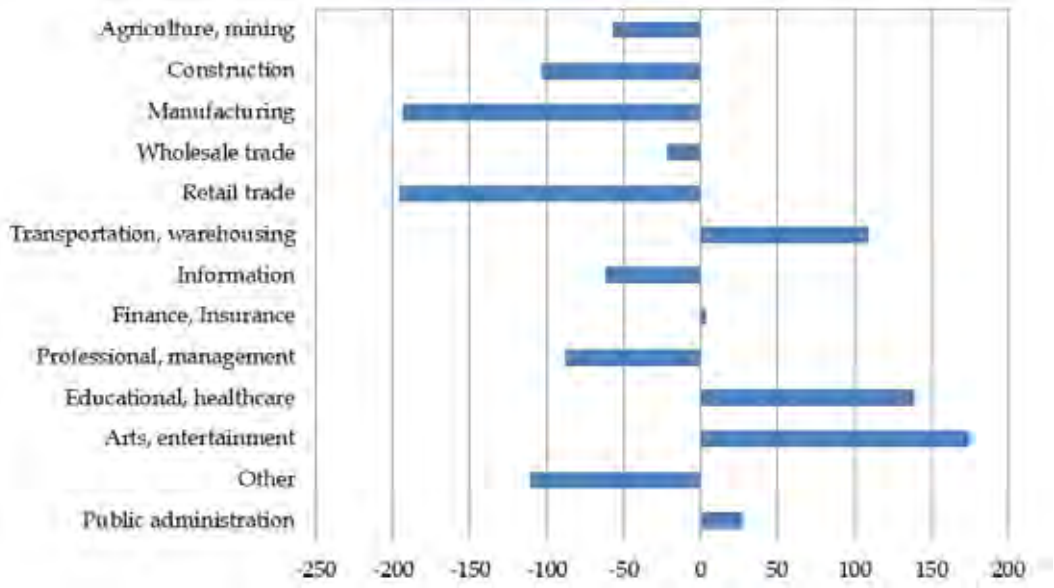
Sources: U.S. Census Bureau, Census 1990, Census 2000 and American Community Survey 2012.

[a] 2013 data for Placer County is preliminary data for the month of October 2013.

Industries and occupations that pay low to moderate-income wages continue to dominate employment in Yuba County. The industries which employ the most people include retail trade (11 percent), transportation and warehousing, and utilities (8 percent); educational services, and health care and social assistance (30 percent); and Arts, entertainment, and recreation, and accommodation and food services (14 percent). Several industries experienced significant reduction in employees since 2000, these include agriculture, forestry, fishing and hunting, and mining (38 percent decline); manufacturing (51 percent decline); information (38 percent decline); professional, scientific, and management, and administrative and waste management services (32 percent decline). Industries experiencing growth during this same time period include transportation and warehousing, and utilities (up 46 percent); educational services, and health care and social assistance (up 12 percent); arts, entertainment, and recreation, and accommodation and food services (up 38 percent) and public administration (up 11 percent) (Figure 5.82).

In summary, the market conditions as captured in the population, employment, and land use trends described above support the designation of the MYV as a smart growth support area.

Figure 5.82 Yuba County Change in Employment by Industry (2000 to 2012)



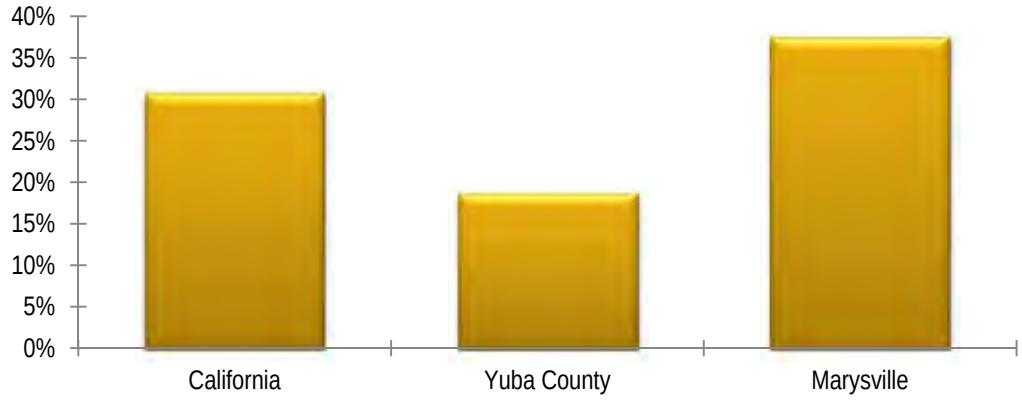
Source: U.S. Census Bureau Census 2000 and American Community Survey 2012.

Land Use

MYV's role as a smart growth support area is focused on commercial office, retail, and some types of research and development and industrial land use that can occupy multi-story buildings.

Yuba County's housing stock has a higher portion of single family homes, 71 percent, compared to 65 percent for the state average. Marysville's housing stock has a slightly smaller single family home percentage than the County, with 62 percent of the housing stock comprised of single family homes. Multifamily units make up 38 percent of Maryville's housing stock, while countywide, such units are only 19 percent of the housing stock, and the State has 31 percent multifamily units (Figure 5.84).

Figure 5.83 Yuba County and Marysville Share of Multifamily Housing (2012)



Source: U.S. Census Bureau American Community Survey 2012.

The study area within approximately one-half mile of the airport is a low density area comprised mostly of industrial and open space uses, and private homes on rural lots. Land immediately to the east of the airport is primary of residential use and neighborhood commercial. A floodplain lies along the east side of the Feather River and west of the airport. To the south and west, the land is primarily agricultural and open space uses with pockets of residential. Immediately to the north of the airport there is an industrial park, and open space.

Regulatory Environment

Yuba County has land use authority for the airport and the study area surrounding it. The dominant zoning districts in the study area are listed in Table 5.80.

Table 5.80 Marysville Zoning District near MYV

Zoning Districts	Description	High/Medium/Low
A/RR05	Rural Residential Zone	Medium
R1, R 2	Single Family or Medium Density Residential	Medium
C	General Commercial Zone	Low
M-1, M2, M3	General Industrial Zone	High
"AP" Airport Zone (M)	Airport Zone – Limits the heights and uses of structures within the zone	

Source: City of Marysville Municipal Code.

Access to Transportation Infrastructure

Approximately one mile to the east of the airport CA-65 and CA-70 meet. CA-70 runs north-south until it meets CA-65 extending from the southeast, then leads northwest towards Maryville. CA-90 runs several miles west of the airport beyond Feather River and it connects Yuba City to rural lands to the west of the airport, but there is no connection over the Feather River directly to the west.

Freight rail service runs along the State Route 65 corridor. Amtrak provides passenger rail service into Marysville from the north and south along the Coast Starlight Route between the City of Los Angeles, CA and Seattle, WA. Locally, Yuba-Sutter Transit offers scheduled local fixed route service from 6:30 a.m. to 6:30 p.m. weekdays and from 8:30 a.m. to 5:30 p.m. on Saturdays. The service offers a route that serves the immediate vicinity of the airport, which connects directly to the City of Linda and connects with other routes that would provide access to Marysville and Yuba City. Buses operate every 30 to 60 minutes.

Economic Analysis and Regional Growth Potential

The Yuba County Airport Industrial Park was established in the 1980s with subdivided industrial lots that were slowly absorbed by construction and building materials firms. To date, the Yuba County Airport has attracted only 30 private firms that employ 156 workers. Table 5.81 presents employment by industry sector.

Table 5.81 MYV Area Employment by Industry (2013)

Industry Sector	Jobs	Industry Sector	Jobs
Agriculture and Mining	2	Professional & tech services	0
Utilities	2	Management & administration	0
Construction	32	Education & health care	6
Manufacturing	36	Arts, Entertainment & recreation	0
Wholesale	41	Accommodations	0
Retail	8	Food service & drinking	0
Transportation & Communication	8	Automotive Services	2
Information	0	Other services	14
Finance, Insurance, real estate	3	Public administration	3
		Total	157

Source: ESRI Project Area Employment Estimate 2012.

The Yuba County Airport project area includes 256,000 square feet of light industrial, office and warehouse space. The northern segment of the project area (between Pasado and Melody Roads) includes a significant amount of residential and vacant land, in addition to many of the construction and building materials firms located in the industrial park. The central portion of the project area includes the airport entryway and the relatively new business park buildings, in addition to some older light industrial space. The lower portion of the project area, which extends down to Ella Avenue, is comprised of residential and vacant land used for agricultural production.

The current employment by industry was converted and allocated into employment by four land use categories: retail commercial; light industrial and general commercial; office, business park, and R&D flex space; and warehouse space. This distribution is shown in Table 5.82.

Table 5.82 MYV Area Employment by Industry Converted to Building Type (2013)

Building Type	Employment by Building Type	Building SF per Employee	Total Occupied SF	FAR	Acreage
Retail Commercial	6	450	3,000	0.25	1
Light Industrial & General Commercial	104	2,000	207,000	0.26	18
Office, business park & R&D flex space	37	400	15,000	0.49	1
Warehouse	10	3,000	31,000	0.15	5
Hotel					0
Undeveloped Land					437
Residential					532
Golf Course					0
Parks					0
Roadways and Public Spaces					6
Total	157		256,000		1,000

Source: EDR Group.

The Yuba County Airport project area is poorly suited to attract big box retail establishments because of its rural, isolated location and the relatively small number of people (approximately 25,000) living in nearby Olivehurst and Marysville. Highway 70 travelers would not be able to see the retail stores until they exit the roadway and travel along two-lane roads through Olivehurst. The two-lane roads through neighborhoods then intersect with the two-lane Airport frontage road (Arboga Road) where retail stores may become visible.

The study team assumed that the FAR in the smart growth support area would increase 50 percent (from ranges of 0.25-0.49 to 0.37-0.74), and that 25 percent of the now vacant land would be developed. The resulting capacity would result in almost 500 additional light industrial and warehouse jobs. This new capacity will be more than 3,000 jobs if office uses are considered. Table 5.83 illustrates the land use assumptions and employment results.

Table 5.83 MYV Area Land Use Capacity Assuming Smart Growth Scenario (2040)

Building Type	Acres	Employment by Building Type	Floor Area per Employee	Occupied Floor Area	FAR
Retail Commercial	0	20	450	8,000	0.37
Light Industrial	55	460	2,000	926,000	0.39
Office, business park & General Commercial	37	2,970	400	1,187,000	0.74
Warehouse	41	130	3,000	393,000	0.22
Hotel	0	0	N/A		
Undeveloped Land	329				
Residential	532				
Golf Course	0				
Parks	0				
Roadways and Public Spaces	6				
Subtotal Light Industrial & Warehouse	96	590		1,319,000	
Total	1,096	3,580		3,833,000	
Projected New Capacity: Light Industrial & Warehouse		476		1,081,000	
Projected New Capacity: All		3,423		3,577,000	

Source: EDR Group.

The economic forecast for Yuba County shows that six industrial sectors will lose 10 or more jobs[106]. Yuba County could retain 120 jobs, leading to $8.3 million of labor income for county residents and almost $12 million in gross state product. Table 5.84 illustrates these results. Note that this benefit results from retaining jobs that would otherwise be lost due to market demands in other parts of the County.

[106] Forecast by Moody's Analytics mapped to three digit NAICS sectors by EDR Group as part of the TREDIS economic analysis module.

Table 5.84 MYV Area Economic Analysis (2040)
(In Millions of Current 2013 U.S. Dollars)

Sectors	County Impacts	Jobs	Labor Income (Millions)	Value Added (Millions)	Output (Millions)
Beverage and tobacco products, wood product manufacturing, fabricated metal manufacturing, transportation equipment manufacturing, furniture and home furnishings manufacturing, and wholesale trade	Direct	120	$8.3	$11.8	$34.6
	Total in Yuba County	165	$10.6	$15.6	$40.7

Source: EDR Group.

Note: Total impacts include direct, indirect and induced effects (indirect and induced effects are commonly referred to as "multiplier" impacts), and represent contribution in Yuba County. Direct labor income, value added and output, as well as "multiplier" impacts were calculated using the IMPLAN modeling package. All dollars are in 2013 values.

In the 2035 MTP/SCS, SACOG forecasts strong growth for the region and Yuba County. Related forecasts by the California Department of Finance show that Yuba County's population will grow 20 to 36 percent each decade between 2010 and 2050. The Plumas Lake Specific Plan, for example, located just south of the airport near the State Routes 70 and 65 interchange, including over 15,500 dwelling units. In addition, the U.S. Economic Development Administration (EDA) provided Yuba County with a $1.8 million grant to upgrade the Airport's wastewater collection system, which will increase the capacity to support growth. In addition, a developer built a 60,000 square foot spec building and announced plans to build a second spec building within the industrial park.

The Yuba County Airport and surrounding area has two smart growth-related designations according to the MTS/SCS. Yuba County Airport is located within four miles of two employment centers designated by the MTP/SCS, including the City of Yuba and the City of Marysville. The airport, however, is not designated as a Transit Priority Area (TPA) in SACOG's MTP/SCS. TPAs located near high-service transit stations are areas in which many local governments are working to encourage development of housing and employment.[107] Roseville and northern Sacramento (approximately 25 miles away) are the two closest TPAs to the Yuba County Airport.

[107] TPAs are defined as areas within one-half mile of a major transit stop (existing or planned light rail, street car, or train station) or an existing or planned high-quality transit corridor included in the MTP/SCS, defined as a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours.

5.3 LAND BANK AIRPORTS

Most all the airports selected for this study are in regions where the finite supply of developable land is shrinking, although not at a steady pace. The erratic nature of the State's business cycle drives absorption of a region's supply of vacant land in fits and starts. A region with a declining but sufficient supply of developable vacant land may choose to set aside some parcels to accommodate especially fiscally beneficial or job-intensive future development in the future. An airport area with nearby vacant land today could accommodate future development – for smart growth development patterns, industrial development supporting regional smart growth developments – or provide regional open space as an offset for development on sensitive habitat in another part of the region.

This practice is known as land or mitigation banking. Land banking is often used in California to mitigate environmental impacts associated with development projects. The California Department of Fish and Wildlife defines a land bank as a privately or publicly owned land managed for its natural resource values. In exchange for permanently protecting, managing, and monitoring the land, the mitigation bank operator is allowed to sell habitat credits to developers who need to satisfy legal requirements for mitigating the environmental impacts of development projects[108].

Land banking may also be used to assemble sufficient acreage to attract a large private developer (e.g., business park, warehousing, logistics village, foreign trade zone, etc.) or institutional entity (e.g., university, utility, military, etc.). The parcel assembly can be accomplished through local government purchasing, a specific plan, or zoning of the available land (including features such as development credits, third party land management, etc.). Land banking strategies require close partnerships between cities and counties surrounding the airport to align local and regional planning efforts with airport activity.

Study Airports

Five airports selected for this study had relatively low population or employment surrounding them. The screening process (Chapter 3) determined that these five airports could not attract development commensurate with the Role 1 and Role 2 categories, but could serve as land bank areas. These Role 3 airports included three airside categories, including three limited use, one community, and one regional airport, as shown in the Table 5.85 below. This section discusses the potential role and benefits of these airports in supporting regional smart growth development goals.

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[108] California Department of Fish and Wildlife, accessed January 2014 at http://www.dfg.ca.gov/habcon/conplan/mitbank/.

Table 5.85 Limited Use and Rural Airport Area Population and Employment (2012)

Airport	Nearest City and County	Airside Category	Population		Employment	
			City	County	City	County
Blue Canyon	Colfax, Placer County	Limited Use	1,943	350,074	900	162,000
Cameron Airpark	Cameron Park, El Dorado Co.	Community	17,586	180,441	8,200	81,100
Dinsmore	Mad River, Humboldt County	Limited Use	301	134,317	na	53,900
Gravelly Valley	Clearlake, Lake County	Limited Use	15,127	64,360	3,620	21,690
Hollister Municipal	Hollister, San Benito County	Regional	35,140	55,467	14,700	22,900

Source: U.S. Census Bureau American Community Survey 2012 (population); California Department of Finance (employment); 2012 employment data not available for Cameron Park, California.

The airports provide service to different areas across the State, including three very remote areas, and two in moderately developed suburban areas.

- Blue Canyon is located 70 miles northeast of Sacramento on Interstate 80; the nearest town is Colfax, a small town about 20 miles away. The airport is owned by Placer County. It has one asphalt runway and tie downs and no other facilities. The surrounding area is undeveloped.
- Cameron Airport is located 34 miles east of downtown Sacramento in El Dorado County and 15 miles from Placerville. The airport is owned by the Cameron Park Airport District. It has one asphalt runway, several hangars, and tie downs. The airport is unique in providing runway access from a residential community, where houses have aircraft garages and streets wide enough to accommodate aircraft. The surrounding area is largely residential, with some vacant property to the northeast and east. El Dorado County is part of the Sacramento Area Council of Governments, the Metropolitan Planning Organization (MPO).
- Dinsmore Airport is located on State Highway 36 near the Van Duzen River in Humboldt County. The airport is seven miles from Mad River, a very small rural residential community, and 45 miles from Fortuna, a small, mostly rural city (population approximately 11,000). The surrounding area is undeveloped.
- Gravelly Valley is a remote airport in Lake County on the northern side of Lake Pillsbury. It is owned by the U.S. Forest Service and maintains a gravel runway. The area surrounding the airport is undeveloped.
- Hollister Municipal Airport is located approximately five miles north of the City of Hollister, 15 miles from Gilroy, and approximately one mile from State Highway 156. The airport is owned and operated by the City of Hollister, and has two runways, several hangars and other airport-related business facilities. The airport obtained through-the-fence approval for some

adjoining property with the intention to promote aviation-related business development, which has not yet occurred. There is a commercial and light industrial park to the east of the airport; otherwise the surrounding area is largely undeveloped agricultural land. Hollister is part of the Association of Monterrey Bay Area Governments, the region's MPO.

The limited use airports of Blue Canyon, Dinsmore, and Gravelly Valley are so remote as to have little to no impact on their regional planning activities. These airports serve an important role in California's aviation infrastructure by providing key air facilities for agriculture, fire fighting, medical emergency, and recreation. These same services can link the airport to the regional economy. The activity is low enough, however, that they were not immediately relevant to this study.

The Cameron Airpark and Hollister Municipal Airports, however, are located near denser population and employment areas. In addition, these areas are regulated by policies fostering growth of the community in concert with airside activity: Cameron Airpark has an adjoining residential community, and Hollister Municipal gained FAA approval for neighboring properties to have more direct airport access. These policies indicate a supply-side framework that could support growing demand for business and industrial uses. While there is currently little market demand at these airports to support development, based primarily on economic recovery and future surges in demand for retirement homes, land banking could support long-range planning efforts.

Potential Land Banking Benefits

Over the long-term, the economies and land markets in each of these regions may undergo transformations that are next to impossible to predict at present, such as the unexpected booms to otherwise moribund economies from fracking, solar power, and tourism (annual festivals and sporting event). Land banking allows a region to set land aside such that it may be positioned to capture unforeseen economic development opportunities. This strategy requires the airport authority, adjacent jurisdictions and the region to encourage or regulate compatible land uses on the parcels, such as interim uses that would preserve or even develop useful infrastructure (e.g., roads, utilities, soil conditions). Examples could include self storage warehouses and recreational facilities (golf courses, shooting ranges, car racing, etc.). In addition or as an alternative, these parcels could be designated as open spaces.

Encouraging Compatible Land Use

Some of the five land bank airport areas have already used strategies around active airport property to ensure that future development is compatible with, supports and is supported by airport activity. Land acquisition has also provided space for airport expansion (e.g., runway length, hangars, terminals, etc.):

- Cameron Airpark and Hollister Municipal Airport: The MPOs encompassing these airports have policies supportive of land bank strategies; and recognize the economic and environmental benefits of policies to guide smart growth development patterns, preserve open space, and encourage reduced per capita automobile use.
- Livermore Municipal Airport: The City of Livermore acquired land surrounding the airport after World War II expressly to provide room for compatible uses and future expansion. Much of the land south and west of the airport is still available for development.
- Buchanan Field: Contra Costa County and the City of Concord have already benefited from compatible commercial and industrial development near Buchanan Field, which has relatively high employment density. The design of the City of Concord business and industrial parks does not yet fully reflect smart growth characteristics, but the uses and building design have been amenable to continued airport activity and growth.

Encouraging Smart Growth Development

The central function of Role 2 airports involves supporting Sustainable Communities Strategies (SCS) which are designed to encourage infill development, which would improve transportation access, reduce GHG and support economic growth. As infill communities absorb developable land for small scale commercial and residential land use within existing urban areas, however, the remaining supply of land available for larger scale commercial and industrial land uses could become scarce. This limited supply could drive up land prices, discouraging future development and business growth. The high land prices – or simply rapidly rising prices – could give businesses legitimate concerns that their options for growth are limited, resulting in out-migration to regions with lower-priced land and similar transportation, utility, and labor access.

Land banking could allow airports and/or local communities to provide land for unforeseen future commercial and industrial land uses. This could help avoid land speculation which could slow smart growth. A jurisdiction would need to establish a clear process by which property would be provided to developers or existing businesses. Once established, the land would be available to uses that would most benefit the region and support the SCS. Likewise, in cases where the local jurisdiction remains a partner in the process, land could be developed according to smart growth or other development principals determined most appropriate to the area.

Protecting Open Spaces

Finally, land banking can provide a means to preserve open space or agricultural lands in the region. Left undeveloped, such land provides recreational and ecosystem benefits to the region. Holding land can also encourage infill and

other transportation-efficient land use patterns in other parts of the region. By limiting land supply near airports – which often provide good transportation and utility access – land banking encourages development in areas targeted for development through the SCS.

Conclusion

Land banking may not present airport authorities with their desired role for advancing their region's economic development. Nevertheless, this strategy may be the most an optimal given the lack of suitable conditions and strong trends in their region. Give such a context, land banking provides a long term, sustainable approach to a region.

6.0 Findings and Implications

This study provides airport stakeholders with practical information and guidance to help them bolster their airport's role in supporting regional smart growth and economic development. The majority of this guidance relies on the information obtained from 20 case studies of a broad cross section of the five airport types or classifications in California.[109]

The study attempts to assemble, organize and analyze the raw information from unique case studies into a compelling narrative. The narrative is meant to show stakeholders how they may leverage their airport's potential contribution to their region's smart growth and economic development. The study authors constructed each case study on four legs, where each leg provides critical background information about the potential role for developable land in and around each airport (i.e., airport area). These legs represent the demand-side, supply-side, accessibility, and economic development:

1. **Market conditions (i.e., demand-side).** The historical and future trends for a region's population, employment, and land use provide a strong predictor of each airport area's role within its region. This correlation seems stronger for an airport area which is located in a regional economy that is expanding, which means airport areas can attract jobs and development if the region is growing economically. When airports are located in regions that are not experiencing economic recovery from the Great Recession, however, they are unlikely to expand their economic fortunes in contrary to their region's stagnation or decline. Nevertheless, an airport area's supply of land with good access and utilities and fewer regulatory constraints and community opposition confers significant competitive advantages over other sites within a struggling region. This supply of developable land should become an effective catalyst for business attraction when the region begins to recover. Furthermore, some aviation-related businesses may operate somewhat independently of a region's major industries.
2. **Regulatory environment and community perspective (i.e., supply-side).** No matter if a region's economy is expanding, stagnating, or contracting, an airport area cannot attract new development if its parcels are constrained by land use and environmental regulations or the adjacent communities are effective opponents to development. Each case study describes how the lack of these constraints may be helping airport areas to attract or retain development relative to other areas in a region where adjacent residential

[109] Commercial / Primary, Metropolitan, Regional, Community, Limited Use. These are described in Subsection 2.1, page 2-1.

communities, environmentally sensitive habitat, historic preservation, or other regulatory constraints impose higher cost or more delay on potential development.

3. **Transportation Infrastructure (i.e., accessibility).** The strength of any airport to realize its potential contribution to smart growth and economic development depends on its accessibility to customers (e.g., shoppers, passengers, visitors, etc.); employees (i.e., number and mix of the labor pool), and shipments of raw materials or finished products (i.e., goods movement via trucking or rail). So each case study describes the roadway access, which includes proximity to major arterials, freeways and onramps, and rail heads) and the type and service level of public transit. While the quality and quantity of the transportation infrastructure varies significantly by airport, the accessibility afforded by existing transportation infrastructure at all of the case study airports is at least as good and often better (and less congested) than for alternative areas with a region. This advantage may be most often the result of siting airports near freeways or major arterials and the preservation of land for other infrastructure and parking. Nevertheless, most airports lack high frequency transit service, which reduces their labor access and therefore competitiveness as a potential smart growth area.

