International Air Cargo Development Project

Global Transportation and Industrial Park
Ardmore, Oklahoma

Ardmore Development Authority
FY21 RAISE Grant Application
July 2021

Project Overview

RAISE Project Name:	International Air Cargo Development, Global Transportation & Industrial Park, Ardmore, OK
Applicant:	Ardmore Development Authority
Applicant Address:	410 W. Main St., Ardmore, OK 73401 Mita Bates, President 580-223-6162; mbates@ardmore.org
Project Address & Location:	Ardmore Municipal Airport 620 General Drive, Ardmore, OK 73401 34°17'34.21" N, 97°01'08.57" W
Project Components:	Construct an 800'x100' cargo building, improve landside road, construct landside parking lot, improve and install utilities (sanitary sewer, fire suppression system, water line, storm drain), construct customs building, construct electric vehicle charging stations.
Project Readiness:	Ardmore Development Authority is prepared to begin work immediately upon approval of the Categorical Exclusion and completed Grant Agreement.
Grant Request:	$25,000,000
Total Project Cost:	$39,246,558
Benefit Cost Ratio:	2.24:1
Rural Area:	Project is 100% in a Rural Area
Eligible Project Category:	This project is eligible as an intermodal project described in the RAISE NOFO section C.3.i.(a)(5)
Supporting Documentation:	Attached and online at https://www.knbltd.com/RAISE
Persistent Poverty Opportunity Zone Overburdened Community	Ardmore is an Overburdened Community and Opportunity Zone with areas of Native American Poverty above 20 percent.

The Problem

Congestion in the I-35 corridor and the DFW area generally makes getting air freight into and out of DFW and AFW Airports more time consuming and expensive than it should be. Once on the airport, freight handling operations and aircraft congestion add additional costs to air cargo. Ardmore offers:

- A shorter truck haul for some shippers.
- Faster travel time into and out of the airport.
- Lower landing costs for aircraft.
- No aircraft congestion.
- Lower fees for loading/unloading the aircraft and lower storage fees.

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Project Description

The purpose of this project is to construct a new international air cargo facility at the Ardmore Municipal Airport (ADM) near Ardmore, Oklahoma. The ADM was built as an Army Airfield and operated as such from 1942 to 1946. The airfield reopened in 1953 to 1959 as the Ardmore Airforce Base. The ADM is currently owned by the City of Ardmore and leased to the Ardmore Development Authority (ADA), a political subdivision of the State of Oklahoma.

The overall goal of the project is to develop the current ADM and its Industrial Park located on airport property into more of an integrated freight-handling facility with global connections.

While much work has been done as outlined below, there is still a need to improve the infrastructure at the ADM so air cargo carriers can operate out of Ardmore, a centrally located facility. The individual items that need to be constructed are an 80,000 square foot air cargo warehouse, a parking lot (landside), a US Customs building for international shipments, a fire suppression system, water, sewer, storm sewer, grading, roadway changes, electric vehicle charging stations, ground handling equipment and drainage improvements.

Concurrently with this project, a privately funded project will construct an 80,000 square yard parking apron for aircraft just north of the proposed air cargo buildings. While not part of the RAISE Grant project the apron is necessary to utilize the improvements funded by the RAISE Grant.

The project will provide a lower cost alternative for many shippers and offer efficiencies compared to Dallas/Fort Worth International Airport (DFW), such as less congestion on the roadways serving the airport and faster cargo processing once at the airport.

The project assets will be owned by the ADA and sub-leased to an air cargo partner, and in this case, WP Global (WPG), a joint venture of Watco and Knightsbridge Partners, is prepared to lease the assets upon project completion to begin immediate air cargo operations.

A concurrent project to develop the rail transportation opportunities more fully is underway. The current yard tracks located on the west side of the industrial park will be updated and expanded. The purpose of the rail and air cargo projects are to develop Ardmore into a complete multimodal facility – truck, rail and air transportation.

Transportation Challenges

The DFW area is one of most congested in the country in terms of highway traffic. It also one of the deadliest for users – the April 25, 2019, issue of the *Dallas Tribune* headline[1] reads "Texas Leads the Nation in Traffic Deaths." A local NBC News report[2] on October 3, 2019, in the Dallas Fort Worth area said that "Dallas Ranks in the Top in US for Fatal Crashes." While a reduction in truck traffic in the DFW and the nearby Fort Worth Alliance Airport region is an

[1] https://www.texastribune.org/2019/04/25/texas-traffic-deaths-bills-safety/ (last visited 06/22/21)
[2] https://www.nbcdfw.com/news/local/dallas-ranks-among-top-in-us-for-fatal-crashes-report/273443/ (last visited 07/01/21)

incremental improvement to crashes and congestion, it will help make the roads in the DFW area safer.
The June 20, 2021, *Dallas Morning News* published an article[3] on truck congestion on I-20 in Dallas near an Amazon Fulfillment facility – the article quoted truck drivers who waited 12 hours to unload. While this is a single facility – the article is an example of the congestion issues in the Dallas area.

In March 2016, the North Central Texas Council of Local Governments released the "Freight Congestion and Delay Study Final Report,"[4] showing that truck delays averaged more than five hours per day on major roadways in the Dallas Fort Worth area. Figure 2-3 from that report is below.

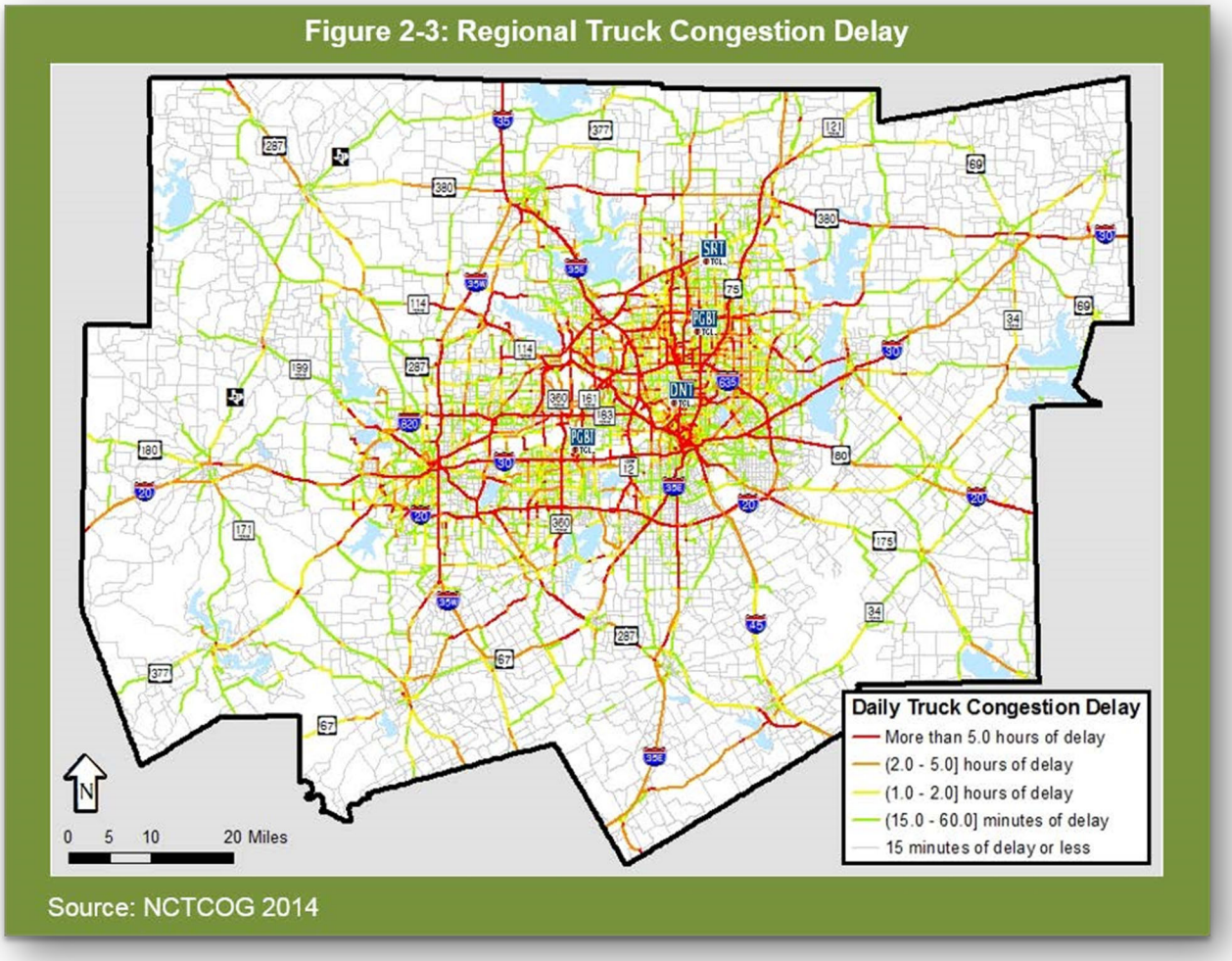


Fig 1. Freight Congestion and Delay Study Final Report March 2016

[3] https://www.dallasnews.com/business/retail/2021/06/20/its-like-this-every-day-amazon-fulfillment-center-in-dallas-forces-truck-drivers-to-wait-for-hours-to-unload/ (last visited 07/01/21)
[4] https://www.nctcog.org/nctcg/media/Transportation/DocsMaps/Plan/Freight/fcds20150507MJ_3-14-16.pdf (last visited 07/01/21)

According to the report, "truck-involved crashes are focused on the limited access roads. IH 35W through downtown Ft. Worth and IH 35E in downtown Dallas have the highest concentration of crashes. Other high crash areas include SH 114 near the DFW Airport, IH 35E and IH 635 on the north side of Dallas, and IH 20 on the south side of Dallas."

