



# Colorado Aerotropolis Visioning Study

## Colorado Aerotropolis Visioning Study

### Assessment of Growth Projections for the Colorado Aerotropolis Study Area

Prepared by



May 2016





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## Assessment of Growth Projections for the Colorado Aerotropolis Study Area

### Introduction and Overview

An Aerotropolis is an urban plan in which the layout, infrastructure, and economy are centered on an airport.

The Colorado Department of Transportation (CDOT) conducted a study regarding the infrastructure requirements that could enhance economic development surrounding Denver International Airport (DIA). The Colorado Aerotropolis Visioning Study, funded by a Federal Highway Administration grant, along with additional funds from DIA, collaboratively engaged local jurisdictions to examine the benefits and impacts of a proactively planned Aerotropolis infrastructure surrounding DIA. An infrastructure framework for transportation, water, wastewater, power, communications, and drainage is critical to fostering and supporting economic development surrounding the airport.

CDOT engaged Adams County, City of Aurora, City of Brighton, City of Commerce City, City and County of Denver, as well as DIA, in the Visioning Study.

### Study Vision

At the onset, study participants jointly developed a vision for a Colorado Aerotropolis:

*A sustainable, efficient, well-connected, and globally recognized Colorado Aerotropolis that capitalizes on the economic opportunity surrounding the Denver International Airport through collaborative planning, development, and marketing.*

### Study Objectives

CDOT had the following objectives for the study:

- Agree on a collaborative vision for a Colorado Aerotropolis.
- Learn about the aerotropolis concept.
- Identify commonalities among the local plans.
- Quantify the potential for economic growth—with or without a Colorado Aerotropolis.
- Identify a framework of possibilities for collaboration on infrastructure investments.
- Outline regional governance options to implement investments in transportation, water, wastewater, drainage, power, and communications systems.

## Working Paper Organization

This working paper is organized into the following sections:

- Purpose: Range of Potential Aerotropolis Growth Projections
- Definitions of Growth Scenarios
- DRCOG 2040 Socioeconomic Forecasts
- Colorado Aerotropolis Study Area
- Comparative Analysis and Observations
- Comprehensive Plans in the Study Area
- IGA Amendment Commercial Development Pilot Program
- Current Active Developments
- Conceptual Range of Development for Aerotropolis Scenario
- Geographic Allocation of Aerotropolis Employment
- Associated Housing Development

### **Purpose: Range of Potential Aerotropolis Growth Projections**

Employment and population growth forecasts are a key input to the Colorado Aerotropolis Visioning Study, as the level of projected growth is a direct indicator of the additional land use development and economic activity anticipated to occur within a given region. This paper presents the socioeconomic forecasts for the year 2040 as a Business as Usual Scenario, as prepared by the Denver Regional Council of Governments (DRCOG). Further, it explores different approaches for estimating a range of reasonable projections of employment activity under an Aerotropolis Scenario.

### **Definitions of Growth Scenarios**

This working paper describes the characteristics of two scenarios to assess growth projections for the study area.

#### **Business as Usual Scenario**

The Business as Usual Scenario represents a “current trend” environment relative to development surrounding DIA. It is based on the following assumptions:

- Reflects the future socioeconomic forecast dataset in the DRCOG *2040 Fiscally constrained Regional Transportation Plan* (DRCOG 2040 RTP) (DRCOG 2015a).
- Assumes the state and federally funded projects as identified in the *DRCOG 2040 RTP*.
- No amended Intergovernmental Agreement (IGA); therefore, no new on-airport nodes or accesses.

#### **Aerotropolis Scenario**

The Aerotropolis Scenario represents a higher level of regional coordination and marketing relative to infrastructure and development surrounding DIA. It was largely compiled from

information derived from master plans from each of the jurisdictions, as described in detail in the *Infrastructure Development for the Colorado Aerotropolis Study Area* working paper. The Aerotropolis Scenario has the following assumptions:

- 2040 Horizon Year. Only 25 years into the future, 2040 was used because of availability of data for that horizon year. Note that DIA has now been operating for 20 years. It was recognized that a Colorado Aerotropolis would develop over several decades - for another 50 years and beyond. On the other hand, initial steps for the Colorado Aerotropolis development could take place in the next 10 to 15 years.
- An executed IGA Amendment - additional on-airport development; shared revenues; and new accesses onto the DIA property.
- New regional governance mechanism for the Colorado Aerotropolis.
- The Colorado Aerotropolis attracts additional development from the Region, the State, North America, and the globe.
- Assumes the advancement of locally funded transportation projects as identified in the *DRCOG 2040 RTP*, and some additional roadway improvements.

## **DRCOG 2040 Socioeconomic Forecasts**

As a Metropolitan Planning Organization, DRCOG leads regional planning for the Denver metropolitan area and is responsible for developing a transportation plan for the region.

### **Metro Vision Objectives**

DRCOG's *Metro Vision 2035 Plan* (DRCOG 2011) establishes how the future multimodal transportation system will serve the people and businesses of the Denver region. Supported by 14 specific policies, the Plan addresses mobility, land use, and development issues in an integrated manner.

The *Metro Vision Regional Transportation Plan* (MVRTP) implements the transportation elements of the *Metro Vision 2035 Plan*. The MVRTP contains an unconstrained vision plan, outlining the region's total transportation needs, as well as the *DRCOG 2040 RTP*, which includes those projects that can be implemented given reasonably expected revenues. DRCOG adopted the *DRCOG 2040 RTP* in February 2015, and is in the process of preparing a new Metro Vision Plan and MVRTP, with anticipated adoption in mid-2016.

The *DRCOG 2040 RTP* is based on the goals and policy direction of *Metro Vision 2035* along with input received to date from its member governments for the *Metro Vision 2040 Plan*. Specifically, the process for selecting regionally significant roadway capacity projects used criteria updated for the *Metro Vision 2040 Plan*, adopted by the DRCOG Board in April 2014.

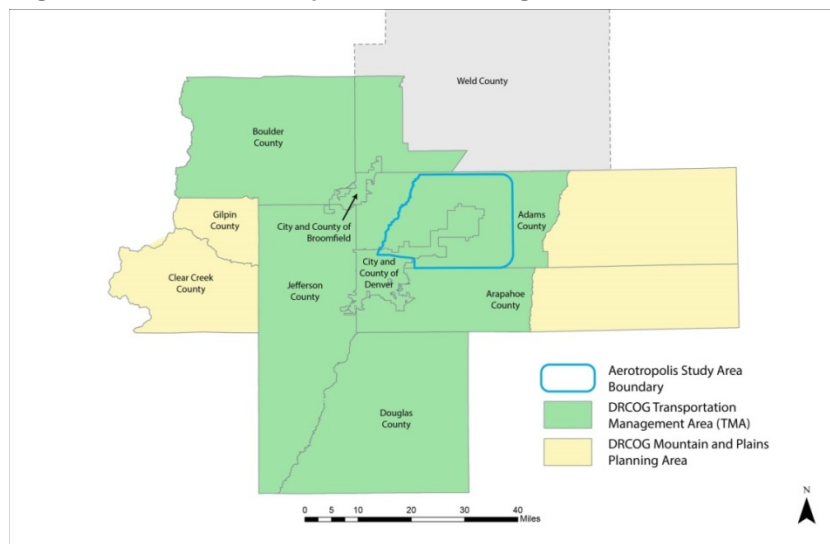
The study area for the Colorado Aerotropolis Visioning Study (study area) is fully located within the boundaries of the *Metro Vision 2040 Plan* and has been included in the studies, projections, and forecasts used to prepare the *DRCOG 2040 RTP*.

## DRCOG Region Population and Employment Projections for 2040

DRCOG's 2040 RTP is prepared for the Transportation Management Area (TMA), which is made up of the counties of Boulder, Broomfield, Denver, Douglas, Jefferson, the western portions of Adams and Arapahoe, and the southeast portion of Weld. The TMA is shown in Figure 1.

DRCOG, in conjunction with the state demographer, establishes regional control totals for population and

Figure 1 DRCOG Transportation Management Area



Source: DRCOG.

employment forecasts for the region. With input from each of the local jurisdictions, DRCOG allocates the population and employment projections throughout the TMA using a land use simulation model. The TMA's population projections will approach 4.3 million persons by 2040, compared to about 3.1 million in 2015. The DRCOG Region 2040 Employment projections are presented in Table 1. As reference, 2015 estimates are included in the table.

Table 1 DRCOG TMA 2040 Employment Projections

County	Acres	2015 Employment	2040 Employment	Annualized Employment Growth Rate 2015-2040
Adams (Within TMA)	363,302	229,115	347,308	1.68%
Arapahoe (Within TMA)	216,003	338,596	493,882	1.52%
Boulder	473,536	195,721	234,917	0.73%
Broomfield	22,439	52,592	111,812	3.06%
Denver	101,159	542,798	572,634	0.21%
Douglas	539,794	146,252	228,155	1.79%
Jefferson	494,763	287,418	337,528	0.64%
Southwestern Weld	128,892	20,898	19,905	-0.19%
<b>DRCOG TMA Total</b>	<b>2,339,889</b>	<b>1,813,390</b>	<b>2,346,141</b>	<b>1.04%</b>
<b>Study Area Total</b>	<b>236,054</b>	<b>145,532</b>	<b>227,700</b>	<b>1.81%</b>

Source: DRCOG 2040 RTP.



