

6.0 LONG-TERM IMPLICATIONS OF THE PROJECT

6.1 SIGNIFICANT ENVIRONMENTAL EFFECTS THAT CANNOT BE MITIGATED

The environmental effects of the Proposed Project and Alternative 1 are addressed in Sections 4.1 through 4.11 of this Program EIR. Additional alternatives are addressed in Section 5.4. Implementation of the General Aviation Improvement Program (“GAIP”) (Proposed Project and Alternative 1) would result in potentially significant impacts related to land use compatibility. This topical issue is discussed in Section 4.6, and summarized in Table 1-2.

6.2 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES THAT WOULD BE CAUSED BY THE PROJECT

Section 15126(c) of the State California Environmental Quality Act (“CEQA”) Guidelines (14 *California Code of Regulations* [“CCR”]) requires that an EIR describe any significant irreversible environmental changes which would occur as a result of the proposed action should it be implemented. The environmental effects related to the implementation of the Proposed Project and Alternative 1 are analyzed in Sections 4.1 through 4.11 of this Program EIR. Implementation of the Proposed Project or Alternative 1 would redevelop land with uses comparable to the uses currently existing on the site. All improvements are on the Airport. When combined with the large capital investment required for implementation of the improvements, it is improbable that the site would revert to any other use. Therefore, the GAIP represents a long-term commitment to aviation support uses on the property.

Construction and long-term operation of the Proposed Project or Alternative 1 would require the commitment and reduction of nonrenewable and/or slowly renewable resources, including petroleum fuels (operation and construction), and natural gas (for construction, lighting, heating, and cooling of structures); and lumber, sand/gravel, steel, copper, lead, and other metals (for use in the building construction, piping, and roadway infrastructure). Other resources that are slow to renew and/or recover from environmental stresses would also be impacted by GAIP implementation, such as air quality through the combustion of fossil fuels and production of greenhouse gases and water usage associated with construction activities. However, by complying with current design standards, such as Title 24 Energy Efficiency Standards for Nonresidential Buildings (*California Code of Regulations* [CCR], Title 24, Part 6) and the applicable California Green Building Standards (“CALGreen”) Code (24 CCR 11), the new facilities would be more energy efficient than the existing buildings, which were constructed when less stringent energy efficiency requirements were in place. Therefore, operation of the Proposed Project or Alternative 1 would be expected to reduce long-term energy usage and associated emissions.

Based on the unconstrained forecast analysis, the Airport will not be able to accommodate all the general aviation demand given the projected fleet mix. As shown in Section 3 of this Program EIR the total number of aircraft operations with the Proposed Project and Alternative 1 are projected

to be less than existing and less than the unconstrained forecasts.¹ It is reasonable to assume that much of the general aviation activity not being accommodated at the Airport would still occur, thereby requiring pilots to travel to more distant airports. The travel to these other airports would require a commitment of resources (e.g., gasoline for vehicles to drive to the other airports) and would result in more regional VMT. The magnitude of the increased usage of resources would be associated with the number of aircraft that would be displaced with the alternative being evaluated (i.e., the No Project would not displace aircraft; however, the types of facilities would not fully align with the demand; Alternative 3 would displace the fewest aircraft; however, similar to the No Project Alternative, the types of facilities would not fully align with the demand; and the Proposed Project would displace the greatest number of aircraft).

6.3 GROWTH-INDUCING IMPACTS OF THE PROPOSED ACTION

Pursuant to Sections 15126(d) and 15126.2(d) of the State California Environmental Quality Act (“CEQA”) Guidelines (14 *California Code of Regulations* [“CCR”]), this section is provided to examine: (1) ways in which the Project could foster economic or population growth and (2) the construction of additional development, either directly or indirectly, in the surrounding environment. Per Section 15126.2(d) of the State CEQA Guidelines, growth-inducing effects are not necessarily beneficial, detrimental, or of little significance to the environment. This issue is presented to provide additional information on ways in which the GAIP could contribute to significant changes in the environment, beyond the direct consequences of the Proposed Project and Alternative 1.