Congestion is not only a safety issue – it is a time and efficiency issue. The cost of being delayed in traffic is directly borne by shippers and, ultimately, by consumers and producers of the products being shipped via air freight. Roadways around the Ardmore Airport are not congested, allowing for a drive in, unload/load and drive out delivery to the air cargo facility.

Ardmore is equal distance from DFW Airport and Will Rogers Airport in Oklahoma City at approximately 100 miles from each. Both OKC and DFW provide facilities for air cargo with OKC moving a little over 100,000 tons via air cargo per year and DFW moving just under 1 million tons per year. DFW volumes are increasing – 911,000 tons in 2018, 952,000 tons in 2019 and 987,000 tons in 2020. Fort Worth Alliance Airport (AFW) is another air cargo airport in the Dallas Fort Worth area. In 2018, AFW had an air cargo volume of 162,000 tons.

Global and Regional Air Cargo Context

According to the Boeing World Air Cargo Forecast 2020-2039, air cargo is growing all over the world year after year, including the United States and the Texas region, creating trade opportunities on a global scale and job creation in the region.

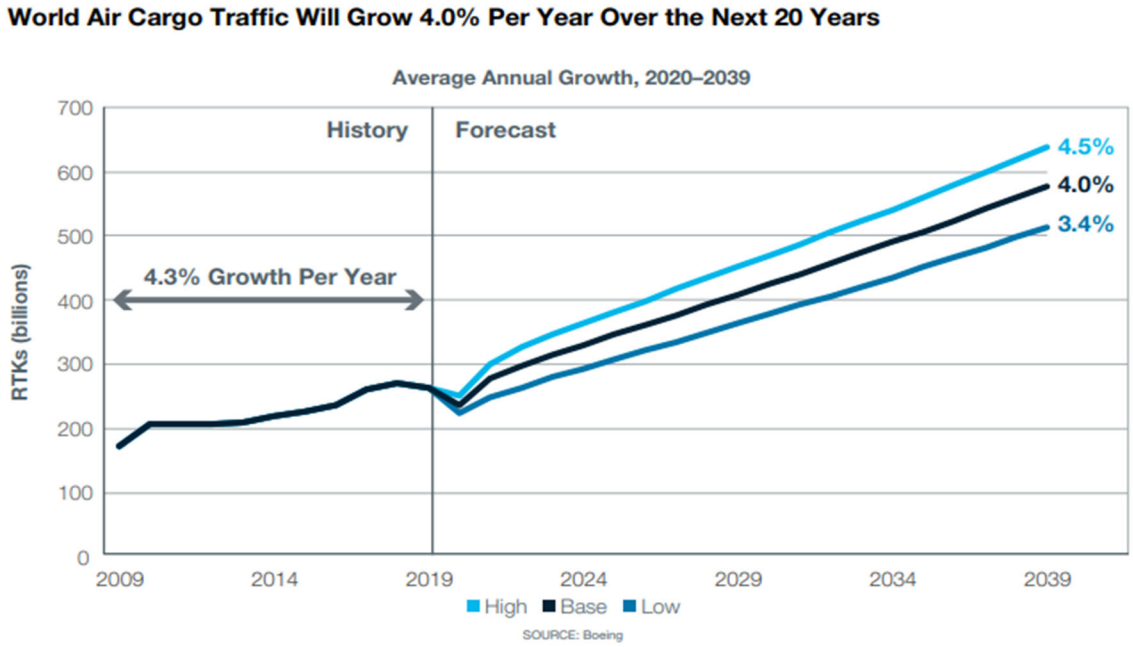


Fig 2 [2020_WACF_PDF_Download.pdf (boeing.com)]

Some of the drivers in the past years and the years to come are perishables, pharmaceuticals, and e-commerce. E-commerce grew significantly during the pandemic.

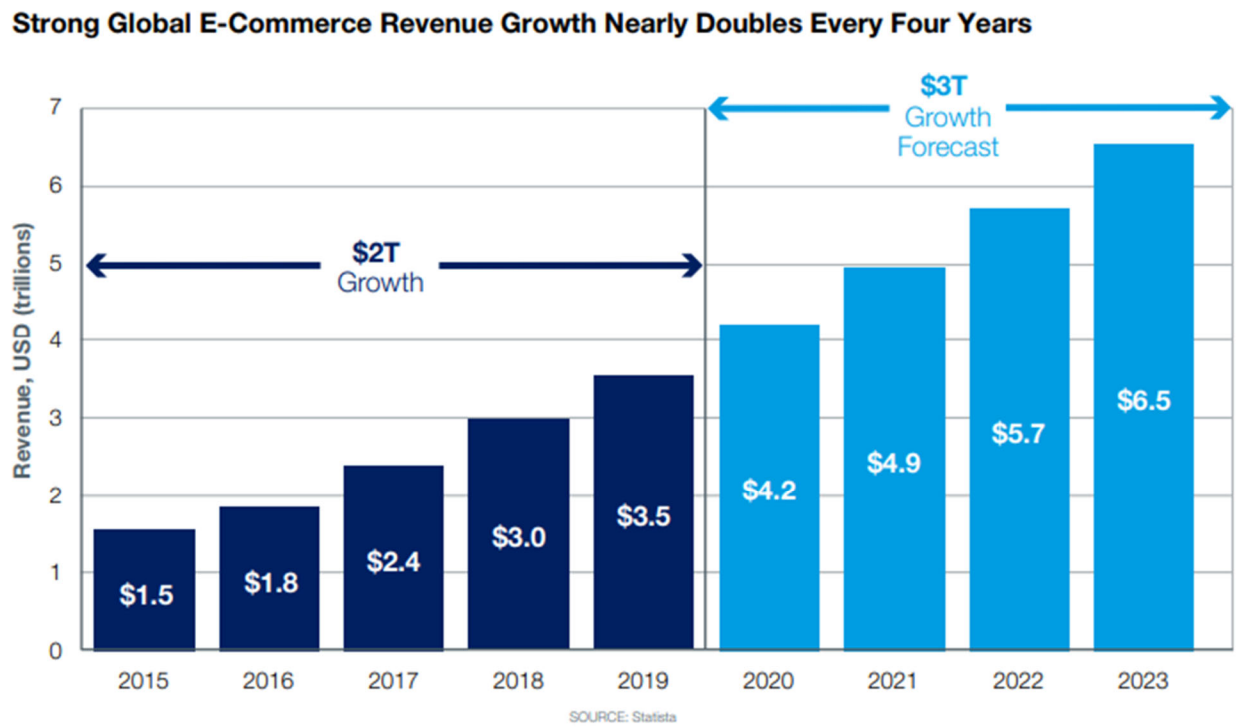


Fig 3. [2020_WACF_PDF_Download.pdf (boeing.com)]

The air industry has seen that there is a need for more dedicated freighters as opposed to to relying on the bellies of passenger aircraft for cargo movements. In North, Central, and South America, carriers are adding freighters by converting B757 and B767 aircraft.

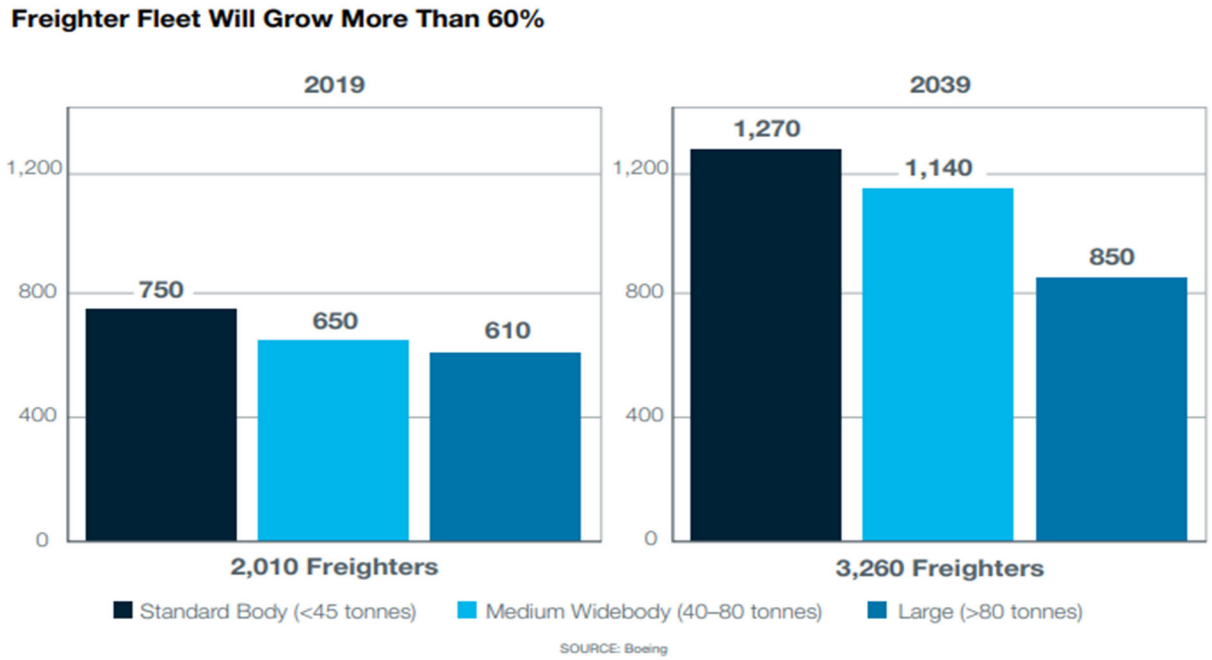


Fig 4. [2020_WACF_PDF_Download.pdf (boeing.com)]