## Observations

The land area in the DRCOG TMA is 2.3 million acres, or about 3,600 square miles.

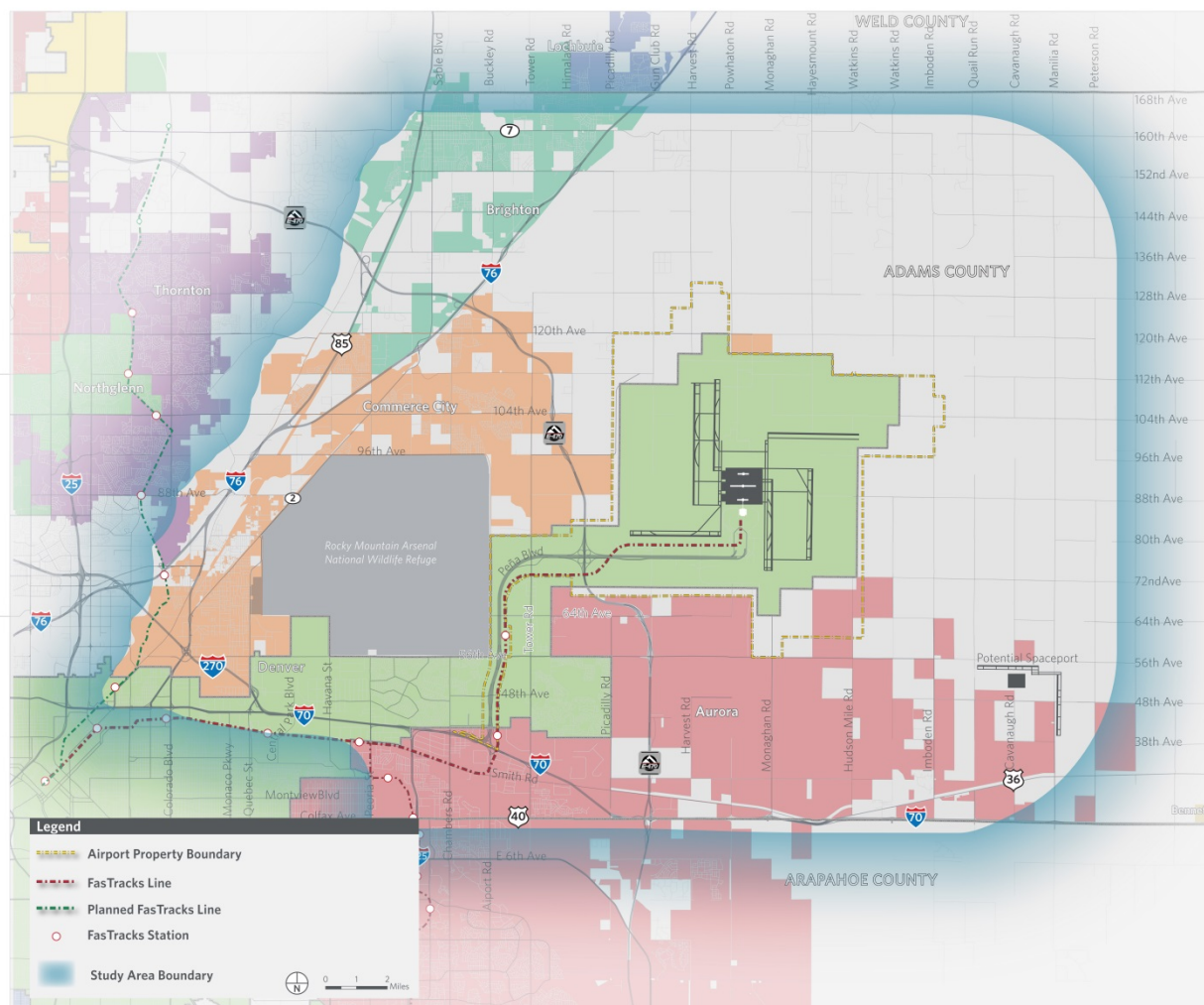
Employment in the TMA is projected to grow at just over at a 1.0% annual average growth rate, to a total of 2.3 million jobs. The highest employment growth rates within the TMA are projected for Adams and Broomfield Counties.

## Colorado Aerotropolis Study Area

The Colorado Aerotropolis study area is shown in Figure 1 and Figure 2. The study area boundaries defined an area of influence that impacts or will be impacted by the current and future economic conditions both on and off airport. It comprises a significant portion of the DRCOG TMA accounting for just over 10% of the total TMA land area.

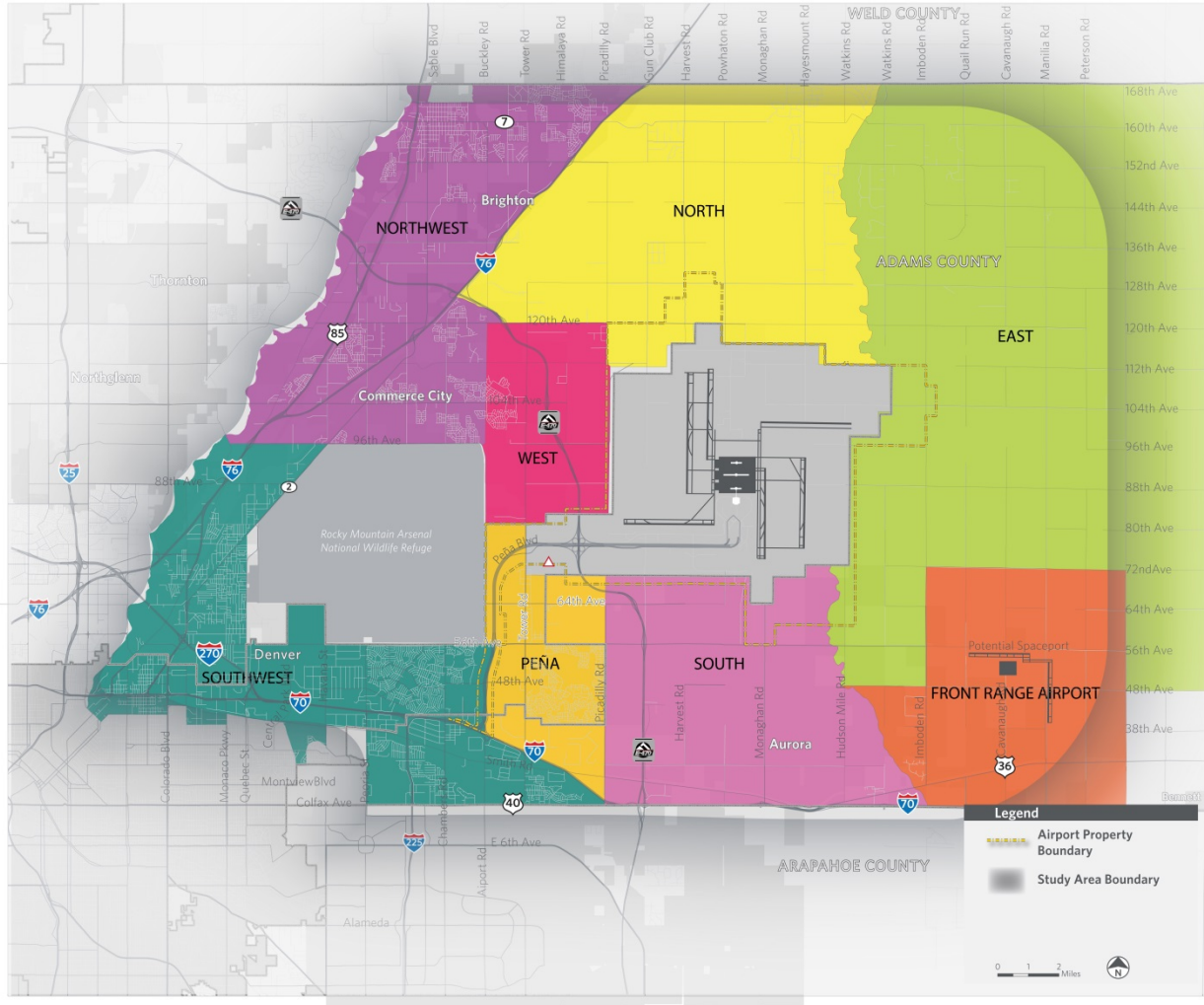
For planning purposes of this study, the study area is further divided into Districts. These are illustrated in Figure 3.

Figure 2 Study Area for the Colorado Aerotropolis Visioning Study



Source: Aerotropolis Study Team.

Figure 3 Study Area Planning Districts



Source: Aerotropolis Study Team.

## Summary of DRCOG Population and Employment Projections

The DRCOG population and employment projections for each of the Districts within the study area are summarized in Table 2.