When considering growth-inducing impacts, it is important to consider the context and historical growth trends of the area. There are many factors that can affect the amount, location, and rate of growth in Orange County and the region in general. These factors include market demand for housing, employment, and commercial services; the acknowledged desirability of climate and living/working environment and commercial economy; the availability of other services/infrastructure; and the land use and growth management policies of local jurisdictions.

Orange County has experienced significant growth in population over the past 55 years. Population in the County has increased from 703,928 in 1960 to 3,153,190 in 2015 (CDR 2016). Concurrent with significant increases in population, the economic character of Orange County has dramatically changed. The predominately rural/agricultural character of Orange County has changed to a diversified commercial/industrial economy. High technology industries, biomedical facilities, retail commercial, light manufacturing, administrative and financial services, and tourism have become major components of the County’s economy. In 1965, the employment-to-population ratio was 22 percent. By 2015, the ratio had increased to approximately 51 percent countywide (note this was down from 54 percent in 2008). Not only had the proportion of jobs to residents increased, but it was also based on a dramatically larger population. The growth in population and employment is projected to continue through 2026 (the Project horizon year) and beyond. Based on the *Orange County Projections 2014 Modified*, developed by the Center for Demographic Research at California State University at Fullerton,

¹ Tables 3-2 and 3-3 provides the information on the Baseline (2016) and unconstrained forecasts (2026) for general aviation operations at the Airport. Tables 3-6 and 3-7 provide the constrained operation forecasts for the Proposed Project and Tables 3-10 and 3-11 provide constrained operation forecasts Alternative 1, respectively. Tables 5-4 and 5-8 provide the constrained forecasts for Alternatives 2 and 3, respectively.

between 2015 and 2040, an approximate 9.7 percent increase in population and a 16.9 percent increase in employment is projected to occur in Orange County (CDR 2016).

To address this issue, potential growth-inducing effects are examined through analysis of the following questions:

- 1. Would this Project remove obstacles to growth (e.g., through the construction or extension of major infrastructure facilities that do not presently exist in the project area or through changes in existing regulations pertaining to land development)?**

Due to the limited space at the Airport, redeveloping the general aviation uses at the Airport would not remove obstacles to growth. The Proposed Project and Alternative 1 would reduce the number of based general aviation aircraft at JWA and is designed to more effectively meet the demand for general aviation facilities. The Proposed Project and Alternative 1 would allow the facilities at the Airport to be upgraded and modernized by the replacement of older facilities; however, the nature of the general aviation operations would not substantially change. The facilities proposed recognize the decline in piston engine aircraft since 1980 at the Airport and growth in business aircraft activity. Therefore, although there would be an overall decline in the number of general aviation operations compared to existing conditions there would be an incremental increase in non-piston flights. This trend is occurring independent of the JWA GAIP. Table 6-1 shows the projected (2026) number of flights by aircraft engine type and percentage change compared to 2016 for the unconstrained condition, the Proposed Project, Alternative 1, and No Project Alternative. The Proposed Project and Alternative 1 are forecast to have a 13.9 percent and a 12.6 percent reduction respectively, in the total number of operations compared to existing conditions (2016).

**TABLE 6-1
JWA FORECAST OPERATIONS BY AIRCRAFT ENGINE TYPE
WITH PERCENTAGE CHANGE COMPARED TO 2016**

Year	Piston	Turbine	Jet	Helicopter/ Other	Total Operations
Estimated 2016 (baseline)	147,300	9,800	31,800	3,900	192,800
2026 Unconstrained Forecasts	147,100	12,000	43,600	5,100	207,800
<i>Percentage change from 2016</i>	<i>-0.1</i>	<i>22.4</i>	<i>37.1</i>	<i>30.8</i>	<i>7.8</i>
2026 Proposed Project (constrained forecasts)	111,000	11,700	40,400	4,800	167,900
<i>Percentage change from 2016</i>	<i>-24.6</i>	<i>19.4</i>	<i>27.0</i>	<i>23.1</i>	<i>-13.9</i>
2026 Alternative 1 (constrained forecasts)	111,600	10,800	41,400	4,800	168,600
<i>Percentage change from 2016</i>	<i>-24.2</i>	<i>10.24</i>	<i>30.2</i>	<i>23.1</i>	<i>-12.6</i>
2026 No Project (constrained forecasts)	147,000	10,900	38,300	4,800	201,000
<i>Percentage change from 2016</i>	<i>-0.2</i>	<i>11.2</i>	<i>20.4</i>	<i>23.1</i>	<i>4.3</i>
Note: Numbers may not add up due to rounding.					
Source: AECOM 2017b.					