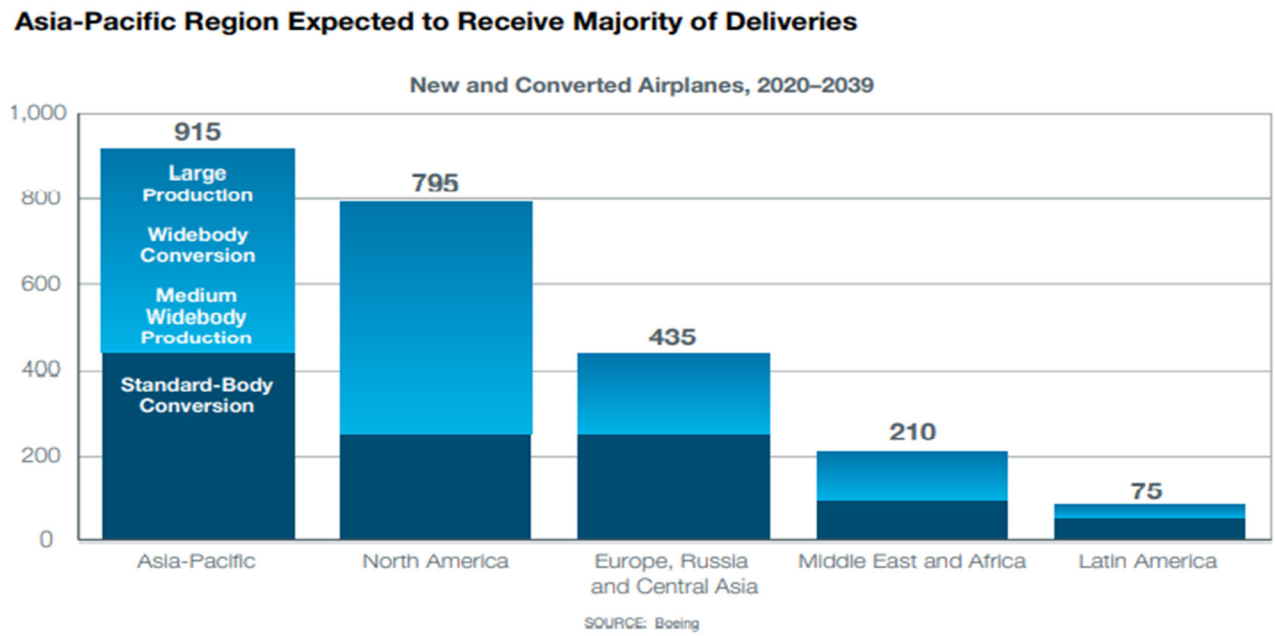


Fig 5. [2020_WACF_PDF_Download.pdf (boeing.com)]

According to IATA (International Air Transport Association), air cargo represents less than one percent of global trade by volume but 35 percent by value with over six trillion dollars of goods carried by air. This shows how the aviation industry is a key enabler for economic links and trade. Air transport is an essential factor in connecting individual countries to the global economy, helping to improve productivity levels to benefit the national economy. Aviation connects businesses to a wide range of global markets, providing a significantly larger customer base for their products than would be accessible otherwise.

The Problem

Many hub airports (in the world and especially in the United States) focus on passenger aircraft, resulting in a reduced focus on air cargo activities with less investments, higher congestion at these airports, higher costs for shippers and forwarders and longer wait times. DFW is one of these congested airports, no longer able to cater to the requirements and needs of the shippers. This is a potential risk for the growth of air cargo transportation overall and a loss in trade and business for companies and jobs for the people in the region.

The Opportunity

Ardmore is ideally located in the region to take part of this growth avoiding further congestion in the Dallas – Fort Worth area. With a dedicated focus on cargo, Ardmore will be able to attract opportunities that global (passenger) hubs, even with a cargo operation, cannot. Many airports in Europe and the United States with the same profile as Ardmore have shown that they can attract business that neighboring hubs could not do anymore.

Having a dedicated air cargo airport close to a major passenger and cargo airport has been successful at airports in the United States and Europe as seen in Figure 6 below.

In 2020, Atlanta was considered by the FAA to be the busiest airport in the United States, Dallas Fort Worth was second busiest, and Chicago O'Hare was fourth busiest. The three airports in Ohio (if added together) would match Tampa, Florida at 23rd.

Cargo Airport Name	Type	Miles to Major Airport/Market	Alternate Cargo Option For
Ardmore, OK	Former Military, Multimodal Center, FTZ	100	Dallas (DFW), Fort Worth Alliance (AFW), Oklahoma City (OKC)
Rockford, IL	Former Military, FTZ	90	Chicago (ORD)
Rickenbacker, OH	Former Military, Intermodal Center, FTZ	20 to 150	Columbus (CMH), Cincinnati (CVG), Cleveland (CLE)
Huntsville, AL	Intermodal Center	200	Atlanta (ATL)
Hahn, Germany	Intermodal Center	70	Frankfurt (FRA)
Paris Vatry, France	Intermodal Center	100	Paris (CDG)
Liege, Belgium	Intermodal Center	50 to 200	Brussels (BRU), Amsterdam (AMS), Frankfurt (FRA), Paris (CDG)

Fig. 6 Hub Airports with Air Cargo Airports Nearby

The FAA "Terminal Area Forecast Summary Fiscal Years 2016 to 2045" publication predicts significant traffic growth at Atlanta, Dallas Fort Worth, and Chicago.

Air Cargo shippers in the Atlanta and Chicago areas can choose an air cargo airport that is nearby. The large airports are getting busier and busier as time goes on. There are only so many slots available for landings and take offs – as the traditional large hub airports get busier it will become more costly and difficult for air cargo only operations to effectively do business at a passenger airport.

Passenger flights will take priority at the traditional airports because passenger enplanements are the main business and the major source of revenue for those airports. Shippers in Dallas can utilize an airport such as AFW, but still must contend with the roadway congestion issues in the DFW Area.

Table S-1 Enplanements at Large Hub Airports (in thousands)

Loc ID	Region	Airport Name	2015	2015 Percent*	2016	2020	2045	Rate** 2015-2045	Airport ranking 2015	Airport ranking 2045
ATL	ASO	HARTSFIELD - JACKSON ATLANTA INTL	48,435	6.15	50,387	55,154	86,043	1.93	1	1
ORD	AGL	CHICAGO O'HARE INTL	35,727	4.54	37,405	40,864	60,134	1.75	2	3
LAX	AWP	LOS ANGELES INTL	35,714	4.54	38,699	44,067	66,133	2.07	3	2
DFW	ASW	DALLAS/FORT WORTH INTL	31,356	3.98	31,451	33,604	54,028	1.83	4	4
JFK	AEA	JOHN F KENNEDY INTL	27,406	3.48	28,901	31,630	52,463	2.18	5	5
DEN	ANM	DENVER INTL	25,907	3.29	27,909	32,459	50,168	2.22	6	6
SFO	AWP	SAN FRANCISCO INTL	23,732	3.01	25,460	29,279	46,355	2.25	7	7
CLT	ASO	CHARLOTTE/DOUGLAS INTL	21,766	2.76	21,837	23,664	37,016	1.78	8	11
LAS	AWP	MC CARRAN INTL	21,257	2.70	22,509	26,913	44,167	2.46	9	8
PHX	AWP	PHOENIX SKY HARBOR INTL	21,209	2.69	21,021	22,929	36,636	1.83	10	12
MIA	ASO	MIAMI INTL	20,494	2.60	21,059	22,253	35,018	1.80	11	15
IAH	ASW	GEORGE BUSH INTERCONTINENTAL/HOUSTON	20,346	2.58	20,399	21,182	35,693	1.89	12	14
SEA	ANM	SEATTLE-TACOMA INTL	19,632	2.49	21,465	24,646	40,065	2.40	13	9
EWR	AEA	NEWARK LIBERTY INTL	18,391	2.33	19,595	22,632	35,858	2.25	14	13
MCO	ASO	ORLANDO INTL	18,217	2.31	19,901	22,392	37,159	2.40	15	10
MSP	AGL	MINNEAPOLIS-ST PAUL INTL/WOLD-CHAMBERLAIN	17,376	2.20	18,062	19,782	29,260	1.75	16	17
BOS	ANE	GENERAL EDWARD LAWRENCE LOGAN INTL	16,079	2.04	17,333	19,926	31,376	2.25	17	16
DTW	AGL	DETROIT METROPOLITAN WAYNE COUNTY	16,010	2.03	16,793	18,035	25,572	1.57	18	19
PHL	AEA	PHILADELPHIA INTL	14,909	1.89	14,834	14,866	21,709	1.26	19	21
LGA	AEA	LAGUARDIA	14,068	1.78	14,796	16,699	19,707	1.12	20	23
FLL	ASO	FORT LAUDERDALE/HOLLYWOOD INTL	12,750	1.62	13,803	16,377	27,016	2.53	21	18
BWI	AEA	BALTIMORE/WASHINGTON INTL THURGOOD MARSHALL	11,389	1.44	12,183	14,323	22,225	2.25	22	20
DCA	AEA	RONALD REAGAN WASHINGTON NATIONAL	10,998	1.39	11,472	13,814	17,195	1.50	23	27
MDW	AGL	CHICAGO MIDWAY INTL	10,746	1.36	11,022	12,534	19,122	1.93	24	24
SLC	ANM	SALT LAKE CITY INTL	10,509	1.33	11,005	12,684	20,990	2.33	25	22
IAD	AEA	WASHINGTON DULLES INTL	10,384	1.32	10,513	11,731	18,733	1.98	26	25
SAN	AWP	SAN DIEGO INTL	9,801	1.24	10,272	11,577	17,812	2.01	27	26
HNL	AWP	HONOLULU INTL	9,483	1.20	9,654	10,387	14,797	1.49	28	30
TPA	ASO	TAMPA INTL	8,989	1.14	9,198	10,032	15,535	1.84	29	29
PDX	ANM	PORTLAND INTL	8,154	1.03	8,904	10,411	16,230	2.32	30	28
Totals			571,234	72.46	597,842	666,846	1,034,215	1.99		

*Percent of total US enplanements.