4. **Economic Benefits.** This study applied data-driven tools to a subset of eight airport areas (four of both Role 1 and Role 2 airports) to estimate the economic benefits of a representative smart growth scenario. The results of these applications of economic impact analysis (i.e., using IMPLAN and TREDIS) were intended to give some estimates of potential economic development near airports. The methodology was not developed with the expectation that stakeholders would use these same analysis tools to estimate their airport's contribution to a region's economic development. The analyses of regional economies identified specific industries and business types that benefit from their location at or near an airport. Airport managers and local economic development agencies (EDD), therefore, can apply the results described in the case studies to help them develop a strategy to target specific industries that fit their type and size of airport.

The study is intended to demonstrate how a systematic assessment of these four components provides airport staff, regional planners, economic development directors, and other stakeholders with tools and knowledge to leverage untapped capacity to attract businesses and improve smart growth. This knowledge should help many stakeholders achieve a common understanding with which to coordinate land use planning within an airport area with regional transportation and economic development planning. While this gap seems to have existed for some time, the recent implementation of regional Sustainable Communities Strategies and the State's recovery from the Great Recession have helped stakeholders to recognize opportunities to integrate airports into regional smart growth and economic development strategies. This study provides tools and strategies to initiate this conversation with empirical data.

The broader findings of this study demonstrate relevant roles for airports and the adjacent land to support smart growth and economic development. Nevertheless, the findings also include challenges to fulfilling this potential which stakeholders should consider when applying the case studies to help leverage their airport's role in regional planning and economic development. These challenges are summarized in the subsections below.

Scaling Case Study Results to the Statewide Airports Community

A traditional understanding of general aviation and small commercial airports regards their primary function as a facility where people and cargo access aircraft. In many cases, the primary function may support enough aviation-dependent business activity to attract ancillary businesses which service these aviation-dependent businesses, and nearby businesses and households. Caltrans DoA and the consultant team assessed airports scattered throughout the State and identified 20 that provided a representative cross-section of California airports and the five functional airport classifications. Subsequent analysis based on the 11 smart growth criteria determined that seven airports could be categorized as potential smart growth areas (Role 1), eight as potential smart growth support areas (Role 2), and the remaining five designated as potential land bank areas (Role 3).

The allocation of case study airports into Roles 1, 2, and 3 cannot be applied to the whole population of airports equally. The seven smart growth area airports, for example, constitute about 35 percent of the 20 case studies, but Role 1 airports were very difficult to find among the fifty-plus candidates. Thus, there is a strong likelihood that Role 1 airports are an extremely small minority of all California airports. A Role 2 airport may be more common among all California airports, but likely not proportional to 40 percent of the case study airports.

The seven Role 1 airport areas have the potential to support high density, pedestrian and transit oriented smart growth nodes, thus directly producing desirable environmental health benefits, such as reduced vehicle miles of travel (VMT), by encouraging more walking and transit use, which results in lower per capita greenhouse gas (GHG) emissions. In addition, the commercial and retail development within these smart growth nodes can retain and create jobs and potentially generate increased tax revenues for local, regional, and state jurisdictions.

The application of the Role 2 airport case studies to the statewide airport population, however, may hold more promise. While the evidence suggests that few airport areas have potential to become nodes for smart growth, they are well positioned to attract the types of development that can sustain and create jobs, generating fiscal benefits to the state and region (i.e., taxes and fees). Their role as smart growth support areas, therefore, involved enabling a region to more aggressively channel high density, pedestrian- and transit-oriented development into their smart growth areas (e.g., central business district, community centers),

and at the same time retain and attract industries that occupy low-rise and land intensive development within and around a Role 2 airport.

Diversity of Airport Community Land Use and Opportunities for Growth

The findings in this study apply across a broad diversity of airports and their adjacent land in terms of critical conditions such as population, employment, land use densities and the amount of vacant land available for development. Nevertheless, these differences will affect significantly the amount of impact an individual airport will have on regional smart growth and economic development. The diversity of the case study airport areas is summarized below.

Study Area Size

As noted in Chapter 4, the airport study areas were selected based on proximate commercial or low density residential development, environmental and design barriers and size of the neighboring community. The study area boundaries focused the case studies – and in particular the economic analysis. The boundaries were set by analysis of existing development around the airport. The study areas range from approximately 100 to 2,000 acres. The Santa Monica Municipal study area has the smallest airport study area (120 total acres), and is the only case study airport area with no undeveloped land, although the Buchanan Field area's share of undeveloped land amounts to less than one percent of its total 621 acres (three acres). Charles M. Schulz, Castle and Gillespie Field airport areas are all between 850 and 900 acres. The largest airport areas are Yuba County at 1,000 acres, Santa Maria Public at 1,750 acres and Fresno Yosemite International at more than 2,000 (Table 6.1).

Table 6.1 Selected Role 1 and Role 2 Airport Size and Employment

Airport	Acres	Undeveloped Acres	Jobs
Role 1 Smart Growth Areas			
Buchanan Field	621	3	5,791
Fresno-Yosemite International	2,040	540	10,910
Gillespie Field	890	123	11,807
Santa Monica Municipal	120	0	1,677
Role 2 Smart Growth Support			
Castle	880	704	179
Charles M. Schulz	860	709	3,430
Santa Maria Public	1,750	723	10,910
Yuba County	1,000	437	157

Source: EDR Group.

Employment Density

Employment densities at the Role 1 smart growth areas are significantly higher than those at Role 2 airports (Table 6.2). Santa Maria Public in Santa Barbara County is the exception, but even this airport has lower current job densities than three of the Role 1 airports. Also, with the exception of the Fresno Yosemite International airport area, there is far more undeveloped land on Role 2 airport areas than in Role 1 areas. More than 500 acres in the Fresno Yosemite International study area is vacant, accounting for about one-quarter of its total land area. Three of the four Role 2 airports have over 700 vacant acres, with Yuba County airport area holding an estimated 437 undeveloped acres.

Table 6.2 Selected Role 1 and Role 2 Airport Existing Development Densities

Airport	Jobs per Acre	Percent Acres Undeveloped
Role 1 Smart Growth Areas		
Buchanan Field	9.3	0.5%
Fresno Yosemite International	5.3	26%
Gillespie Field	13.3	14%
Santa Monica Municipal	14.0	0%
Role 2 Smart Growth Support		
Castle	0.2	80%
Charles M. Schulz	4.0	82%
Santa Maria Public	6.2	41%
Yuba County	0.2	44%

Source: EDR Group.

Development Types

One widely held assumption among stakeholders was that airports are poor neighbors for residential development primarily because aircraft noise and ground transportation entering and exiting the facilities. Nevertheless, six the 15 Role 1 and Role 2 airports are abutted by some residential development, and Yuba County and Buchanan Field Airports have significant amounts nearby. As a conservative hypothesis for the quantitative economic analysis (modeling), however, Role 1 and Role 2 case study airports are likely to attract only nonresidential development: Role 1 airports would attract high density office and retail land use, and Role 2 airports would attract less dense office, manufacturing and warehousing land use. These latter two development types would be more likely to generate trucking and noise, which often engender opposition from nearby residents when adjacent to housing. If Role 2 airport

areas attract industrial uses and planners provide for an adequate buffer, the potential for conflicts with future residential development diminish.

Assumptions Regarding Economic Development Incentives

In addition to screening and allocating case study airports into three roles, this study estimated the potential economic benefits for eight airport areas: four in both Role 1 and Role 2 airports. All Role 1 and Role 2 airports are located in regions where state and regional forecasts project moderate to strong economic growth. Furthermore, the quantitative economic analysis assumed that by 2040 California and the host counties – and local jurisdictions in particular – will have policies in place to attract development to these specific locations and provide the infrastructure needed the targeted industries.

These policies, however, do not include some typical incentives used to attract new businesses or retain existing ones. Economic and fiscal incentive programs are commonly provided by local, regional and state governments, and are often regarded as essential. This study, however, does not assume incentives that affect the forecasts of business retention or attraction. The latest reliable research on this topic discounts their effectiveness.[110] Nevertheless, many engaged in economic development regard them as a necessary part of a proactive strategy to attract businesses. Incentives include local and state tax abatements, worker training programs, land subsidies, no-cost public infrastructure, or a myriad of other concessions and subsidies. The economic development projections in this study assumed each airport will have sufficient infrastructure to serve development and the local and regional taxes and fees will be assessed.

Future Analysis and Application of this Study

This study's findings may inform diverse groups of stakeholders, but the primary audiences are airport staff, regional planners, private developers, businesses and local and regional economic development officials. Some specific possible applications of this study include:

- **Airport managers,** who could use the case studies to develop a development plan for their airport based on the experience of other similar airports in the State. The information and analytical methods in this study may help them evaluate their opportunities for partnering with their community, including the economic development professionals to leverage the value of the airport area within the community.
- **Economic development professionals**, who could use the case study methodology to promote development opportunities for existing firms that

[110] *As Companies Seek Tax Deals, Governments Pay High Price*, Louise Story, New York Times, December 1, 2012, http://www.nytimes.com/2012/12/02/us/how-local-taxpayers-bankroll-corporations.html.

may want to relocate or expand or prospective businesses that are looking for a location. A less obvious but potentially more vital application of this case study may involve giving economic development professionals the tools to retain businesses that may otherwise move out of the region. Although a critical objective of Role 2 airports involves avoiding displacement of businesses that are inconsistent with SCS strategies, economic development officials will affirm that retention remains the most effective and most challenging economic development priority.

- **Aviation users,** such as the Aircraft Owners and Pilots Association or the National Business Aviation Association, could apply the study's findings to help communicate how airside activity leverages the value of airport land. Aviation-related activity can serve as the catalyst for industrial agglomeration that may evolve into a smart growth node and incubator of economic development targeting airport-compatible uses.

The Sustainable Communities Strategy (SCS) provides a formal and ongoing process for understanding how airports can contribute to regional development. Nevertheless, the challenge of finding broader, more integrated roles for airports in many communities, beyond the primary aviation services they provide, has been ongoing long before passage of SB 375 and the mandate for each region to prepare a SCS. So this study is meant to give stakeholders more information and the analytic tools to assess local development potential that can help a region attain a sustainable future.

CAMBRIDGE SYSTEMATICS

Caltrans Airport Forecasting Study

The Role of California Airports in Smart Growth and Economic Vitality

appendices

prepared for

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Appendices

A. Summary of Data for California Airports and Surrounding Areas

This appendix provides data and information in table and charts on key historical and forecasted data about areas surrounding California airports. This material supported the initial qualitative review of California airports, prior to selecting airports for further assessment through the case study methodology. This data is provided as background material and is not directly related to quantitative analysis provided in this report. The aforementioned approach to this qualitative study required some data analysis related to smart growth design principles, but did not support a quantitative, data-driven approach. The nature of the case studies and the uncertainty of economic growth across the state made the qualitative approach the most applicable to practitioners. This data, however, provide useful background to regional demographic and socioeconomic conditions across the state.

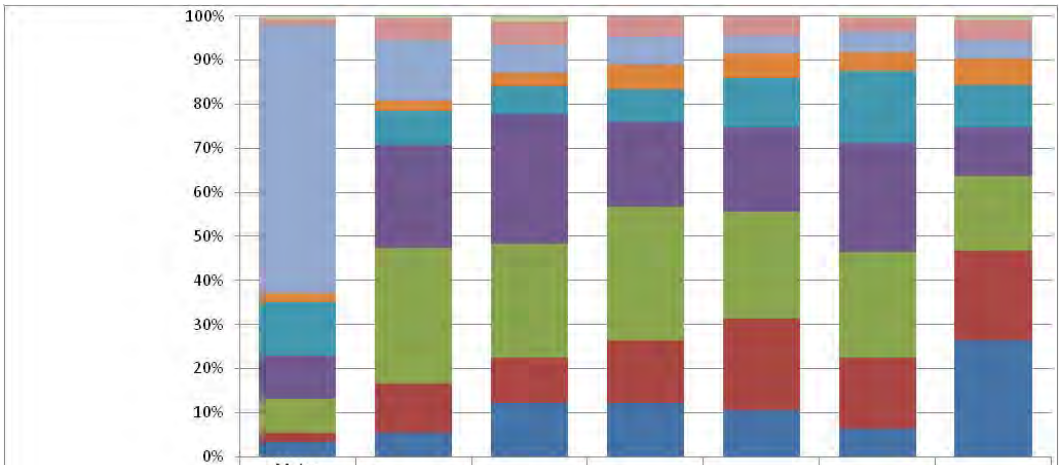
A.1 HISTORICAL DATA RELATED TO ECONOMIC ANALYSIS

Employment by Industry

This section describes the distribution of employment across eight industry categories used in the statewide travel demand model, for each airport airside category (Figure A.1).

- Non-major airport categories have a greater share of primary sector industry activity on or near the airport than in the state overall. This is likely due to the low-density land uses such as agriculture near airports in undeveloped areas.
- Non-major airport categories have a greater share of office-related sectors on or near the airport than in the state overall. Metropolitan airports have the largest share of office uses, at nearly 30 percent of all industry sectors. This reflects the opportunities for aviation-compatible administrative and office facilities in low-density areas near most airports.
- Office, education and retail uses are also strongly represented in non-major airports. Community airports have the greatest share of education and health activities of these airport types.

Figure A.1 Percent Employment by Industry for Airport Categories (2008)



	Major Commercial/ Primary	Commercial/ Primary	Metropolitan	Regional	Community	Limited Use	Statewide
Military	1%	1%	1%	0%	0%	1%	1%
Wholesale	2%	5%	5%	5%	4%	3%	4%
Transportation and Utilities	61%	14%	6%	6%	4%	5%	4%
Other Service	2%	2%	3%	5%	5%	4%	6%
Leisure and Hospitality	12%	8%	6%	8%	11%	16%	9%
Office	10%	23%	29%	19%	19%	25%	11%
Primary Sector	8%	31%	26%	30%	24%	24%	17%
Education and Health	2%	11%	10%	14%	21%	16%	20%
Retail	3%	5%	12%	12%	10%	6%	26%

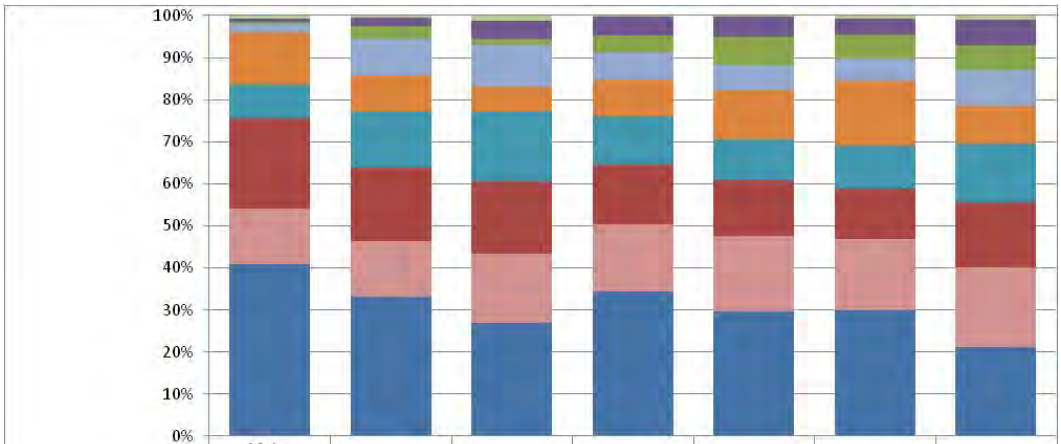
Source: California Statewide Travel Demand Model.

Employment by Occupation

This section describes the distribution of employment across nine occupation types used in the TDM, for each airport category (Figure A.2).

- Airports in all categories have a greater share of blue collar occupations than in the state overall. This corresponds to the greater industry representation in primary sector.
- Office labor, including clerical, managerial and sales occupations, is strongly represented at and near non-major airports. This corresponds closely to statewide occupation shares.

Figure A.2 Percent Employment by Occupation for California Airport Categories (2008)



	Major Commercial/ Primary	Commercial/ Primary	Metropolitan	Regional	Community	Limited Use	Statewide
Military	1%	1%	1%	0%	0%	1%	1%
Health	1%	2%	4%	5%	5%	4%	6%
Education	1%	3%	2%	4%	7%	6%	6%
Professional/Technical	2%	9%	10%	7%	6%	5%	8%
Service	12%	8%	6%	9%	12%	16%	9%
Mangerial/Business	8%	13%	17%	11%	10%	10%	14%
Clerical workers	21%	18%	17%	14%	13%	12%	15%
Sales	13%	13%	16%	16%	18%	17%	19%
Blue collar	41%	33%	27%	34%	30%	30%	21%

Source: California Statewide Travel Demand Model.

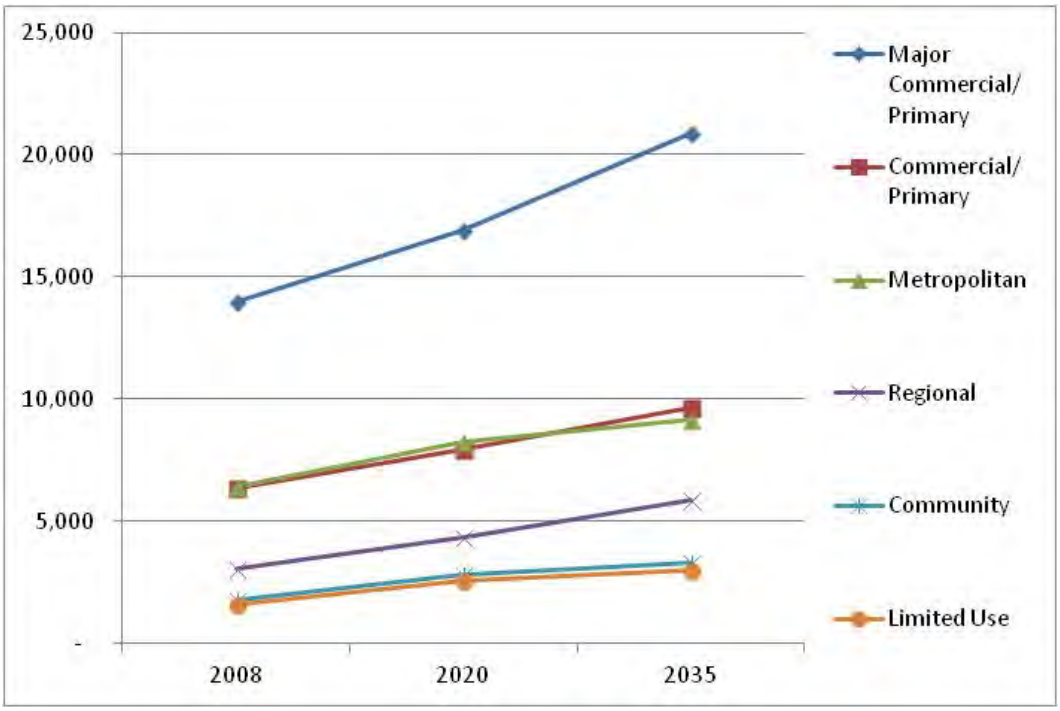
A.2 FORECASTED DATA RELATED TO ECONOMIC ANALYSIS

Projected Employment Growth

The statewide transportation demand model includes forecasts of employment based on local and regional planning efforts. The forecasts extend to the year 2040, with intermediate years included. The forecasts for this study go to the year 2035, in order to align with data available from air travel forecasts. The employment forecasts were estimated by the State's MPOs as part of regional planning activities, which include extensive public outreach and technical modeling. See Figure A.3.

- Employment is expected to grow steadily to 2035 in all airport categories.
- Regional, commercial, and major commercial airports are forecast to experience greater employment growth from 2020 to 2035 than the preceding decade.

Figure A.3 Average Employment per Airport by Industry for California Airport Categories (2008 to 2035)



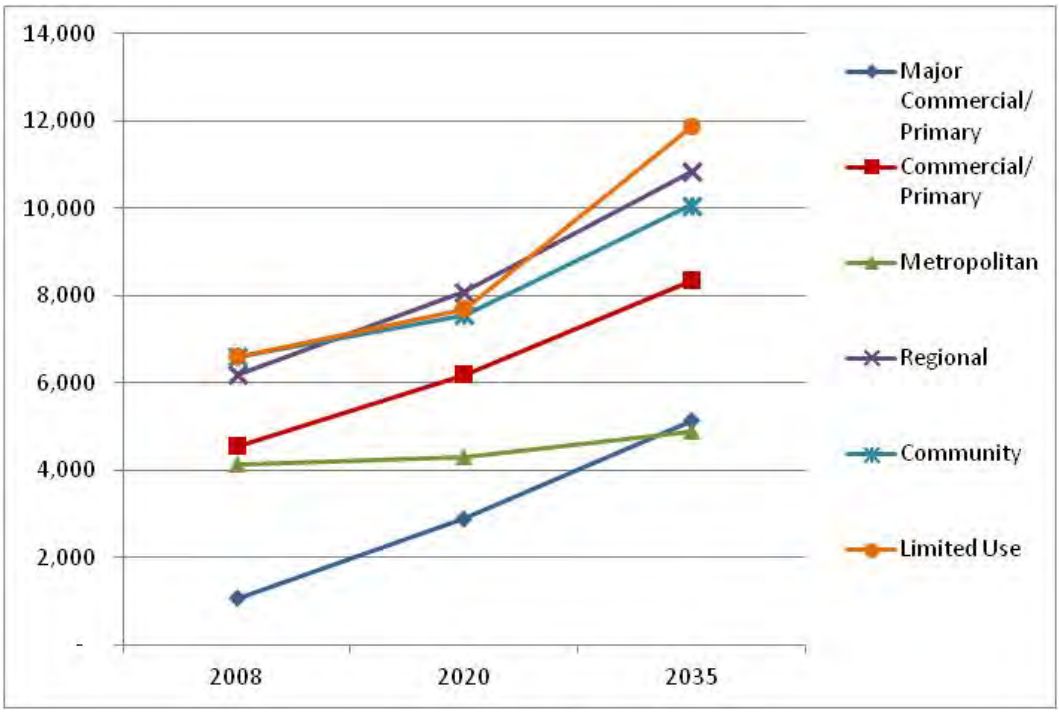
Source: California Statewide Travel Demand Model.

Projected Population Growth

The state travel demand model also includes population forecasts based on local and regional planning efforts and travel demand modeling. Population is generally greatest near airport types with the least existing development (limited use, community, regional). Population growth at these airports is expected to continue, with the growth rate increasing after 2020. See Figure A.4.

- Commercial airports are expected to experience population growth near the airport at rates similar to areas near smaller airports. Major commercial airports, which had the lowest nearby population in 2008, are expected to have nearby population roughly equal to metropolitan airports by 2035.
- Metropolitan airports will experience flat population growth to the year 2020, then increase growth rate slightly to 2035.

Figure A.4 Average Population per Airport by California Airport Category, 2008 to 2035



Source California Statewide Travel Demand Model.

Projected Aviation Capacity Demands

Future air travel demand at different airport types is provided by the Federal Aviation Administration (FAA) in the Terminal Area Forecasts[1]. The data include enplanements (boarding), vehicle activity (take off and landing), and number of vehicles stored at the airport. This study focuses on landside activity (e.g. population, employment, zoning) and therefore did not consider aviation demands directly. The Caltrans Division of Aeronautics coordinates with the FAA to develop and integrate travel demand data into statewide planning efforts.

A.3 INITIAL POPULATION AND EMPLOYMENT PROFILES

Table A.1 provides an overview of population and employment data for areas surrounding selected airports from Caltrans' five airport categories. The data is

[1] For more information, see the Federal Aviation Administration forecast data available at https://aspm.faa.gov/main/taf.asp.

presented based on observed data in 2010, as well as future forecast data from the CSTDM. These airports were selected for representative purposes and may or may not reflect the data used in the case studies prepared for this study.

Study areas for the selected airports were considered to be the travel analysis zones (TAZ) surrounding the airport. TAZs vary in geographic size, based largely on the amount of travel expected in the area. TAZs in less populous areas will typically cover relatively large land areas, while TAZs in urban areas may cover only several blocks. Therefore the airports in urban areas are typically located in zones that encompass only the airport property.

