

TIGER IV

Benefit Cost Analysis

Minot International Airport Access Road

Minot, ND

Table of Contents

Summary and Findings.....	3
Net Economic Impacts to North Dakota	4
Project Matrix	Error! Bookmark not defined.
Project Matrix	5
Summary of Costs and Benefits (7% discount)	5
Summary of Costs and Benefits (3% discount)	6
Qualitative Benefits Not Quantified	6
Livability	6
Improvements in Reliability	6
Baseline Assumptions	7
Alternatives	7
Affected Populations and Types of Impacts	7
Quantified Costs and Benefits: Long-Term Outcomes.....	8
Project Costs	8
State of Good Repair.....	8
Economic Competitiveness Benefits.....	8
Environmental Sustainability Benefits	9
Safety Benefits	9
Short-Term Impacts on Employment and Economic Growth.....	9

Summary and Findings

The City of Minot, North Dakota and Minot International Airport (MOT) is applying for a TIGER IV grant to construct a new four-lane access road to accommodate new airport infrastructure, transit vehicles, increased passenger volumes, and include adjacent walking and bike paths. The access road is a single phase in a five stage, multi-phased Capital Improvement Plan totaling approximately \$98 million.

The focus of this application is on the completion of the Stage 2 Access Road which will:

- Increase the efficiency of traffic flow to and from the airport
- Provide alternative transportation options to the airport for passengers to improve access, efficiency and connectivity while promoting a healthy and active lifestyle
- Reduce greenhouse gas emissions
- Improve the local economy
- Alleviate congestion and increase access road capacity
- Foster a sustainable, long-term workforce
- Improve safety for pedestrians, bicyclists, motorists and transit users

The MOT Access Road is nearly ready to go. The FAA has provided verbal agreement to MOT's consulting engineer to issue the Record of Determination of the Categorical Exclusion during the first part of April 2012. No extenuating and/or adverse environmental impacts were found in the proposed construction area. The city of Minot has confirmed it will include the project in its TIP in June 2012 and no right-of-way access is needed. The urgency of the project is supported by the City of Minot, the North Dakota Aeronautics Commission, Bismarck FAA office, North Dakota's State Senators and Representative, local and state economic development groups and the North Dakota Petroleum Council. The City of Minot and MOT are forced to build a new terminal and parking area to handle the travel demand and flight schedule increases that are projected to last at least 20 years. Airport planning projects that normally take months are being completed in weeks. The access road design will be completed in December of 2012 and ready to bid in early 2013 to coincide with additional Stage 2 construction projects, which will increase efficiencies of local resources and reduce overall construction costs.

A 40% non-federal match of \$1,460,200 has been committed and will be generated through Passenger Facility Charges (PFC). Over 90% percent of the project budget will be used for construction.

This benefit-cost analysis (BCA) follows guidance set forth in the notice of funding availability for TIGER IV grants as published in the January 21, 2012 Federal Register (V77, N20, pp 4863-4880).

The cost to complete this project is \$3,650,500 in 2012 dollars. The City and MOT are requesting a capital investment of \$2,190,300 from the TIGER IV program to complete the project. Per program advice (FR4878), a discount rate of three percent was used. The net present value (NPV) at the three percent discount rate is \$35,815,747 with costs of \$3,650,500, yielding a benefit cost ratio of 1:10. The greatest share of benefits is from time travel savings.

Net Economic Impacts to North Dakota

Temporary Jobs Created Due to Construction				
	Number of Jobs Created on Project	Total Estimated Salary Due to Construction		
Construction (2012-2013, 1 year)	35	\$ 1,651,866		
FTE Projections				
Year	Enplanements (Passengers Boarding)	Primary FTE	Secondary FTE	Total FTE
2012	201,014	115	111	226
2013	223,080	127	123	251
2014	245,145	140	136	276
2015	267,211	153	148	301
2016	289,276	165	160	325
2017	311,342	178	172	350
2018	334,750	191	185	377
2019	358,158	205	198	403
2020	381,566	218	211	429
2021	404,974	231	224	456
2022	428,382	245	237	482
2023	444,479	254	246	500
2024	460,575	263	255	518
2025	476,672	272	264	536
2026	492,768	282	273	554
2027	508,865	291	282	572
2028	524,961	300	291	591
2029	541,058	309	299	609
2030	557,154	318	308	627
2031	573,251	328	317	645
2032	589,347	337	326	663
2033	632,185	361	350	711
Salary Projections				
Year	Enplanements (Passengers Boarding)	Primary Payroll	Secondary Payroll	Total Payroll
2012	201,014	\$ 5,124,936	\$ 3,675,396	\$ 8,800,332
2013	223,080	\$ 5,687,508	\$ 4,078,849	\$ 9,766,357
2014	245,145	\$ 6,250,079	\$ 4,482,303	\$ 10,732,382
2015	267,211	\$ 6,812,651	\$ 4,885,756	\$ 11,698,407
2016	289,276	\$ 7,375,223	\$ 5,289,210	\$ 12,664,432
2017	311,342	\$ 7,937,794	\$ 5,692,663	\$ 13,630,458
2018	334,750	\$ 8,534,591	\$ 6,120,662	\$ 14,655,253
2019	358,158	\$ 9,131,388	\$ 6,548,660	\$ 15,680,048
2020	381,566	\$ 9,728,185	\$ 6,976,658	\$ 16,704,843
2021	404,974	\$ 10,324,981	\$ 7,404,657	\$ 17,729,638
2022	428,382	\$ 10,921,778	\$ 7,832,655	\$ 18,754,433
2023	444,479	\$ 11,332,165	\$ 8,126,968	\$ 19,459,133
2024	460,575	\$ 11,742,552	\$ 8,421,281	\$ 20,163,833
2025	476,672	\$ 12,152,939	\$ 8,715,594	\$ 20,868,533
2026	492,768	\$ 12,563,326	\$ 9,009,906	\$ 21,573,233
2027	508,865	\$ 12,973,713	\$ 9,304,219	\$ 22,277,932
2028	524,961	\$ 13,384,100	\$ 9,598,532	\$ 22,982,632
2029	541,058	\$ 13,794,487	\$ 9,892,845	\$ 23,687,332
2030	557,154	\$ 14,204,874	\$ 10,187,158	\$ 24,392,032
2031	573,251	\$ 14,615,261	\$ 10,481,471	\$ 25,096,732
2032	589,347	\$ 15,025,648	\$ 10,775,784	\$ 25,801,432
2033	632,185	\$ 16,117,826	\$ 11,559,049	\$ 27,676,875