**Annual compound growth rate.

Fig. 7 FAA Projected Airport Growth – Terminal Area Forecast – https://www.faa.gov/data_research/aviation/taf/media/taf_summary_fy_2016-2045.pdf

Project History

The City of Ardmore owns the Ardmore Municipal Airport and Industrial Airpark and the Ardmore Development Authority (ADA), a Public Trust, leases and operates the facility. Since 2010 the airport has undergone $55.5 million in upgrades and maintenance including control tower improvements and a runway extension to more than 9,000 ft., enough space to land larger aircraft like the Boeing 767-200 cargo aircraft.

The Ardmore Industrial Airpark is the only independent airpark in the U.S. with a Federal Aviation Administration (FAA) Contract Control Tower (costs of which are underwritten by the ADA). The airpark is located within Foreign Trade Zone #227 and a State Enterprise Zone and

can become a U.S. Customs & Border Protection port of entry. Zoned heavy industrial, the airpark facility features multiple lot sizes and available pad-ready sites and approximately 1,000 acres of developable land.

Recently completed and soon-to-be completed projects are shown in the table below (Fig. 4)

These projects speak to the commitment of the ADA to maintain and improve the airport and the industrial park. Since 2010 (including 2022 scheduled projects), the ADA has spent $13,978,700, out of the total of $55,583,000 spent to maintain and improve the airport and industrial park. Much of this funding has been airside development funded by the FAA Airport Improvement Program. There have been no previous projects to establish or develop air cargo capabilities at the airport.

ARDMORE MUNICIPAL AIRPORT
CONSTRUCTION AND IMPROVEMENTS

Project Name	Amount	Year Completed	ADA - Amt Funded	One Time or Annual
Runway 13-31 Rehabilitation	$ 2,300,000.00	Q1 CY2022	$ 115,000.00	One Time
RAIL Lighting Replacement	$ 1,500,000.00	Proposed FY 2022	$ 1,500,000.00	CY2022 Proposed
Fire Protection Services	$ 680,000.00	On-going	$ 680,000.00	Annual
Airpark Improvements - Engineering	$ 267,000.00	2018-2019	$ 267,000.00	On-going
Campus-Wide Fire Suppression System	$ 1,400,000.00	2021	$ 1,400,000.00	One Time
Taxiway E Extension/Parallel Taxiway Construction Phase I	$ 3,600,000.00	2020	$ 180,000.00	One-Time
Box Hangar Complex Construction	$ 1,200,000.00	2020	$ 1,200,000.00	One Time
AWOS Modernization and Relocation	$ 190,000.00	2020	$ 190,000.00	One Time
Channel Liner	$ 900,000.00	2019	$ 900,000.00	One Time
Crack and Seal Project	$ 178,000.00	2019	$ 178,000.00	One Time
Hardstand Reconstruction	$ 430,000.00	2018	$ 5,000.00	One Time
Control Tower Modernization	$ 2,500,000.00	2017	$ 2,500,000.00	One Time
Infrastructure Plan - Lochner	$ 100,000.00	2017	$ 100,000.00	One Time
Taxiway Alpha - Partial Reconstruction	$ 6,054,000.00	2017	$ 302,700.00	One Time
Wildlife Fence - Perimeter	$ 650,000.00	2015	$ 650,000.00	One Time
Runway 1735 Rehab Work	$ 45,000.00	2015	$ 45,000.00	One Time
Taxiway E Extension/Parallel Taxiway Construction	$ 12,000,000.00	2022	Scheduled FY2022	One Time
Runway 13-31 Extension	$ 19,991,000.00	2010	$ 3,671,000.00	One Time
ADA PROJECTS FUNDED TO 4-30-2021	**$ 53,985,000.00**		**$ 13,768,700.00**	

Fig. 8 ADA-led investments and improvements at Ardmore

Project Location

The project is located at the Ardmore Municipal Airport. The Airpark is owned by the City of Ardmore and leased to the ADA, a political subdivision of the State of Oklahoma.

The Ardmore Industrial Airpark is a former military airport located 16 miles northeast of Ardmore, Oklahoma (Fig. 5). De-commissioned in the 1960s, the airpark and surrounding land has been developed by various investors and is currently operating in a public-private relationship as an intermodal logistics hub with transload, warehousing, air, truck, and privately-owned rail facilities.

The Ardmore Industrial Airpark is centrally located on the I-35 corridor at the midpoint between Oklahoma City and Dallas, within 500 miles of approximately 20 percent of the U.S. mainland population and a one-day trucking time to approximately 60 million people.

Eighty-five percent of the U.S. can be reached within two days by truck. The Airpark is eight miles east of I-35.

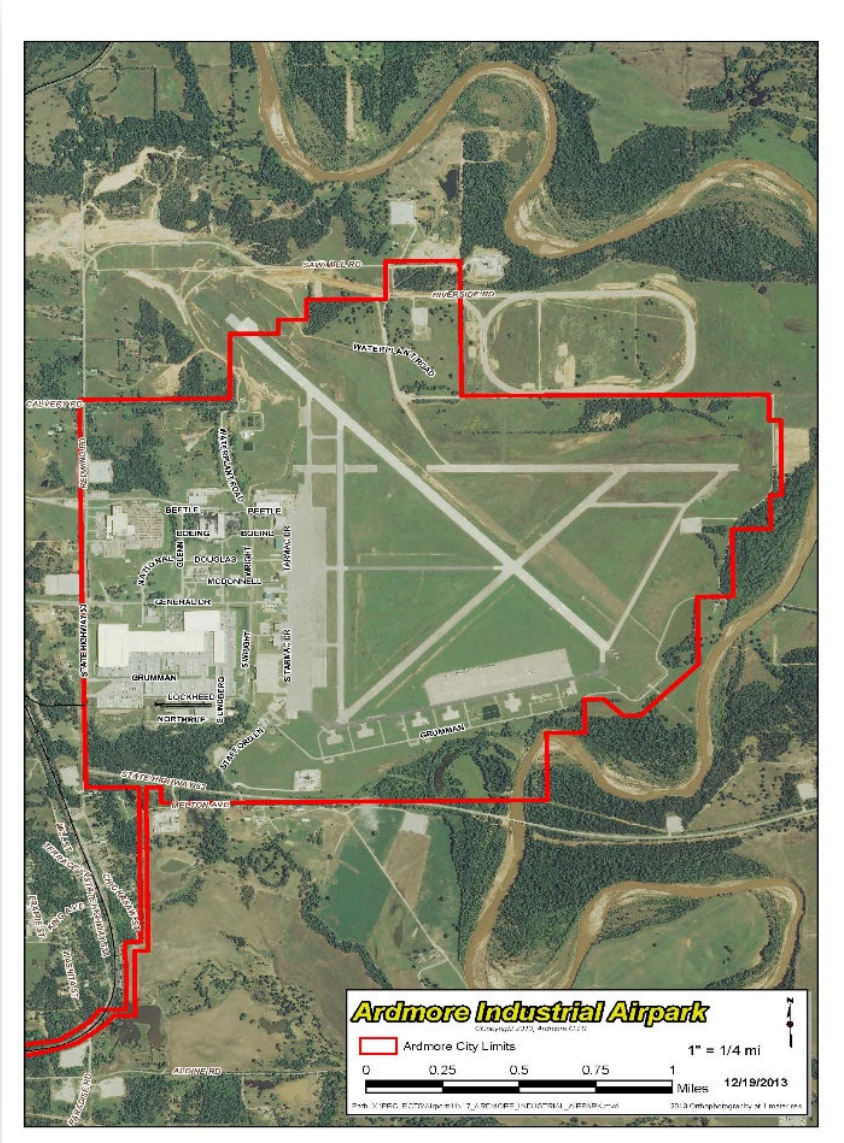


Fig. 9: Ardmore Industrial Airpark

The west side of the airpark has industrial tenants related to and not related to aviation. For example, one tenant, King Aerospace repairs, customizes, and refurbishes corporate aircraft including business jets. Another tenant is Dollar General. Dollar General has their largest national distribution facility on the airpark. The airpark also has rail service available connect to BNSF main line to provide multimodal transportation to businesses that may need truck, rail, or air service at various times.

The project is located at 34° 17’ 34.21” N, 97° 01’ 08.57” W. The area is wholly within a rural area, and within the boundaries of the Chickasaw Nation (see Fig. 12).

Area of Persistent Poverty – Overburdened Communities

While the project is not in an Area of Persistent Poverty, the percentage of Native Americans in the area living in poverty is well above 20 percent. The EPA EJSCREEN below depicts the poverty level of Native Americans in the area.

In the City of Ardmore, the larger lighter shading on the EJSCREEN corresponds with 24 to 53 percent of Native American living in poverty, the smaller darker corresponds to 53 to 99.45 percent living in poverty (Fig. 10) Carter County has an overall poverty rate of about 17 percent.