The GAIP does not provide needed infrastructure that would facilitate growth beyond the Airport or facilities that would attract growth from outside the region. The Proposed Project or Alternative 1 also would not result in any modifications to land uses or land use policies that would encourage the redevelopment in the vicinity of the Airport with more intense land uses.

2. Would this Project result in the need to expand one or more public services to maintain desired levels of service?

There would be new utility distribution lines installed on the Airport to service the new general aviation facilities associated with the Proposed Project and Alternative 1; however, this reconfiguration of facilities would not require upgrades to offsite facilities by the utility providers. The Proposed Project and Alternative 1 would reduce the number of general aviation operations compared to existing conditions and projected No Project operations; therefore, the GAIP would not result in a substantial increase in demand for public services. However, based on the future fleet mix, an increase in aviation fuel usage would be associated with the year 2026 operations.

The Orange County Fire Authority and the Orange County Sheriff's Department, which provide fire, police, and emergency services to the Airport, have facilities at the Airport (Fire Station 33 and the OCSO substation and helicopter facilities). The Proposed Project and Alternative 1 would not change the nature of the Airport operations in a manner that would result in an increased demand for public services.

The GAIP provides an opportunity for a General Aviation Facility ("GAF") for international general aviation arrivals. The physical impacts associated with the implementation of the GAF have been identified as part of the analysis of the GAIP. No significant environmental impacts were identified specific to the GAF, rather they have been addressed as part of the larger GAIP Project. Although Homeland Security/Customs and Border Protection ("CBP") currently provide staffing at JWA for the international commercial carrier flights, the GAF may involve an expansion of the staff if the staff servicing the commercial carriers cannot accommodate the introduction of international general aviation arrivals. Though an estimated number of CBP agents has not been identified, the *General Aviation Forecasting and Analysis Technical Report* (Appendix C to this Program EIR) projects in 2026 approximately 490 annual international general aviation departures would occur at JWA. If CBP inspection is available, it is anticipated that the international departures that originated at JWA would prefer custom clearance at JWA when they return (AECOM 2017).² The number of new CBP agents to service this demand would not be statistically significant to result in substantial growth in the region.³ It should also be noted, CBP inspection service for the international commercial aircraft operations at JWA is currently paid for by user fees. The CBP general aviation

² The 490 annual international departures is the baseline scenario for the unconstrained forecasts. The high scenario would be 570 annual international departures in 2026 and the low scenario is 420 annual departures. These projections are considered the upper bounds for potential international arrivals (AECOM 2017).

³ The Orange County Projections 2014 Modified, the official demographic projections used for planning purposes in Orange County, projects in 2025 Orange County will have a population of 3,350,900 and have 1,792,051 jobs.

inspection services are also assumed to be user fee based. Therefore, the demand would not place an undue burden on the agency.

Many of these flights would still occur even if JWA does not have a GAF. The international general aviation arrivals would need to stop at another airport that offers general aviation CBP services. International general aviation arrivals would represent a small percentage of the overall projected general aviation activity and the increased demand for CBP services would not result in substantial growth at the Airport or the region.

3. Would this Project encourage or facilitate economic effects that could result in other activities that could significantly affect the environment?

Orange County is the third largest county in California by population and sixth largest in the United States (Census 2010). The estimated gross county product for 2016 was \$221.4 billion, which is approximately 10 percent of the gross state product (CDR 2017). JWA is an important contributor to the economy of Orange County. Although an important contributor, the Airport is just one component of the overall economic base of Orange County.

General aviation activities generate revenue for the Airport through lease payments, fees (such as landing fees and fuel flowage fees), tenant investments, and taxes. The improvements proposed by the GAIP would not substantially change the uses at the Airport or substantially increase the magnitude of the revenue generated by general aviation uses at the Airport. Therefore, it would not stimulate the economy of Orange County to the level that other activities, which would result in significant environmental effects, would be encouraged.