Table A.1 Overview of Demographic and Socioeconomic Profiles of Representative Airports by Airside Category

Airport Name	County	City	Employment in Nearest Municipality		Employment in Airport TAZ		Population in Airport TAZ	
			2008	2035	2008	2035	2008	2035
Major Commercial/Primary								
Los Angeles International	Los Angeles	Los Angeles[1]	1,820,092	1,994,134	22,616	15,002	-	35
Sacramento International	Sacramento	Sacramento[2]	966,316	1,327,424	2,213	9,819	3,152	15,367
San Francisco International	San Francisco	San Bruno	-	-	17,103	37,755	-	-
Commercial/Primary								
Fresno Yosemite International	Fresno	Fresno	881	4,418	8,300	9,143	1,363	1,839
McClellan Airfield	San Diego	Carlsbad	1,711	2,333	23,122	26,214	10,245	11,715
Ontario International	San Bernardino	Ontario	109,075	208,240	8,313	25,235	163	151
Redding Municipal	Shasta	Redding	1,703	1,899	1,621	8,861	5,184	8,434
San Diego International	San Diego	San Diego	9,316	20,942	4,740	5,390	50	81
Metropolitan								
Buchanan Field	Contra Costa	Concord	1,588	1,907	16,771	25,501	1,402	1,734
Hayward Executive	Alameda	Hayward	1,017	1,513	6,567	10,024	630	453
Livermore Municipal	Alameda	Livermore	16,771	25,501	5,053	8,715	6,825	8,279
Santa Monica Municipal	Los Angeles	Santa Monica	89,493	101,699	6,387	5,776	580	533
Van Nuys	Los Angeles	Los Angeles[1]	1,820,092	1,994,134	9,683	19,541	935	915

Airport Name	County	City	Employment in Nearest Municipality		Employment in Airport TAZ		Population in Airport TAZ	
			2008	2035	2008	2035	2008	2035
Regional								
Chino	San Bernardino	Chino	2,156	380	410	3,359	1,140	10,636
Hollister Municipal	San Benito	Hollister	1,052	1,315	2,017	6,996	8,601	15,380
Lake Tahoe	El Dorado	South Lake Tahoe	1,247	1,446	2,322	10,035	7,437	2,929
Napa County	Napa	Napa	2,017	6,996	9,123	12,783	89	233
Yuba County	Yuba	Olivehurst	3,023	3,654	1,134	2,280	5,402	7,616
Community								
California City Muni.	Kern	California City	583	2,950	244	814	2,530	3,788
Cameron Air Park	El Dorado	Cameron Park	1,867	1,260	1,049	1,627	5,223	12,065
Castle	Merced	Atwater	2,356	3,223	4,012	6,163	2,626	5,042
Marina Municipal	Monterey	Marina	607	1,780	2,295	4,035	10,773	10,917
University	Yolo	Davis	1,597	851	12,016	13,475	2,355	4,294
Limited Use								
Adin	Modoc	Adin	635	1,351	113	1,190	2,814	4,160
Blue Canyon	Placer	Blue Canyon	113	1,190	3,901	2,348	8,841	18,787
Dinsmore	Humboldt	Dinsmore	635	1,351	4,187	9,951	16,599	4,225
Gravelly Valley	Lake	Lake	113	1,190	635	1,351	6,541	7,043
Harris Ranch	Fresno	Coalinga	3,589	9,557	3,589	9,557	4,137	10,582

Source: 1) SCAG 2008 RTP – 2010 and 2035 Employment Estimates; 2010 is the most approximate year to 2008; and 2) SACOG 2012 MTP/SCS – 2008 and 2035 Employment Estimates for the SACOG region.

A.4 REPRESENTATIVE AIRPORT TRAFFIC PROFILES

This data is based on reports to the Federal Aviation Administration (FAA) and the California Department of Transportation. Airport data will be supplemented or confirmed through interviews with airport managers. The data includes current year enplanements, air traffic, and air freight. Forecasted enplanements are also included for future years from the FAA (Table A.2).

Table A.2 Summary of Air Traffic for Preliminary Case Study Airports by Airport Category

			Enplanements	
Airport Name	2011 Air Traffic	2011 Freight (U.S. Tons)	2011 Actual	2035 Forecast
Major Commercial/Primary				
Los Angeles International	433,452	1,860,540	30,528,737	55,222,199
Sacramento International	125,151	72,028	4,370,895	9,252,370
San Francisco International	427,074	420,220	20,056,568	34,815,661
Commercial/Primary				
Fresno Yosemite International	135,454	11,025	615,320	896,676
McClellan Airfield	137,718	NA	45,518	104,904
Ontario International	90,751	410,120	2,271,458	2,625,537
Redding Municipal	104,674	1,221	38,290	68,493
San Diego International	201,720	130,850	8,465,683	15,460,950
Metropolitan				
Buchanan Field	93,874	NA	15	15
Hayward Executive	86,069	NA	2	2
Livermore Municipal	124,213	NA	2	2
Santa Monica Municipal	165,130	NA	100	100
Van Nuys	504,502	2	1,018	1,018
Regional				
Chino	164,588	NA	13	13
Hollister Municipal	NA	NA	14	14
Lake Tahoe	23,540	NA	32	32
Napa County	53,953	NA	69	69
Yuba County	35,300	NA	6	6
Community				
California City Municipal	37,200	NA	NA	NA

Airport Name	2011 Air Traffic	2011 Freight (U.S. Tons)	Enplanements	
			2011 Actual	2035 Forecast
Cameron Air Park	36,036	NA	NA	NA
Castle	72,153	NA	NA	NA
Marina Municipal	40,000	NA	NA	NA
University	NA	NA	NA	NA
Limited Use				
Adin	1,000	NA	NA	NA
Blue Canyon	100	NA	NA	NA
Dinsmore	23,540	NA	NA	NA
Gravelly Valley	1,200	NA	NA	NA
Harris Ranch	NA	NA	NA	NA

Source: FAA (Air Traffic, Growth forecast), Caltrans (2011 Actual, 2011 Air Freight).

Note: Forecasted 2035 enplanements estimated by applying the growth rate from the Federal Aviation Administration Terminal Area Forecast, years 2011 and 2035.

B. Characteristics of Smart Growth Potential at Airports

This analysis includes a two-step exercise to determine a set of characteristics for evaluating the potential for smart growth at airports. Two questions were explored.

1. Determine what characteristics make some places more likely to attract smart growth than other places.
   a. If you were trying to predict where Smart Growth will occur next, what would you look for?
   b. If you were a developer looking for a location to build a Smart Growth development, what would you look for?
   c. If you were an agency trying to encourage Smart Growth, where would you do it?
2. Assess whether airports and the land near airports fare better on any of these characteristics than other places.

B.1 Characteristics Making Places More Likely to Attract Smart Growth

Interviews were conducted with the following experts:

- Chris Ratekin, Sustainable Mobility Branch, California Department of Transportation;
- Dr. Daniel Chatman, Department of City and Regional Planning, University of California, Berkeley; and
- William Fulton, Smart Growth America

The report summarizes finding from the following reviewed reports:

- California Department of Housing and Community Development (HCD) Transit-Oriented Development (TOD) Housing Program Second Round Criteria;
- California Department of Housing and Community Development (HCD) Infill Infrastructure Grant (IIG) Program Second Round Criteria;
- Smart Scorecard for Development Projects, Congress for New Urbanism, U.S. EPA, January 2002;

- New Jersey Smart Growth Scorecard; and
- Maryland Smart Growth Scorecard, November 2001.

Table B.1 summarizes the characteristics that make a place more likely so attract smart growth.

Table B.1 Characteristics Making Places More Likely to Attract Smart Growth

	Characteristic
1	Surrounding population density
2	Surrounding employment density
3	Good supporting transportation infrastructure (auto, transit, bicycle, walking)
4	Permanence of transportation infrastructure
5	Easy to walk around (e.g., block length, continuous sidewalks, lighting, street width)
6	Supportive parking environment
7	Amenities within ½ mile
8	Availability of land for development
9	Suitability of land for development (e.g., not steep slope, floodplain, stream)
10	Proximity to service infrastructure (e.g., water, sewer, fire, police)
11	Lack of resistance to development in surrounding area

Source: Cambridge Systematics, 2013.

The key to smart growth is to generate pedestrians. The first seven characteristics in Table B.1 correlate with generating pedestrians at a given location. A location with high population or employment density nearby is more able to attract pedestrians. Good supporting transportation infrastructure is necessary to get people to and from the location. Permanent transportation infrastructure is more likely to attract development (rail and airports are permanent, buses are not). A location with a good walking network will be attractive to pedestrians.

For most locations in the United States, a supportive parking environment is needed as most people travel by private automobile. This means sufficient parking, but in a way that allows for an attractive walking environment (e.g., parking behind or in structures rather than in large surface lots between building fronts and sidewalks).

A location with amenities nearby is more likely to attract pedestrians. Several amenities are listed in the documents reviewed. They generally fall into the following categories:

- Retail (e.g., grocery store, convenience store, etc.);
- Entertainment (e.g., theater, restaurant, etc.);

- Services (e.g., bank, child care, senior center, dry cleaner, medical, dental, etc.);
- Recreation (e.g., recreation center, health club, etc.);
- Public spaces (e.g., park, playground, etc.); and
- Public services (e.g., school, social service center, library, post office, etc.).

The last four characteristics in Table B.1 address the likelihood developers would be willing to develop in a certain location.

A good proxy for the 11 characteristics listed in Table B.1 is to look for places with high land value. A high land value indicates the desirability of a place for development. The higher the land value, the more attractive it is for higher density development, which is in turn a key component of smart growth.

B.2 HOW AIRPORT LAND SUPPORTS SMART GROWTH ATTRACTIVE CHARACTERISTICS

How airports fare with respect to the 11 characteristics listed in Table B.1 will vary on an airport-by-airport basis. However, some broad statements can be made:

- **Surrounding population density.** The population density near airports is generally lower than the surrounding region.
- **Surrounding employment density.** Some airports have significant employment activity nearby, other do not. Those that do not could generate it by identifying economic development possibilities based on economic location efficiency (i.e., identify economic activity that is efficient to locate near an airport).
- **Good supporting transportation infrastructure.** Airports generally have good supporting transportation infrastructure. However, it is typically focused on getting people to and from the airport terminal complex itself, and less so on getting people to and from the surrounding land. Thus, some redevelopment of the transportation infrastructure may be needed to attract Smart Growth to land near airports.
- **Permanence of transportation infrastructure.** The airport itself and the roadway network are permanent. However, most airports are served by bus transit, which is not permanent.
- **Easy to walk around.** The environment near airports is generally not conducive to walking. However, it could be made walking conducive by implementing form based codes for future development.
- **Supportive parking environment.** Airports generally have ample parking supply. However, it is typically provided in a manner that precludes an

attractive walking environment. Thus, some redevelopment of the parking infrastructure may be needed to attract Smart Growth to land near airports.

- **Amenities within ½ mile.** There are generally fewer amenities in the vicinity of airports than in the surrounding region.
- **Availability of land for development.** This varies airport-by-airport. The airport terminal itself could be a possibility for development.
- **Suitability of land for development (e.g., not steep slope, floodplain, stream).** The land near airports is generally suitable for development.
- **Proximity to service infrastructure (e.g., water, sewer, fire, police).** Service infrastructure is generally provided at or near airports.
- **Lack of resistance to development in surrounding area.** There is usually less resistance to development near airports than in the surrounding region.

Based on the above general statements, Table B.2 provides a typical rating for airports and the land near airports relative to the 11 characteristics making places attractive for smart growth. Again, these ratings should be adjusted for individual airports.

Of the first seven characteristics (i.e., those related to generating pedestrians at a given location), airport land typically rates better than the surrounding region on two, and worse than the surrounding region on three.

Of the last four characteristics (i.e., those related to the likelihood developers would be willing to develop), airport land typically rates better than the surrounding region on three.

Table B.2 Typical Ratings for Airport Land on Smart Growth Attractive Characteristics

	Smart Growth Attractive Characteristics	Typical Rating for Airport Land
1	Surrounding population density	–
2	Surrounding employment density	
3	Good supporting transportation infrastructure (auto, transit, bicycle, walking)	+
4	Permanence of transportation infrastructure	+
5	Easy to walk around (e.g., block length, continuous sidewalks, lighting, street width)	–
6	Supportive parking environment	
7	Amenities within ½ mile	–
8	Availability of land for development	
9	Suitability of land for development (e.g., not steep slope, floodplain, stream)	+
10	Proximity to service infrastructure (e.g., water, sewer, fire, police)	+
11	Lack of resistance to development in surrounding area	+

+ = Better than surrounding region – = Worse than surrounding region

Source: Cambridge Systematics, 2013.

TBD – breaking down the table into residential versus commercial smart growth attractive characteristics.

C. Literature Review: Land Use and Industry near Airports

This appendix provides background and summarizes past airport and market access research on the types of uses around airports. This information was used to develop the structured interview guide and to lay the foundation for the economic assessment of the Tier 1 airports.

C.1 INDUSTRIES THAT TYPICALLY CLUSTER NEAR AIRPORTS

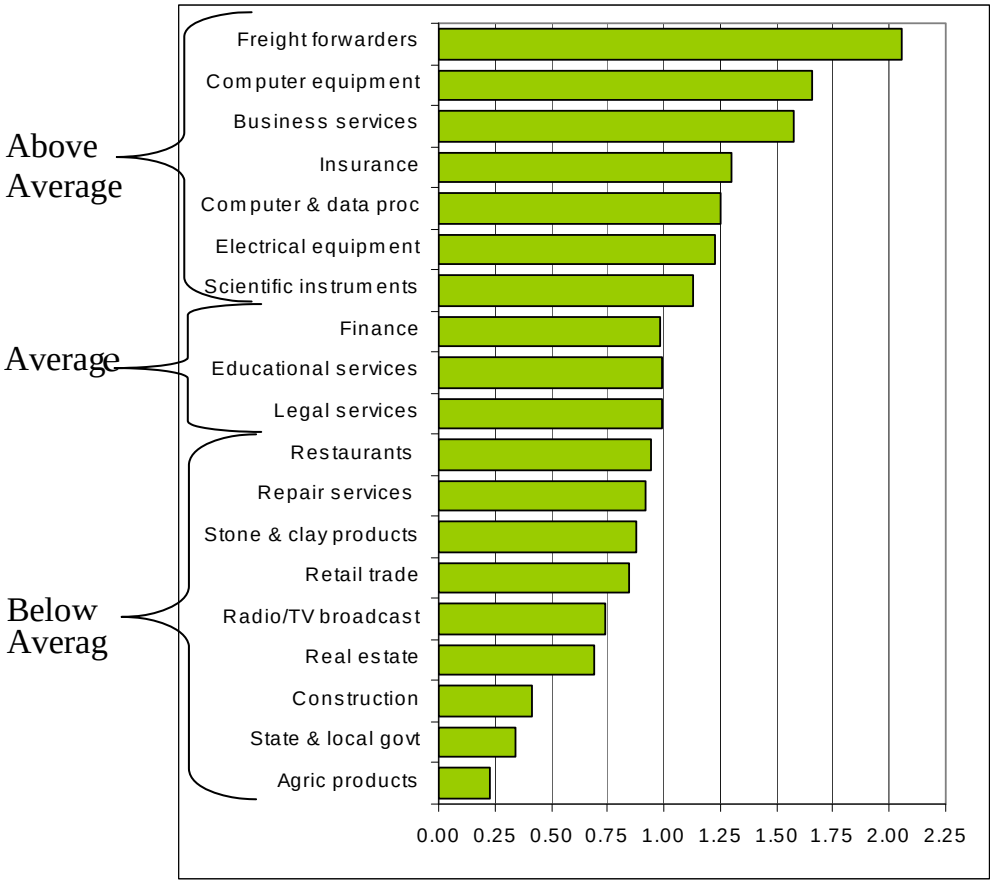
The following types of industries tend to rely most heavily on air transportation, and therefore may cluster near airports.

Technology based manufacturing and services, including sectors such as business and professional services, manufacture of electronic equipment, and instruments. These industries rely on air services much more than other sectors, for both passenger and cargo travel needs, for the following reasons:

- The products produced tend to be delicate and time-sensitive, so that they need to be shipped by air. Typically, these are technology-related products where value reflects high labor costs and precision manufacturing, but may also be perishable agricultural products (including fish and meat, live or processed).
- Products that are heavy to ship, but that carry a large return on transportation costs invested, including just-in-time manufacturing and equipment needed to maintain high yielding production.
- Business and professional services depend on sales of professional expertise, which often require travel to meet with clients and make presentations.
- Companies have statewide, western, national and even global business networks, requiring frequent and often international travel between the various offices.
- Tourism. GA and commercial airports serve resorts and tourist destinations.

Producers of high-tech products, business services and computer-oriented firms are among the industries that spend the most money on air services. Most of these industries spend at least 25 percent more on air services than the average industry in the United States, and a few spend 50 percent or more than the average of all industries in the United States. This is shown in national statistics on industry reliance on air travel shown on Figure C.1.

Figure C.1 Industry Reliance on Air Travel



Source: U.S. Dept. of Commerce and Bureau of Transportation Statistics, 2000: Transportation Satellite Accounts, 1996.

Note: Values reflect the relative reliance on air travel among individual industries, represented as a proportion of the national average (which is air travel costs representing 3.6 percent of total industry revenue).

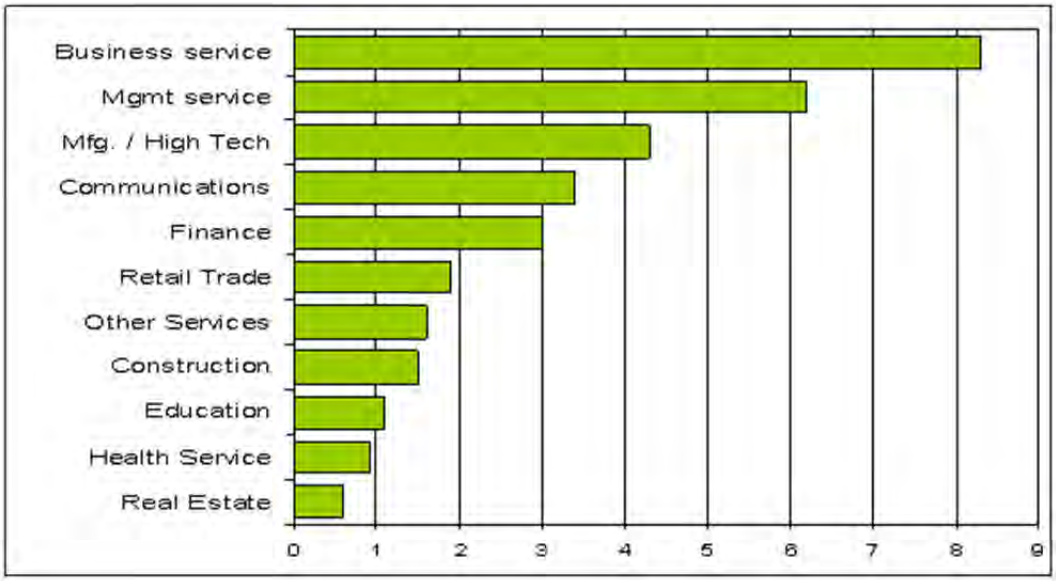
Reliance on air cargo transport is due to the unique characteristics of products:

- Long average shipping distances of cargo in these industries,
- High average value per ton of the goods produced within these sectors,
- High export ratios and long export distances demanded by these sectors, and
- Nature of the demands of product delivery.

Surveys show that rates of airline passenger travel vary widely among businesses, with the greatest amount of employee air travel occurring in the business and management services, local manufacturing sectors and finance, Figure C.2. Many New England businesses in high-growth industries are part of global business networks, requiring frequent and often international travel between the various offices, as illustrated in the text boxes on the following page.

Boston annually hosts 2.8 million delegates to business conventions, representing 21% of all visitors to the City. Over 70% of delegates to business conventions in the City arrive by air, compared to 31% for other (private business, leisure and personal) visits. (Sources: Greater Boston Convention and Visitors Bureau and Massachusetts Office of Travel and Tourism.) Major investments in hotels, convention facilities, and new or expanded businesses are likely to further increase demand for passenger and cargo services at Logan.

Figure C.2 Rates of Employee Air Travel



Source: Massport, Business Survey, 1998.

Note: Values reflect average annual air passenger trips.

The most recent Transportation Satellite Account (2011) provides data not more recent than 1997. Exhibit 3 below shows the propensity by sector to purchase air services (air services for hire or to use private aircraft (in house).

Table C.1 Division of Air services by purchase and self-Supplied by Percent of Total Outlay (in Producers Prices)

Industry	Air Services for Hire	Air Services In-House
Construction	96%	4%
Manufacturing Products	95%	5%
Trade	90%	10%
Utilities	68%	32%
Information	70%	30%
Financial Services	70%	30%
Professional and Business Services	84%	16%
Education and Health Services	70%	30%
Leisure and Hospitality	72%	28%
Other Services	70%	30%

Source: Transportation Satellite Accounts: A Look at Transportation's Role in the Economy, 2011. Data are 1997.

C.2 ILLUSTRATIONS OF INDUSTRY RELIANCE ON AVIATION

Below are excerpts of interviews and observations from past studies conducted by EDR Group. Note that all airports have logistics components that serve passengers and shippers. These components, including car rental, taxi cab and other passenger transport services; trucking, freight forwarding and other air cargo related supports are service industries that will grow if the demands for these services exist. Therefore, they are not considered in the list below.

Cargo and Cargo/Business Travel

Perishables. A 1997 study of the seafood industry showed that firms throughout eastern Massachusetts are increasing their use of airfreight with increases in demand for fresh seafood both domestically and internationally. Representatives of seafood processing and distribution companies located in Boston said that, despite the fact that more fresh fish is docked and sold in places like Portland, ME and New Bedford, they do not want to leave the city because they are unwilling to lose their easy access to Logan Airport. Typically, freshly caught fish are flown to Boston, cut into steaks or fillets by Boston seafood processors and the flown to the Midwest, so diners at "white table cloth restaurants" can enjoy fresh ocean seafood dinners.

High-tech Products. EMC (data storage products) Most of EMC's product is shipped via air cargo to customers worldwide. Even domestic deliveries tend to rely on air transport, as shipments are often time-critical. EMC receives many air

cargo shipments from suppliers that are also time critical. The incoming volume of shipments has increased proportional to EMC's business growth. Also, numerous business trips involving air flights are made daily by employees of EMC operations worldwide.

Heavy Equipment. Air travel is critical for both business travel and cargo at a midsized establishment specializing in manufacture and sales of naval and oil exploration equipment. The time factor for these sales is much more important than the actual shipping costs, and the mode of shipment depends upon the customer's needs. The weight of products being shipped is often irrelevant if compared to the costs incurred by oil rigs not being operational while replacement equipment is needed. The industry market has become more global and diversified over the past ten years, resulting in increases in air travel, which is particularly important for sales to the oil industry. Employees at this mid-sized company make approximately 2,000 trips a year, including international flights to the UK, France, Australia, Japan, Korea, Indonesia, Malaysia and Taiwan.

Just-in-Time for Traditional Manufacturing. Although airport traffic of a GA Airport in Wisconsin is primarily composed of general aviation operations, the demand for air cargo operations has grown rapidly in recent years. Most of the airport's activity growth can be traced to an increase in "on-demand" services by local automobile assembly and components plants. Such services are vital to automotive plants, where introduction of just-in-time logistics and production methods has increased the importance of uninterrupted materials deliveries. (Other local companies with perishable products, including a cheese manufacturer and a juice company, also use the airport for rapid transport needs.)

Medical Devices. Smith-Nephew is a producer of medical devices. Aviation is critical or business travel, hosting visitors, and cargo shipments. Deliveries rely on air transportation. Products are sterile surgical instruments that are delivered to hospital operating theaters worldwide on-demand, and are exceptionally time-sensitive. Forty percent of products are shipped internationally, with major markets in Western Europe, Australia, Japan and South Africa.

Business Travel

For Profit. The Global Education Division of IBM sends four to five thousand employees on 6,500 to 8,500 business trips per year, with destinations including San Francisco and various points in Europe and Asia. Regional airports are increasingly used for flights to metro New York, Washington, D.C. and other short-haul destinations.

Non-Profit. MITRE is a Federally funded research and development center that performs engineering, systems research, and strategic management for the Departments of Defense, Aviation, Treasury, and other agencies. MITRE has 60 sites globally, with 7 in Europe, 5 in Asia, and 2,500 employees at its Bedford,

MA site. Employees make frequent business trips between sites and rely on Logan for approximately 95% of their air travel. Air travel has increased in the past 10 years as the company has grown and its customer base has expanded and diversified.

Tourism

High-end Leisure Travel. Resorts, depend on GA airports for bringing in high paying customers. A recent study in South Dakota estimated that air travelers to the state spend almost $51 million annually in staying at hunting resorts. One resort reported that the average visitor arriving through a nearby GA airport spends $3,300 a day. Similar rates of spending are reported by resorts in Colorado that service skiers that arrive by private jet.

C.3 AIRPORT BUSINESS AND LAND USE ACTIVITY

This section describes land use and business activities on or proximate to airports and classifies the relationships of those activities to the airport. For the purposes of this discussion, the relationships between airports and "on-airport" or airport-proximate land uses fall into one of three categories:

- **Aviation/airport dependent**. This group includes business activities that operate at an airport or provide services directly to businesses and passengers who use the airport. Examples include charter aircraft services as well as maintenance and flight instruction providers.
- **Aviation/airport reliant.** This group includes businesses or activities that have a higher than average use of air service for freight or business travel, which may motivate location close to airports.
- **Non-aviation/airport reliant:** This group includes businesses or activities that are *not* dependent or reliant on air service for production, shipping, or other business activities. Other factors motivate the location of these businesses on or near airports; these may include real estate costs, proximity to other transportation facilities, or zoning issues related to environmental impacts (e.g., noise).