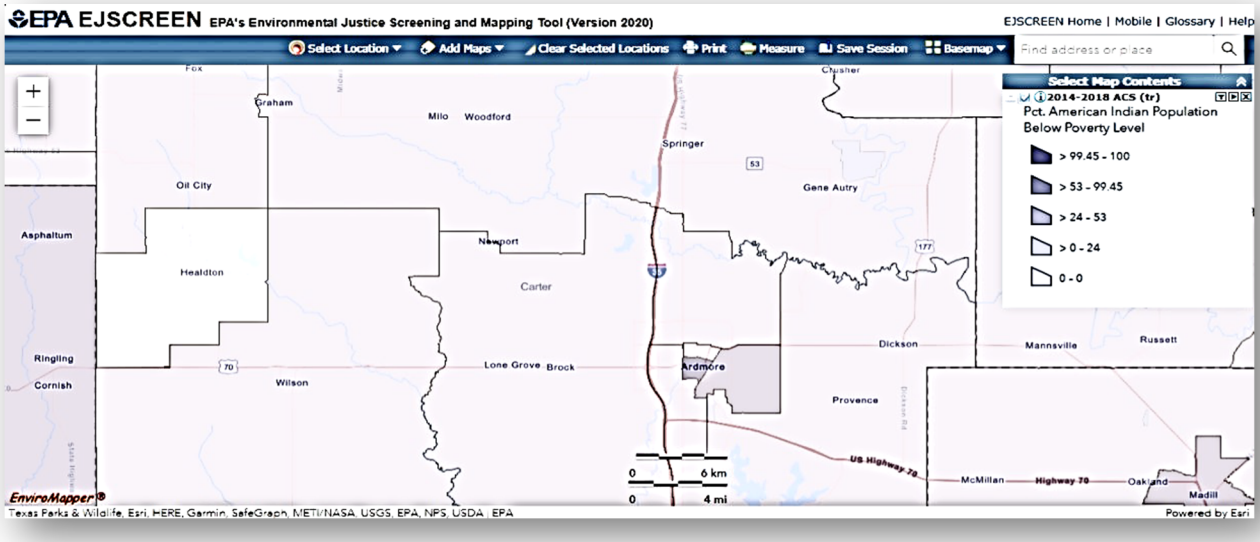


Fig. 10: EJSCREEN Percentage of Native Americans Living in Poverty

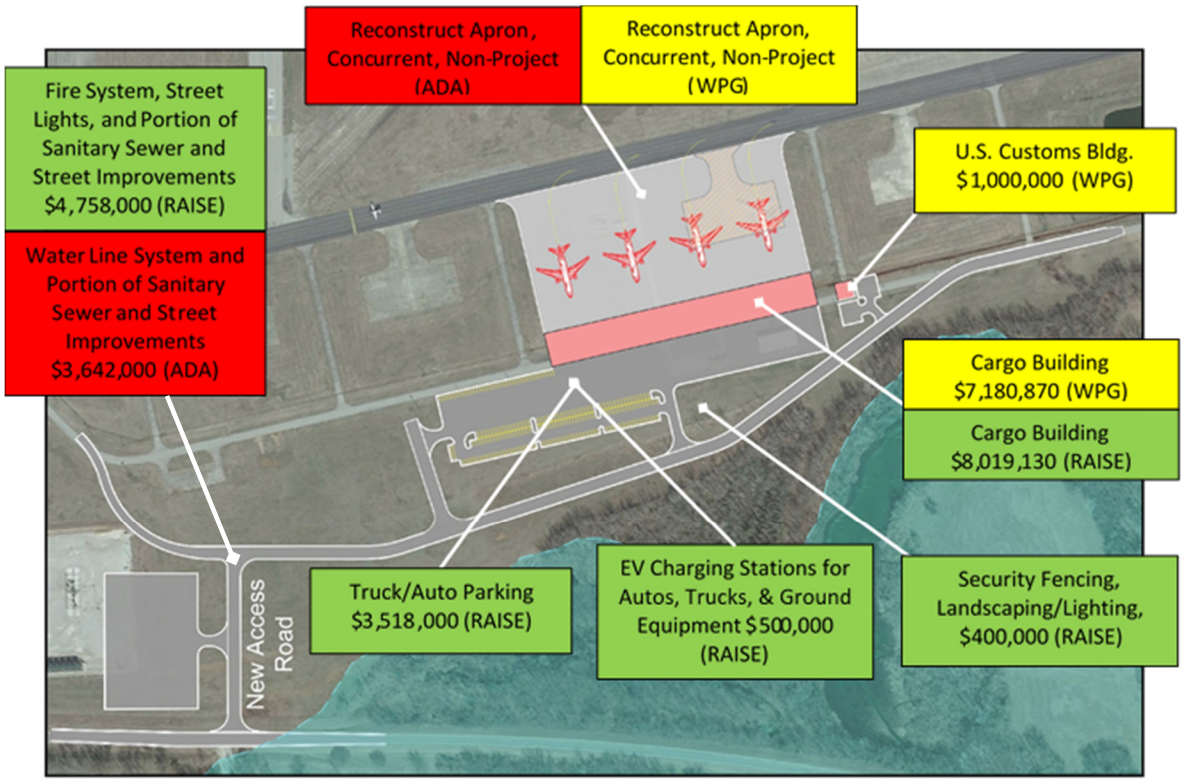
The lighter shaded block corresponds to Opportunity Zone #40019892800 and is also Census Tract 8928.

Dr. Russell Evans, Professor of Economics at Oklahoma City University and Executive Director of the Steven C Agee Economic Research and Policy Institute was consulted regarding the job creation related to the construction of the project. He found that in Carter County $113,000 in construction output accounts for one job. Using a construction cost of $34.75 million results in 307 direct jobs with total jobs including indirect and induced jobs as a multiplier of 1.6 of the direct jobs, resulting in an additional 184 indirect and induced jobs. The total jobs created during construction will be about 492. Census data shows that about 10 percent of the local population is Native American. Employment data shows that Native Americans make up about 10 percent of the labor force. We can expect that about 31 Native Americans will be employed directly by the project, and another 18 will be employed in indirect and induced positions.

Dr. Evans estimates once the project is fully operational up to 4580 jobs could be created. We expect that with the current ratio of population and employment statistics that approximately 458 Native Americans would be employed.

Grant Funds, Sources and Uses of all Project Funding

PROJECT COMPONENTS	RAISE ELIGIBLE COMPONENT COST	FUNDING SOURCE		
		FEDERAL	NON-FED MATCH	
		RAISE	WPG	ADA
Utility Improvements, Street Lights (Low E)	100,000	100,000		
Utility Improvements, Water Line System	650,000			650,000
Utility Improvements, Fire System	3,300,000	3,300,000		
Utility Improvements, Sanitary Sewer	1,600,000	235,000		1,365,000
Street Improvements (Landside)	2,750,000	1,123,000		1,627,000
Parking Lot, Auto & Truck	3,518,000	3,518,000		
Lighting (Low E)	100,000	100,000		
Cargo Building (800' x 100') (80,000 sf) (LEED v4.1 Certified	15,200,000	8,019,130	7,180,870	
Security Fencing	200,000	200,000		
EV Charging Stations	500,000	500,000		
Landscaping (Eff Water Use)	100,000	100,000		
U.S. Customs & Inspection Building (~5,000 sf)	1,000,000		1,000,000	
Construction SubTotal		17,195,130	8,180,870	3,642,000
Contingency (6-10% of Const. SubT)		1,719,513	490,852	218,520
Engineering and Architectural Design (10-16% of Const. SubT + Cont.)		2,751,221	613,565	273,150
Construction Inspection & Materials Testing (8% of Const. SubT + Cont.)		1,375,610	572,661	254,940
Construction & Project Management		1,382,488	n/a	n/a
Administration		576,037	n/a	n/a
Total RAISE Project Portion by Funding Source		**25,000,000**	**9,857,948**	**4,388,610**
RAISE Project Funding %		63.70%	25.12%	11.18%
RAISE Project Portion Total		**39,246,558**		



Any costs more than the grant amount will be paid by the ADA and WPG. Any costs that are not grant eligible such as preliminary engineering and any additional environmental work needed to support the Environmental Determination will also be paid by the ADA and WPG.

Local Match

The grant request is for $25,000,000. A separate project to construct an apron will be funded by private funds and be completed concurrently with the RAISE Grant project. The remainder of the funds needed will be provided by ADA and WP Global. The financial commitment letters are attached and located at https://www.knbltd.com/RAISE.

Selection Criteria

Safety

The project safety benefits are primarily related to truck cargo diversions from the congestion in the DFW area and a shorter truck haul for cargo currently being shipped out of Oklahoma City. The value of the safety benefits for the cargo diversion from OKC are detailed in the BCA. We were unable to quantify the safety benefits of diverting some cargo from the more congested DFW area to the less congested Ardmore area.

While a reduction in truck traffic in the DFW and AFW region is likely an incremental improvement to crashes and congestion, it will certainly help make the roads in the DFW area safer. Limitations in the public crash data provided by the State of Texas precludes an accurate estimate of possible crash rate reductions.

The truck miles saved by a diversion of cargo that would have gone to Oklahoma City provides a direct safety benefit as there is a reduction of 1.2 million miles.

Environmental Sustainability

Slower moving trucks produce more emissions per mile than faster moving trucks, because the engine speed is similar, but the distance travelled is less. The BCA posits some of the cargo traffic currently moving into and out of DFW and FWA Airports will choose to ship out of Ardmore. This shift to a different airport for air cargo shipments will result in less emissions. The emissions difference is due to the slower speed in congested traffic. The difference in actual truck miles to DFW airport or Ardmore Airport we assumed to be similar as DFW has a large draw area. On any given truck move Ardmore may be closer or further away than DFW. We do not believe there will be a significant mileage savings for DFW diverted air cargo.