The GAIP would provide a short-term stimulation to the local economy as improvements are constructed. Project construction would result in a number of design, engineering, and construction-related jobs, which would last for five to six years until GAIP construction is completed. This would provide economic stimulus in the area; however, these jobs are typically filled by existing residents of the region and would not be substantial enough to foster economic activity that would change the growth levels or patterns in Orange County. As a result, economic effects associated with the Proposed Project or Alternative 1 would not significantly affect the environment.

4. Would approval of this Project involve some precedent-setting action that could encourage and facilitate other activities that could significantly affect the environment?

The GAIP would provide for the implementation of a GAF at the Airport. Such a facility would allow general aviation international arrivals. Although the ability to accommodate international arrivals for general aviation aircraft would be a change in services provided, it would not substantially encourage and facilitate other activities that could significantly affect the environment. The GAIP will provide the framework for general aviation improvements at the Airport. As discussed above under Item 2, the *General Aviation Forecasting and Analysis Technical Report* estimates in 2026 approximately 490 annual international general aviation departures would occur at JWA and projects an equivalent number of international arrivals if CBP inspection is available at the Airport, this

represents a small percentage of the total flights of general aviation flights at the Airport, some of which are already flying to the Airport after stopping at a different airport for CBP services. The physical impacts of building the GAF are addressed in the GAIP as a component of the full service fixed base operators (“FBOs”). Expansion of new facilities off-Airport would not be required or expected because of the introduction of international general aviation activities. Following selection of a GAIP development scenario, leases at the Airport would be approved, which would be a stabilizing factor at the Airport and provide a continuation of the long-term commitment to general aviation activities. This action would not affect policies related to any uses off the Airport property. The GAIP would not encourage or facilitate additional growth beyond the Airport. In addition, international arrivals already occur for commercial carriers at JWA. Therefore, no precedent-setting action would be needed since CBP services already exist at JWA.

6.4 ENERGY ANALYSIS

Section 21100(b)(3) of the *California Public Resources Code* and Appendix F to the State CEQA Guidelines require a discussion of potential energy impacts of proposed projects. Appendix F states:

The goal of conserving energy implies the wise and efficient use of energy. The means of achieving this goal include:

- (1) Decreasing overall per capita energy consumption,
- (2) Decreasing reliance on fossil fuels such as coal, natural gas and oil, and
- (3) Increasing reliance on renewable energy sources.

Appendix F of the State CEQA Guidelines also identifies that “EIRs include a discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful and unnecessary consumption of energy”.

The analysis in this section utilizes the data from air quality and greenhouse gas emissions (“GHG”) analyses evaluated in Section 4.2 and Section 4.4, respectively. Because the California Emissions Estimator Model (“CalEEMod”) program does not display the amount and fuel type for construction-related sources, additional calculations were conducted and are summarized below.

6.4.1 SHORT-TERM CONSTRUCTION

Project construction would require the use of construction equipment for grading, hauling and building activities; all off-road construction equipment is assumed to use diesel fuel. Construction also includes the vehicles of construction workers and vendors traveling to and from the Project site and on-road haul trucks for the export of materials from site clearing and demolition and the export and import of soil for grading.

Off-road construction equipment use was calculated from the equipment data (mix, hours per day, horsepower, load factor, and days per phase) provided in the CalEEMod construction output

files included in Appendix E of the this Program EIR. The total horsepower hours for the Project was then multiplied by fuel usage estimates per horsepower-hour included in Table A9-3-E of the SCAQMD’s CEQA Air Quality Handbook.

Fuel consumption from construction worker, vendor, and delivery/haul trucks was calculated using the trip rates and distances provided in the CalEEMod construction output files. Total vehicle miles traveled (“VMT”) was then calculated for each type of construction-related trip and divided by the corresponding Orange County-specific miles per gallon factor using California Air Resources Board’s (“CARB’s”) EMFAC 2014 model. EMFAC provides the fuel consumed for each vehicle type. Consistent with CalEEMod, construction worker trips include 50 percent light duty gasoline auto and 50 percent light duty gasoline trucks. Construction vendor and delivery/haul trucks were evaluated as heavy-duty diesel trucks.