Various research efforts inform our understanding of the relationships between airports and surrounding land uses. The Bureau of Transportation Statistics Transportation Satellite accounts have identified freight forwarding, computer equipment, business services, computer and data processing, electrical equipment and scientific instrument industries as those with a higher than average reliance on air travel.[2] Similarly, through examining the role of the scale

[2] U.S. Dept. of Commerce and Bureau of Transportation Statistics, 2000: Transportation Satellite Accounts, 1996.

of aircraft operations and access to the airport (e.g., drive time) on county-level industry composition (e.g., employment *per-capita*) for the U.S., EDRG has found that light manufacturing industries that rely on exporting and importing air cargo, and service industries (such as media, technical or scientific, or administrative services) that rely on employee business travel are among the business sectors that value air transportation.[3] The value these businesses assign to air service may motivate them to locate operations close to airports when possible. This concept is supported by an analysis by Appold and Kasarda (2006), which studied the role of the 25 busiest U.S. airports[4] as urban anchors using an examination of employment composition and dynamics using broad NAICS categorizations from Zip Business Pattern data for 1995 and 2002) identifies that *Manufacturing, Wholesale trade,* and *Transportation and Warehousing* activities are 1 to 3 times more concentrated within an airport radius (measured in 2.5-, 5-, and 10-mile increments) than within the same radius to the central business the airport serves.[5]

Businesses may have varying types of aviation needs within these aviation-reliant industries, however. For example, some must locate adjacent or in very close proximity to an airport or major transportation artery (such as freight transportation businesses and hotels and lodging), while others simply need convenient and reliable access to an airport, and are more flexible in location decisions.[6] For businesses that are less reliant on air service for their activities (such as broadcasting, construction, agriculture, and stone and clay products industries), their links to the airport are even less clear.[7]

It is also worth noting that despite general patterns in industry aviation dependence or reliance (motivating business location), both the physical spread of business location around an airport (from an immediate district to an "airport region") and the mix of business activities found will vary widely from one airport facility to another.[8] Factors shaping this variation include land availability, parcel assembly, land ownership, property taxes, land-side access, abutting land uses, airport size or classification (i.e., general aviation versus

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[3] Alstadt and Weisbrod, The Relationship of Transportation Access and Connectivity to Local Economic Outcomes: A Statistical Analysis, Transportation Research Board, Annual Conference January 2012. Also see Appendix 1 – Market Access Memo.

[4] All are large or medium commercial hubs and are not the focus of this project. This research is mentioned to note the principle of locating near an airport due to the value assigned to air service.

[5] See Appendix 1: Market Access Memo.

[6] See Appendix 2: TF Green Research Memo.

[7] See "Initial Thoughts of Industries that are Attracted to Airports," September 19, 2012.

[8] See Appendix 1: Market Access Memo.

regional), among others.[9] The dynamic that determines this mix and physical spread may range from the organic to the highly facilitated (i.e., planning policies were leveraged to market and attract synergistic land uses), and the pace of airport and other land use "co-location" can be difficult to predict.

Table C.2 below categorizes examples of different land use activities identified through this survey according to adjacent airport type and according to the "aviation/airport dependent," aviation/airport reliant," and "non-aviation/ airport reliant" categories mentioned above. The inclusion of industries or activities in a given category is based on EDRG's experience researching patterns of aviation dependence.

Table C.2 Examples of Airport-Proximate Industries/Activities (by Airport Type and Relationship)

	Industries/Activities Located in Proximity to Airports		
	Dependent	Reliant	Not Dependent or Reliant
General Aviation	• Air charter services • Repair and maintenance services • Flight instruction companies • Fixed based operators • Hangar sales and leasing centers • Aerospace manufacturing • Car rentals • Taxi service • Restaurants • Mail/cargo freight forwarders (e.g., FedEx)	• Investment firms • Printer manufacturing • Phone/Internet service providers • Engineering consultants • Pharmaceutical companies • Business administration • Corporate headquarters	• Agricultural operations • Construction companies • Brewing companies • Plastics manufacturing • Construction products manufacturing • Automotive racing schools • Fertilizer manufacturing • Tanning • Rubber mill • Fiber container production
Reliever	• Air charter services • Aircraft component suppliers fueling services • Repair, maintenance, and restoration services • Flight instruction companies • Fixed based operators • Hangar sales and leasing centers • Aviation museums	• High-tech industries • Financial, accounting and engineering services • Real estate services • Electronics manufacturing • Silicone/polymer manufacturing • Corporate offices • Phone/Internet service providers	• Agricultural operations • Packaging manufacturing • Processed food manufacturing • Sports complexes • Public school warehouse and food service facilities • Solar arrays • Golf courses

[9] Ibid.

	Industries/Activities Located in Proximity to Airports		
	Dependent	Reliant	Not Dependent or Reliant
	• Aerospace manufacturing • Car rentals • Taxi service • Restaurants • Mail/cargo freight forwarders (e.g., FedEx)		
Small/ Medium Commercial	• Passenger transportation (scheduled and non-scheduled) • Hotels and motels • Couriers • Restaurants • Taxi service • Food service • Retail and restaurants, • Other ground transportation to/from airport • Fuel vendors • Airport support activities • Hangar rental • Flight training • Parking lots and garages • Mail/cargo freight forwarders (e.g., FedEx)	• Merchant wholesalers • Ambulatory health care services, • Machinery manufacturing and maintenance • Electronics repair and maintenance • Electrical equipment and appliance manufacturing • Truck transportation • Computer and electronic product manufacturing • Telecommunications • Publishing industries (except Internet) • Internet service providers • Data processing	

Source: EDR Group, 2012.

The summary presented in Table C.2 suggests a number of possible land development trends for the areas around general aviation airports.

- Areas adjacent to airports may provide manufacturing facilities with opportunities to expand that may not be available in denser or more developed parts of the community (see the Smyrna/Rutherford County Airport and Corvallis Municipal Airports examples). It is possible that office operations may have similar concerns.
- Airport-area sites are likely attractive for activities that require a lot of space but not necessarily built development. Examples include the solar array at the Smyrna/Rutherford Regional Airport, the farm incubator at the Port of

Skagit, and the raceway and driving schools at the Sebring Regional Airport and Commerce Park.

- While the mix of land uses around a given airport depends on a wide variety of factors – including individual business needs, the characteristics of the airport, and the availability of property elsewhere – facilitation on the part of economic development authorities and others plays an important role in shaping this mix.
- The desire to avoid environmental impact conflicts, specifically related to noise, is likely a significant motivator for non-aviation businesses locating near airports. That said, the combination of manufacturing, sports, and human service activities at the Chesterfield County Airport Industrial Park suggest that potential environmental conflicts among widely different uses can be managed.

As we move forward, we should consider the following factors when interviewing airport operators and tenants of airport or adjacent business/industrial parks, and local economic developers:

- Expansion potential that is considered when making sitting decisions. Airport or business park tenants (particularly those in manufacturing) may consider future opportunities to expand as one of their key criteria. Because of this, they may evaluate whether a particular airport and/or related industrial park may provide these opportunities (air service availability aside).
- Complementary factors that create viable economic development climate, including: 1) adjacent transportation facilities, 2) available/access to cost effective infrastructure, including water, sewer, electricity and broadband, 3) real estate prices in comparison with "traditional" local development sites, 4) airport or airport business park business attraction efforts (including tax credits or other financing), 5) open space and supportive zoning, and 6)opportunities to avoid land use conflicts (noise, air quality) when they make business siting decisions on or near airports.

Changes of land use over time, and if development is being attracted to parcels proximate to airports or is leaving airport areas, and if there are discernible reasons for either trend

C.4 MARKET ACCESS: LIST OF CANDIDATE INDUSTRY ACTIVITIES TO LOCATE ON OR NEAR AIRPORT FACILITIES

Opportunities will range from businesses that are typically found *within/around the airport perimeter* depending on land available each side of the fence [supporting passenger/cargo aircraft needs, entities with complimentary needs e.g., Air National Guard, Aerial Spraying-Photographic Services, Aviation-

development activities], to other forms of business location driven by (or not deterred by) proximity to the air services offered (passenger and/or cargo, frequency and scale of operations), such as HQ offices, hotels, restaurants, ground transportation providers (including car rental agencies), and industrial activities that ship/receive goods by air.

The physical spread of business location around an airport (from an immediate district to an " airport region"), as well as the mix of business activities found, will be highly variable from one facility to another (even if the two facilities carry the same State airport functional classification designation) as a result of land availability (determined by topography, extent of pre-existing development, zoning), parcel assembly, land ownership, property taxes, landside access, abutting land uses, producer amenities of the location. The portion of business location within an airport district that is the result of nearby air transportation services will clearly look different within a community airport setting in contrast to a regional airport setting.

The process by which the in-fill around an airport has occurred to date may reflect a dynamic between *entirely organic* (the area and region was endowed with attractive cost and quality assets needed for conducting business) with no zoning conflicts, and a process that is heavily facilitated by leveraging planning policies (at minimum to protect the operating envelop of aircraft) to market and attract synergistic tenant uses to airport-adjacent land.

The pace of co-location can be hard to predict. There are cases where an airport authority has prepared for business park absorption only to wait years before a new link inserted into the road network completes the "corridor functionality" that a new business entrant requires for an improved base of business operations. Likewise, some airport district plans start to come to fruition only after excess (superior grade) commercial/industrial real estate supplies have been exhausted elsewhere in the city/metro-area.

EDR Group has examined the role of *the scale of aircraft operations* <u>and</u> *access to the airport,* drive time, (# of Annual operations ÷ access time) on county-level industry composition (e.g., employment *per-capita*) for the U.S. In general, business sectors that are known to value air transportation include light manufacturing industries that rely on exporting and importing air cargo, and service industries that rely on employee business travel. The Table C.3[10] showing instances of significant relationship indicates different business activities place different importance on being close to the scale of air services they require (whether for business travel or air-cargo flows). This identification

[10] Alstadt and Weisbrod, The Relationship of Transportation Access and Connectivity to Local Economic Outcomes: A Statistical Analysis, Transportation Research Board, Annual Conference January 2012.

is not meant to capture key suppliers to the functioning of an airport and fleet of aircraft (*aviation support*).

Table C.3 Industry Sensitivities to Airport Access-"Quality" ranked on Domestic Airport Sensitivity

NAICS	Sector Description	Sensitivity to Access Measure Scale -0 to 10
511	Publishing Industries (except Internet)	10
541-551	Professional Scientific, Technical, Services	10
561	Administrative & Support Services	10
711-713	Amusement & Recreation	10
512	Motion Picture & Sound Recording	9
230	Construction	7
323	Printing & Related Support Activities	7
531	Real Estate	7
721-722	Accommodations, Eating & Drinking	7
811-812	Repair, Maintenance, & Personal Services	7
813	Religious, Civic, Professional, Organizations	7
920	Government & non NAICs	7
339	Miscellaneous Manufacturing	5
513	Broadcasting	5
514	Internet & data process services	5
524	Insurance Carriers & Related Activities	5
525	Funds, Trusts, & Other Financial Vehicles	5
532	Rental & Leasing Services	5
533	Lessors of Nonfinancial Intangible Assets	5
212-213	Mining & Support Activities	4
325	Chemical Manufacturing	4
331	Primary Metal Manufacturing	4
221	Utilities	3
335	Electric Equipment, Appliances, etc.	3
336	Transportation Equipment	3
337	Furniture & Related Products	3
420	Wholesale Trade	3
441-454	Retail Trade	3
481-487	Transportation	3

NAICS	Sector Description	Sensitivity to Access Measure Scale -0 to 10
521-523	Monetary, Financial, & Credit Activity	3
562	Waste Management & Remediation	3
611	Educational Services	3
113	Forestry & Logging	2
313	Textile Mills	2
316	Leather & Allied Products	2
327	Nonmetallic Mineral Products	2
332	Fabricated Metal Products	2
333	Machinery Manufacturing	2
334	Computer & Electronic Products	2
491-493	Mail, package delivery & warehousing	2
111	Crop Production	0
112	Animal Production	0
114	Fishing, Hunting & Trapping	0
115	Support for Agriculture & Forestry	0
211	Oil & Gas Extraction	0
311	Food Products	0
312	Beverage & Tobacco Products	0
314	Textile Product Mills	0
315	Apparel Manufacturing	0
321	Wood Products	0
322	Paper Manufacturing	0
324	Petroleum & Coal Products	0
326	Plastics & Rubber Products	0
621-624	Health Care & Social Services	0

Source: EDR Group, 2012.

An analysis by Appold and Kasarda (2006) of airports as urban anchors for the 25 busiest U.S. airports (an examination of employment composition and dynamics using broad NAICS categorizations from Zip Business Pattern data for 1995 and 2002), identifies that *Manufacturing, Wholesale trade,* and *Transportation & Warehousing* activities are 1-to-3-times more concentrated within an airport radius (2.5, 5, and 10-miles) than within the same radius to the central business the airport serves. While this is of interest, it does not conclusively explain the diverse factors (zoning, land availability, traffic conflicts) that may also be at

work in the location decisions of a manufacturer, a distributor, or a transportation logistics firm.

Case studies would be the best approach for trying to "predict" the spatial lure of airport districts to other business types that profess no real need for airport services.

C.5 NATIONAL AIRPORT LAND USE CASE STUDIES

The case studies described below include both airports that have been reviewed as part of larger economic impact studies and airports that have been identified through a recent Internet search on land and business activities on or proximate to general aviation airports. These case studies include (when available) information about 1) on-airport and airport area businesses, industries, or activities, 2) the size, tenants, and activities of airport-related or airport-proximate business or industrial parks, and 3) anecdotal information pertaining to business attraction and sitting.

Mesa Falcon Field Airport (Mesa, Arizona)

The City of Mesa's Falcon Field general aviation airport has been identified as the 5th busiest general aviation airport in the U.S. in 2011, and Falcon Field's 105 on-airport businesses employ over 1,000 people.[11] Businesses that depend on Falcon Fields aviation activities traffic include air charter services, aircraft component suppliers, fueling services, repair, maintenance, and restoration services, flight instruction companies, fixed based operators, hangar sales and leasing centers, and a Commemorative Air Force museum, among others.[12] Non aviation dependent airport tenants include several financial, accounting, and real-estate businesses, a software company, an Internet service provider, and an optometry/ophthalmology services center, along with several firms offering office space for lease.[13] The surrounding Falcon Field off-airport employment, which is made up of a series of more than 10 industrial parks, employs over 13,000. Tenants include companies in the aerospace/aviation, high-tech, manufacturing and software industries, with Boeing's Apache Helicopter facility serving as the largest employer.[14] The Falcon Field area is promoted by the non-profit Falcon Field Area Alliance, which has described itself as seeking to attract

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[11] City of Mesa, Arizona. "Falcon Field Employment Center." 2012. http://www.mesaaz.gov/economic/FalconField.aspx. (Accessed October 24, 2012).

[12] City of Mesa, Arizona. "Falcon Field Business Listings." 2012. http://apps.mesaaz.gov/falconfield/tenants.aspx. (Accessed October 24, 2012).

[13] Ibid.

[14] City of Mesa, Arizona. "Falcon Field Employment Center." 2012. http://www.mesaaz.gov/economic/FalconField.aspx (Accessed October 24, 2012).

regional headquarters and financial services businesses to the area in addition to aerospace and aviation-related firms, suggesting a more structured, intentional approach to creating the land use mix surrounding the airport. [15]

Skagit Regional Airport (Burlington, Washington)

The Skagit Regional Airport, a general aviation airport, is part of the Port of Skagit, which is described as an economic development engine for Skagit County in northwest Washington. The Port includes the La Conner Marina and the Bayview Business Park along with the airport, and identifies its goal as to "attract manufacturers in different sectors, such as aerospace, agriculture processing and clean tech to complement existing tenants."[16],[17] In addition to typical airport tenants such as fixed base operators, restaurants, hangar leasing companies, and repair and maintenance providers, on-airport non-aviation related tenants at Skagit Regional Airport include several construction companies. [18]The Port reports that as of spring 2012, the airport, business park, and marina house "76 businesses that employ nearly 1,000 people."[19] Slightly more than half of the businesses in the overall Port are part of the aerospace industry, with the largest tenant being aerospace manufacturer Hexcel Corp.[20] Non-aviation-related tenants specific to the business park include Comcast, Seawolf Marine Manufacturing, Olympic Pipeline, Skagit Valley Malting and Brewing, U.S. Mower (industrial, forestry, and roadside mowing equipment), Fiberglass

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[15]Mike Sunnucks, "New Falcon Field Group Promoting Area Development," *Phoenix Business Journal,* August 29, 2004. http://www.bizjournals.com/phoenix/stories/2004/08/30/story6.html (Accessed October 24, 2011).

[16]Port of Skagit. "About the Port." 2012. http://www.portofskagit.com/about-the-port. (Accessed October 24, 2012).

[17]Marc Stiles. "Real Estate Buzz: Industrial Market Blooms in Skagit County."April 26, 2012, Seattle Daily Journal of Commerce. http://www.portofskagit.com/images/uploads/djc_real_estate_buzz_clip.pdf.(Accessed October 24, 2012).

[18]Port of Skagit. "Airport Tenants" 2012. http://www.portofskagit.com/skagit-regional-airport/tenants/. (Accessed October 24, 2012.)

[19]Marc Stiles. "Real Estate Buzz: Industrial Market Blooms in Skagit County."April 26, 2012, Seattle Daily Journal of Commerce. http://www.portofskagit.com/images/uploads/djc_real_estate_buzz_clip.pdf.(Accessed October 24, 2012).

[20]Ibid.

Supply (reinforced plastics manufacturing), along with a vegetable seeds company and a farms incubator program, among others.[21]

Chesterfield County Airport (North Chesterfield, Virginia)

The Chesterfield County Airport, a reliever airport for the Richmond International Airport, adjoins the Chesterfield Airport Industrial Park, a 265-acre industrial park for light industry and manufacturing that is home to more than 100 businesses.[22,23] Airport dependent businesses include fixed-based operators, onsite flight training companies, charter services, repair services, and restaurants.[24,25] Materials, machine and electronics manufacturing comprise a number of the businesses in the industrial park, although packaging and processed food facilities are also represented (for example, as of 2008, Maruchan Virginia, Inc, a ramen and instant-soup manufacturer, was the largest tenant, and moved to expand its existing facilities in 2009).[26,27,28] Neighbors to these operations include a wide variety of activities, ranging from sports and dance complexes to technical and engineering services firms to the Chesterfield County Schools food and warehousing operations to Church of Latter Day Saints

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[21] Port of Skagit. "Current Tenants [Bayview Business Park.]" 2012/ http://www.portofskagit.com/bayview-business-park/current-tenants. (Accessed October 24, 2012.)

[22] Chesterfield County Airport. "Chesterfield County Airport – Richmond, Virginia." 2012. http://flychesterfield.com/ (Accessed October 24, 2012.)

[23] Chesterfield Economic Development. "Commercial Property Online Search." 2012. http://www.chesterfieldbusiness.com/page.asp?id=5 (Accessed October 24, 2012).

[24] Chesterfield County Airport. "Chesterfield County Airport – Richmond, Virginia." 2012. http://flychesterfield.com/ (Accessed October 24, 2012.)

[25] Chesterfield County, VA. "Chesterfield County Airport." 2010. http://www.chesterfield.gov/airport/ (Accessed October 24, 2012).

[26] "Chesterfield Airport Industrial Park: Businesses Located in the Chesterfield Airport Industrial Park." August 25, 2010. https://maps.google.com/maps/ms?ie=UTF8&hl=en&cid=6921540860998839120&hq=&hnear=&msa=0&msid=113081965295176481565.0004830863ae705daf592&ll=37.402523,-77.525899&spn=0.012516,0.015396&t=h&source=embed/ (Accessed October 24, 2012.)

[27] Wesley P. Hester. "Industrial Park Expansion: The County Wants to Open Land For Development Around Airport." March 2, 2008. *Richmond Times-Dispatch-Va.* "http://www.redorbit.com/news/business/1277537/industrial_park_expansion_the_county_wants_to_open_land_for/(Accessed October 24, 2012.)

[28] Chesterfield Economic Development. "2009 Investment Announcements." http://www.chesterfieldbusiness.com/page.asp?id=239&t=2009_Investment_Announcements. (Accessed October 24, 2012.)

recovery and animal welfare facilities.[29] The president of one tenant, Quantum Silicones, Inc, (a silicone and polymer manufacturing business,) indicated that he found the area's "location and potential" attractive when making siting decisions, and uses the nearby air service to connect with clients.[30]

Smyrna/Rutherford County Airport (Smyrna, Tennessee)

The Smyrna/Rutherford County Airport is a reliever airport for the Nashville Area. [31] Airport dependent companies include several fixed base operators and fueling services.[32] The airport is adjacent to the 400 acre Smyrna Airport Business Park, a master planned development that offers aviation sites with direct airfield access, corporate headquarter locations, commercial, and industrial sites.[33] Both Nissan and Thompson Machinery (heavy construction equipment) rent office space on this site.[34] The Smyrna Municipal Golf Course lies on the south side of the airport.

The Nashville Business Journal has reported that as of 2012, the business park is home to more than two dozen businesses but has lacked a corporate powerhouse.[35] As part of an effort on the part of the Smyrna/Rutherford County airport authority to secure new tenants and "color the types of firms that set up

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[29] "Chesterfield Airport Industrial Park: Businesses Located in the Chesterfield Airport Industrial Park." August 25, 2010. https://maps.google.com/maps/ms?ie=UTF8&hl=en&cid=6921540860998839120&hq=&hnear=&msa=0&msid=113081965295176481565.0004830863ae705daf592&ll=37.402523,-77.525899&spn=0.012516,0.015396&t=h&source=embed/ (Accessed October 24, 2012.)

[30] Wesley P. Hester. "Industrial Park Expansion: The County Wants to Open Land For Development Around Airport." March 2, 2008. *Richmond Times-Dispatch-Va.* "http://www.redorbit.com/news/business/1277537/industrial_park_expansion_the_county_wants_to_open_land_for/(Accessed October 24, 2012.)

[31] Smyrna/Rutherford County Airport. "About Us." http://www.smyrnaairport.com/about_us (Accessed October 24, 2012).

[32] Smyrna/Rutherford County Airport. "Pilot Info." http://www.smyrnaairport.com/pilot_info (Accessed October 24, 2012).

[33] Smyrna/Rutherford County Airport. "Business Site Opportunities." http://www.smyrnaairport.com/business_sites (Accessed October 24, 2012).

[34] Kevin Litwin. "Smyrna Airport is Tennessee's Busiest for General Aviation." April 19, 2012. *BusinessClimate.com* http://businessclimate.com/murfreesboro-smyrna-la-vergne-tn-economic-development/smyrna-airport-tennessees-busiest-general-avia. (Accessed October 24, 2012).

[35] Annie Johnson. "Smyrna Aims to Lure Firms with Solar Field." February 10, 2012. *Nashville Business Journal.* http://www.bizjournals.com/nashville/print-edition/2012/02/10/smyrna-firms-with-solar-field.html?page=all (Accessed October 24, 2012).

shop and create jobs in the region," the Business Park recently became home to a 6-acre, 1 megawatt solar farm through a partnership with the airport authority and Soltas Smyrna, LLC. [36,37] Several airports around the country, including both local airports and larger international facilities, have installed solar arrays on airport property.[38] Since the installation of the array, the airport has received a number of inquiries from potential tenants, and Rutherford County's economic development director noted that, "the installation of a new solar field to the airport continues to position the park and our community as a destination for clients that are pivotal in green technology."[39]

Sebring Regional Airport and Commerce (Sebring, Florida)

The Sebring Regional Airport and Commerce Park includes the Sebring Regional general aviation airport as part of a 2,000 acre overall site. This area is shared with the Sebring International Raceway, which leases property from the airport, property owned by the Sebring Utility Commission, existing industrial sites, a "catalyst site" that will focus on health care and science activities, along with acreage planned for future commerce, aviation, and industrial development.[40,41] Established aviation and aerospace-related tenants of the airport include Aero-Med/C.J. Systems Aviation Group (aero-medical facility), Carter Aircraft (aircraft maintenance, repair, and painting), Float Planes & Amphibs (sales, repair, and construction of ultra-light sports planes), Lockwood Aviation/Pt Buildings (flight school and engine service center), among others. Non-aviation related tenants include: Everglades Foods, Inc. (seasoning products), Funder America, Inc. (melamine laminate board and other construction products manufacturing), Genpak LLC (Manufacturer of polystyrene products), Globalstar USA, LLC (mobile satellite voice and data services provider), Turf Care Supply Corp. (fertilizer manufacturing plant), Sebring Custom Tanning

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[36] Ibid.

[37] http://www.dnj.com/article/20120429/SPOTLIGHT/304290087/Smyrna-Airport-flying-high-possibilities

[38] Annie Johnson. "Smyrna Aims to Lure Firms with Solar Field." February 10, 2012. *Nashville Business Journal.* http://www.bizjournals.com/nashville/print-edition/2012/02/10/smyrna-firms-with-solar-field.html?page=all (Accessed October 24, 2012).