Aircraft at larger airports like DFW are subject to delays, both in the air and on the ground. These delays add to operating costs and emissions. An aircraft may be directed to stay on the hold line for a period of time, or directed into a holding pattern, or given a shorter than normal take off window requiring more throttle. The amount and value of the emissions from aircraft was not estimated due to the wide variety of aircraft, delay times and types.

The air cargo volumes diverted from Oklahoma City will result in a shorter truck move and thus there will be less fuel used and less vehicle emissions for that traffic.

The Ardmore Development Authority is committed to planning for environmental sustainability through a holistic vision of reducing aerial pollution (e.g., NOx and particles) and greenhouse emissions (e.g., carbon dioxide). The ADA recognizes that existing and interested tenants of the

industrial airpark have a want and need for the airpark to offer sustainable energy sources and greener alternatives as part of their corporate ESG planning. Therefore, to meet this need, the ADA's plan will address the emissions of aircraft, ground handling services, terminals and support facilities, landside facilities, and the emissions of its supply chain as well as the direct emissions of industrial park tenants.

The plan is to include:

1) Electric Vehicle Charging Stations – The project includes the installation of electric vehicle charging stations as needed to accommodate the needs of airside ground handling and support vehicles as well as private and commercial landside automobiles.

2) Use of Electric Vehicles – Electric ground handling equipment will be required at the new air cargo handling facilities. Additionally, the ADA has committed to convert to an all-electric fleet of ground handling and support vehicles, replacing combustion engine equipment with electric equipment as practicable and as replacement needs arise.

3) A 50-Megawatt Solar Farm – ADA and its partners, WP Global, the Chickasaw Nation, Mammoth Energy Services & Lion Power Systems, and the local public utility OG&E, are working together to develop and construct a 50-to-100-Megawatt solar farm adjacent to the airpark on 160 acres owned by the Chickasaw Nation. It will be able to supply all the needs of existing airpark tenants and airport operations, with additional capacity available for future development, or supply to the local power grid.

4) Aircraft Towing Systems – A company called Aircraft Towing Systems is currently testing its technology at the airpark. The technology allows aircraft to shut down engines after landing and be towed into parking spaces by an in-ground system, reducing aircraft and ground handling emissions and improving safety. The ADA intends to incorporate this technology into new construction as it becomes available for commercial use.

5) LEED Certification – New cargo facilities (including project facilities) will be required to comply with LEED sustainable construction criteria and must pursue LEED certification. This must include low energy, efficient indoor and outdoor lighting systems and efficient water use systems for indoor clean water, and low water use landscaping. Designers are currently exploring the use of storm water run-off for landscaping and other non-potable water uses, such as ground handling equipment cleaning.

6) Stakeholder Participation – Although existing and future tenants already express the desire to participate in sustainability planning and projects, the ADA will continue to encourage the inclusion and mutual dialogue through regular engagement of businesses and partners and will actively pursue future users of the cargo facilities who have plans in place to utilize sustainable business practices.

Quality of Life

In much of rural America the traditional quality of life infrastructure such as connectivity (rural public transit for example) or expanding access to health care, bike paths and bike lanes simply do not exist. Quality of life for rural and Native American citizens more often is related to jobs. Can a person find a job? Will it allow them to stay in the area they prefer, or will they have to move to an urban area? Carter County and the surrounding counties have all experienced times of growth and decline.

In recent years most of the area counties are showing modest levels of population growth. Dr. Evans projects an additional 4580 jobs to be available in this area once the project is built and fully operational. The project itself will provide 492 construction jobs in Carter County with construction output numbers of one job per every $113,000 in construction cost. Native Americans constitute about 10 percent of the labor force in Carter County, so we expect roughly 49 jobs to be held by Native Americans.

Racial Equity

The Chickasaw Nation (Fig.12) encompasses 13 counties in south central Oklahoma including the town of Ardmore. The Chickasaw Nation Department of Commerce letter of support says, "This project will help facilitate economic development and job creation in a rural area of persistent poverty, which is precisely the sort of project the RAISE program was designed to support." The letter from the Chickasaw Nation Department of Commerce is attached and can be viewed at https://www.knbltd.com/RAISE.

Fig. 12 Geographic Boundaries of the Chickasaw Nation

Community Benefits

Having an air cargo facility at Ardmore will provide additional jobs in the community. In the July 2019 "Oklahoma Air Cargo Expansion Feasibility Study" developed in conjunction with the US Department of Commerce, Dr. Russell Evans projected 1,572 direct jobs created and another 3,008 because of the multiplier effect of the facility.

Cargo Port Operations Low: 300 M Pounds Enplaned @ $1.75 Revenue per Pound

	Employment	Labor Income	Output
Direct Impact	1,572	$159,509,541	$525,000,000
Multiplier Impact	3,008	$158,018,645	$513,957,179
Total Impact	4,580	$317,528,186	$1,038,957,179

Fig. 13 Job Creation after project completion

Economic Competitiveness

The project will lower the cost of movement of goods by shortening the trucking distance for cargo, eliminating roadway delays resulting from congestion, eliminating at airport delays for loading and unloading trucks, lower cost landing fees compared to DFW, and eliminating aircraft delays due to congestion at the airport.

Air cargo tends to be time sensitive high value cargo. Companies ship by air to meet deadlines, or the destination is an overseas supplier or customer whose products cannot be transported by ship. Air cargo is often international in nature. Global Agribusiness Ventures (GAV) plans on developing cocoa and cashew processing facilities to the US. They mention in their letter of support that despite the US being the largest consumer of cashews, there no US processing facilities. GAV also states that, "We anticipate locating in Ardmore post project completion." GAV's letter is attached or can be viewed at https://www.knbltd/RAISE.

Rank	Industry	Export Value 2018	Share of Total
1	333 Machinery, Except Electrical	$1,085,660,696	17.80%
2	336 Transportation Equipment	$1,059,637,617	17.40%
3	334 Computer & Electronic Products	$894,190,633	14.70%
4	325 Chemicals	$655,332,778	10.70%
5	332 Fabricated Metal Products	$512,520,268	8.40%
6	335 Electrical Equip, Appliances &	$370,681,466	6.10%
7	311 Food & Kindred Products	$353,611,068	5.80%
8	111 Agricultural Products	$289,015,679	4.70%
9	331 Primary Metal Mfg.	$236,218,644	3.90%
10	326 Plastics & Rubber Products	$147,518,243	2.40%
11	Other	$498,037,967	8.20%
	Total	$6,102,425,059	100.00%

Source: U.S. Census; usatrade.census.gov

Fig 14. Oklahoma Exports

The destination for Oklahoma exports is primarily North America and Europe, with these two regions combining to account for 64 percent of all Oklahoma exports in 2018. Europe accounted for nearly $1.5 billion or 24 percent of total exports.

Rank	Industry	Export Value 2018	Share of Total
1	North America	$2,422,267,599	39.70%
2	Europe	$1,478,833,217	24.20%
3	Asia - Other	$1,160,363,568	19.00%
4	Asia - Near East	$336,646,738	5.50%
5	South America	$279,341,449	4.60%
6	Africa	$139,195,312	2.30%
7	Australia and Oceania	$113,636,771	1.90%
8	Asia - South	$94,569,549	1.50%
9	Central America and Caribbean	$77,570,856	1.30%
	Total	$6,102,425,059	100.00%

Source: U.S. Census; usatrade.census.gov

Fig. 15 Oklahoma Export Destinations

This project will provide the option of faster, more efficient, and less costly shipping to overseas destinations. This additional capacity at Ardmore (including the railroad access) will complement existing facilities by offering shippers additional choices.

Chicago O'Hare air cargo is so congested, Ardmore has been contacted by shippers using the project facilities when a shipment is time sensitive – the shipper would dray the cargo to Chicago from Ardmore to get it to the customer on time.

State of Good Repair

The project will relocate the existing road, build a truck parking apron, add water, sewer and power to the site, add electric charging for trucks and ground handling equipment, build a cargo warehouse, extend fire suppression to the area. Concurrently, a privately funded non-RAISE project will replace a small concrete aircraft apron with a larger one designed to handle the weight of a large, loaded aircraft and repair a section of taxiway. The current apron area needs expansion and rehabilitation. An additional new apron area is scheduled for completion by December 2022.

Asphalt pavement periodic maintenance costs are detailed in the BCA and will be the responsibility for the ADA. The maintenance of the air cargo building will be the responsibility of the ADA and WP Global.

Partnership and Project Parties

This project is a Public-Private Partnership between the Ardmore Development Authority, the Ardmore Municipal Airport, the City of Ardmore, Watco, Knightsbridge Partners and the State of Oklahoma. Additional partners, both domestic and international are expected to become involved once the project is completed.

The project components to be constructed, described in the funding plan on page 15, will be

owned by the applicant, the Ardmore Development Authority. All the structural assets required to operate an air cargo operation are intended for sub-lease to an air cargo partner, and in this case, WP Global is prepared to lease the assets upon project completion to begin immediate air cargo operations.

Support letters have been received from Oklahoma's Congressional Delegation (Sen. J. Inhofe, Sen. J. Lankford, & Rep. T. Cole), the Chickasaw Nation (Comm. Sec. B. Lance), The State of Oklahoma (Lt. Gov. M. Pinnell and Comm. Sec. S. Mueller), Oklahoma Aeronautics Commission (Dir. G. Ardies), State Senators F. Simpson and T. Townley, The City of Ardmore, Ardmore Chamber of Commerce, WATCO Companies, Global Agribusiness Ventures, Eneus Energy, First National Bank & Trust Company of Ardmore, American Nation Bank (Ardmore), BancFirst (Ardmore).