Table 2 DRCOG 2040 Population and Employment Projections for Study Area Districts

Area	Population 2015	Population 2040	Employment 2015	Employment 2040
North	4,789	12,406	990	979
West	6,078	7,886	2,191	2,479
East	2,545	4,745	549	636
Front Range Airport	917	1,945	495	625
South	2,646	3,184	1,002	1,011
Peña	20,146	37,649	8,011	13,678
DIA (Non Terminal)	60	55	7,331	15,237
Terminal	16	16	13,406	29,019
Northwest	67,053	123,299	22,177	25,259
Southwest	92,882	128,484	89,380	138,777
<b>Study Area (Total)</b>	<b>197,132</b>	<b>319,669</b>	<b>145,532</b>	<b>227,700</b>

Source: DRCOG 2040 RTP.

### Observations

The Districts in the study area have a 2015 population of 197,100, which is projected to grow to 319,700 in 2040. Employment in the Districts in 2015 is approximately 145,500 jobs and is projected to increase to 227,700 in 2040.

**Northwest and Southwest Districts.** The vast portion of the study area population and employment projections is in these two Districts in the south and western portion of the study area.

**DIA Terminal District.** Employment numbers for the DIA Terminal District represent airline, cargo, rental car company, DIA, and other employees who directly support airport operations. DIA, in conjunction with the FAA, prepares airline passenger enplanement forecasts for planning purposes. These numbers are the basis for employment projections that DRCOG used for the 2040 data set in the Terminal District.

**DIA Non-Terminal District.** Employment forecasts in the DIA Non-Terminal District reflect other development activity on the airport property. These projections are based on preliminary information of DIA's regarding potential development activity on airport property.

**South District.** This district is mostly within the City of Aurora. There are only 1,000 employees in 2015, and the DRCOG 2040 dataset does not indicate any growth in employment in this area. Aurora and DRCOG are working together to review and update the 2040 forecasts in the Aurora area near DIA.

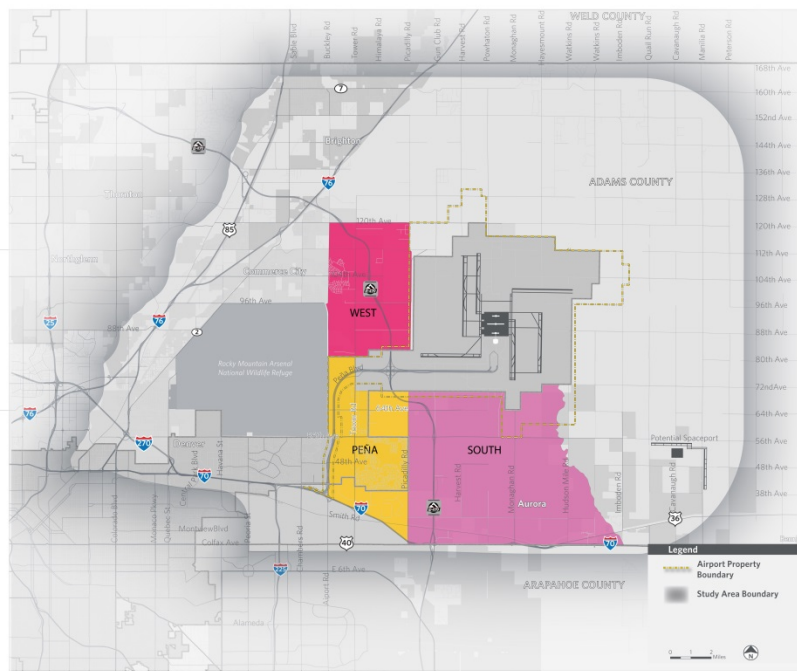
**West District.** This district is mostly within the City of Commerce City. There are 2,200 employees in 2015, and the DRCOG 2040 dataset indicates growth to only 2,500 employees in this area. Commerce City and DRCOG are working together to review and update the 2040 forecasts in this area near DIA.

**North and East Districts.** The existing and projected numbers for population and employment in these Districts are non-consequential, reflecting the lack of existing and projected activity.

**Aerotropolis South and West Concentrated Development Area.** Given the disparity in the projected development among the study area Districts, the study team decided to focus the analysis on the South, Peña and West Districts to the south and west of DIA. This

Concentrated Development Area is shown in Figure 4 and tabulated in Table 3.

**Figure 4 South and West Concentrated Development Area**



Source: Aerotropolis Study Team.

**Table 3 South and West Concentrated Development Area - Population and Employment**

District	Acres	2015 Population	2015 Employment	2040 Population	2040 Employment
West	9,647	6,078	2,191	7,886	2,479
South	23,620	2,646	1,002	3,184	1,011
Peña	9,763	20,146	8,011	37,649	13,678
<b>Total</b>	<b>43,030</b>	<b>28,870</b>	<b>11,204</b>	<b>48,719</b>	<b>17,168</b>

Source: DRCOG 2040 RTP.

## Comparative Analysis and Observations

The Concentrated Development Area has 43,030 total acres. According to DRCOG, population in this subarea in 2015 is estimated at 28,870 and projected to grow to 48,719 in 2040. The DRCOG employment forecast in this area in 2015 is 11,204 comprising 0.6% of the Region’s total. The employment in the Concentrated Development Area is projected to grow by about 6,000 employees to 17,168 in 2040, comprising 0.7% of the Region’s total. It is noted that this is a small amount of growth given current developments and the potential in this area. In contrast, the *DRCOG 2040 RTP* has a robust set of roadway improvement projects in the

vicinity of DIA. DRCOG is working with the communities to better align these projections in a future update of the 2040 dataset.

### Regional Employment Centers

The study team compared the population and employment numbers in the Concentrated Development Area with those of other recognized employment centers in the Denver metropolitan area (as defined by DRCOG). The employment centers are shown in Figure 5.

The projections for population and employment in these employment centers are compared to the projections for the study area in Table 4 and Table 5.

Table 4 Comparison of Population Projections

County	Acres	2015 Population	2040 Population	Annualized Population Growth Rate 2015-2040
<b>Study Area Total</b>	236,054	197,132	319,669	<b>1.95%</b>
<b>Concentrated Development Area</b>	43,030	28,870	48,719	<b>2.12%</b>
<b>Comparison Areas</b>				
<b>DTC</b>	6,838	23,172	37,552	<b>1.95%</b>
<b>CBD</b>	1,767	33,691	46,343	<b>1.28%</b>
<b>Fitzsimons</b>	1,028	7,449	9,071	<b>0.79%</b>
<b>Downtown Boulder</b>	556	9,746	13,060	<b>1.18%</b>
<b>Aurora City Center</b>	921	10,037	12,818	<b>0.98%</b>
<b>Cherry Creek</b>	674	10,166	10,780	<b>0.23%</b>
<b>Interlocken</b>	1,252	8,887	17,798	<b>2.82%</b>

Source: Aerotropolis Study Team.

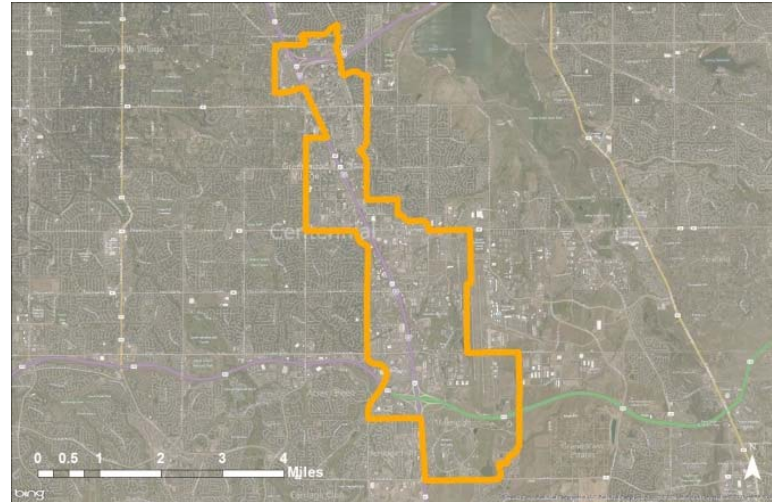
Table 5 Comparison of Employment Projections

County	Acres	2015 Employment	2040 Employment	Annualized Employment Growth Rate 2015-2040
<b>Study Area Total</b>	236,054	145,532	227,700	<b>1.81%</b>
<b>Concentrated Development Area</b>	43,030	11,204	17,168	<b>1.72%</b>
<b>Comparison Areas</b>				
<b>DTC</b>	6,838	154,336	214,634	<b>1.33%</b>
<b>CBD</b>	1,767	150,458	152,279	<b>0.05%</b>
<b>Fitzsimons</b>	1,028	15,892	39,462	<b>3.71%</b>
<b>Downtown Boulder</b>	556	16,598	16,658	<b>0.01%</b>
<b>Aurora City Center</b>	921	9,867	9,430	<b>-0.18%</b>
<b>Cherry Creek</b>	674	19,756	19,238	<b>-0.11%</b>
<b>Interlocken</b>	1,252	13,308	18,652	<b>1.36%</b>

Source: Aerotropolis Study Team.