[39] Ibid.

[40] Sebring Regional Airport and Commerce Park. "Sebring Regional Airport and Commerce Park." http://www.sebring-airport.com/pdf/SRA%20Brochure.pdf (Accessed October 24, 2010).

[41] Sharise Cruz. "Sebring Regional Airport's Plan to Change the Face of Florida." *North America Business Review: U.S. Edition.* http://www.businessreviewusa.com/company-reports/sebring-regional-airport. (Accessed October 24, 2010).

(tanning of animal hides), Han Cor Inc. (producer of high-density polyethylene plastic drainage pipe), several granite products manufacturers, and several automotive racing schools, among others. [42] An article in Highlands Today (part of Tampa Media Group, which owns the Tampa Tribune) [43], as well as other reports[44], describe the proactive work the industrial park's executive director has done to recruit tenants, but there is limited detail about other factors that may have attracted existing tenants to the site. Various forms of tax credits, refunds, and financing are available in the Highlands County area, in which the airport is located, for economic development purposes.[45]

Corvallis Municipal Airport (Corvallis, Oregon)

The Corvallis Municipal general aviation Airport is just south of a 220-acre industrial park, which has attracted nearly 20 high-technology, light manufacturing, and services businesses.[46] On- airport aviation related tenants include fixed based operators, air medical services, hangar rental companies, and flight schools, among others. Industrial Park tenants include Fed Ex, Oregon Rubber Mills, Western Pulp Products (producer of molded fiber containers),WKL Investments, Viewplus Technologies (Braille printers and learning systems), and

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[42] Sebring Regional Airport and Commerce Park. "Sebring Regional Airport and Commerce Park." http://www.sebring-airport.com/pdf/SRA%20Brochure.pdf (Accessed October 24, 2010).

[43] Bill Rettew, Jr. "Sebring's Airport Business Park Prepares for Growth." September 21 2008. *Highlands Today*. http://www2.highlandstoday.com/news/highlands-news/2008/sep/21/la-sebring-airports-business-park-prepares-for-gro-ar-309018/?referer=http://www.google.com/url?sa=t&rct=j&q=airport%20%2B%20business%20parks%20%2B%20general%20aviation&source=web&cd=75&ved=0CDgQFjAEOEY&url=http%3A%2F%2Fwww2.highlandstoday.com%2Far%2F309018%2F&ei=NRB8UP-sNYjW0gHr84CACQ&usg=AFQjCNG6fR0wy5c57Asof0YSZqicv1K5cg&shorturl=http://bit.ly/tT5p7B (Accessed October 24, 2008.)

[44] "General Aviation Airports: Economic Development Engines for Florida's Community Development." March 2006. http://www.sebring-airport.com/docs/draft-final-report-feb-2006.pdf Available From: http://sebring-airport.com/NewsEvents.html. (Accessed October 24, 2012). Pages 20-26.

[45] Trade and Industry Development. "Growing, Growing, Growing: Highlands County, Florida." June 30, 2006. http://www.tradeandindustrydev.com/Region/Florida/growing-growing-growing-highlands-county-florida-3998 (Accessed October 24, 2012).

[46] City of Corvallis, Oregon. "Industrial Park." 2012. http://www.corvallisoregon.gov/index.aspx?page=1058 (Accessed October 24, 2012).

Kattare Internet systems, among others.[47] Surveys conducted in support of Oregon's 2008 Aviation plan reported that the Corvallis Municipal Airport has recreation, local business, tourism, out-of-town business, and agricultural users, and provides mail/cargo service to surrounding communities.[48] The Corvallis Airport Industrial Park was made part of the Benton Corvallis Enterprise Zone in 2008; the Enterprise Zone provides tax abatements for new investments that create employment in the area.[49]

The Corvallis Gazette-Times reported that in October 2012, the Benton County Board of Commissioners voted to rezone the airport industrial park from "urban industrial" to special use zone airport industrial park.[50] This means that up to 90,000 square feet of land in the Park can be used for business support services, professional or administrative offices or call centers, and an additional 10,000 square feet can be used for convenience stores, farm stands or restaurants. While the new zoning has been pursued by local economic development authorities to make the property more attractive for development, existing industrial tenants have expressed concern about the zoning change. The president of Oregon Rubber Mills, which has been a tenant of the Park for about 20 years, stated "We have trucks, we have noise, we're capable of operating 24 hours a day, seven days a week — we have a lot of things that might not mix well with other types of businesses. If you put somebody right next door to us, we could have a problem." A representative of Western Pulp Products stated that making the park available to non-industrial activities could make it more difficult for companies like Western Pulp Products to operate, expand, or sell their businesses.[51]

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[47] Coffman Associates. *Corvallis Municipal Airport: Airport Master Plan (Draft Final Report). Chapter 1: Inventory.* http://airportstudy.com/media/corvallis/cvo_mp/Ch1%208-2012.pdf (Accessed October 24, 2012). Exhibit 1L.

[48] Mead and Hunt, in cooperation with Economic Development Research Group. *2007 Oregon System Plan.* "Corvallis Municipal Airport – Individual Airport Report." Prepared for the Oregon Department of Aviation. February 2008. "http://www.oregon.gov/aviation/docs/system_plan/airport_reports/corvallis_municipal.pdf, Page 25. (Accessed October 24, 2012).

[49] Corvallis Benton Chamber Coalition. "The Corvallis Airport Industrial Park." 2010. http://corvallis.snappages.com/airport-industrial-park.htm (Accessed October 24, 2012).

[50] Bennett Hall. "Airport Industrial Park Rezoned." October 17, 2012. *Corvallis Gazette-Times.* http://www.gazettetimes.com/news/local/airport-industrial-park-rezoned/article_708de424-17f3-11e2-9dff-001a4bcf887a.html. (Accessed October 24, 2012).

[51] Ibid.

Donaldson Center/SCTAC (Greenville, South Carolina)

The Donaldson Center general aviation airport is proximate to Greenville, South Carolina (as is the Greenville Downtown general aviation airport and the Greenville-Spartanburg International Airport.) The Donaldson Center general aviation airport lies six miles south of Greenville and is a part of the SC Technology and Aviation Center (SC-TAC), a 2600 acre "progressive business airport and advanced park." [52, 53] Over 80 companies are located within the Center. SC-TAC reports that the largest categories of industries represented at the park are manufacturing and engineering services, with prominent private-owned employers including Lockheed Martin, Stevens Aviation, 3M, Cytec Carbon fibers and Ethox Chemicals. SC-TAC provided the following employment breakdown (by industry) for 2010:[54]

- "34 percent Aviation-related activities;
- 31 percent Manufacturing-related activities;
- 22 percent Trade businesses; and
- 13 percent others, including 50 diverse categories ranging from biotech research and development, to pharmaceutical development and professional consulting"

An economic impact study completed for Donaldson Airport reports "The airport is a vital component of the Donaldson Center Industrial Air Park [prior to the creation of the SC-TAC] whose tenants, including Lockheed Martin, Michelin, 3-M and many others, depend on the airport to transport people, goods and parts." [55]

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[52] South Carolina Technology and Aviation Center. "Your Runway to the World Takes Off Here." 2012. http://www.sc-tac.com/location.aspx (Accessed October 24, 2012).

[53] South Carolina Technology and Aviation Center. "A Quick Snapshot of SCTAC." 2012. http://sc-tac.com/quick-facts.aspx (Accessed October 24, 2012).

[54] South Carolina Technology and Aviation Center. Economic Impact Analysis Concludes SCTAC Industries Contribute 1.4 Billion to Local and State Economy in 2010." 2011 ""http://www.sc-tac.com/page1881224.aspx (Accessed October 24, 2012).

[55] Wilbur Smith Associates for the South Carolina Department of Commerce. *The Economic Impact of Donaldson Center Airport*. 2006. http://www.scaeronautics.com/systemplan/images/EconomicImpactRptsPdf%5CEIR_GYH.pdf. (Accessed October 24, 2012). Page 3.

Terrell Municipal Airport (Terrell, Texas)

This general aviation airport, which is owned by the City of Terrell, is adjacent to the Airport Business Park. [56]Tenants at the Airport Business Park include an Autozone Distribution Center, and Madix, Inc, a manufacturer of store fixtures and shop fittings.[57] Madix, Inc. houses its corporate headquarters as well as manufacturing facilities at this location. Maine's Paper and Food Service, Inc. recently established a distribution center at the Airport Business Park, and according to Maine's President and CEO, "Terrell was the perfect location for the new distribution center, with a strategic distribution site, a strong workforce and city incentives." [58] (The center will serve 196 restaurants throughout Texas, Arkansas, Louisiana, Missouri and Oklahoma.)[59]The Terrell Economic Development Corporation identifies its 4,500 acre tax increment financing district, which includes the Airport Business Park, as "the single largest Rural TIF in Texas" and "one of the most aggressive in the State of Texas," which includes support from Urban Development Action Grants, Industrial Revenue Bonds, Texas Capital Fund, Enterprise Zone, and the Skills Development Fund for Job Training.[60]

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[56]Terrell Municipal Airport. "Welcome to Terrell Municipal Airport." http://www.terrellairport.com/index.htm (Accessed October 24, 2012).

[57]Terrell Economic Development Corporation. "Airport Business Park." http://www.terrelltexasedc.com/TEDC_Airport.pdf (Accessed October 24, 2012).

[58]PR Newswire. "Maine's Paper and & Food Service, Inc. to Hire 100 Employees for New Terrell Location." October 21, 2011. http://www.prnewswire.com/news-releases/maines-paper-food-service-inc-to-hire-100-employees-for-new-terrell-location-132267408.html (Accessed October 24, 2012).

[59]**Candace Carlisle,** "NY-based Maine's to open a North Texas distribution center, hire up to 400." September 29, 2011. *Dallas Business Journal,* http://www.bizjournals.com/dallas/news/2011/09/29/new-york-based-maines-to-open-a.html?ana=RSS&s=article_search&utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+industry_20+%28Industry+Commercial+Real+Estate%29. (Accessed October 24, 2012).

[60]Terrell Municipal Airport. "Taking Business to New Heights!" 2012. http://www.terrellairport.com/pdf/Airport-brochure.pdf. (Accessed October 24, 2012). Page 5.

D. Case Study Interview Guide

D.1 INTERVIEW GUIDE

Background Information

1. Airport Name
2. Airport Manager
   a. Name
   b. Title
   c. Contact information

Interview

Your participation in this interview will last from 15 to 45 minutes, depending on the complexity of activities at the airport.

Industries around the Airport

1. What is the current range of public and private aviation uses on the airport (e.g., recreational, business, cargo, crop dusting, firefighting? *Try to inquire exact industries and companies and provide examples. We would like stories here.*
2. What industries are located on your airport, including seasonal activities, and whether there is direct use of aircraft facilities. *Check off uses on List 1. If there are industries not included on the list, please explain.*
3. What industries are located near your airport? Check off uses on List 1. If there are industries not included on the list, please add the type and explain what they do.
4. Who are the businesses that have based aircraft at the airport? *Start with any information that we obtained from web search.*
5. Are there businesses that regularly use the airport that are not based there? E.g., corporate aircraft bringing staff to area businesses; UPS/FedEx (ground and air freight forwarders)/AmeriFlight; seasonal charters, occasional diverted flights from nearby airports that might experience poor weather conditions, etc.

Table D.1 Examples of Airport-Proximate Industries/Activities

Industries/Activities Located in Proximity to Airports		
Dependent	**Reliant**	**Not Dependent or Reliant**
☐ Air charter services	☐ Investment firms	☐ Agricultural operations
☐ Flight instruction companies	☐ Printer manufacturing	☐ Construction companies
☐ Fixed-based operators	☐ Phone/Internet service providers	☐ Brewing companies
☐ Hangar sales and leasing centers	☐ Engineering consultants	☐ Plastics manufacturing
☐ Aerospace manufacturing	☐ Pharmaceutical companies	☐ Construction products manufacturing
☐ Car rentals	☐ Business administration	☐ Automotive racing schools
☐ Taxi service	☐ Corporate headquarters	☐ Fertilizer manufacturing
☐ Mail/cargo freight forwarders (e.g., FedEx)	☐ High-tech industries	☐ Tanning
☐ Aircraft component suppliers fueling services	☐ Financial, accounting and engineering services	☐ Rubber mill
☐ Repair, maintenance, and restoration services	☐ Real estate services	☐ Fiber container production
☐ Aviation museums	☐ Electronics manufacturing	☐ Packaging manufacturing
☐ Passenger transportation (scheduled and non-scheduled)	☐ Silicone/polymer manufacturing	☐ Processed food manufacturing
☐ Hotels and motels	☐ Corporate offices	☐ Sports complexes
☐ Couriers	☐ Merchant wholesalers	☐ Public school warehouse and food service facilities
☐ Food service	☐ Ambulatory health care services	☐ Solar arrays
☐ Retail and restaurants	☐ Machinery manufacturing and maintenance	☐ Golf courses
☐ Other ground transportation to/from airport	☐ Electrical equipment and appliance manufacturing	
☐ Fuel vendors	☐ Truck transportation	
☐ Airport support activities	☐ Computer and electronic product manufacturing	
☐ Parking lots and garages	☐ Telecommunications	
	☐ Publishing industries (except Internet)	
	☐ Internet service providers	
	☐ Data processing	

6. Have non-aviation businesses located on or near the airport? Do you know why they decided to locate here? Was the airport a factor in their decision? *If none, skip to next question.*

   Prompts: Try to find out about whether it is because there are an availability of utilities, the location is proximate to freeway connections, whether it is due to lack of NIMBYism, whether there are transit connections, or perhaps there is available land for development? Check off the following "reasons" why non-aviation dependent uses locate there and explain.

Table D.2 Why Non-Aviation Businesses Locate at the Airport

	Business Name and/or Type	Reasons to Locate at Airport
Amount of land available for non-aviation uses		
Availability of parking (e.g., lots, garages, park-n-ride)		
Cost of property		
Compatibility of surrounding land uses		
Proximity to existing communities		
Availability of utilities/infrastructure		
Proximity to highways and freeways		
Existing transit connections		
Lack of environmental constraints (e.g., noise, safety)		
Other:		

7. Have there been any proposals or interest in a business/industrial park around your airports? Do you think this is realistic? Why or why not?
8. What kind of businesses would you like to attract in the future? Do you have a strategy for doing so?
9. What kind of future do you see for your airport in 25 years time?

   Development Potential

10. Is there an airport specific business plan currently in use? If so, what year was it developed? What successes came of it?
11. Is there an airport specific marketing plan currently in use? If so, what year was it developed? What successes came of it?
12. What is the availability or likelihood for you to leverage (Federal, state or local) funding to provide complementary infrastructure to attract businesses?

13. Do you work with your economic development agency to promote business development?
14. **[ONLY AT RELEVANT AIRPORTS]** What is the potential for scheduled passenger service? What about for freight services? Other?

E. Methodologies for Estimating Economic Potential of Role 1 and Role 2 Airports

E.1 ROLE 1: POTENTIAL PRODUCTIVITY IMPACTS GENERATED BY SMART GROWTH POLICIES

Background

The relationship between economic density and productivity is widely known[61], with research tracing back well over a century. Fundamentally, increasing the scale and density of economic activity increases the size of markets, reduces shared costs, facilitates knowledge spillovers, and stimulates innovation—all of which can lead to increased productivity and growth. Yet, behind these broad outcomes lie a range of specific mechanisms that operate across a range of spatial and industrial scales.

With respect to the GA and small commercial airports in consideration in the present study, two distinct types of agglomeration are of particular importance. The first recognizes the airport as a transportation hub. Airports can provide rapid access to nearby and distant cities in California and other states. Distances enabled by connectivity provided by airports depend on sizes of runways, types of aircraft used and, for commercial service, the connectivity to hub airports. The second simply recognizes the airport as a locus of economic activity—a sub-metropolitan agglomeration of firms that, through co-location, can enjoy greater efficiency and productivity than if the firms were arranged in a more dispersed spatial arrangement.

It is important to emphasize that while these two categories can be (and indeed, will be) measured distinctly—the second is fundamentally related to the first through the processes of agglomeration (i.e., positive spatial feedback). This is best illustrated by an example. Assume that two firms (a warehouse and a small corporate headquarters) are attracted to an airport as a *transportation asset*. They may develop or expand warehousing and office space to specifically take advantage of the airport (for freight shipment and passenger travel,

[61]See Weisbrod et al., 2012, http://www.edrgroup.com/pdf/Alstadt-Weisbrod-Market%20Access-TRB-2012.pdf.

respectively). Once these firms are there, other firms may subsequently be attracted to the site in order to be near the first two firms (for example, a trucking company or a sandwich shop). Note that this secondary attraction is not directly related to the airport itself, but might not exist were it not for the presence of the airport. Finally, the two initially airport-dependent firms may move or go out of business, and the buildings may become re-occupied by firms that have no interest in the airport at all, but are instead attracted by the clustered activity (including the trucking firm and sandwich shop). Again, the specific firms may not be directly related to the airport, but the airport remains a strong residual influencer of the agglomeration process.

In what follows below, for each airport, we attempt to identify how increasing airport density yields productivity in two distinct ways. The first is the additional productivity enjoyed by firms from being proximate to the airport as a transportation asset. The second is the additional productivity enjoyed by firms from being part of clustered economic activity.

Methodology

Our general approach is summarized in the following steps:

1. For each airport presented in the case studies (Section 5), estimate gross employment changes by two-digit NAICS sector resulting from smart growth policy;
2. Estimate net employment changes for the State of California;
3. Use TREDIS to estimate net productivity change from the change in airport access; and
4. Develop and apply statistical relationships to determine productivity effects from increased employment density at zip-code level.

Determine Gross Employment Change in Airport Zip Codes

For both impact types discussed above, a common starting point was to determine the gross change in employment that could be expected from applying smart growth policies to the four airports discussed in Section XX. As outlined there, smart growth policies could be expected to increase the floor-area-ratio (FAR) for different land uses that conform to general zoning guidelines – which in turn would accommodate more employment. These results are summarized in Table E.1.

Table E.1 Summary of Estimated Employment Change by Land Use

Land Use	Buchanan	Santa Monica	Fresno	Gillespie
Light Industrial	1,796	5,615	6,360	1,520
Warehousing	412	1,551	1,000	10
Office	7,430	0	6,800	7,301
Retail	573	0	0	0
Total	**10,211**	**7,166**	**14,160**	**8,831**

Note: Sources are discussed in Part 3 of this technical memorandum and in Section 5.1. The sources include ESRI, the National Association for Industrial and Office Properties, Google Maps, observations from site visits and interviews first with airport managers and subsequently with local economic development officials

The next step in determining the economic consequences of these land use changes is to estimate which NIACS industries would likely utilize the four different land uses. These breakouts are summarized in Table E.2. For the "Retail" land use, employment is assumed to be split evenly between "pure" retail sector (e.g., drug stores) and restaurants (the accommodations and food services sector). For the "Office" land use, employment mix is estimated based on observed mix among sectors 53 to 56 for all U.S. zip codes containing a GA or Reliever airport.[62] For the "Light Industrial" land use, employment mix is based on work conducted for SCAG.[63] Applying these splits to the employment changes in Table E.2 yields potential gross changes in employment by NAICS sector—as shown in Table E.3.

[62] The source of this data comes from a database from being developed as part of an ACRP project currently in progress (Landau, et. al., ACRP 03-28).

[63] Employment Density Study, prepared for Southern California Association of Governments by The Natelson Company, Inc., October 2001.

Table E.2 Estimated Employment Mix by 2-digit NAICS Category for Each Land Use

	Land Use Type			
NAICS Sector	Light Industrial	Warehousing	Office	Retail
11 Agriculture, Forestry, Fishing and Hunting				
21 Mining Quarrying and Oil and Gas Extraction				
22 Utilities				
23 Construction	22%			
31-33 Manufacturing	39%			
42 Wholesale Trade	20%			
44-45 Retail Trade	2%			50%
48-49 Transportation and Warehousing	2%	100%		
51 Information				
52 Finance and Insurance				
53 Real Estate and Rental and Leasing			11%	
54 Professional, Scientific, and Technical Services			38%	
55 Management of Companies and Enterprises			12%	
56 Administrative and Support and Waste Management and Remediation Services	5%		39%	
61 Educational Services				
62 Health Care and Social Assistance				
71 Arts, Entertainment, and Recreation				
72 Accommodation and Food Services	2%			50%
81 Other Services (except Public Administration)				
92 Public Administration	2%			
Total	100%	100%	100%	100%

Table E.3 Estimated Potential Employment Change by NAICS from Smart Growth Policy

NAICS	Industry	Buchanan	Santa Monica	Fresno	Gillespie
11	Agriculture	0	0	0	0
21	Mining	0	0	0	0
22	Utilities	0	0	0	0
23	Construction	60	188	212	51
31-33	Manufacturing	1,008	3,150	3,569	853
42	Wholesale Trade	273	852	965	231
44-45	Retail Trade	375	199	225	54
48-49	Transportation & Warehousing	429	1,605	1,061	25
51	Information	0	0	0	0
52	Finance & Insurance	0	0	0	0
53	Real Estate & Leasing	254	0	233	250
54	Prof., Scientific, Tech. Services	3,866	408	3,881	3,781
55	Management of Companies	224	0	205	220
56	Administrative & Support Services	3,308	285	3,267	3,238
61	Educational Services	0	0	0	0
62	Health Care & Social Assistance	0	0	0	0
71	Arts, Entertainment, & Recreation	0	0	0	0
72	Accommodation & Food Services	315	167	189	45
81	Other Services	0	0	0	0
92	Government	100	311	353	84
	TOTAL - All Sectors	10,211	7,166	14,160	8,831

The next step is to use the results from Table E.4 to estimate the employment levels for each of the "no policy" and four "smart growth policy" scenarios (one for each case study airport). This step requires drawing on base-year employment data by zip code (obtainable from LEHD[64]) as well as statewide employment forecasts by two-digit NAICS sector (provided by Moody's Analytics). For each California zip code, baseline 2040 employment forecasts are calculated by applying statewide growth rates to the base-year zip code employment figures.

[64] Longitudinal Employer-Household Dynamics, a Census product (see http://lehd.ces.census.gov/).

Next, the increased employment shown in Table E.4 is added (separately) to each of the four airport zip codes (Table E.4). To determine the net effect of the land use change, we assume that *direct effect* of the smart growth policy would be limited to employment redistribution. That is, for all scenarios, total California employment (by NAICS code) is held constant.

All four airports share the same *baseline* spatial distribution, and the *smart growth* scenario for each airport has the effect of increasing employment within the airport zip code (according to Table E.4), while drawing from other California zip codes so that total California employment matched the baseline scenario. For simplicity, employment is assumed to be drawn proportional to 2011 levels. That is, if a (non-airport) zip code contained 0.5 percent of statewide retail employment in 2011, then 0.5 percent of the retail employment *attracted to* the airport smart growth area is assumed to be drawn from that zip code in 2040.

It should be noted that this "zero-sum" assumption is made in order to isolate the pure productivity gains associated with increased density near airports. In reality, the economy is not constrained to "zero-sum" growth. This fact is captured by the multiplier analysis (discussed below). That is, even though the *direct effect* of the smart growth policy is assumed to only change the location of employment (and not its statewide levels), the increased productivity from the new arrangement leads to increased productivity, which stimulates secondary (indirect and induced) effects that ultimately increase statewide employment levels (along with income and Gross State Product—GSP).

Furthermore, it should be noted that the choice of California as the control area is somewhat arbitrary. In reality, many sectors likely to be attracted to airports (notably Professional, Scientific, Technical Services and Management of Companies and Enterprises) are national in scale, such that individual firms attracted to the airport may come from large cities outside the state.

Table E.4 Employment Scenarios for Four Case Study Airport Zip Codes

Measure	Buchanan (94520)	Santa Monica (90405)	Fresno (93727)	Gillespie (92020
2011 Baseline Employment Levels	39,161	16,250	19,737	28,047
2040 Baseline Employment Levels	51,228	20,852	23,671	32,149
2040 Smart Growth Employment Levels	61,439	28,018	37,831	40,980
2040 Smart Growth Employment Impact	10,211	7,166	14,160	8,831

Predict Airport Access Impacts

The previous section outlined how implementing airport-specific smart growth policies may change the general pattern of employment location in the state. This section looks at how this change in access to airports translates to economic

productivity—independent of density effects (which are discussed in the next section).

The TREDIS Market Access model was used to estimate these impacts. This module estimates economic impacts from changes in transportation access and connectivity. One of the specific access variables used in the model calibration is "average access time to domestic airport," which is defined as "average ground access time to the nearest commercial airport with scheduled operations, weighted by the scale of airport activity (takeoffs + landings)." [65] Based on the predicted change in employment location in the previous section, we are able to determine the net change in airport access—which has been calculated for each airport. However, the resulting access changes are quite small because 1) there are many airports throughout the state, 2) employment tends to be located in urban areas near hub airports (though generally not located as close to the hubs as the prospective smart growth areas adjacent to these four airports), and 3) the four airports in question are of moderate size.