Innovation

The project is well understood from a design, bid letting and construction standpoint and will be utilizing conventional methods for project delivery.

For the past several years, the ADA and its partners have been working with top government trade officials in the United Kingdom in anticipation of a post-Brexit economy. The U.K. government has a memorandum of understanding with the State of Oklahoma, set to be signed in September of 2021. The MOU outlines an agreement between the State of Oklahoma and the U.K. to develop a Trusted Trader relationship whereby the entities will form a "customs superhighway" of trade between airports in Wales, Northern Ireland, and Scotland and Ardmore, OK. Such an arrangement would improve access for manufacturers and agricultural producers in Oklahoma and the broader region to export markets in the U.K., as well as give the same opportunity to counterparts in the U.K. Examples of products to flow back and forth are pecans, fresh pork from Oklahoma and Welsh lamb and other luxury food goods from the U.K. – both previously unavailable in either market due to E.U. trade rules. Automobile, aerospace, defense, and energy equipment parts and electronic components could flow in both directions as both geographies have significant industries of those types. This represents a major opportunity for U.S. trade into uncongested airspace in the middle of the United States, and into an economically distressed area that would benefit greatly by becoming such a gateway for trade between the U.S. and the U.K.

This project supports the U.S. and Oklahoma Commerce and Agricultural Departments' missions to develop trade with countries in central and south America, particularly imports and exports of agricultural, medical, and manufactured goods. Guatemala, Costa Rica, and Panama have all expressed interest with the Oklahoma federal delegation to develop this trade through ADM.

The ADA is committed to incorporating new technologies that streamline cargo operations and have the potential to make a positive environmental impact. The ADA and its private partners have consulted Physical 2 Digital Limited (www.p2dl.com) to provide the technology solution for the aforementioned "customs superhighway". Using a platform such as that offered by P2DL, cargo operators at ADM will benefit from simpler customs procedures when importing and exporting goods to and from ADM by enabling them to forward declare all relevant

documentation to the appropriate Government competent authorities. Everyone involved in the supply chain will be able to visualize movements and understand the full end-to-end provenance of goods and can further calculate carbon and sustainability metrics. Integration of this type of innovative technology will be required by the U.K. government to do business with them. In fact, it was they who introduced ADA and its partners to P2DL because they are already engaging them to streamline movements of goods from the mainland U.K. to Northern Ireland across the Irish Sea.

Environmental Risk Review

Because the project is located on airport property, a Documented Categorical Exclusion (CatEx) written by Lochner Engineering and dated February 2021 was submitted to Dean McMath at the FAA on March 8, 2021. To date, there has not been a response from FAA. The CatEx can be viewed at https://www.knbltd.com/RAISE and is also attached to the grant application.

Project Schedule

Based on November 2021 Notice of Award date, we anticipate the following schedule.

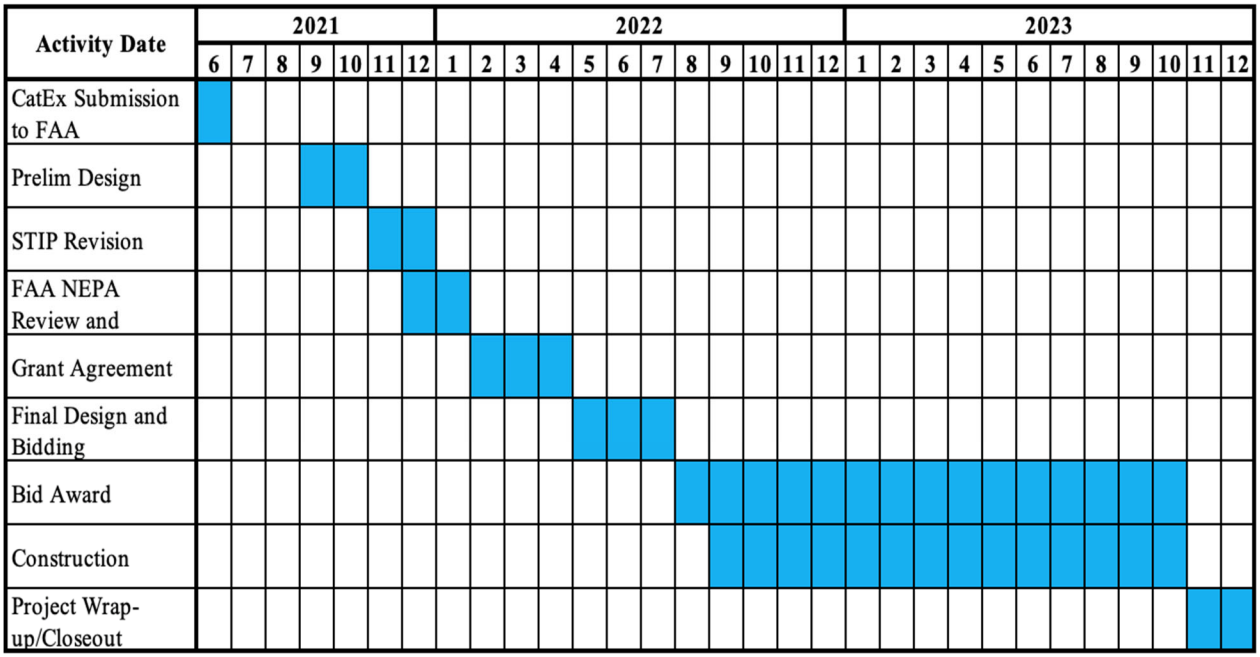


Fig 16 Project Schedule

Required Approvals

Prior to construction, a Notice of Intent must be filed with the ODEQ. A Stormwater Pollution Prevention Plan (SWPPP) shall be developed prior to filing the Notice of Intent. The SWPPP shall describe the project area and its outfalls in detail and describe BMPs to be utilized to minimize erosion and sedimentation of nearby waterbodies. The SWPPP will include all land disturbance being completed with the project. No additional approvals are required.

Assessment of Project Risks and Mitigation Strategies

Procurement Delays

No procurement delays are anticipated. This is a normal construction project with commonly available materials. We believe the current high prices and current shortages of construction materials and labor will have returned to normal by the time the project is bid.

Environmental Uncertainties

The primary uncertainties relate to weather during the construction season causing delays. Appropriate time was built into the schedule to accommodate weather issues.

Real Estate Acquisition

Real estate acquisition is not required for this project.

Benefit Cost Analysis

This grant application includes a benefit cost analysis conducted for the Global Transportation Industrial Park 2021 Raise Grant application. This project, located at the Ardmore Airport, would develop a portion of the airport to be able to ship large quantities of air cargo through a dedicated air cargo apron and air cargo warehouse. The Ardmore Municipal Airport and Industrial Park is owned by the City of Ardmore, OK and leased to the Ardmore Development Authority. The Industrial Park is contained within the boundaries of the airport.

Since 2010 the Ardmore Development Authority, the FAA, the State of Oklahoma, and private entities have spent over $55.5 million on maintenance and improvements at the airport and industrial park. These funds were expended to help expand the economic presence of south-central Oklahoma and the Ardmore area. This commitment to the facility shows how serious the parties are about their belief that this airport and industrial park can become a transformative influence in the south-central region of Oklahoma. The goal is to develop the facility into a global intermodal transportation center that also houses industrial park tenants many of which have global customers. The location of Ardmore – halfway between Dallas/Fort Worth and Oklahoma City is ideal for growth, while offering a less congested and less costly option for shippers and business.

Under existing condition (the No-Build Scenario) the airport and industrial park will continue as is – there will be no cargo flights out of Ardmore. Any economic benefits this project would have accrued will not happen. Air freight will continue to be shipped at increasing volumes from DFW, AFW and OKC. Any possible relief for time sensitive shipments through O'Hare will not be available at Ardmore.

Benefit Cost Analysis Assumptions and Explanation

The BCA assumes two separate areas of benefit. First is a destination shift from the Dallas Fort Worth airport for a small percentage of their current air cargo volumes. This shift is possible because shippers that can use Ardmore will choose to do so because of lower costs and faster throughput times. The cost savings come from reduced expenses related to congestion, delays in truck movements, aircraft delays and reductions in airport costs such as reduced landing fees. We estimated a starting volume of 25,000 tons for the first year at Ardmore – that represents 2.5 percent of the freight volume of DFW. We anticipate the second year will be 35,000 tons, then an annual growth of 12 percent for the next 10 years. For years 2035 to 2044, we think that growth will slow to five percent - still slightly above the FAA forecast of 3.5 percent growth for domestic shipments and 4.2 percent growth for international air cargo. Beyond 2044, we see growth at about GDP growth of three percent.

The truck delay costs are calculated assuming that a truck coming into DFW or AFW is traveling (or stopped in traffic with the engine running) for four additional hours due to congestion and is moving at a slow speed – being very inefficient for the distance moved. Once the truck is in the airport, delays will likely be with the truck shut off - such as waiting to get loaded or unloaded. We assumed the truck gets six miles per gallon. The emissions values are as described in the BCA Guidance. CO2 emissions are based upon the gallons burned. We do not know the fuel economy of the truck at slow highway speeds - but potentially similar engine speeds so we assumed the fuel burn was like normal fuel economy. Assuming the miles traveled to Ardmore or DFW are the same the emissions would be similar – however traffic moves slower during congestion in the DFW area, so the truck is running for the equivalent of 33.4 more miles. Emissions rates are calculated on a per mile basis, to account for the slower speeds we assumed 33.4 additional miles to calculate emissions.