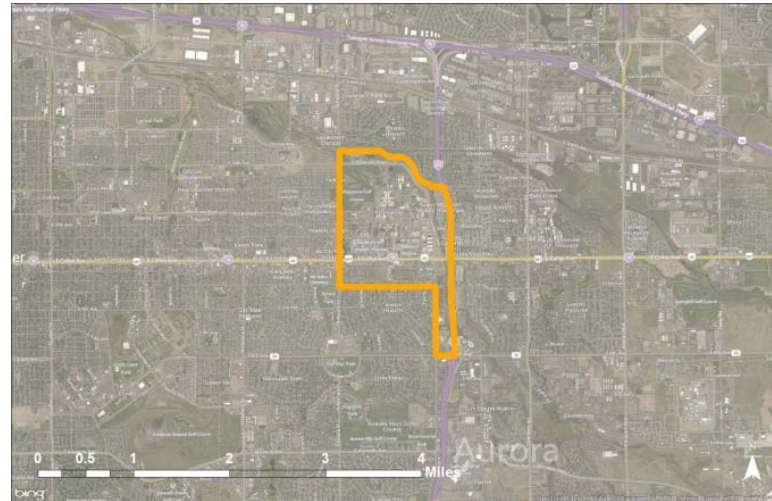


Figure 5 Employment Centers in DRCOG's Greater Transportation Region



Aerotropolis Study Area and all Employment Centers

Denver Technological Center (DTC)



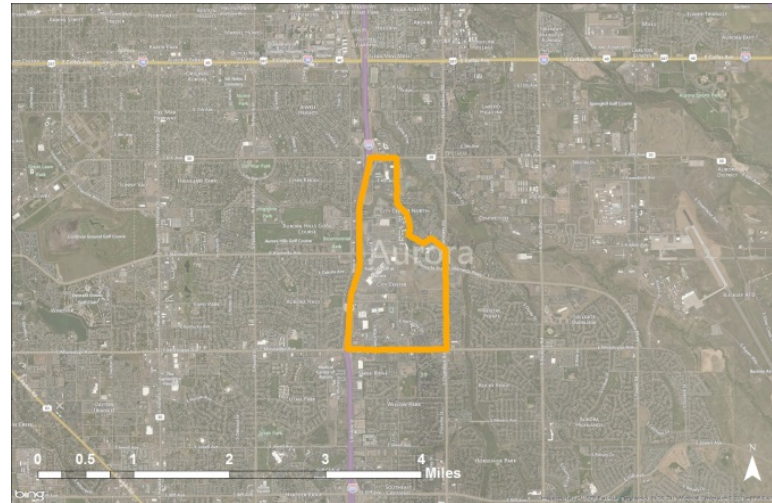
Denver Central Business District (CBD)

Fitzsimons

Figure 5 Employment Centers in DRCOG's Greater Transportation Region



Downtown Boulder

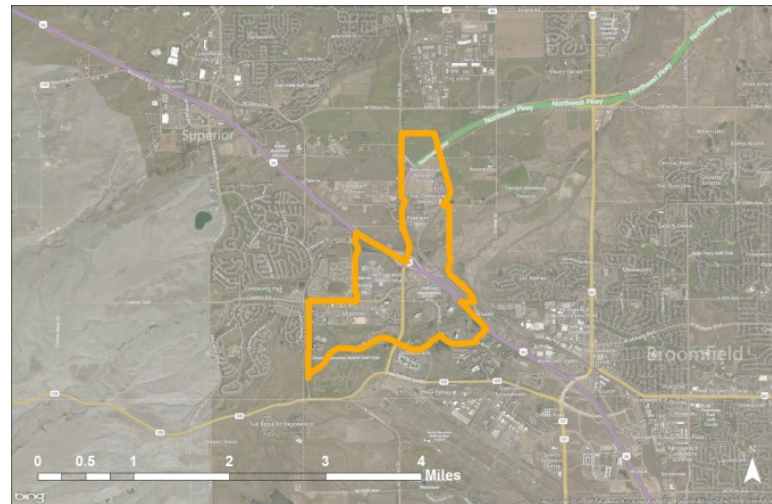


Aurora City Center



Cherry Creek

Source: Aerotropolis Study Team.



Interlocken

## Observations

The acreage of the Concentrated Development Area is vastly larger than that of the other employment centers. However, projections for the employment centers can provide a frame of reference to predict the number of additional jobs to be located in the Concentrated Development Area.

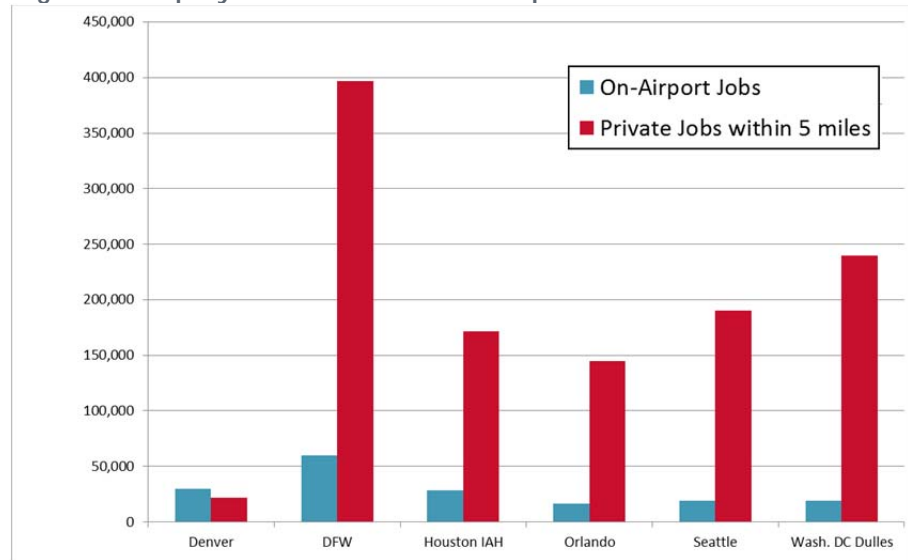
The CBD and DTC areas have about 150,000 employees each, with modest growth projected for 2040. Other centers have employment levels in 2015 ranging from 10,000 to 20,000. Only Fitzsimons is expected to have significant growth to 2040.

The density of jobs per acre in these employment centers is relatively high. Equivalent job densities in the Concentrated Development Area would only be realized at specific employment nodes or pods within the Concentrated Development Area.

## Peer Airports

Airports around the United States attract commercial development. Several airports serve as good comparative case studies, illustrating how an airport can attract jobs and serve as the center of a strong economic ecosystem. In general, airports similar to DIA have attracted from 6 to 13 jobs off-airport property (within five miles) for every job on airport property (including non-aviation related jobs located away from the terminal and all aviation jobs at and around the terminal) (Kasarda 2012). Figure 6 shows compares on-airport and off-airport jobs at DIA to five airports that have similarities to DIA. These airports are not in close proximity to their respective central business districts and were built in areas with relative scarcity of development at the time of construction, just like DIA.

Figure 6 Employment Data at Peer Airports



Source: Kasarda 2012.

## Observations

As shown in Figure 6, the DIA area lags far behind peer airports in proximate private job growth.



## Comprehensive Plans

Each of the study jurisdictions has adopted a comprehensive plan that geographically identifies land use categories and their projected levels at build-out. The plans provide a theoretical representation of the build-out that could occur in the Aerotropolis study area, which is shown in Table 6. The number of potential employees was derived from conservative assumptions of the number of employees per acre by land use type, multiplied by the aggregate areas of future land uses within the Aerotropolis study area boundary. This number represents the cumulative number of employees for this area by land use at its maximum potential.

Table 6 Potential Build-out in Aerotropolis Study Area Based on Comprehensive Plans

Jurisdiction	Total Population (max)	Total Employment (max)
Denver	150,000	244,000
Commerce City	227,000	295,000
Aurora	363,000	480,000
Adams County	67,000	214,000
<b>Total Study Area</b>	<b>807,000</b>	<b>1,233,000</b>
<b>Concentrated Development Area</b>	<b>290,000</b>	<b>728,000</b>

Source: Aerotropolis Study Team based on available comprehensive plans.

## Observations

Should the build-out plans included in the comprehensive plans all come to fruition (in other words, the maximum amount of development activity that could occur by 2040), there would theoretically be 1.2 million employees in the Aerotropolis study area. That would be an amount equal to one-half of all employment in the Denver metropolitan area in 2040. Within the Concentrated Development Area, the theoretical employment level would be over 700,000.

These numbers reflect 1) the immense amount of land near DIA, and 2) the aggressive development visions of the local communities and their level of interest in developing land around DIA.