As a result, the TREDIS model predicted net effects from employment relocation to be universally less than $500,000 in 2040 Gross State Product (for all airports). Because of the small order of magnitude of these results (and in contrast to the significant impacts from "pure" economic density, discussed in the next section), these effects – though positive – are not "significant". As such, the final results presented in Section 5.1 do not include airport accessibility effects and reflect impacts from agglomeration.

Predict Airport Density Impacts

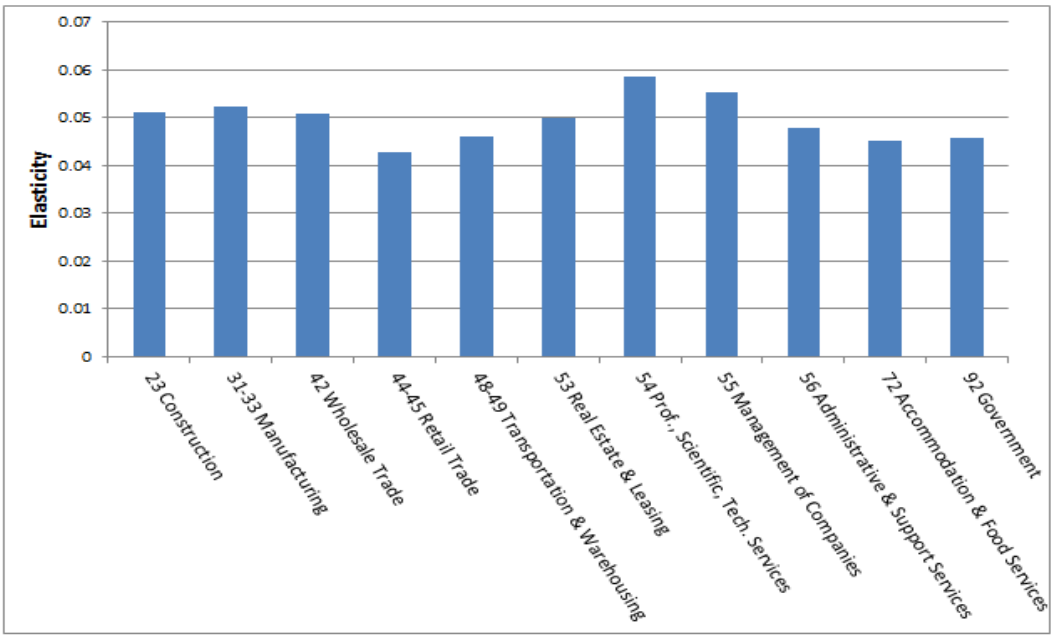
As discussed in the introduction, although the productivity impacts from airport access may be small, airports can still have a large residual impact on the process of industrial clustering. This section presents the methodology used to estimate this density effect. The overall approach used was to develop and apply statistical relationships between sector-specific employment density and income at the zip code level.

The model used to calibrate the effect is based entirely on 2011 California zip code data: two-digit NAICS employment data compiled from LEHD, average zip code income compiled from County Business Patterns, and zip code land area compiled from Census TIGER files. This yields a raw dataset of roughly 1,500 California zip codes. For each zip code, we calculate sector-specific employment density values (e.g., retail jobs per square mile), and form a series of log-linear regressions with total zip code income. Figure E.1 shows the results in terms of California's average income elasticity with respect to each industry's

[65] Weisbrod et al., 2012, page 6 [http://www.edrgroup.com/pdf/Alstadt-Weisbrod-Market%20Access-TRB-2012.pdf].

employment density[66] (for those industries affected by the smart growth policy). Based on this analysis, elasticities range from roughly 0.4 to 0.6.

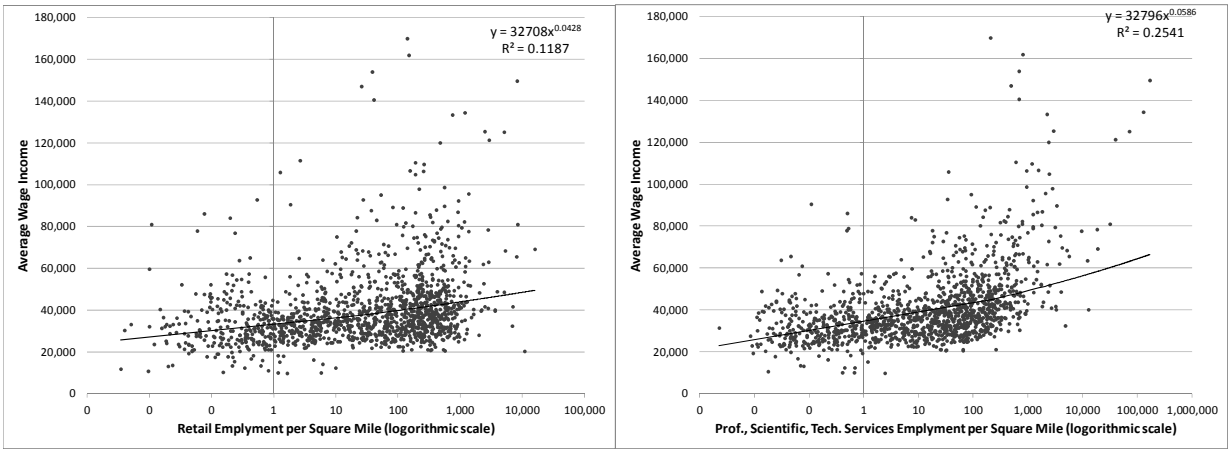
Figure E.1 California Average Income Elasticity with Respect to Sector-Specific Employment Density
Jobs per Square Mile



For comparison, Figure E.2 shows the regression lines for Retail Trade (left) and Professional, Scientific, Technical Services (right)—the least and most sensitive, respectively. Each graph shows the distribution of zip codes in terms of sector-specific employment density (the horizontal axis) and average annual wage income per worker (the vertical axis). Each point on the charts represents a single zip code, and the line indicates the best log-linear fit. These figures emphasize that employment density for Professional, Scientific, & Technical Services has stronger leverage on personal income than Retail employment density.

[66] An elasticity predicts the percent change in one variable from the percent change in another. In the current analysis, each elasticity predicts the percent change in zip code average wage income based on a 1 percent change in sector-specific employment density (jobs per square mile).

Figure E.2 Comparison of Regression Results for Retail vs. Professional, Scientific, Technical Services



Next, the results of the zip code-level regressions are applied to the "baseline" and "smart growth" employment scenarios described above (Figure E.2) to determine the expected change in income for each zip code in California. The net income growth associated with these changes is summarized in Table E.5.

Table E.5 Summary of Employment Density Changes by Airport and Resulting Income Growth

	Buchanan	Santa Monica	Fresno	Gillespie
Zip Code	94520	90405	93727	92020
Zip Code Land Area (sq. mi.)	14.0	2.2	27.2	9.3
2011 Employment Density	2,796	7,247	727	3,027
2040 Baseline Employment Density	3,657	9,299	871	3,470
2040 Smart Growth Employment Density	4,386	12,495	1,393	4,423
California Direct Income Growth from Densification (mil.)	$38.3	$23.9	$58.3	$28.3

Apply Multiplier Impacts

The final step in estimating the total economic impacts from smart growth policies is to calculate the secondary "multiplier" impacts resulting from the initial productivity gain. Multiplier impacts arise due to the increased output and income associated with the initial productivity gain. Those businesses that enjoy greater worker productivity end up purchasing more intermediate goods and services in the statewide economy. Further, the income gains bolster local economies through increased demand for consumer goods such as groceries and household services. Multiplier impacts, in this case, were calculated with a 2011 IMPLAN model of California. Total economic impacts (including direct and multiplier effects) from the smart growth policies are shown in Table E.6.

Table E.6 Total Economic Impacts to California (2040)

Airport	Employment	Output (Million Dollars)	Value Added (Million Dollars)	Income (Million Dollars)
Buchanan	1,225	$242.94	$151.90	$104.61
Santa Monica	855	$294.49	$130.48	$78.22
Fresno	2,009	$584.68	$285.58	$178.75
Gillespie	921	$211.00	$121.26	$80.04

Here, it is important to emphasize that the increased economic efficiency has the ultimate effect of increasing statewide employment (along with income and Gross State Product—GSP), even though the direct employment impacts of the smart growth policy are analytically constrained to be zero at the state level, through multiplier effects.

Detailed Results

In the following tables, the "direct" impact to California is based on the predicted net change in statewide income from the 1) increased employment density at each airport location, and 2) the relationships between zip code income and sector-specific employment density. The direct income change is converted to Value added and Output based on 2011 ratios, and multiplier impacts are estimated based on the resulting change in output[67]. Note that the direct employment effect is zero due to the assumption that the increased employment density at the four airport locations would be accounted for from other parts of the state, but that multiplier impacts include positive employment impacts.

[67]Source: 2011 IMPLAN model of the state of California.

Table E.7 Economic Impacts to California from Buchanan Airport, by Sector

	Direct Impacts to California				Multiplier Effects to California				Total Impacts to California			
NAICS Sector	Employment	Output ($mil)	Value Added ($mil)	Income ($mil)	Employment	Output ($mil)	Value Added ($mil)	Income ($mil)	Employment	Output ($mil)	Value Added ($mil)	Income ($mil)
11 Agriculture	0	0.00	0.00	0.00	6	0.90	0.44	0.33	6	0.90	0.44	0.33
21 Mining	0	0.00	0.00	0.00	2	0.73	0.40	0.12	2	0.73	0.40	0.12
22 Utilities	0	0.00	0.00	0.00	1	1.35	0.65	0.21	1	1.35	0.65	0.21
23 Construction	0	0.46	0.28	0.24	11	1.45	0.86	0.76	11	1.91	1.14	1.00
31-33 Manufacturing	0	14.61	4.41	2.08	43	26.67	8.05	3.81	43	41.28	12.46	5.89
42 Wholesale Trade	0	1.47	1.08	0.62	25	4.54	3.34	1.93	25	6.01	4.43	2.55
44-45 Retail Trade	0	2.59	1.94	1.24	91	7.14	5.34	3.40	91	9.74	7.28	4.64
48-49 Transportation & Warehousing	0	1.65	0.90	0.71	34	4.58	2.50	1.97	34	6.23	3.40	2.68
51 Information	0	0.00	0.00	0.00	14	5.46	3.22	1.79	14	5.46	3.22	1.79
52 Finance & Insurance	0	0.00	0.00	0.00	39	9.24	5.28	2.72	39	9.24	5.28	2.72
53 Real Estate & Leasing	0	7.25	5.54	0.83	68	13.18	10.07	1.51	68	20.43	15.61	2.34
54 Prof., Scientific, Tech. Services	0	29.13	21.23	17.24	253	36.43	26.55	21.56	253	65.55	47.78	38.80
55 Management of Companies	0	1.31	0.82	0.71	14	2.82	1.76	1.53	14	4.12	2.57	2.23
56 Administrative & Support Services	0	23.90	16.36	13.83	428	28.23	19.32	16.34	428	52.14	35.68	30.17
61 Educational Services	0	0.00	0.00	0.00	12	0.82	0.54	0.48	12	0.82	0.54	0.48
62 Health Care & Social Assistance	0	0.00	0.00	0.00	56	5.73	3.85	3.38	56	5.73	3.85	3.38
71 Arts, Entertainment, & Recreation	0	0.00	0.00	0.00	13	1.12	0.76	0.48	13	1.12	0.76	0.48
72 Accommodation & Food Services	0	1.92	1.11	0.75	75	5.02	2.91	1.96	75	6.94	4.02	2.71
81 Other Services	0	0.00	0.00	0.00	32	2.42	1.61	1.41	32	2.42	1.61	1.41
92 Government	0	0.09	0.08	0.07	7	0.73	0.71	0.61	7	0.82	0.79	0.68
Total	**0.00**	**84.39**	**53.75**	**38.33**	**1,225**	**158.56**	**98.15**	**66.28**	**1,225**	**242.94**	**151.90**	**104.61**

Table E.8 Economic Impacts to California from Santa Monica Airport, by Sector

	Direct Impacts to California				Multiplier Effects to California				Total Impacts to California			
NAICS Sector	Employment	Output ($mil)	Value Added ($mil)	Income ($mil)	Employment	Output ($mil)	Value Added ($mil)	Income ($mil)	Employment	Output ($mil)	Value Added ($mil)	Income ($mil)
11 Agriculture	0	0.00	0.00	0.00	16	2.22	1.08	0.82	16	2.22	1.08	0.82
21 Mining	0	0.00	0.00	0.00	5	2.05	1.11	0.34	5	2.05	1.11	0.34
22 Utilities	0	0.00	0.00	0.00	2	1.78	0.85	0.28	2	1.78	0.85	0.28
23 Construction	0	1.42	0.84	0.74	20	2.61	1.55	1.36	20	4.02	2.39	2.10
31-33 Manufacturing	0	74.97	22.64	10.70	157	98.58	29.76	14.07	157	173.54	52.40	24.76
42 Wholesale Trade	0	6.99	5.15	2.97	67	12.23	9.01	5.19	67	19.23	14.16	8.16
44-45 Retail Trade	0	1.02	0.76	0.49	63	4.93	3.69	2.35	63	5.95	4.45	2.83
48-49 Transportation & Warehousing	0	10.65	5.82	4.59	113	15.21	8.30	6.55	113	25.86	14.12	11.14
51 Information	0	0.00	0.00	0.00	13	5.06	2.98	1.66	13	5.06	2.98	1.66
52 Finance & Insurance	0	0.00	0.00	0.00	33	7.68	4.39	2.26	33	7.68	4.39	2.26
53 Real Estate & Leasing	0	0.00	0.00	0.00	26	5.03	3.84	0.58	26	5.03	3.84	0.58
54 Prof., Scientific, Tech. Services	0	4.59	3.34	2.71	85	12.23	8.91	7.24	85	16.82	12.26	9.95
55 Management of Companies	0	0.00	0.00	0.00	16	3.39	2.11	1.83	16	3.39	2.11	1.83
56 Administrative & Support Services	0	1.34	0.92	0.77	71	4.71	3.22	2.73	71	6.05	4.14	3.50
61 Educational Services	0	0.00	0.00	0.00	10	0.67	0.44	0.39	10	0.67	0.44	0.39
62 Health Care & Social Assistance	0	0.00	0.00	0.00	46	4.69	3.15	2.77	46	4.69	3.15	2.77
71 Arts, Entertainment, & Recreation	0	0.00	0.00	0.00	10	0.87	0.59	0.37	10	0.87	0.59	0.37
72 Accommodation & Food Services	0	2.18	1.26	0.85	68	4.54	2.63	1.77	68	6.72	3.89	2.62
81 Other Services	0	0.00	0.00	0.00	28	2.12	1.40	1.23	28	2.12	1.40	1.23
92 Government	0	0.07	0.07	0.06	6	0.68	0.66	0.57	6	0.75	0.72	0.62
Total	**0**	**103.22**	**40.79**	**23.87**	**855**	**191.27**	**89.69**	**54.34**	**855**	**294.49**	**130.48**	**78.22**

Table E.9 Economic Impacts to California from Fresno Airport, by Sector

	Direct Impacts to California				Multiplier Effects to California				Total Impacts to California			
NAICS Sector	Employment	Output ($mil)	Value Added ($mil)	Income ($mil)	Employment	Output ($mil)	Value Added ($mil)	Income ($mil)	Employment	Output ($mil)	Value Added ($mil)	Income ($mil)
11 Agriculture	0	0.00	0.00	0.00	27	3.86	1.88	1.43	27	3.86	1.88	1.43
21 Mining	0	0.00	0.00	0.00	8	3.51	1.90	0.58	8	3.51	1.90	0.58
22 Utilities	0	0.00	0.00	0.00	4	3.44	1.64	0.54	4	3.44	1.64	0.54
23 Construction	0	1.83	1.08	0.95	33	4.18	2.48	2.18	33	6.01	3.56	3.13
31-33 Manufacturing	0	123.13	37.18	17.57	264	165.28	49.91	23.59	264	288.41	87.08	41.16
42 Wholesale Trade	0	7.87	5.79	3.34	96	17.47	12.87	7.41	96	25.34	18.66	10.75
44-45 Retail Trade	0	1.01	0.75	0.48	121	9.49	7.09	4.52	121	10.49	7.85	4.99
48-49 Transportation & Warehousing	0	12.60	6.88	5.43	153	20.66	11.28	8.90	153	33.27	18.16	14.33
51 Information	0	0.00	0.00	0.00	28	10.92	6.44	3.58	28	10.92	6.44	3.58
52 Finance & Insurance	0	0.00	0.00	0.00	72	17.04	9.75	5.02	72	17.04	9.75	5.02
53 Real Estate & Leasing	0	7.11	5.43	0.82	94	18.08	13.82	2.07	94	25.19	19.25	2.89
54 Prof., Scientific, Tech. Services	0	25.57	18.64	15.13	289	41.54	30.27	24.58	289	67.11	48.91	39.72
55 Management of Companies	0	1.32	0.83	0.72	35	7.29	4.55	3.94	35	8.61	5.37	4.66
56 Administrative & Support Services	0	23.29	15.94	13.48	471	31.07	21.26	17.98	471	54.36	37.20	31.46
61 Educational Services	0	0.00	0.00	0.00	22	1.48	0.98	0.86	22	1.48	0.98	0.86
62 Health Care & Social Assistance	0	0.00	0.00	0.00	101	10.40	6.98	6.13	101	10.40	6.98	6.13
71 Arts, Entertainment, & Recreation	0	0.00	0.00	0.00	23	1.97	1.34	0.83	23	1.97	1.34	0.83
72 Accommodation & Food Services	0	0.92	0.53	0.36	95	6.33	3.66	2.47	95	7.25	4.20	2.83
81 Other Services	0	0.00	0.00	0.00	61	4.60	3.05	2.67	61	4.60	3.05	2.67
92 Government	0	0.07	0.07	0.06	13	1.36	1.31	1.12	13	1.43	1.37	1.18
Total	**0**	**204.72**	**93.13**	**58.34**	**2,009**	**379.95**	**192.45**	**120.42**	**2,009**	**584.68**	**285.58**	**178.75**

Table E.10 Economic Impacts to California from Gillespie Airport, by Sector

	Direct Impacts to California				Multiplier Effects to California				Total Impacts to California			
NAICS Sector	Employment	Output ($mil)	Value Added ($mil)	Income ($mil)	Employment	Output ($mil)	Value Added ($mil)	Income ($mil)	Employment	Output ($mil)	Value Added ($mil)	Income ($mil)
11 Agriculture	0	0.00	0.00	0.00	7	1.03	0.50	0.38	7	1.03	0.50	0.38
21 Mining	0	0.00	0.00	0.00	2	0.87	0.47	0.14	2	0.87	0.47	0.14
22 Utilities	0	0.00	0.00	0.00	1	1.19	0.57	0.19	1	1.19	0.57	0.19
23 Construction	0	0.54	0.32	0.28	11	1.39	0.83	0.73	11	1.94	1.15	1.01
31-33 Manufacturing	0	26.02	7.86	3.71	61	38.09	11.50	5.44	61	64.11	19.36	9.15
42 Wholesale Trade	0	1.29	0.95	0.55	23	4.25	3.13	1.80	23	5.54	4.08	2.35
44-45 Retail Trade	0	0.36	0.27	0.17	50	3.93	2.94	1.87	50	4.29	3.21	2.04
48-49 Transportation & Warehousing	0	0.09	0.05	0.04	19	2.52	1.37	1.08	19	2.60	1.42	1.12
51 Information	0	0.00	0.00	0.00	11	4.42	2.61	1.45	11	4.42	2.61	1.45
52 Finance & Insurance	0	0.00	0.00	0.00	31	7.27	4.16	2.14	31	7.27	4.16	2.14
53 Real Estate & Leasing	0	6.45	4.93	0.74	58	11.12	8.50	1.28	58	17.57	13.43	2.02
54 Prof., Scientific, Tech. Services	0	21.07	15.36	12.47	189	27.23	19.85	16.12	189	48.30	35.21	28.59
55 Management of Companies	0	0.41	0.26	0.22	10	2.06	1.29	1.12	10	2.48	1.54	1.34
56 Administrative & Support Services	0	17.22	11.79	9.97	313	20.64	14.13	11.95	313	37.86	25.91	21.91
61 Educational Services	0	0.00	0.00	0.00	9	0.64	0.42	0.37	9	0.64	0.42	0.37
62 Health Care & Social Assistance	0	0.00	0.00	0.00	43	4.47	3.00	2.63	43	4.47	3.00	2.63
71 Arts, Entertainment, & Recreation	0	0.00	0.00	0.00	10	0.87	0.59	0.37	10	0.87	0.59	0.37
72 Accommodation & Food Services	0	0.26	0.15	0.10	40	2.67	1.55	1.04	40	2.93	1.70	1.14
81 Other Services	0	0.00	0.00	0.00	26	1.91	1.27	1.11	26	1.91	1.27	1.11
92 Government	0	0.09	0.09	0.08	6	0.61	0.58	0.50	6	0.70	0.67	0.58
Total	**0**	**73.81**	**42.02**	**28.33**	**921**	**137.19**	**79.25**	**51.71**	**921**	**211.00**	**121.26**	**80.04**

E.2 ROLE 2. POTENTIAL PRODUCTIVITY IMPACTS GENERATED BY SMART GROWTH POLICIES

The purpose of a Role 2 airport area (smart growth support hub) is to retain companies that could leave California without supportive land use and incentive policies. The hypothesis of this analysis is that manufacturing and industrial service companies would disinvest from their current locations because of inadequate local support, including infrastructure, land available for expansion, and population densities that view such companies as undesirable neighbors.

This analysis looks at potential outcomes for counties by 2040 if jobs are saved in airport smart growth areas. Four airports were selected as examples of Role 2 airport smart growth areas. The airports and the counties in which they are located are listed in Table E.11. The four Role 2 airport smart growth areas are illustrated in Figures E.3 and E.4 below.

Table E.11 Sample Role 2 Smart Growth Airport Areas

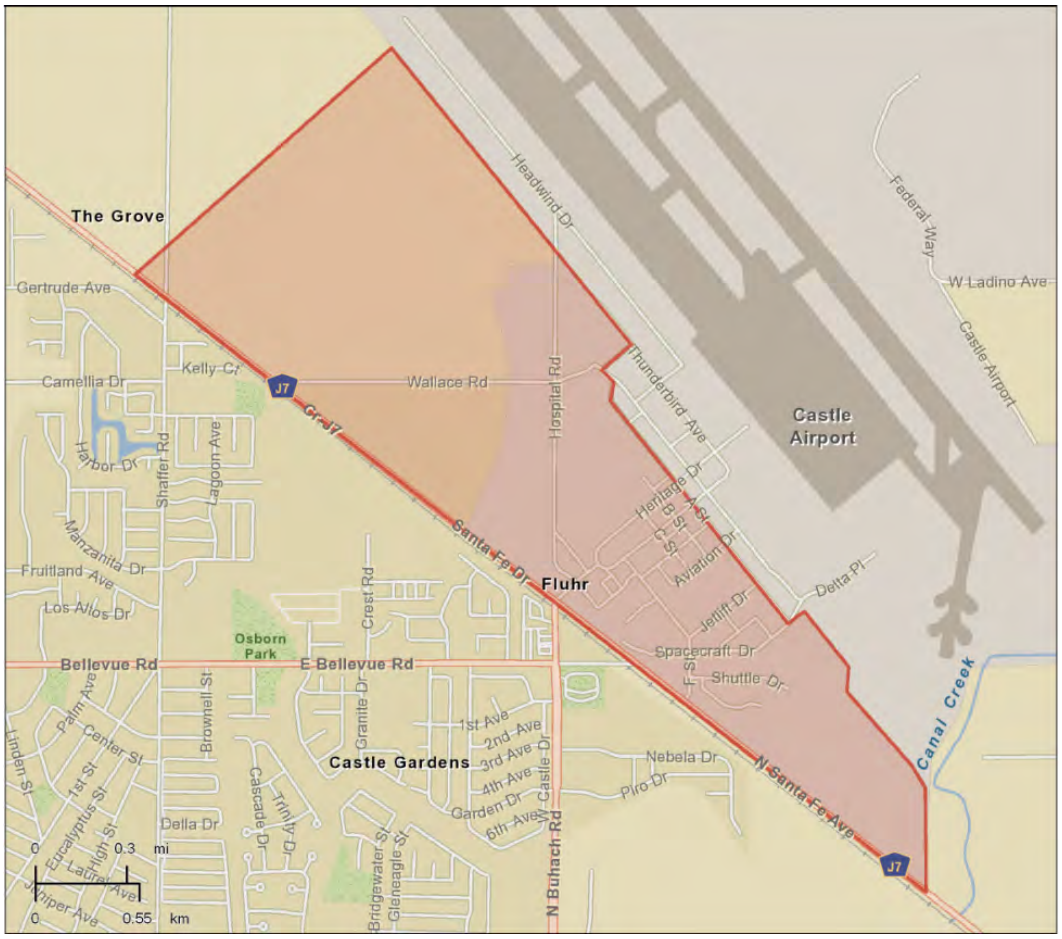
Airport	County
Castle Airport (Castle Air Base)	Merced
Santa Maria Public Airport	Santa Barbara
Sonoma County Airport	Sonoma
Yuba County Airport	Yuba

Current employment by industry and total acreage of each site were estimated though ESRI Business Analyst Online, which combines a GIS system with an industry and employment database. The consultant team traveled to each area and completed driving surveys of the four project areas. Notes were compiled about key businesses, vacant land areas, infill sites, roadways, open space and potential environmental constraints. Combining the site visit observations and the existing employment in each area, the ESRI employment data were converted into employment by building types, and sorted into four land use categories: commercial retail, light industrial and general commercial, office, business park & R&D flex space, and warehouse space.