Landing fee avoided. This assumes that the cargo would be going to DFW or FWA if Ardmore is not developed into an air cargo airport. Ardmore more will be less expensive to fly into and out of because the airport does not have the infrastructure to maintain and because congestion issues at DFW and FWA increase costs. Ardmore is more efficient because of the decrease in congestion and the increase in efficiency. The tons of cargo forecasted to come into Ardmore are divided by the payload of the 767-200 (46.2 tons). The number of aircraft landings is likely calculated to be lower than actual because the volume max of the shipment may well be reached before the payload limit. The maximum landing weight of a fully loaded 767-200 is 283,000 lbs., the landing fee is calculated on a dollar figure less than DFW (to calculate savings) - the landing fee at DFW varies but is approximately $10 per ton of landed weight. We used a value of $5 per ton less than DFW.

Delay costs for the aircraft are calculated from the overall delay time at DFW - from a FAA document "Calculating Delay Propagation Multipliers for Cost - Benefit Analysis" table 4-1 pg. 4-3 divided by the total number of flights from DFW. Document can be found at http://www.faa.gov/regulations_policies/policy_guidance/benefit_cost/media/faabca.pdf. Operating costs for the 767-200 are provided from the FAA at http://FAA.gov/regulations_policies/policy_guidance/media/econ-value-section-4-op-costs.pdf. Table 4-7 2018 Part 121 Pg. 4-8 costs were inflated to 2019 values.

The operating costs are assumed to be during a time when the aircraft is either in flight or moving under its own power on the ground - the delay may be as a holding pattern above the airport or waiting on a hold line. To account for non-flight operating time, essentially using less fuel, we reduced the operating costs by 25 percent.

The emissions rates for a 2013 model truck are as described in a report entitled "Updated Emission Factors of Air Pollution from Vehicle Operations in GREET using MOVES" done by Argonne National Labs is September 2013. CO2 emissions are based upon the excess fuel used by trucks in congested traffic assuming 10,180 grams of CO2 in each gallon of fuel.

The second area of benefit is assuming a destination shift of air cargo from Oklahoma City to Ardmore. Oklahoma City is 100 miles north of Ardmore on I-35. Oklahoma City airport (OKC) is currently handling about 100,000 tons of air cargo a year. Tulsa is about 75 miles NE of Oklahoma City, Wichita, Kansas is 255 miles north of Oklahoma City. We assumed that of the volumes going into OKC half originate (or terminate) north of OKC and half south of OKC. Of the 50,000 tons coming from (or going to) destinations south of OKC we assumed Ardmore will initially attract twenty percent of that volume (10,000 tons) then grow for 10 years at a five percent rate (from 2024 to 2033) - slightly above the FAA domestic and international cargo forecast of 3.85 percent (average of domestic forecast of 3.5 percent and international forecast of 4.2 percent - FAA Aerospace Forecast Fiscal Years 2020 to 2040 pg. 23). From 2034 to 2043, we used the FAA forecast growth rate average of 3.85 percent. From 2044 to 2052 we used a growth rate matching an assumed GDP growth rate of three percent.

We assumed that the volume of cargo above was being trucked to (and from) Ardmore and saving 25 miles of trucking (one way) or 50 miles total on average. A shipper located near Ardmore would save many more miles, where as a shipper located 50 miles from Ardmore and 50 miles from OKC would not save any miles, regardless of which airport they choose to ship from. Since both airports are in uncongested areas there are not truck, airport, or aircraft congestion costs to be saved by choosing one airport over the other. Likewise, the landing fees at both OKC and Ardmore are similar enough to likely not be a factor. The benefit then is the shorter truck haul for those shippers closer to Ardmore. The crash rates are as presented by Oklahoma DOT for 2019 in three categories – fatalities, injury, and property damage only. The rate is calculated as a number per 100 million vehicle miles traveled. The costs per injury (since Oklahoma does not split them out in more than one category) was as presented in the February 2021 BCA guidance averaged from the KABCO Levels B and A (non-incapacitating and incapacitating respectively) to a 2019 monetized value of $331,650.

In addition to the cost savings related to less crashes, there is an emissions reduction that was calculated using the GREET data for a 2013 model truck as described above. The values for emissions savings are as described in the February 2021 BCA Guidance. The emissions data is described in "Updated Emissions Factors of Air Pollutants from Vehicle Operations in GREET using MOVES" Argonne National Laboratory September 2013 Table A18. This document is attached and can be reviewed at https://www.knbltd.com/RAISE.

The most sensitive variable in the BCA is the projected volume of freight. We believe that we have been conservative with the projected volumes.

Operations and Maintenance Costs

Maintenance costs for the asphalt and concrete pavements are shown below as year of expenditure dollars and included in the BCA spreadsheet calculations.

ARDMORE MUNICIPAL AIRPORT
ARDMORE, OKLAHOMA

CARGO FACILITY PARKING AND STREET

Life Cycle Cost Analysis - Bituminous Pavement

(Costs Associated Only with Bituminous Pavement)

ITEM NO.	ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
	New Construction				
1	Cement Treated Subgrade (12")	94,000	S.Y.	$11.00	$1,034,000.00
2	Asphalt Subbase Course (3")	16,400	Tons	$80.00	$1,312,000.00
3	Asphalt Base Course (6")	30,400	Tons	$80.00	$2,432,000.00
4	Bituminous Prime Coat	15,600	Gal.	$3.00	$46,800.00
5	Bituminous Tack Coat	31,600	Gal.	$3.00	$94,800.00
6	Asphalt Surface Course	12,250	Tons	$110.00	$1,347,500.00
				Total	$6,267,100.00
				$ / S.Y. =	$150.41
	Clean & Seal Joints & Cracks - Seal Coat (Yr. 7)				
1	Mobilization	1	L.S.	$30,000.00	$30,000.00
2	Temporary Marking, Lighting and Barricades	1	L.S.	$6,000.00	$6,000.00
3	Pavement Marking Removal	6,500	S.F.	$1.50	$9,750.00
4	Clean and Seal Existing Joints & Cracks (Less than 1")	25,000	L.F.	$2.00	$50,000.00
5	Clean and Seal Existing Joints & Cracks (1" to 2")	5,000	L.F.	$6.50	$32,500.00
6	Pavement Friction Seal Coat Surface Treatment	94,000	S.Y.	$3.00	$282,000.00
7	Reflectorized Pavement Marking	6,500	S.F.	$2.00	$13,000.00
				Total	$423,250.00
				$ / S.Y. =	$10.16
	Clean & Seal Joints & Cracks - Seal Coat (Yr. 15)				
1	Mobilization	1	L.S.	$32,000.00	$32,000.00
2	Temporary Marking, Lighting and Barricades	1	L.S.	$7,000.00	$7,000.00
3	Pavement Marking Removal	6,500	S.F.	$1.75	$11,375.00
4	Clean and Seal Existing Joints & Cracks (Less than 1")	25,000	L.F.	$2.00	$50,000.00
5	Clean and Seal Existing Joints & Cracks (1" to 2")	5,000	L.F.	$6.75	$33,750.00
6	Pavement Friction Seal Coat Surface Treatment	94,000	S.Y.	$3.00	$282,000.00
7	Reflectorized Pavement Marking	6,500	S.F.	$2.50	$16,250.00
				Total	$432,375.00
				$ / S.Y. =	$10.38
	Rehabilitation of Bituminous Surface Course (Yr. 20)				
1	Mobilization	1	L.S.	$34,000.00	$34,000.00
2	Temporary Marking, Lighting and Barricades	1	L.S.	$8,000.00	$8,000.00
3	2" Mill Existing Pavement Surface Course	94,000	S.Y.	$5.00	$470,000.00
4	Clean and Seal Existing Joints & Cracks (Less than 1")	10,000	L.F.	$2.25	$22,500.00
5	Clean and Seal Existing Joints & Cracks (1" to 2")	2,500	L.F.	$7.00	$17,500.00
6	Bituminous Tack Coat	31,600	Gal	$3.50	$110,600.00
7	Bituminous Surface Course	12,250	Tons	$150.00	$1,837,500.00
8	Reflectorized Pavement Marking	6,500	S.F.	$2.75	$17,875.00
				Total	$2,517,975.00
				$ / S.Y. =	$60.43
	Clean & Seal Joints & Cracks - Seal Coat (Yr. 30)				
1	Mobilization	1	L.S.	$34,000.00	$34,000.00
2	Temporary Marking, Lighting and Barricades	1	L.S.	$8,000.00	$8,000.00
3	Pavement Marking Removal	6,500	S.F.	$2.00	$13,000.00
4	Clean and Seal Existing Joints & Cracks (Less than 1")	25,000	L.F.	$2.25	$56,250.00
5	Clean and Seal Existing Joints & Cracks (1" to 2")	5,000	L.F.	$7.00	$35,000.00
6	Pavement Friction Seal Coat Surface Treatment	94,000	S.Y.	$3.50	$329,000.00
7	Reflectorized Pavement Marking	6,500	S.F.	$2.75	$17,875.00
				Total	$493,125.00
				$ / S.Y. =	$11.83

Fig. 17 O&M Schedule for Asphalt Pavements

Residual Value

Major capital projects create an initial value in the facility, which depreciates over time, but often has a life that is beyond a standard benefit-cost analysis period. In this case, the analysis period is 30 years. The life of the project was assumed to be 40 years. We used a straight-line depreciation for 30 years to determine the residual value.

Summary of BCA

The discounted benefits of $64,351,594 was added to the discounted residual value ($768,828), the periodic maintenance costs ($927,122) subtracted. That value was divided by the discounted construction cost ($28,678,334) for a benefit cost ration of 2.24:1. The net present value is $35,673,260.

BCA Spreadsheet with Explanation

The BCA and explanation are attached to the application as an Excel spreadsheet, or may be viewed or downloaded from https://www.knbltd.com/RAISE