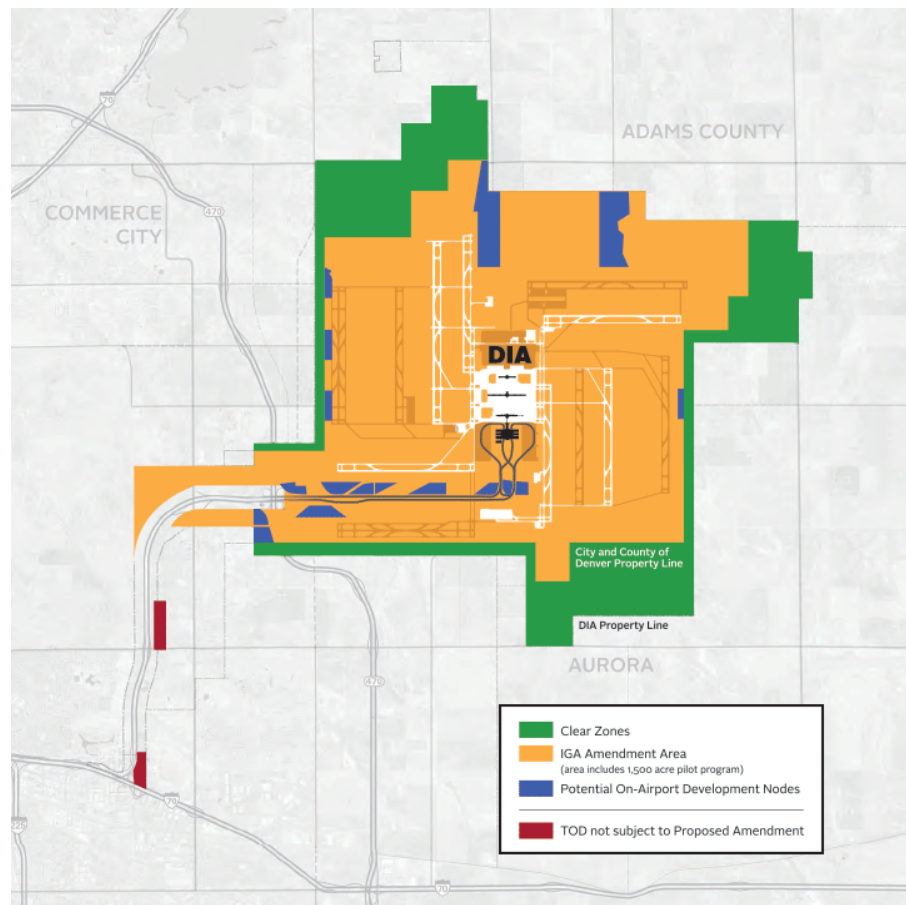
## IGA Amendment Commercial Development Pilot Program

Another frame of reference for employment activity is based on the amendment to the Intergovernmental Agreement (IGA) that was approved by Denver and Adams County in November 2015 (included in the Appendix). Among other things, this amendment creates a 1,500-net-leasable-acre pilot program for commercial developments on DIA property. The 1,500 acres are located “within the fence” at several nodes along the DIA property boundary where there would be new access roads. At each node, development would occur both on and off airport property. Figure 7 displays the potential development nodes. In addition to the 1,500 acres of net leasable acres, Adams County and Denver could agree at a later date to open more airport land to development. There would be restrictions on the type of land use within the airport, including:

- No residential.
- No businesses that would compete with businesses at Fitzsimons/Anschutz.
- Limited number of hotel rooms.

The restrictions on development within the Clear Zones would be lifted, and those areas annexed and rezoned to allow development. The Clear Zones are currently outside DIA property, and development within them would be under the purview and tax base of the municipalities, once annexed.

Figure 7 Potential Development Nodes Along the DIA Property Boundary



Source: Denver International Airport.

The study team developed a range of estimates for potential off-airport private employment that would result from development of on-airport commercial activity. The estimates provide a reasonable projection of economic activity and do not imply an accuracy level; they are provided for information only. As shown in Table 8, the 1,500 on-airport net leasable acres allowed as an initial commercial development level under the IGA Amendment can be estimated to accommodate approximately 37,000 jobs at full build-out, assuming the following mix of land use types: 20% transit oriented development, 60% industrial/distribution, 13% office, and 7% commercial; and further assuming a typical number of employees per acre by land use type. A reduction factor was also assumed to account for

buildable area, land needed for transportation, infrastructure and open space, and land use restrictions.

**Table 7 Potential Commercial Development in the IGA Pilot Program**

Land Use Type	Acres	60% Reduction	FAR	Total Square Feet	Employees (per Square Foot)	Employees
Transit Oriented Development	300	120	2	10,454,400	600	17,000
Industrial/Distribution	900	360	0.4	6,272,640	1000	6,000
Office	200	80	1	3,484,800	300	12,000
Commercial	100	40	0.6	1,045,440	500	2,000
<b>Build-out Total</b>						<b>37,000</b>
<b>2040 Total assuming 50% Build-out</b>						<b>18,500</b>

Source: Arland Land Use Economics.

### Observations

The 1,500 net leasable acres on DIA property could have a maximum build-out number of approximately 37,000 employees. If 50% of build-out is reached by 2040, the number of Aerotropolis-related on-airport employees in 2040 could be about 18,500.

### Current Active Developments

Several active developments within the local communities in the vicinity of DIA are in various stages of the planning and/or implementation process. These developments are in the early steps toward fulfillment of the comprehensive plans and constitute near-term activity near DIA. When combined, they represent the potential for identifying a collaborative infrastructure framework for the envisioned Colorado Aerotropolis. For comparison, the DRCOG projections show an increase of about 7,900 employees in the same time period.

Figure 8 displays the locations of these active developments. Table 8 summarizes the level of activity of each proposed development by jurisdiction.

**Table 8 Land Use Plans and Planned Developments**

Jurisdiction	Dwelling Units	Retail (sf)	Hotel (rooms)	Office (sf)	Industrial (sf)	Commercial Mixed Use (sf)
Commerce City	50,575 to 55,675 units			130,000 to 145,000 jobs		270 acres
Brighton		1,000,000				2,000,000
Aurora	21,425	7,854,816	6,942	30 million sf + 2,200 acres at Transport	25 million sf + 5,343 acres	
Denver	6.325 units + 640 acres of sfd	2,636,912	1,085	9,545,392		2,775,368
Adams County				17.2 million sf of DIA Development		

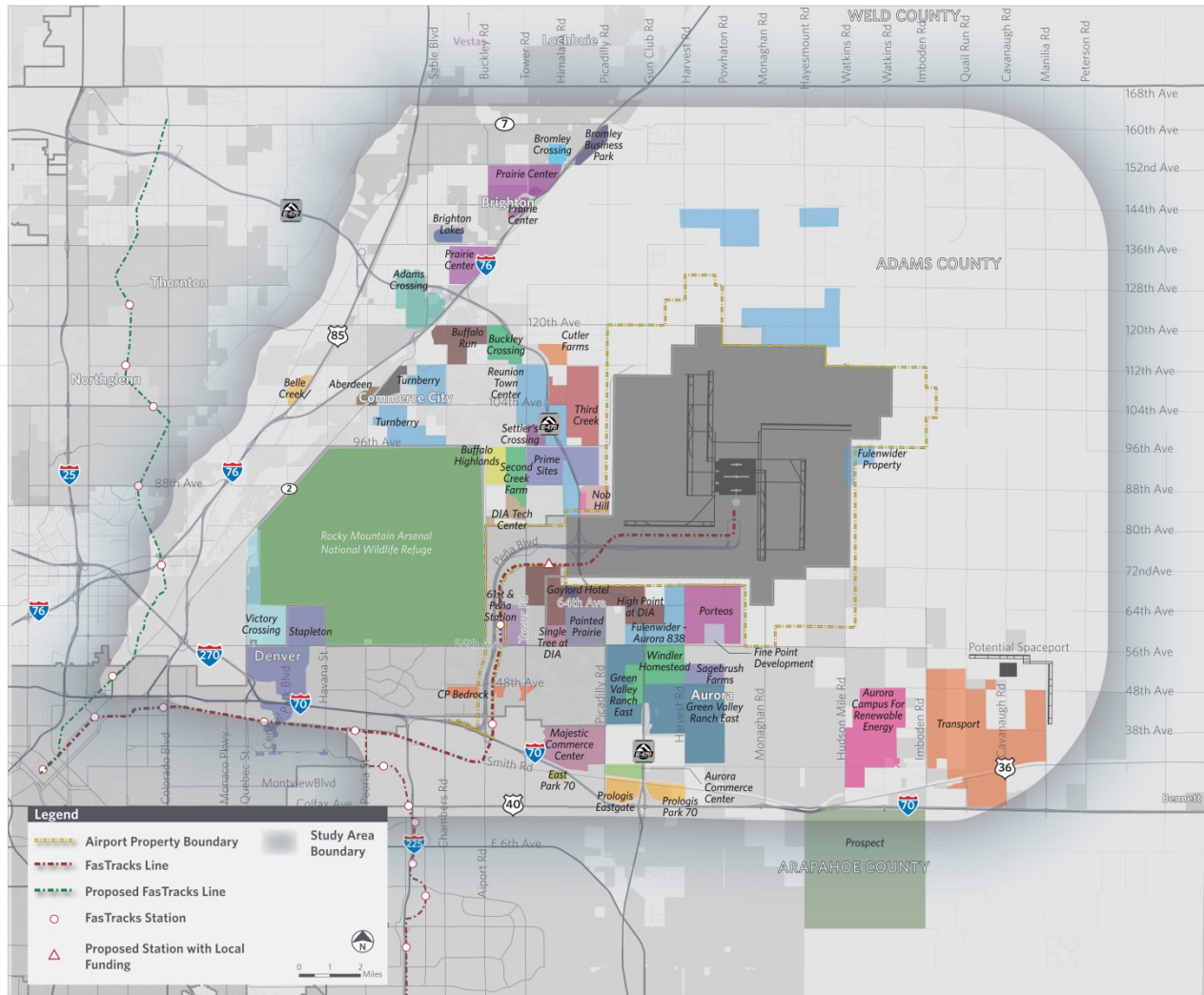
Source: Arland Land Use Economics.