Three further steps are employed to calculate densities in each smart growth area. First, the employment by land use types are calculated from ESRI Business Analyst and the site visits are converted into built space using "square feet per employee" data, using ratios from the National Association for Industrial and Office Properties (NAIOP). Second, detailed reviews of Google Maps complement the driving surveys and yield estimates of the total acres by land use. Lastly, Floor Area Ratio (FAR) ranges are calculated using the following formula:

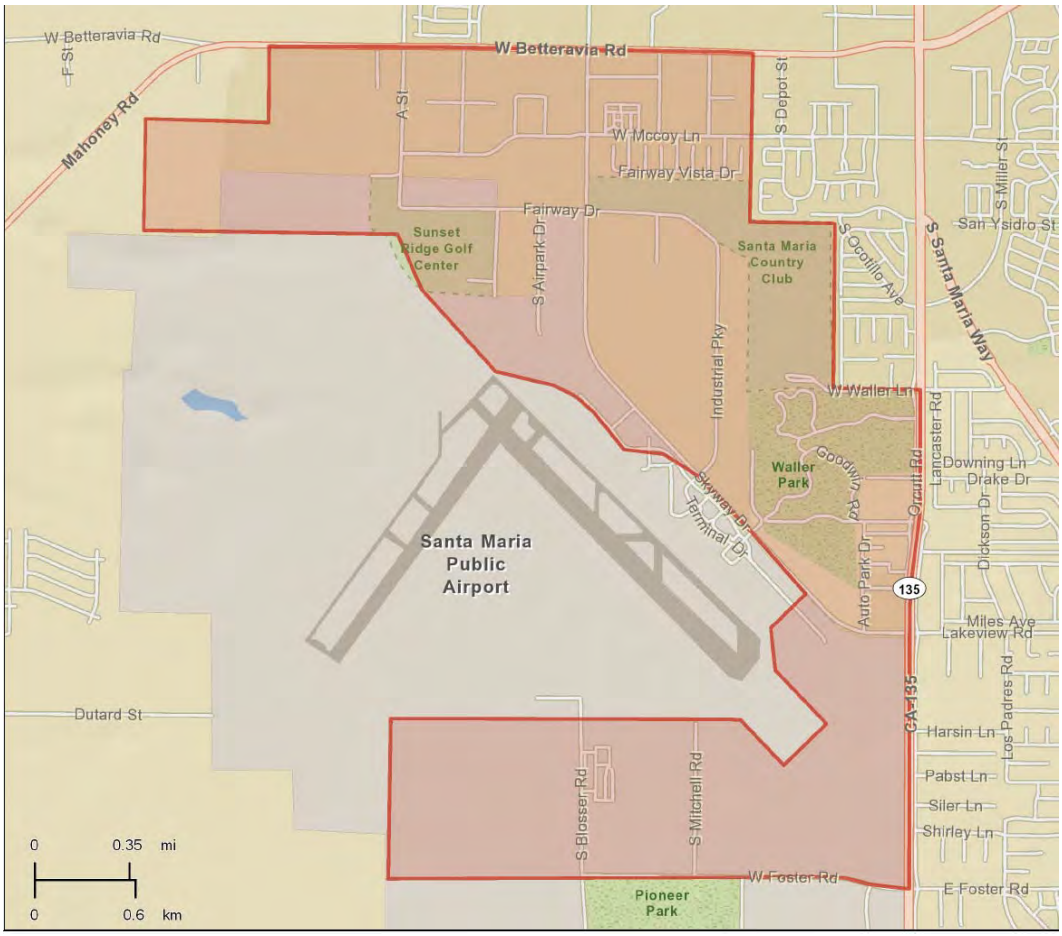
Total Square Feet by Land Use / (Acreage by Land Use * 43,560)

Figure E.3 Prospective Castle Airport Smart Growth Area



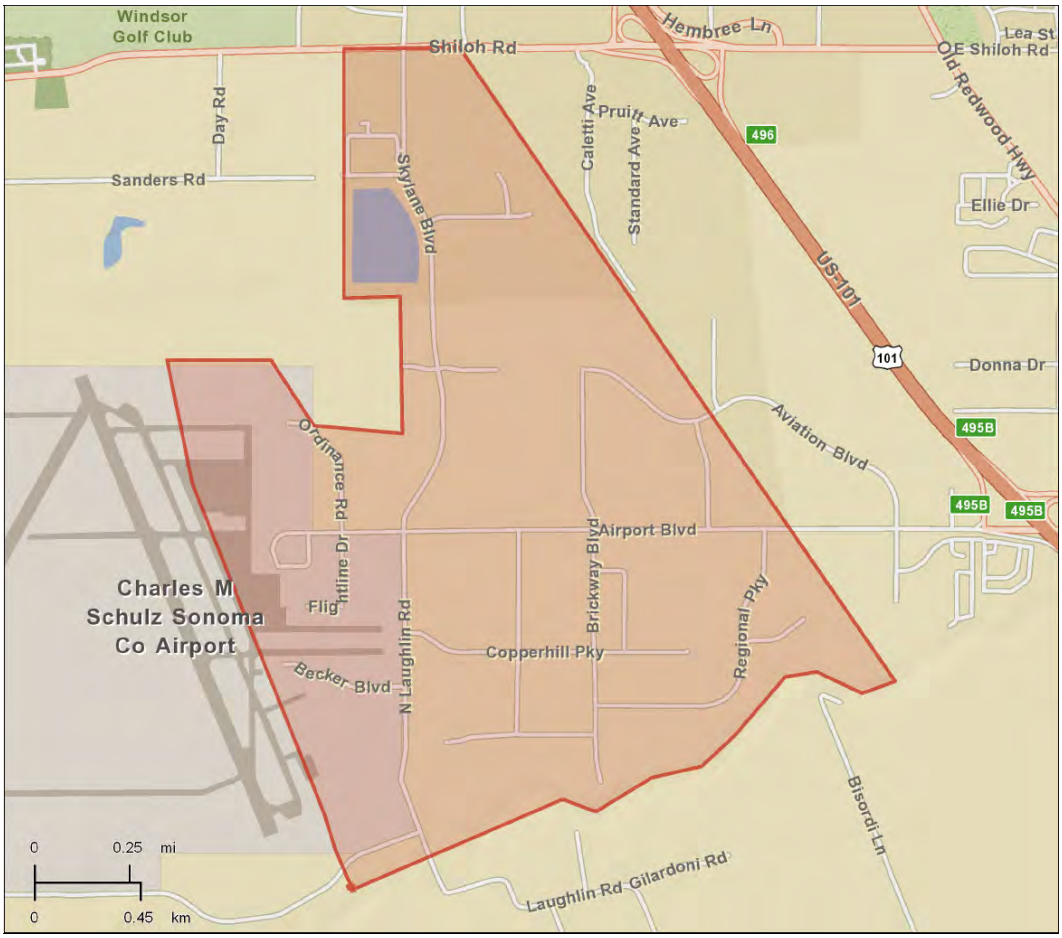
Source: ESRI Business Analyst Online.

Figure E.4 Prospective Santa Maria Public Airport Smart Growth Area



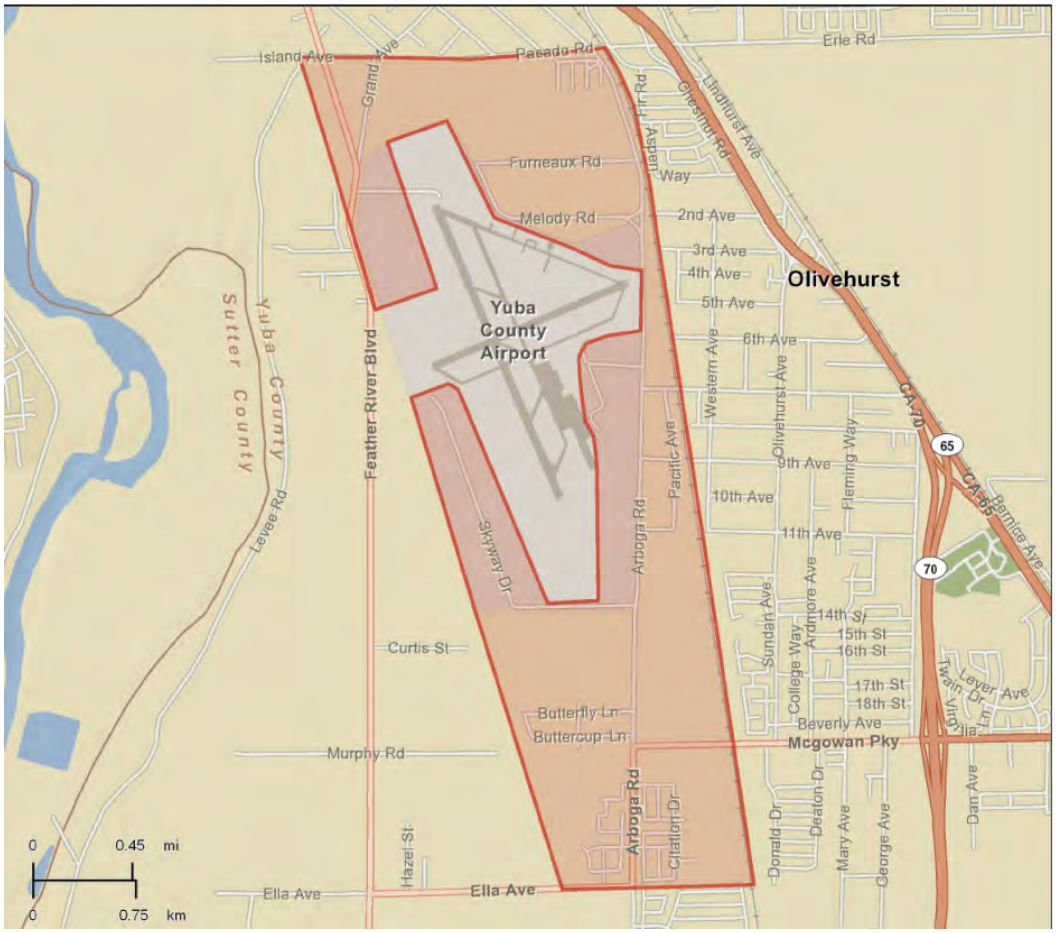
Source: ESRI Business Analyst Online.

Figure E.5 Prospective Sonoma County Airport Smart Growth Area



Source: ESRI Business Analyst Online

Figure E.6 Prospective Yuba County Airport Smart Growth Area



Source: ESRI Business Analyst Online.

Potential increases in development density for each smart growth area are calculated on the bases of: (1) increased floor to area ratio (FAR); and (2) allocation of currently vacant land for economic development. The levels of FAR increases and absorption of vacant land are based on reasonable assumptions based on site visits, current FAR (as estimated) and current land use. Note that the FAR used in this analysis is not as-of-right-zoning maximums, but are the effective building densities based on observation and research. Also, in all four cases, it was assumed that 62 percent to 85 percent of vacant land would remain vacant by 2040. Thus, much more development potential would remain in each smart growth area (see Table E.12)

As displayed in Table E.12 , a 50 percent increase in floor to area ratio is assumed for three of the four Role 2 airport smart growth areas to be in effect by 2040. The exception this is the Castle Airport smart growth area because the current effective FAR is exceptionally low, appearing significantly less than 0.1. Therefore, a future FAR of 0.3 is assumed for the Castle Airport area, which falls on the low end of the ranges of assumed future FARs shown for the other three airport areas.

Table E.12 Density Changes Assumed for Smart Growth

	Change in FAR		Vacant Land Absorption	
Airport Smart Growth Area	Percent	Range	Percent	Acres
Castle Airport (Castle Air Base)	N/A	.30	15%	78
Santa Maria Public Airport	50%	.24 - .76	25%	181
Sonoma County Airport	50%	.31 - .38	38%	157
Yuba County Airport	50%	.22 - .74	25%	108

County Employment Base: 2013 to 2040

The approach used to estimate the potential role of these four Role 2 smart growth areas is based on county- and industry-specific projections to 2040 by Moody's Analytics adapted to three digit NAICS code. Summing all industries in the county economies shows that that Moody's Analytics projects the total job base in county that houses a designated Role 2 airport smart growth area will increase between 2013 and 2040. The net overall job growth is expected to be between 14,000 and 114,000 jobs per county (Table E.13).

These projections encompass all sectors of county economies absent of smart growth incentives or other policies. Although, the four counties are expected to experience net job growth by 2040, each of the counties is projected to lose of manufacturing, warehousing and trucking jobs by 2040. The specific sectors that are expected to experience job losses will vary by county. Only sectors that are projected to lose ten or more jobs were counted—to distinguish job losses due to layoffs or minor efficiency gains with business relocation.[68]

There is a possibility that, with incentives, a portion of non-industrial jobs may migrate to smart growth areas, but is also possible that the service and knowledge based industries will continue to expand in areas where they are now located[69]. In addition, the Project Team began this study by assuming that the Role 2 smart growth areas would be prime sites for big-box retail. However, after visiting each site and reviewing local retail patterns, the Project Team concludes that each of the four Role 2 smart growth areas is not suitable as a big-box location for various reasons, which are discussed in the individual area case studies in Section 5.2.

[68] This is admittedly a rough framework, which does not account for the churning of multiple companies in a single sector growing, shrinking or relocating.

[69] Note that these industries were at one time assumed to not migrate to the smart growth districts.

Table E.13 Total Job Growth Projected by County

County	Projected Job Increase
Merced	8,895
Santa Barbara	113,720
Sonoma	63,452
Yuba	14,422

Source: Moody's Analytics and EDR Group

Job migration to Role 2 smart growth areas are developed by the following steps. First projections by Moody's Analytics are used to identify sectors at the three-digit NAICS level under manufacturing, warehousing and truck transportation divisions per county that are projected to lose ten or more jobs from 2013 through 2040. These are assumed to be the jobs that could be saved if they could be absorbed in smart growth areas. Total jobs projected to be lost per county and by sector (limited to sectors with losses of ten or more jobs) are shown on Table E.14. As can be seen, the total job losses in these industrial sectors range from 120 jobs in Yuba County to almost 4,300 jobs in Sonoma County.

These jobs could fit into the assumed expanded capacities of the Role 2 smart growth areas for three of the four (Merced, Santa Barbara and Yuba counties), after presuming adjustments in FAR and the development of vacant land. For Sonoma County, however, the jobs projected to be lost exceed the capacity presumed for the airport smart growth area. Although, assumptions could be made to further utilize vacant land or further expand FAR, the Project Team decided to scale back potential job relocation to match the assumptions based on the site visit and the 50 percent change in FAR (Table E.15).

To summarize, the hypothesis presented is that the Role 2 airport smart growth areas will serve to absorb potential industrial-related job losses projected in the directs' host counties from 2013 to 2040. Job losses and company closings of course can stem from multiple causes, including: poor management, searches for dramatically lower wages, and loss of market shares. There is little that smart growth policies can do to mitigate these factors. However, if job dislocation is due to a lack of suitable land, or residential communities that do not want associated social/environmental impacts associated with industrial establishments, then smart growth areas may be an outlet to allow the counties to retain these jobs. For the purposes of this assessment, it is assumed that the development of the areas will be a means for job retention. The job levels assumed to be retained in 2040 due to these areas are shown in Table E.15.

Table E.14 Manufacturing, Wholesale Trade and Truck Transportation Jobs Projected to be Lost by County

	Counties			
NAICS Code and Sector	Merced	Santa Barbara	Sonoma	Yuba
311: Food Manufacturing	(756)	(128)	(593)	
312: Beverage & Tobacco Product Mfg	(21)	(347)	(1,000)	(11)
313: Textile Mills			(10)	
314: Textile Products Mfg		(27)	(47)	
315: Apparel Mfg	(13)	(32)	(64)	
316: Leather & Allied Product Mfg				
321: Wood Product Mfg		(19)	(25)	(30)
322: Paper Mfg	(23)		(11)	
323: Printing & Related Support Activities	(199)	(127)	(141)	
324: Petroleum and Coal Products Mfg		(25)		
325: Chemical Mfg		(148)	(73)	
326: Plastics & Rubber Products Mfg		(29)	(139)	
327: Nonmetal Mineral Product Mfg			(38)	
331: Primary Metal Mfg	(11)	(64)		
332: Fabricated Metal Mfg	(45)	(108)	(204)	(19)
333: Machinery Mfg		(25)	(323)	
334: Computer and Electronic Mfg		(270)		
335: Electrical Equipment & Appliance Mfg	(11)			
336: Transportation Equipment Mfg	(219)	(979)	(66)	(20)
337: Furniture and Home Furnishings Mfg		(53)	(163)	(14)
339: Miscellaneous Mfg	(63)	(690)	(789)	
420: Wholesale Trade		(713)	(594)	(26)
484: Truck Transportation	(384)	(375)		
Totals	(1,743)	(4,156)	(4,280)	(120)

Source: Moody's Analytics and EDR Group.

Table E.15 Adjusted Estimates to Accommodate Additional Capacity of Sonoma County Airport Smart Growth Area

NAICS Code and Sector	Sonoma County Adjusted Projected Job Losses
311: Food Manufacturing	(593)
312: Beverage & Tobacco Product Mfg	(1,000)
313: Textile Mills	
314: Textile Products Mfg	
315: Apparel Mfg	
316: Leather & Allied Product Mfg	
321: Wood Product Mfg	
322: Paper Mfg	
323: Printing & Related Support Activities	(141)
324: Petroleum and Coal Products Mfg	
325: Chemical Mfg	
326: Plastics & Rubber Products Mfg	(139)
327: Nonmetal Mineral Product Mfg	
331: Primary Metal Mfg	
332: Fabricated Metal Mfg	(204)
333: Machinery Mfg	(323)
334: Computer and Electronic Mfg	
335: Electrical Equipment & Appliance Mfg	
336: Transportation Equipment Mfg	
337: Furniture and Home Furnishings Mfg	(163)
339: Miscellaneous Mfg	(338)
420: Wholesale Trade	(126)
484: Truck Transportation	
Total	(3,026)

Source: Moody's Analytics and EDR Group.

Econometric Analysis

Once the jobs and industries were identified, the Project Team employed the IMPLAN modeling package. IMPLAN was first used to estimate direct effects for personal income, value added and total output (equivalent to business sales/business revenues) that would be saved if businesses perceive the advantage of relocating to the airport smart growth areas by 2040 as opposed to leaving their 2013 county locations, and perhaps California. Secondly the "multiplier impacts" were calculated, which would be the retained economic

activity in the each respective county generated by: (1) directly affected companies using a portion of its business revenue to purchase supplies and services (indirect impacts); and (2) spending of the wages earned by workers due to direct and indirect activities (induced impacts).

Impacts by county are presented in Table E.16, below, which represent the potential retention of jobs, personal income earned by workers, value added (contribution to gross state product) and economic output. The overarching assumption is that the companies represented by these projected job losses to the counties end up not leaving the counties because of the outlet provided by the airport smart growth areas located in the respective four counties, and thus continue to employ local workers and purchase business supplies and services in the respective county economies.

Direct impacts represent the industrial job losses projected by Moody's Analytics per county from 2013 to 2040, and the dollars (in 2013 value) associated with those jobs in terms of personal income, value added to the economy and output (which is the business revenue that supports the jobs and includes personal income and value added). The multipliers embody the penetration of these direct activities in all sectors of the county economies. As an illustration of the breadth of these impacts, employment by three digit NAICS (North American Industrial Classification Sectors) are presented in Table E.17.

Table E.16 Direct, Indirect and Induced and Total Impacts by County Due to Jobs Saved in Airport Smart Growth Areas

			Labor Income	Value Added	Output
County	Impact Type	Jobs	Dollars in $ Millions, 2013 Value		
Merced	Direct	1,743	$86	$123	$607
	Indirect & Induced	1,259	$52	$95	$165
	Total	*3,004*	*$138*	*$218*	*$772*
Santa Barbara	Direct	4,159	$326	$549	$1,541
	Indirect & Induced	4,288	$230	$370	$578
	Total	*8,447*	*$556*	*$919*	*$2,119*
Sonoma	Direct	3,026	$232	$357	$1,098
	Indirect & Induced	3,907	$188	$321	$563
	Total	*6,934*	*$419*	*$678*	*$1,661*
Yuba	Direct	120	$8	$12	$35
	Indirect & Induced	45	$2	$4	$6
	Total	*165*	*$11*	*$16*	*$41*

Sources: Moody's Analytics, IMPLAN, LLC and EDR Group.

Note: Columns may not add due to rounding.