Water usage for dust control was calculated based on a minimum control efficiency of 66 percent (three times daily) with an application rate of 3,020 gallons per acre per day.⁴ CalEEMod defaults were used to determine the electricity equivalent to delivery of potable water in Southern California (0.009727 kWhr). It should be noted, that the Proposed Project construction schedule assumes more days associated with demolition and grading than is anticipated for Alternative 1; therefore, the water usage for dust suppression is greater.

Tables 6-2 and 6-3 present the maximum energy and water usage for the Proposed Project and Alternative 1 scenarios.

**TABLE 6-2
PROPOSED PROJECT CONSTRUCTION ENERGY CONSUMPTION**

Source	HP (hours)	VMT	Diesel Fuel (gallons)	Gasoline (gallons)	MWh
Off-road Construction Equipment	89,976		4,499		
Worker commute		2,160,459		105,775	
Vendors		335,174	58,803		
On-road haul		5,805,660	1,018,537		
Water - dust control					3,188
Totals	89,976	8,301,293	1,081,838	105,775	3,188
HP: horsepower; VMT: vehicle miles traveled; MWh: megawatt hours					
Source: CalEEMod output (from Air Quality Technical Report, Landrum & Brown 2018)					

⁴ Data provided by Landrum and Brown and developed using the *Air & Waste Management Association Air Pollution Engineering Manual* (1992 Edition).

**TABLE 6-3
ALTERNATIVE 1 CONSTRUCTION ENERGY CONSUMPTION**

Source	HP (hours)	VMT	Diesel Fuel (gallons)	Gasoline (gallons)	MWh
Off-road Construction Equipment	93,301		4,665		
Worker commute		2,630,124		128,770	
Vendors		334,719	58,723		
On-road haul		7,098,000	1,245,263		
Water - dust control					3,149
Totals	93,301	10,062,843	1,308,651	128,770	3,149
HP: horsepower; VMT: vehicle miles traveled; MWh: megawatt hours					
Source: CalEEMod output (from <i>Air Quality Technical Report</i> , Landrum & Brown 2018)					

6.4.2 TRANSPORTATION

As described in Section 4.8, Transportation/Traffic, the GAIP (Proposed Project and Alternative 1) would not substantially increase the number of vehicle miles traveled (“VMT”). The VMT associated with the operations of the Proposed Project would be slightly reduced and Alternative 1 would remain relatively unchanged compared to the Baseline (2016) numbers because the number of aircraft operations would be reduced under both scenarios. However, both the Proposed Project and Alternative 1 would result in the displacement of general aviation aircraft. This would add between 6,405 weekday VMT (Alternative 1) and 6,649 weekday VMT (Proposed Project) when compared to the Baseline (2016) (ATC 2018). Although the additional VMT would result in an incremental increase in energy usage, this limited number of miles would not represent a meaningful change in the regional energy usage.⁵

In addition to vehicle trips, there would be fuel (i.e., energy) usage associated with the aircraft operations. Table 6-4 provides a comparison of the aircraft fuel usage for general aviation operations for the Proposed Project, Alternative 1, and the No Project compared to the Baseline (2016). As shown, there would be an increase of 23 and 25 percent when compared to the Baseline for the Proposed Project and Alternative 1, respectively. This is four and six percent higher than the No Project Alternative for the Proposed Project and Alternative 1, respectively. Although higher than the baseline condition, this increase in fuel consumption associated with Proposed Project or Alternative 1 is reflective of market demands for the type of aircraft and would not be considered inefficient, wasteful, or unnecessary.

⁵ As discussed in Section 4.8, the added VMT for the Proposed Project represents an 0.0022 percent increase in the number of vehicle miles traveled on regional circulation network. For Alternative 1 it is 0.0021 percent of the trips on the regional circulation network.