### Conceptual Range of Development for Aerotropolis Scenario

With an Aerotropolis Scenario, new employment would occur both on and off airport property. Table 9 indicates the level of employment potential given the 1,500 acres of commercial-use DIA leasable land. In general, under a proactively planned Aerotropolis, it is expected that more employment would occur off airport than on airport. This is primarily because there are additional costs and security and regulatory requirements for firms

operating within the airport. Land leases would be under the control of the FAA for on-airport development.

Figure 8 Active Developments in the Vicinity of the Aerotropolis Study Area



Source: Aerotropolis Study Team based on available comprehensive plans.

For some firms, it is worth being closer to airfield operations; however, most firms may instead prefer an off-airport location that is relatively close to the airport. Table 9 illustrates a range of potential employment levels for the Concentrated Development Area south and west of the airport given different various ratios of on- to off-airport employees.

Table 9 also shows the resulting share of total 2040 regional employment for the range of levels.

Table 9 Potential Levels of 2040 Employment Related to Aerotropolis Development

2040 Base Scenario Employment* (see Table 3)	On-Airport Aerotropolis-Related Employment (see Table 7)	Potential Range of Off-to On- Airport Employment	Off-Airport Aerotropolis Employment*	2040 Total Employment*	2040 Regional Employment (see Table 1)	Share of Regional Employment
17,000		Base Case		17,000	2,346,000	0.7%
17,000	18,500	1:1	18,500	35,500	2,346,000	1.5%
17,000	18,500	2:1	37,000	54,000	2,346,000	2.3%
17,000	18,500	3:1	55,500	72,500	2,346,000	3.1%

\* Within the Concentrated Development Area.

Source: Aerotropolis Study Team and DRCOG 2040 RTP.

## Observations

In 2015, there are about 11,000 employees in the Concentrated Development Area. DRCOG currently forecasts a growth to about 17,000 jobs in the Concentrated Development Area by 2040, comprising only 0.7% of the Denver region's total employment.

There is a wide range of potential population and employment levels under an Aerotropolis Scenario. For example, at the low end of the range, assuming only a 1:1 ratio of off-airport to on-airport employment, an Aerotropolis Scenario would have about 35,000 off-airport jobs in 2040. This would represent a tripling of current employment in the area, and represent just 1.5% of the Denver metropolitan area's total employment. The peer airports have a range of 1:6 to 1:13 on-airport to off-airport jobs. All of these range well under the theoretical 700,000 employment level envisioned by the comprehensive plans (see Table 6).

Any of these numbers represent a higher level of employment activity than the current DRCOG 2040 projections. However, the *DRCOG 2040 RTP* has a robust set of roadway improvement projects in the vicinity of DIA. DRCOG is working with the communities to better align these projections in a future update of the 2040 dataset.

As mentioned previously, the DRCOG forecasts abide regional control totals of employment and population, as established for the DRCOG area by the state demographer. Additional employment associated with the development of an Aerotropolis would require that either:

- 1) future growth in employment be reallocated from other locations of employment growth projected within the DRCOG Region, or
- 2) a higher level of regional employment occurs than is indicated by the regional control total.

The first case requires reconsideration of the allocation of employment growth within the Denver metropolitan area. DRCOG periodically updates its forecasts, and the new planning framework for an Aerotropolis might provide the input for such a reallocation. However, other communities of the Denver metropolitan area have plans and expectations for continued employment growth and might resist a major reallocation.

The second case would represent faster regional growth with the Aerotropolis attracting more employment from the national and global marketplace. This may be a more likely case because firms desiring to locate close to the airport may be a different set of firms than those who would relocate from elsewhere in the Denver metropolitan area. In fact, this is the central premise under investigation by the study: A proactively planned Aerotropolis is of economic benefit to the region, over and above the normal growth levels projected for the Denver metropolitan area under current trends.

For the purpose of this study, the study team selected a conservative ratio of 3 off-airport jobs to 1 on-airport Aerotropolis related job to conduct the sketch planning economic analysis. This ratio would result in approximately 80,000 Aerotropolis-related jobs in the Concentrated Development Area, comprised of 18,500 on-airport and 6,000 Business as Usual Scenario growth plus 55,500 new for a total of 61,500 off-airport jobs in 2040. Together with terminal (air-operations-related) on-airport jobs, the number of future jobs in the vicinity of the airport could total 143,000 in 2040.

Table 10 compares the level of employment on and around the airport under the Business as Usual and Aerotropolis Scenarios, assuming a 3:1 ratio of off-airport to on-airport jobs (new jobs in non-aviation businesses opened up by the IGA Amendment). The Aerotropolis Scenario employment projections reflect a conservative level of activity given available capacity, rather than a demand market analysis, to make a hypothetical comparison to the Business as Usual Scenario.

It is recognized that as more detailed studies are conducted, growth projections will be updated and revised accordingly.

**Table 10 Aerotropolis Employment Projections**

Area	Category	2015 Existing	2040 Business as Usual Scenario		2040 Aerotropolis Scenario		
			Growth	Total	Growth from Aerotropolis	Total Growth (includes Business as Usual)	Total
On-Airport	Terminal Related	35,000	17,000	52,000	0	17,000	52,000
	Aerotropolis Related	0	0	0	18,500	18,500	18,500
	Subtotal	35,000	17,000	52,000	18,500	35,500	70,500
Off-Airport (Concentrated Devt. Area)	Terminal Related	n/a	n/a	n/a	n/a	n/a	n/a
	Aerotropolis Related	11,000	6,000	17,000	55,500	61,500	72,500
	Subtotal	11,000	6,000	17,000	55,500	61,500	72,500
On- and Off-Airport	Aerotropolis Related Subtotal	11,000	6,000	17,000	74,000	80,000	91,000
	<b>Total</b>	<b>46,000</b>	<b>23,000</b>	<b>69,000</b>	<b>74,000</b>	<b>97,000</b>	<b>143,000</b>

**Table 10 Aerotropolis Employment Projections**

Area	Category	2015 Existing	2040 Business as Usual Scenario		2040 Aerotropolis Scenario		
			Growth	Total	Growth from Aerotropolis	Total Growth (includes Business as Usual)	Total

Sources: Aerotropolis Study Team, DRCOG 2040 RTP, DIA.

Note: terminal-related on-airport employment is based upon data from DIA, rather than the DRCOG data.

### Geographic Allocation

Within an Aerotropolis Scenario, where “collaboration is the new competition,” the various cities, counties, and private interests would achieve mutually beneficial economic growth. Under the scenario, employment centers could be located throughout the study area, and would cross jurisdictional boundaries and create an agglomeration economy benefiting landowners.

To set the stage for sketch planning, the study team allocated the 61,500 Aerotropolis off-airport jobs to various areas within the study area, using the guiding principles below. Note: a land use allocation model was not used to perform this step because this is simply a conceptual allocation to set a framework for sketch-level planning and analysis.

Guiding Principles:

- Access to Super-Regional Multimodal Transportation Facilities
- Contiguous to Active Developments
- Gravitational Pull of Larger Development(s)
- Connectivity to DIA
- Consideration of Geographic Diversity
- Input from Stakeholders

The study team performed the same allocation exercise for the Business as Usual Scenario, which would add 6,000 jobs within the Concentrated Development Area.

Figure 9 illustrates the results of these allocation exercises, which show potential Business as Usual Scenario employment centers as purple areas, and Aerotropolis Scenario centers as orange areas.

The range of acreage within the Concentrated Development Area required to accommodate these 61,500 jobs is based on typical employment densities at comparable locations, assumptions of employees per square foot of building space, and other principles. The range of land needed is 3,200 to 5,000 acres. Note that each orange circle represents an approximate area of 160 acres and 2,000 jobs. This equates to 12.5 jobs per acre, comparable to a typical suburban office park.