Table E.17 Potential Total Jobs by Sector Saved Per County in Role 2 Smart Growth Areas

Smart Growth Area	Castle Airport (Castle Air Base)				Santa Maria Public Airport				Sonoma County Airport				Yuba County Airport			
County	Merced				Satan Barbara				Sonoma				Yuba			
Impact Type / NAICS Code & Description	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
111 Crop Farming	0	12	1	12	0	39	5	44	0	205	6	210	0	0	0	0
112 Livestock	0	26	0	27	0	6	0	6	0	150	2	152	0	0	0	0
113 Forestry & Logging	0	3	0	3	0	0	0	0	0	1	0	1	0	0	0	0
114 Fishing- Hunting & Trapping	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0
115 Ag & Forestry Services	0	11	1	12	0	15	3	18	0	120	4	124	0	0	0	0
211 Oil & gas extraction	0	0	0	0	0	30	1	31	0	1	0	1	0	0	0	0
212 Mining	0	0	0	0	0	4	0	4	0	1	0	1	0	0	0	0
213 Mining services	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
221 Utilities	0	5	1	6	0	5	3	8	0	5	2	8	0	0	0	0
230 Construction	0	29	4	33	0	65	18	83	0	48	16	64	0	2	0	2
311 Food products	756	8	0	764	128	1	1	130	593	66	6	664	0	0	0	0
312 Beverage & Tobacco	21	0	0	21	347	3	2	352	1,000	22	5	1,027	11	0	0	11
313 Textile Mills	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
314 Textile Products	13	0	0	13	59	0	0	59	0	0	0	0	0	0	0	0
316 Leather & Allied	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
321 Wood Products	0	0	0	0	19	0	0	20	0	6	1	6	30	0	0	30
322 Paper Manufacturing	23	0	0	23	0	0	0	0	0	0	0	0	0	0	0	0
323 Printing & Related	199	7	1	207	127	2	1	130	141	2	1	144	0	0	0	0
324 Petroleum & coal prod	0	0	0	0	25	1	0	26	0	0	0	0	0	0	0	0
325 Chemical Manufacturing	0	0	0	0	148	6	1	154	0	2	0	3	0	0	0	0
326 Plastics & rubber prod	0	0	0	0	29	0	0	29	139	4	0	143	0	0	0	0
327 Nonmetal mineral prod	0	0	0	0	0	5	0	5	0	11	1	11	0	0	0	0

Smart Growth Area	Castle Airport (Castle Air Base)				Santa Maria Public Airport				Sonoma County Airport				Yuba County Airport			
County	Merced				Satan Barbara				Sonoma				Yuba			
Impact Type / NAICS Code & Description	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
331 Primary metal mfg	11	0	0	11	64	1	0	66	0	0	0	0	0	0	0	0
332 Fabricated metal prod	45	1	0	46	108	2	0	110	204	4	0	208	19	0	0	19
333 Machinery Mfg	0	0	0	0	25	0	0	25	323	1	0	324	0	0	0	0
334 Computer & other electronics	0	0	0	0	270	2	0	272	0	1	0	1	0	0	0	0
335 Electrical equipment & appliances	11	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0
336 Transportation equipment	219	0	0	219	979	1	0	980	0	0	0	0	20	0	0	20
337 Furniture & related prod	0	0	0	0	53	0	0	53	163	0	0	163	14	0	0	14
339 Miscellaneous mfg	63	0	0	63	690	2	0	692	338	1	1	340	0	0	0	0
42 Wholesale Trade	0	39	8	47	713	98	34	846	126	140	48	314	26	2	1	29
441 Motor vehicle & parts dealers	0	2	12	14	0	6	39	45	0	4	34	38	0	0	0	0
442 Furniture & home furnishings	0	0	2	2	0	2	13	15	0	1	10	11	0	0	0	0
443 Electronics & appliances stores	0	0	3	3	0	2	13	15	0	2	10	11	0	0	0	0
444 Bldg materials & garden dealers	0	2	8	10	0	5	20	25	0	4	20	24	0	0	0	0
445 food & beverage stores	0	4	25	29	0	14	77	91	0	10	65	75	0	0	1	1
446 Health & personal care stores	0	1	7	8	0	6	30	36	0	3	20	23	0	0	0	0
447 Gasoline stations	0	0	5	5	0	1	12	13	0	1	11	12	0	0	0	0
448 Clothing & accessories stores	0	1	8	9	0	7	41	48	0	5	33	38	0	0	0	0
451 Sports- hobby- book & music stores	0	1	4	5	0	4	21	25	0	3	19	21	0	0	0	0
452 General merchandise stores	0	5	29	34	0	12	66	77	0	7	48	55	0	0	1	1
453 Misc retailers	0	1	9	11	0	8	42	50	0	6	37	43	0	0	0	0
454 Non-store retailers	0	1	10	11	0	4	32	36	0	4	35	38	0	0	0	0
481 Air transportation	0	0	0	0	0	2	2	4	0	2	3	5	0	0	0	0

Smart Growth Area	Castle Airport (Castle Air Base)				Santa Maria Public Airport				Sonoma County Airport				Yuba County Airport			
County	Merced				Satan Barbara				Sonoma				Yuba			
Impact Type / NAICS Code & Description	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
482 Rail Transportation	0	2	0	2	0	3	0	4	0	0	0	0	0	0	0	0
483 Water transportation	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
484 Truck transportation	384	126	6	516	375	59	9	443	0	99	11	110	0	3	0	3
485 Transit & ground passengers	0	2	3	5	0	3	5	7	0	5	10	15	0	0	0	0
486 Pipeline transportation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
487 Sightseeing transportation	0	4	0	5	0	20	4	24	0	33	7	40	0	1	0	1
492 Couriers & messengers	0	5	0	6	0	28	4	32	0	17	7	24	0	0	0	0
493 Warehousing & storage	0	19	1	21	0	40	5	45	0	10	2	12	0	0	0	0
511 Publishing industries	0	1	0	1	0	13	3	17	0	4	2	6	0	0	0	0
512 Motion picture & sound recording	0	0	1	1	0	1	5	6	0	1	4	5	0	0	0	0
515 Broadcasting	0	2	1	3	0	9	2	11	0	6	2	8	0	0	0	0
516 Internet publishing and broadcasting	0	0	0	0	0	2	1	3	0	1	0	1	0	0	0	0
517 Telecommunications	0	9	5	14	0	7	5	12	0	10	8	18	0	0	0	0
518 Internet & data process services	0	0	0	0	0	1	2	3	0	0	1	1	0	0	0	0
519 Other information services	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
521 Monetary authorities	0	9	5	14	0	25	28	53	0	27	24	51	0	0	0	1
522 Credit inmediation & related	0	2	1	3	0	4	5	10	0	9	11	20	0	0	0	0
523 Securities & other financial	0	7	4	11	0	54	53	106	0	57	62	119	0	1	0	1
524 Insurance carriers & related	0	2	3	6	0	8	22	31	0	6	26	32	0	0	0	0
525 Funds- trusts & other finance	0	0	0	0	0	0	16	16	0	0	9	9	0	0	0	0

Smart Growth Area	Castle Airport (Castle Air Base)				Santa Maria Public Airport				Sonoma County Airport				Yuba County Airport			
County	Merced				Satan Barbara				Sonoma				Yuba			
Impact Type / NAICS Code & Description	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
531 Real estate	0	9	24	33	0	48	192	239	0	49	156	205	0	0	1	1
532 Rental & leasing services	0	8	2	9	0	16	7	23	0	14	6	20	0	0	0	0
533 Lessor of nonfinance intangible assets	0	1	0	1	0	3	0	4	0	2	0	2	0	0	0	0
541 Professional- scientific & tech services	0	87	15	102	0	472	101	572	0	345	101	446	0	5	1	5
551 Management of companies	0	58	1	59	0	150	6	156	0	85	4	89	0	2	0	2
561 Admin support services	0	111	16	127	0	406	113	519	0	188	77	265	0	4	1	4
562 Waste mgmt & remediation services	0	4	1	6	0	7	5	12	0	7	5	12	0	0	0	0
611 Educational services	0	0	5	5	0	1	78	79	0	1	58	59	0	0	0	0
621 Ambulatory health care	0	0	44	44	0	0	191	191	0	0	132	132	0	0	1	1
622 Hospitals	0	0	17	17	0	0	95	95	0	0	58	58	0	0	2	2
623 Nursing & residential care	0	0	20	20	0	0	75	75	0	0	59	59	0	0	1	1
624 Social assistance	0	0	33	33	0	0	79	79	0	0	84	84	0	0	1	1
712 Performing arts & spectator sports	0	6	6	12	0	14	20	34	0	21	33	54	0	0	0	0
712 Museums & similar	0	0	0	0	0	0	4	4	0	0	2	2	0	0	0	0
713 Amusement- gambling & recreation	0	1	10	11	0	5	48	53	0	4	41	45	0	0	0	0
721 Accommodations	0	0	0	0	0	1	3	4	0	1	2	3	0	0	0	0
722 Food services & drinking places	0	26	57	83	0	78	255	333	0	61	205	267	0	1	2	3
811 Repair & maintenance	0	28	10	39	0	51	33	85	0	42	30	72	0	1	0	1

Smart Growth Area	Castle Airport (Castle Air Base)				Santa Maria Public Airport				Sonoma County Airport				Yuba County Airport			
County	Merced				Satan Barbara				Sonoma				Yuba			
Impact Type / NAICS Code & Description	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
812 Personal & laundry services	0	1	8	9	0	6	48	54	0	3	44	47	0	0	0	0
813 Religious- grantmaking- & similar orgs	0	4	14	18	0	15	76	91	0	11	55	66	0	0	1	1
814 Private households	0	0	12	12	0	0	25	25	0	0	23	23	0	0	1	1
92 Government & non NAICs	0	79	21	100	0	208	70	279	0	97	53	149	0	3	1	5
Totals	1,743	774	486	3,004	4,159	2,120	2,168	8,447	3,026	2,061	1,846	6,934	120	27	19	165

Sources: Moody's Analytics, IMPLAN, LLC and EDR Group.

Note: Columns may not add due to rounding.

Site Visits and Interviews

The consultant team traveled to and drove through the project area for all eight airports included in the smart growth study. Photographs were taken and notes were compiled on the existing land uses, the business types in place and the conditions of vacant sites and land areas. Key people contacted via email or phones were asked questions about economic development, land use policies and their opinions about each project area's smart growth potential. The persons interviewed listed in Table E.18 below, sorted by their airport location.

Table E.18 List of Persons Interviewed, by Airport Location

Buchanan Field	Carol Johnson *City of Concord Planning Manager*
	John Montagh *City of Concord Economic Development Director*
Gillespie Field	Marie Jo Diamond *San Diego East County Economic Development Council*
	Melanie Kush *City of Santee Planning and Zoning Manager*
	Dana Quittner *San Diego County Planning Department*
	Manjeet Ranu *City of El Cajon Planning Manager*
Santa Monica	David Martin *City of Santa Monica Planning Manager*
Fresno-Yosemite Airport	Sophia Pagoulatos *City of Fresno Supervising Planner*
	Jennifer Clark *City of Fresno Department of Development & Resource Management Director*
	Dwight Kroll *City of Clovis Planning Director*

F. Rating and Categorizing Airports

This memorandum describes how we categorized the remaining airports for study by Smart Growth role and recommends a set for quantitative economic analysis and a set for qualitative analysis.

The 20 remaining airports for study are listed in Table F.1.

F.1 SMART GROWTH ROLES

Previously, we identified four possible roles airports could play in supporting Smart Growth. These are:

1. **Smart Growth Node:** A limited number of airports are potential sites for Smart Growth. These airports have some competitive advantages compared to the surrounding region to attract Smart Growth. Given airport noise will be problematic for residential development, these airports will likely attract commercial and industrial Smart Growth.
2. **Retainer and Attractor of Non-Smart Growth:** Some airports have the potential to accommodate commercial or industrial development that does not conform to Smart Growth policies. In these situations, the retention and attraction of non-Smart Growth development at the airport would allow other parts of the region to pursue Smart Growth.
3. **Transit Hub:** Some airports may be located where a new or expanded transit or park-n-ride hub would encourage regional transit usage.
4. **Land Banking:** Some airports could serve as a land bank that would provide capacity for future Smart Growth.

Table F.1 Remaining Airports for Study

Airport Name	County	Type
Gillespie Field	San Diego	Regional
Fresno Yosemite Int'l	Fresno	Commercial/Primary
Concord-Buchanan Field	Contra Costa	Metropolitan
Santa Maria	Santa Barbara	Commercial/Primary
Castle	Merced	Community
Yuba County	Yuba	Regional
Sonoma County	Sonoma	Commercial/Primary
Livermore Municipal	Alameda	Metropolitan
Napa County	Napa	Regional
Auburn	Placer	Community
Gravelly Valley	Lake	Limited Use
Dinsmore	Humboldt	Limited Use
Hollister	San Benito	Regional
Redding Municipal	Shasta	Commercial/Primary
Santa Monica	Los Angeles	Metropolitan
Van Nuys	Los Angeles	Metropolitan
San Diego Int'l	San Diego	Commercial/Primary
Hayward Executive	Alameda	Metropolitan
Cameron	El Dorado	Community
Blue Canyon	Placer	Limited Use

Characteristics Supporting Smart Growth

Previously (see Appendix B), we identified 11 characteristics supportive of Smart Growth:

1. Surrounding population density
2. Surrounding employment density
3. Good supporting multimodal transportation infrastructure
4. Permanence of transportation infrastructure
5. Easy to walk around.
6. Potential for supportive parking environment
7. Amenities within ½ mile

8. Availability of land on or off airport for development
9. Suitability of land for development
10. Proximity to service infrastructure (e.g., water, sewer, fire, police)
11. Community stance on developing the surrounding area

Rating the Airports

Using research on each of the airports and interviews conducted with each of the airports, we rated each airport on each of the 11 characteristics. The ratings are shown in Table F.2.

For more details on the definitions of each of the ratings, see Table 3.

Categorizing the Airports

We used weighted scoring to identify airports for the four Smart Growth roles. The scores were developed by:

- Assigning a numerical score to each of the ratings (see Table 4); and then
- Assigning a weight to each of the 11 characteristics (see Table 5).

A score of -100 is assigned to the None rating, which is only used for the availability of land for development and suitability of land for development characteristics. This is because an airport with no available and suitable land for development (or redevelopment) is not a viable candidate for either of the two Smart Growth roles using these two characteristics.

Table F.2 Assignment of Scores to Ratings

Rating	Score
None	-100
n/a	0
Unknown	0
Poor	0
Potential	1
Redevelop	2
Modest	2
Good	3
Very Good	4

For Role 1 (Smart Growth Node), all 11 characteristics come into play. The availability and suitability of land for development (or redevelopment) and the surrounding employment density are the most important, followed by the surrounding population density.

For Role 2 (Retainer and Attractor of Non-Smart Growth), six of the 11 characteristics come into play (i.e., the characteristics with non-zero weights in Table 5). Again, the availability and suitability of land for development (or redevelopment) are the most important. Surrounding population density and surrounding employment density play a role, but are not as critical as for Role 1. Many of the other characteristics do not come into play for Role 2 because they are not necessary for non-Smart Growth. For example, it is not important to have multimodal transportation infrastructure or nearby amenities to have non-Smart Growth.

For Role 3 (Transit Hub), the two multimodal transportation related characteristics come into play.

The resulting weighted scores for role 1 (Smart Growth Node) are shown in Table 6. The top eight airports in this table show potential to be a Smart Growth node. The four airports with the highest score (highlighted in light red) are recommended for quantitative economic analysis. The next four highest scores (highlighted in light green) are recommended for qualitative analysis.

The resulting weighted scores for Role 2 (Retainer and Attractor of Non-Smart Growth) are shown in Table F.7. The airports recommended for Role 1 quantitative economic analysis are greyed out. The top seven remaining airports in this table show potential to be a retainer and attractor of non-Smart Growth development. The four airports with the highest score (highlighted in light red) are recommended for quantitative economic analysis. The next three highest scores (highlighted in light green) are recommended for qualitative analysis.

The resulting weighted scores for Role 3 (Transit Hub) are shown in Table 8. The top four airports in this table show potential to be transit hubs. The four airports with the highest score (highlighted in light green) are recommended for qualitative analysis. We do not plan to conduct quantitative analysis for Role 3 airports.

The remaining airports (i.e., not highlighted in Tables 6, 7, or 8) are Role 4 (Land Bank) airports.

Appendix 1. Characteristics Rating and Categorizing Tables

Table 2 Rating Airports by Smart Growth Supportive Characteristics

Airport Name	Surrounding population density	Surrounding employment density	Supporting multi-modal transportation infrastructure (auto, transit, bicycle, walking)	Permanence of multi-modal transportation infrastructure	Easy to walk around (e.g., block length, continuous sidewalks, lighting, street width)	Potential for supportive parking environment	Amenities within ½ mile	Availability of land on or off airport for development	Suitability of land for development (e.g., not steep slope, floodplain, stream)	Proximity to service infrastructure (e.g., water, sewer, fire, police)	Community stance on developing surrounding area
Blue Canyon	Poor	Poor	Poor	n/a	Poor	Poor	Poor	None	None	Poor	Poor
Castle	Modest	Modest	Poor	n/a	Modest	Potential	Poor	Very Good	Good	Modest	Modest
Concord-Buchanan Field	Good	Good	Potential	n/a	Poor	Potential	Good	Good	Good	Good	Good
Gravelly Valley	Poor	Poor	Poor	n/a	Poor	Potential	Poor	Very Good	Good	Poor	Good
Livermore Municipal	Modest	Modest	Potential	n/a	Poor	Potential	Modest	Good	Good	Good	Modest
San Diego Int'l	Good	Good	Good	Poor	Poor	Potential	Good	Redevelop	Good	Good	Unknown
Santa Monica	Good	Good	Good	Poor	Modest	Potential	Good	Redevelop	Good	Good	Unknown
Van Nuys	Good	Good	Modest	Poor	Modest	Potential	Good	Redevelop	Good	Good	Unknown
Yuba County	Modest	Modest	Poor	n/a	Poor	Potential	Modest	Very Good	Good	Modest	Modest
Cameron	Modest	Poor	Poor	n/a	Poor	Potential	Poor	None	None	Modest	Poor
Dinsmore	Poor	Poor	Poor	n/a	Poor	Potential	Poor	Very Good	Good	Poor	Good
Hayward Executive	Good	Good	Poor	n/a	Modest	Potential	Good	Redevelop	Good	Good	Unknown
Hollister	Poor	Poor	Poor	n/a	Poor	Potential	Poor	Very Good	Good	Poor	Good
Napa County	Poor	Modest	Poor	n/a	Poor	Potential	Poor	Very Good	Good	Modest	Good
Redding Municipal	Poor	Poor	Poor	n/a	Poor	Potential	Poor	Very Good	Good	Poor	Good
Sonoma County	Poor	Good	Poor	n/a	Poor	Potential	Poor	Very Good	Good	Good	Good
Fresno Yosemite Int'l	Modest	Good	Good	Poor	Modest	Potential	Modest	Good	Good	Good	Good
Gillespie Field	Modest	Good	Good	Good	Modest	Potential	Modest	Good	Good	Good	Poor
Auburn	Modest	Modest	Poor	n/a	Poor	Potential	Poor	Good	Good	Modest	Good
Santa Maria	Modest	Modest	Modest	Poor	Poor	Potential	Modest	Very Good	Good	Modest	Good

Table 3 Definition of Ratings

Rating	Surrounding population density	Surrounding employment density	Supporting multimodal transportation infrastructure	Permanence of multimodal transportation infrastructure	Easy to walk around	Potential for supportive parking environment	Amenities within ½ mile	Availability of land for development	Suitability of land for development	Proximity to service infrastructure	Community stance on developing surrounding area
None								No to little land available for development	Not applicable because no or little land available for development		
n/a				Not applicable because no or little existing multimodal capability							
Poor	No or little population in vicinity	No or little employment in vicinity	Currently no or little multimodal capability	Existing multi-modal transportation provided by buses, which are not	Few positive walking environment features	Obstacles prevent development of supportive parking	No to little amenities within 1/2 mile			No to little service Infrastructure nearby	High resistance to development in surrounding area
Potential			Currently no or little multimodal capability, but has potential			Potential to develop supporting parking environment					
Revelop								Possible, but requires redevelopment of existing uses			
Modest	Some population in vicinity	Some businesses in vicinity	Existing bus service		Some positive walking environment features		Some amenties within 1/2 mile			Modest service infrastructure nearby	Some community concerns with development
Good	High population in vicinity	High businesses in vicinity	Frequent existing bus or rail service	Existing multi-modal transportation provided by rail, which is			Several amenties within 1/2 mile	Land available for development	Land suitable for development	Service infrastructure nearby	Little or no resistance to development nearby
Very Good								Considerable land available for development			

Table 5 Weighting of Smart Growth Characteristics

Smart Growth Role	Surrounding population density	Surrounding employment density	Supporting multimodal transportation infrastructure	Permanence of multimodal transportation infrastructure	Easy to walk around	Potential for supportive parking environment	Amenities within ½ mile	Availability of land for development	Suitability of land for development	Proximity to service infrastructure	Community stance on developing surrounding area
Role 1 (Smart Growth Node)	3	4	1	1	1	1	1	4	4	1	1
Rate 2 (Retain, Attract Non-Smart Growth)	2	3						4	4	1	1
Role 3 (Transit Hub)			1	1							

Table 6 Identifying Airports for Role 1 (Smart Growth Node)

Airport Name	Surrounding population density	Surrounding employment density	Supporting multimodal transportation infrastructure	Permanence of multimodal transportation infrastructure	Easy to walk around	Potential for supportive parking environment	Amenities within ½ mile	Availability of land on or off airport for development	Suitability of land for development	Proximity to service infrastructure	Community stance on developing surrounding area	**Role 1 Score**
Concord-Buchanan Field	Good	Good	Potential	n/a	Poor	Potential	Good	Good	Good	Good	Good	**56**
Fresno Yosemite Int'l	Modest	Good	Good	Poor	Modest	Potential	Modest	Good	Good	Good	Good	**56**
Gillespie Field	Modest	Good	Good	Good	Modest	Potential	Modest	Good	Good	Good	Poor	**56**
Santa Monica	Good	Good	Good	Poor	Modest	Potential	Good	Redevelop	Good	Good	Unknown	**53**
Van Nuys	Good	Good	Modest	Poor	Modest	Potential	Good	Redevelop	Good	Good	Unknown	**52**
San Diego Int'l	Good	Good	Good	Poor	Poor	Potential	Good	Redevelop	Good	Good	Unknown	**51**
Hayward Executive	Good	Good	Poor	n/a	Modest	Potential	Good	Redevelop	Good	Good	Unknown	**50**
Santa Maria	Modest	Modest	Modest	Poor	Poor	Potential	Modest	Modest	Good	Modest	Good	**49**
Castle	Modest	Modest	Poor	n/a	Modest	Potential	Poor	Very Good	Good	Modest	Modest	**49**
Yuba County	Modest	Modest	Poor	n/a	Poor	Potential	Modest	Very Good	Good	Modest	Modest	**49**
Livermore Municipal	Modest	Modest	Potential	n/a	Poor	Potential	Modest	Good	Good	Good	Modest	**47**
Sonoma County	Poor	Good	Poor	n/a	Poor	Potential	Poor	Very Good	Good	Good	Good	**47**
Auburn	Modest	Modest	Poor	n/a	Poor	Potential	Poor	Good	Good	Modest	Good	**44**
Napa County	Poor	Modest	Poor	n/a	Poor	Potential	Poor	Very Good	Good	Modest	Good	**42**
Gravelly Valley	Poor	Poor	Poor	n/a	Poor	Potential	Poor	Very Good	Good	Poor	Good	**32**
Dinsmore	Poor	Poor	Poor	n/a	Poor	Potential	Poor	Very Good	Good	Poor	Good	**32**
Hollister	Poor	Poor	Poor	n/a	Poor	Potential	Poor	Very Good	Good	Poor	Good	**32**
Redding Municipal	Poor	Poor	Poor	n/a	Poor	Potential	Poor	Very Good	Good	Poor	Good	**32**
Cameron	Modest	Poor	Poor	n/a	Poor	Potential	Poor	None	None	Modest	Poor	**-791**
Blue Canyon	Poor	Poor	Poor	n/a	Poor	Poor	Poor	None	None	Poor	Poor	**-800**
Maximum Score	**Good**	**Good**	**Good**	**Good**	**Modest**	**Potential**	**Good**	**Very Good**	**Good**	**Good**	**Good**	**67**

Table 7 Identifying Airports for Role 2 (Retain, Attract Non-Smart Growth)

Airport Name	Surrounding population density	Surrounding employment density	Availability of land on or off airport for development	Suitability of land for development	Proximity to service infrastructure	Community stance on developing surrounding area	**Role 2 Score**
Concord-Buchanan Field	Good	Good	Good	Good	Good	Good	45
Sonoma County	Poor	Good	Very Good	Good	Good	Good	**43**
Fresno Yosemite Int'l	Modest	Good	Good	Good	Good	Good	43
Santa Maria	Modest	Modest	Very Good	Good	Modest	Good	**43**
Castle	Modest	Modest	Very Good	Good	Modest	Modest	**42**
Yuba County	Modest	Modest	Very Good	Good	Modest	Modest	**42**
Gillespie Field	Modest	Good	Good	Good	Good	Poor	40
Livermore Municipal	Modest	Modest	Good	Good	Good	Modest	**39**
Napa County	Poor	Modest	Very Good	Good	Modest	Good	**39**
Auburn	Modest	Modest	Good	Good	Modest	Good	**39**
Redding Municipal	Poor	Modest	Very Good	Good	Good	Good	**37**
San Diego Int'l	Good	Good	Redevelop	Good	Good	Unknown	38
Santa Monica	Good	Good	Redevelop	Good	Good	Unknown	38
Van Nuys	Good	Good	Redevelop	Good	Good	Unknown	38
Hayward Executive	Good	Good	Redevelop	Good	Good	Unknown	38
Gravelly Valley	Poor	Poor	Very Good	Good	Poor	Good	**31**
Dinsmore	Poor	Poor	Very Good	Good	Poor	Good	**31**
Hollister	Poor	Poor	Very Good	Good	Poor	Good	**31**
Cameron	Modest	Poor	None	None	Modest	Poor	**-794**
Blue Canyon	Poor	Poor	None	None	Poor	Poor	**-800**
Maximum Score	**Good**	**Good**	**Very Good**	**Good**	**Good**	**Good**	**49**

Note: Grey text denotes airports selected for Role 1.

Table 8 Identifying Airports for Role 3 (Transit Hub)

Airport Name	Supporting multimodal transportation infrastructure	Permanence of multimodal transportation infrastructure	**Role 3 Score**
Gillespie Field	Good	Good	**6**
San Diego Int'l	Good	Poor	**3**
Santa Monica	Good	Poor	**3**
Fresno Yosemite Int'l	Good	Poor	**3**
Sonoma County	Poor	n/a	**3**
Van Nuys	Modest	Poor	**2**
Santa Maria	Modest	Poor	**2**
Concord-Buchanan Field	Potential	n/a	**1**
Livermore Municipal	Potential	n/a	**1**
Blue Canyon	Poor	n/a	**0**
Castle	Poor	n/a	**0**
Gravelly Valley	Poor	n/a	**0**
Yuba County	Poor	n/a	**0**
Cameron	Poor	n/a	**0**
Dinsmore	Poor	n/a	**0**
Hayward Executive	Poor	n/a	**0**
Hollister	Poor	n/a	**0**
Napa County	Poor	n/a	**0**
Redding Municipal	Poor	n/a	**0**
Auburn	Poor	n/a	**0**
Maximum Score	**Good**	**Good**	**6**

Appendix 2 : Multimodal Transportation at Airports

The following are notes on multimodal transportation at the airports in Table 8 with score of two or greater.

Santa Monica	Big Blue Bus, fairly frequent
Van Nuys	FlyAway bus
Fresno Yosemite International	Two FAX routes, each every 30 min
McClellan-Palomar	Existing NCTD bus
Gillespie Field	Green Line LRT at the corner of airport, somewhat removed from existing development
Santa Maria	Existing SMAT bus