**TABLE 6-4
GENERAL AVIATION AIRCRAFT FUEL ENERGY CONSUMPTION**

Scenario	Fuel Consumption (gallons)	Fuel Increase (gallons)/ Percentage Increase Compared to Baseline (2016)
Baseline (2016) Conditions	2,121,429	—
No Project Alternative	2,516,786	395,357/19%
Proposed Project	2,610,000	488,571/23%
Alternative 1	2,653,214	531,785/25%
Source: Landrum & Brown 2018 (The FAA's Aviation Environmental Design Tool Version 2d)		

Another component of transportation energy usage is the ground support equipment (“GSE”) (e.g., tugs, water carts, lavatory carts, and other ramp service equipment/vehicles) used to support the aviation activities. The fuel usage associated with the GSE would be incrementally decreased with the implementation of MN AQ-2 (included in Section 4.4, Greenhouse Gas Emissions), which requires the general aviation FBOs to employ Zero Emission Vehicle (“ZEV”) GSE where available for 90 percent or greater of the GSE operating hours. This would be applicable to both the Proposed Project and Alternative 1.

6.4.3 ENERGY DEMAND

As identified in Section 4.6, Greenhouse Gas Emissions, Title 24 of the *California Code of Regulations* (“CCR”, specifically, Part 6) is California’s Energy Efficiency Standards for Residential and Non-residential Buildings. Title 24 was established by the California Energy Commission (“CEC”) in 1978 in response to a legislative mandate to create uniform building codes to reduce California’s energy consumption and to provide energy efficiency standards for residential and non-residential buildings. The current applicable standards are the 2016 Standards, effective July 1, 2017. The 2016 standards are five percent more efficient for nonresidential buildings than the previous 2013 code. It should also be noted, the California Energy Commission is in the process of developing the 2019 standard measures, which are proposed for adoption in 2018 with an effective date of January 1, 2020 (CEC 2018)

The 2016 California Green Building Standards Code (24 CCR, Part 11), also known as the CALGreen code, contains mandatory requirements for new residential and nonresidential buildings (including buildings for retail, office, public schools, and hospitals) throughout California. The development of the CALGreen Code is intended to (1) cause a reduction in GHG emissions from buildings; (2) promote environmentally responsible, cost-effective, healthier places to live and work; (3) reduce energy and water consumption; and (4) respond to the directives by the Governor. In short, the code is established to reduce construction waste; make buildings more efficient in the use of materials and energy; and reduce environmental impact during and after construction.

The GAIP (Proposed Project and Alternative 1) would promote building energy efficiency through compliance with energy efficiency standards (Title 24 and CALGreen). The Proposed Project would replace approximately 134,000 square feet of existing aging facilities with

approximately 97,000 square feet new and more efficient facilities and Alternative 1 would provide 110,000 square feet of new buildings that would require conditioned air.⁶ New FBO facilities would be constructed in compliance with Title 24 Energy Efficiency Standards for Non-residential Buildings. Energy efficiency standards are substantially more stringent than the standards applied at the time the existing facilities were constructed. As noted above, the 2016 standards are five percent more efficient for nonresidential buildings than the previous 2013 code. Additionally, the 2013 standards were 30 percent more efficient for nonresidential buildings than the previous 2008 code. To further promote energy efficiency, minimization measure MN GHG-1 requires all general aviation-related development and uses facilitated by approval of the GAIP to comply with applicable measures set forth in its *Climate Action Plan*. Additionally, it is anticipated that energy usage of the GAIP (Proposed Project and Alternative 1) would be less when compared with existing conditions based on the mandatory requirements for new construction under the CALGreen code (RR GHG-1 and RR GHG-2).

6.5 REFERENCES

- Austin Transportation Consulting (ATC). 2018. (April) *John Wayne Airport General Aviation Improvement Program Traffic Impact Analysis*. Orange, CA. (Appendix I)
- California Energy Commission (CEC). 2018. <http://www.energy.ca.gov/title24/2019standards/prerulemaking/> (last accessed March 24, 2018)
- Center for Demographic Research (CDR). 2016 (June 23, final approval). Orange County Projections 2014 Modified (Data Sets, an excel spreadsheet). Fullerton, CA: CDR.
- . 2017 (June). Orange County Facts & Figures. <http://www.fullerton.edu/cdr/ocff.pdf> (accessed November 11, 2017).

⁶ Hangars would not be air conditioned or heated; therefore, these facilities do not add substantially to the energy usage.