## Observations

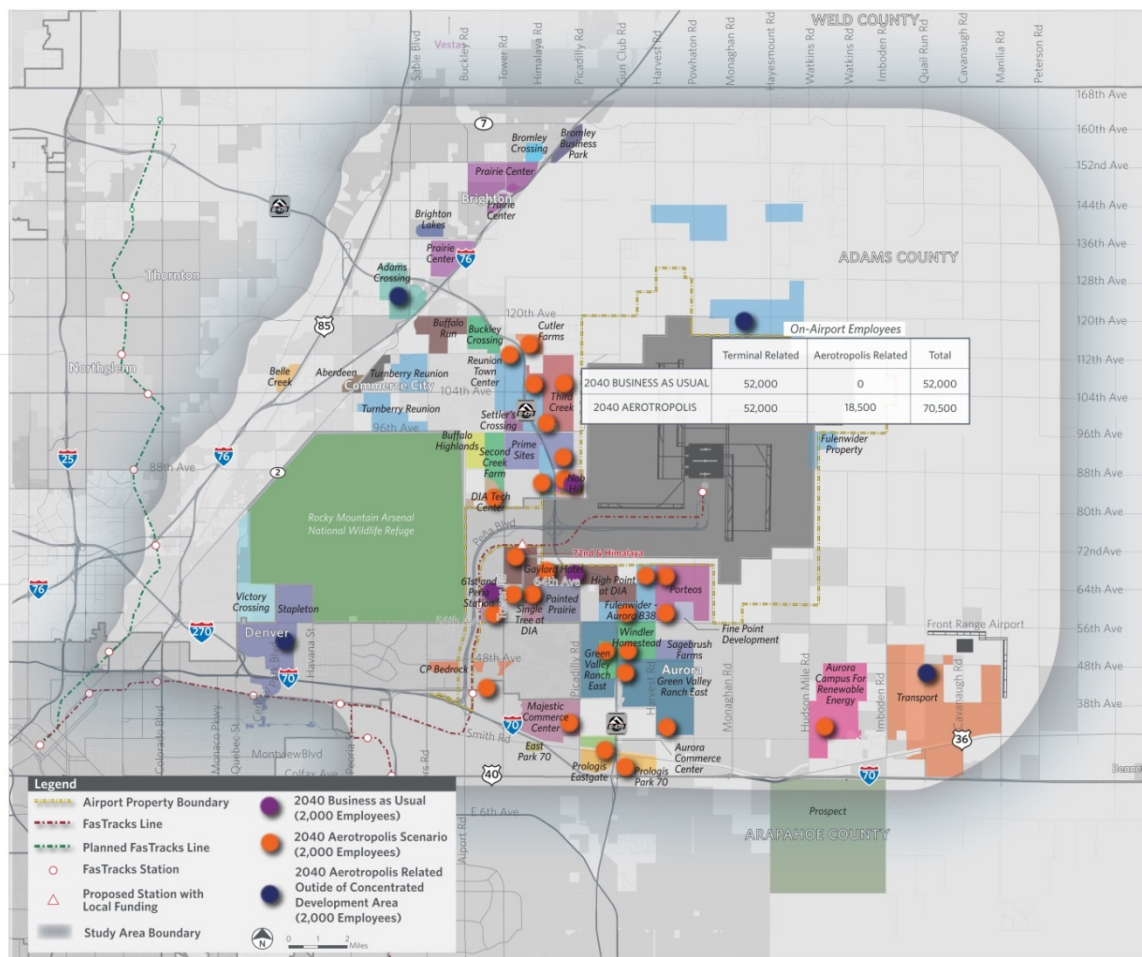
Additional land is opened up to development, and significant new employment centers could emerge. Of particular interest, employment could be centered on the E-470 corridor through Northeast Aurora, the 56<sup>th</sup>-64<sup>th</sup> corridor just south of DIA, and along Piccadilly in Commerce City west of DIA.

An even split of new employment centers between Denver, Aurora, and Commerce City may not naturally occur. However, through collaboration and sharing of resources, i.e., providing transportation improvements within and to each jurisdiction, it is possible to encourage an equitable development pattern where all benefit. For example, the Front Range Airport has applied to the Federal Aviation Administration to become a designated spaceport.

It is recognized that as more detailed studies are conducted, growth projections will be updated and revised accordingly.

As the Aerotropolis grows beyond the 2040 horizon, new employment centers would be expected to develop around the airport beyond those shown primarily in the Concentrated Development Area.

Figure 9 Allocation of Employment Growth - Aerotropolis Scenario



Source: Aerotropolis Study Team.



## Associated Housing Development

With new employment comes new housing. This study is primarily focused on the economic benefit of attracting new business to the area. However, housing needs would be associated with the employment growth.

The Aerotropolis study area is currently, and is planned to be in the future, an area of diverse housing types, including multifamily units located in TOD districts and single-family dwellings. Typical land area requirements for residential neighborhoods would typically include:

- Housing units.
- Public rights-of-way, including streets, alleys, sidewalks, trails, etc.
- Local parks and open space.
- Local neighborhood shops
- Schools.
- Community services.
- Some higher-order roads.

Based on research of typical Denver metropolitan area residential developments, a range of possible residential densities emerges, as shown in Figure 10.

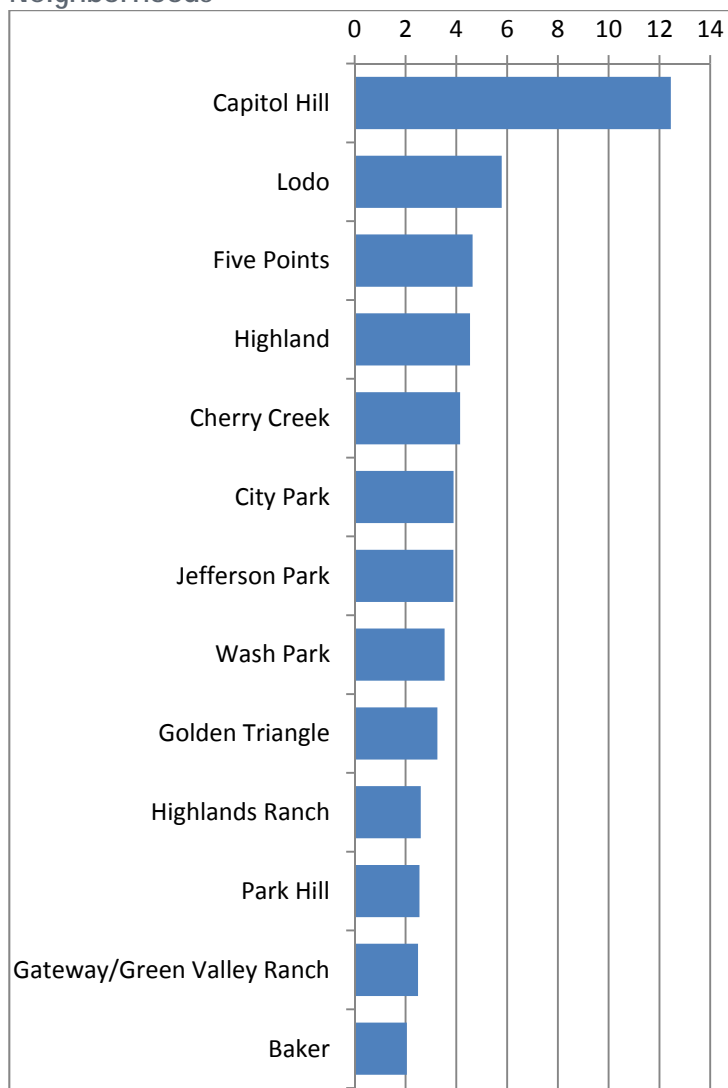
While Capitol Hill stands out as extremely dense, its total district density is still just 12.5 units per acre, well below “site” densities for multifamily developments, which typically fall in the 15 to 30 units per acre range, and can be as high as 150 units per acre for very tall buildings.

Similarly, Green Valley Ranch, which is situated in the study area, typically sees site densities in the 4 to 12 units per acre range.

However, at the neighborhood or district level, the actual density is closer to 2 units per acre after accounting for open space, parks, streets, etc.

It is important to note that the densities described herein do not represent target densities or indicate other preferences, but are simply provided as a reference for the sketch planning analysis.

Figure 10 Dwelling Units per Acre in Denver Neighborhoods



Source: U.S. Census Bureau, 2010 Census.

## Observations

Given the parameters outlined above, a residential density in the 2 to 4 units per acre range is in line with expected development patterns in the study area. This recognizes that some of this development would occur in higher-density, more urban and/or transit-oriented nodes with high “site” densities, while some would naturally take a more suburban form.

The Concentrated Development Area has about 2.45 people per household and 2.84 people per job (DRCOG 2015b). At these ratios, an additional 75,000 housing units associated with Aerotropolis growth would be required. At 2 to 4 house units per acre, this new housing development would require approximately 23,000 acres of land to maintain a balanced housing-employment ratio in the area. The total area of the already-planned developments in the study area is 30,000 acres.

Further information on the residential development associated with the growth in Aerotropolis-related employment is contained in the *Colorado Aerotropolis Economic and Financial Analysis* working paper (Aerotropolis Study Team).

## References

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## Appendix

### Amendment to 1988 Annexation and Intergovernmental Agreements on a New Airport - June 2015



# AMENDMENT TO 1988 ANNEXATION AND INTERGOVERNMENTAL AGREEMENTS ON A NEW AIRPORT

## Final Term Sheet

June 3, 2015

### I. Approval process and timing

- A. An Amendatory IGA reflecting the terms set forth herein will be approved by the governing bodies of Denver and Adams County, with the current municipal members of the Airport Coordinating Committee (the "ACC") also approving the Amendatory IGA as third-party beneficiaries, no later than *July 1, 2015*. The current municipal members of the ACC are: Aurora, Commerce City, Brighton, Thornton and Federal Heights. The Amendatory Agreement will, in one document, modify or supplement certain provisions of both the "Intergovernmental Agreement on Annexation" and the "Intergovernmental Agreement on a New Airport" dated April 21, 1988 (herein collectively referred to as the "1988 Agreements.")
- B. The Amendatory IGA will be referred to the voters of both Denver County and Adams County at the *November 3, 2015* state coordinated election. In the event the voters in either or both counties disapprove the agreement on that date, the Amendatory IGA may be re-submitted at the *November 8, 2016* state general election for voter approval in the county or counties where the measure was previously defeated.
- C. The ballot questions submitted to the voters in Adams County and Denver County will be compatible, with the voters in each county being asked to approve the Amendatory IGA. The ballot question in Denver County will additionally include language binding the city to a "multiple fiscal year financial obligation" to share tax revenue as described below.
- D. Upon approval by the voters in both Denver County and Adams County, the Amendatory IGA will become effective on the January 1 following the approval in both counties.

### II. Preservation of the existing 1988 Agreements

Except as specifically set forth below, all the terms and conditions of the 1988 Agreements (including by way of example but not limitation, the noise provisions, restrictions on residential development, the hotel formula, restrictions on land use in relation to the Scenic Buffer, and provisions related to access roads) will remain in full force and effect. Denver will retain the authority to develop Accessory Uses and natural resources located anywhere on the New Airport Site to the extent allowed by the 1988 Agreements and all other rights it has those agreements.

### III. Amendments regarding land use restrictions

The 1988 Agreements will be amended as follows:

- A. Fifteen-hundred acres located on the New Airport Site or in the Transportation Corridor north of 72<sup>nd</sup> Ave. will be released in perpetuity from the land use restrictions contained in the 1988 Agreement. Denver will exercise sole discretion to determine when and where to utilize the fifteen-hundred acres and create Development Parcels at DIA, subject only to the following restrictions: (1) residential development will be prohibited on this acreage; (2) businesses that would potentially compete with current and future business and institutional land uses at the Anschutz Medical Campus and the Fitzsimmons Life Science District in Aurora will be

prohibited on this acreage; (3) to the extent any hotels are located on this acreage, the limitation on number of hotel rooms in the 1988 IGA will continue to apply.

- B. Adams County on behalf of the ACC may negotiate and agree with Denver at any time to release additional acreage from the land use restrictions contained in the 1988 Agreements and allow for the creation of additional Development Parcels, either: (1) on a site-specific or project-specific basis; or (2) by releasing an additional amount of acreage.
- C. Restrictions on land use in the Clear Zones as set forth in the 1988 Agreements will be released entirely. Land use in the Clear Zones will remain subject to federal regulations on use and development. The parties will cooperate to modify zoning and other land use laws as necessary to allow development within the Clear Zones. Taxes derived from commercial development in the Clear Zones in Adams County will be retained entirely by the applicable governing Adams County jurisdiction(s).
- D. Denver will promptly notify the ACC jurisdictions of any proposed leasing and concessions activity at DIA (outside of the terminal complex area) when and to the extent such information has been made available to the general public. For example, Denver will provide notice when a request for proposals is published in regard to new leases and concessions, and when a specific lease or concession is submitted to the Denver City Council for approval.
- E. Adams County will sign the Amendatory IGA as a party. Aurora and Commerce City will remain third-party beneficiaries to the applicable provisions of the 1988 Agreements. Aurora and Commerce City will be third-party beneficiaries to the Amendatory IGA. The remaining ACC municipal members will be third party beneficiaries to the revenue sharing obligations. .
- F. Consistent with the 1988 Agreements, only those ACC municipalities with contiguity to the New Airport site (currently Aurora and Commerce City) will be treated as a third-party beneficiaries in regard to the land use provisions of the Amendatory IGA.

#### **IV. Financial terms in consideration for release of land use restrictions**

- A. Upon the effective date of the Amendatory IGA, Denver will transmit to Adams County a one-time cash payment of \$10 million, for distribution as determined by the ACC. No additional cash payment will be required for the discretionary release of additional acreage for Development Parcels as provided in III (B) of this Term Sheet.
- B. Beginning on the effective date and continuing in perpetuity, Denver will share with the ACC jurisdictions fifty percent (50%) of all Denver tax revenue derived from either the development or use of the Development Parcels, with the following exceptions: (1) revenue derived from any Denver tax or tax rate which, as of the effective date of the Amendatory Agreement, was obligated by voter-approval, bond covenant, or any other form of contract to be spent for a particular purpose, for as long as such revenues remain so obligated; (2) revenue derived from any voter-approved new, increased or extended Denver tax adopted after the effective date of the Amendatory Agreement and obligated for a particular purpose; or (3) revenue derived from Denver's debt service mill levies. If Denver ever allows a tax-exempt entity to develop or use any Development Parcel and negotiates a payment in lieu of taxes with such an entity, Denver will share with the ACC jurisdictions fifty percent (50%) of any such payment in lieu of taxes.
- C. The Amendatory IGA will contain procedures for documenting Denver's draws upon the 1500-acre "bank" for the establishment of Development Parcels; for documenting and remitting tax

revenue generation and sharing from the Development Parcels on no less than an annual basis; and for audit rights that may be exercised by the ACC jurisdictions in regard to the tax revenue sharing.

- D. Denver tax revenue shared with Adams County will be distributed as determined by the ACC. Any arrangement the ACC jurisdictions may negotiate among themselves for allocation of the Denver shared tax revenue will be reflected in a separate agreement between the ACC members and will not be a component of the Amendatory IGA. All current municipal members of the ACC will be treated as third-party beneficiaries in regard to the tax revenue sharing provisions of the Amendatory IGA.
- E. To the extent Denver offers tax incentives to commercial developers and tenants to induce businesses to locate or remain upon a Development Parcel, tax revenues that Denver is obligated to share with Adams County will *not* be utilized for such incentives, *unless* Adams County on behalf of the ACC agrees. Denver will not approve any form of tax increment financing resulting in a reduction in the amount of tax revenue from the Development Parcels that Denver is obligated to share with Adams County, unless Adams County on behalf of the ACC agrees.
- F. Denver will reserve the right to modify, decrease or eliminate Denver taxes that are subject to sharing under the Amendatory Agreement; however, Denver will not, without the consent of Adams County on behalf of the ACC, take or approve any action that would have the effect of reducing or eliminating any shared Denver tax or tax rate specifically imposed in or on the Development Parcels.

**V. Regional planning and marketing entity**

The Amendatory IGA will provide that, via a separate agreement to be negotiated between the parties, Denver and the ACC jurisdictions will form a new regional entity to promote and market development opportunities on and around DIA and assist in coordinating land use and infrastructure planning efforts by the respective jurisdictions on and around DIA. However, the entity will have no authority to regulate or otherwise control land use or development within any of the jurisdictions. The entity will be governed by a board consisting of equal representation by Denver appointees and ACC appointees.

**VI. Miscellaneous contract terms**

- A. The parties will agree to mutually defend the Amendatory IGA in the event of a challenge by any party who is not a third-party beneficiary to the Amendatory IGA.
- B. The parties' rights and remedies under the 1988 Agreements will remain in place outside of the Development Parcels for disputes that arise in the future about whether development falls within the range of land uses allowed upon the New Airport Site under the original 1988 Agreements. In the event of an alleged breach by Denver of the land use restrictions contained in the 1988 Agreements, as modified by the Amendatory IGA, the ACC party will provide written notice to Denver and the parties will attempt to resolve the dispute informally. Prior to either party filing suit over such a dispute, the parties will enter into formal non-binding mediation in an attempt to resolve the dispute. In the event the parties proceed to litigation and achieve a final judgment, the prevailing party will be awarded its attorney's fees and costs incurred in the litigation, and a prevailing ACC party will be awarded any withheld tax revenue sharing plus interest at the statutory rate. If Denver decides, prior to final judgment in any such litigation, to render the case

moot by locating the disputed land use in a Development Parcel, the ACC party will be awarded one-half of its attorney's fees and costs incurred to date in the case.

- C. The Amendatory IGA will also function as a settlement agreement in which Adams County, Aurora, Brighton, Commerce City, Federal Heights, and Thornton will waive any claims they may have against Denver regarding an alleged breach, or anticipatory breach, of the land use provisions in the 1988 Agreements based on the following: (1) any use or development of the New Airport Site, completed or in process (as demonstrated by the issuance of certificate of occupancy or building permit), that occurred prior to the date upon which Adams County referred the Amendatory IGA to a vote of the people; or (2) Denver's land use planning or marketing activities for the New Airport Site that occurred prior to the date upon which Adams County referred the Amendatory IGA to a vote of the people, but such planning or marketing efforts do not meet the requirements of waiver (1) unless a building permit or certificate of occupancy has been issued prior to the date upon which Adams County referred the Amendatory IGA to a vote of the people. This waiver will not be construed as changing in any manner the land use provisions of the 1988 Agreements to the extent those provisions will continue to govern the use of the New Airport Site in the future, nor will the waiver prevent the parties from enforcing those provisions in regard to any use or development of the New Airport Site established after the date upon which Adams County referred the Amendatory IGA to a vote of the people or from enforcing the 1988 Agreements in the future.
  
- D. At any time under the Amendatory Agreement, Denver may decide to locate a land use which Denver considers to be an Accessory Use in a Development Parcel. No such decision on Denver's part will be considered a waiver or admission by Denver that the land use in question or any similar land use may not qualify as an Accessory Use in the future.

This Term Sheet shall not be considered a binding contract, but is intended solely to serve as the basis for drafting the Amendatory IGA. Each party and third-party beneficiary agrees to submit to their respective governing bodies the Amendatory Agreement for approval by the governing body as a whole (either as a primary party or a third-party beneficiary), subject to ultimate approval by the voters before the Amendatory IGA will be executed or go into effect.