Project Matrix

Selection Criteria	Description	Inputs	Value	Monetized Value	
				Discount Rate 7%	Discount Rate 3%
Economic Competitiveness	Travel time savings	Savings of time on average hour rate for time on access road	\$37,310,225 in lost wages for passengers over 20 years	\$ 57,084,453	\$ 35,643,624
Environmental Sustainability	Reduced pollution	CO ₂ cost savings	Approximately 75 metric tons of CO ₂ saved	\$ 240,696	\$ 150,482
Liveability	Promotion of healthy, active lifestyle	Reduced personal fuel consumption	Over \$21,000 saved in fuel costs	\$ 33,017	\$ 21,641
Total Cost				\$ (3,650,500)	\$ (3,650,500)
Total Benefits				\$ 57,358,166	\$ 35,815,747
Net Present Value				\$ 53,707,666	\$ 32,165,247
Cost Benefit Ratio				1:16	1:10

Summary of Costs and Benefits (7% discount)

Year		Cost of Improvements		Benefits	
		Cost of Improvements	Discounted 7%	Total Benefits	Total 7%
	2012	\$ (3,650,500)	\$ (3,650,500)	\$ -	\$ -
	2013			\$ -	\$ -
1	2014			\$ 711,105	\$ 711,105
2	2015			\$ 775,026	\$ 829,278
3	2016			\$ 838,947	\$ 960,510
4	2017			\$ 902,868	\$ 1,106,052
5	2018			\$ 970,677	\$ 1,272,360
6	2019			\$ 1,038,487	\$ 1,456,531
7	2020			\$ 1,106,296	\$ 1,660,252
8	2021			\$ 1,174,106	\$ 1,885,357
9	2022			\$ 1,241,915	\$ 2,133,842
10	2023			\$ 1,288,545	\$ 2,368,937
11	2024			\$ 1,335,174	\$ 2,626,489
12	2025			\$ 1,381,803	\$ 2,908,491
13	2026			\$ 1,428,432	\$ 3,217,103
14	2027			\$ 1,475,061	\$ 3,554,669
15	2028			\$ 1,521,691	\$ 3,923,731
16	2029			\$ 1,568,320	\$ 4,327,044
17	2030			\$ 1,614,949	\$ 4,767,594
18	2031			\$ 1,661,578	\$ 5,248,619
19	2032			\$ 1,708,207	\$ 5,773,626
20	2033			\$ 1,832,303	\$ 6,626,576
	NPV	\$ (3,650,500)	\$ (3,650,500)	\$ 25,575,491	\$ 57,358,166

Summary of Costs and Benefits (3% discount)

		Cost of Improvements		Benefits	
Year		Cost of Improvements	Discounted 3%	Total Benefits	Total 3%
	2012	\$ (3,650,500)	\$ (3,650,500)	\$ -	\$ -
	2013			\$ -	\$ -
1	2014			\$ 711,105	\$ 711,105
2	2015			\$ 775,026	\$ 798,277
3	2016			\$ 838,947	\$ 890,039
4	2017			\$ 902,868	\$ 986,588
5	2018			\$ 970,677	\$ 1,092,506
6	2019			\$ 1,038,487	\$ 1,203,891
7	2020			\$ 1,106,296	\$ 1,320,976
8	2021			\$ 1,174,106	\$ 1,444,002
9	2022			\$ 1,241,915	\$ 1,573,221
10	2023			\$ 1,288,545	\$ 1,681,258
11	2024			\$ 1,335,174	\$ 1,794,362
12	2025			\$ 1,381,803	\$ 1,912,739
13	2026			\$ 1,428,432	\$ 2,036,603
14	2027			\$ 1,475,061	\$ 2,166,177
15	2028			\$ 1,521,691	\$ 2,301,694
16	2029			\$ 1,568,320	\$ 2,443,391
17	2030			\$ 1,614,949	\$ 2,591,519
18	2031			\$ 1,661,578	\$ 2,746,336
19	2032			\$ 1,708,207	\$ 2,908,109
20	2033			\$ 1,832,303	\$ 3,212,955
	NPV	\$ (3,650,500)	\$ (3,650,500)	\$ 25,575,491	\$ 35,815,747

Qualitative Benefits Not Quantified

Livability

The project will **create more affordable and convenient transportation choices** by providing a walking and bike path to the airport as well as adding mass-transportation stops at the airport. The proposed project is anticipated to drop customer wait times by nearly 50 percent (from 10 minutes to 5 minutes). The decreased travel and wait time will reduce household transportation costs, reduce the nation's dependence on foreign oil by providing more efficient access to air service for the workers in the industry, improve air quality, reduce greenhouse gas emissions and promote public health.

Improvements in Reliability

The completion of the enlarged access road to MOT will allow more efficient access to the airport for motorized vehicles while simultaneously improving the flow of pedestrians to the facility by incorporating walking and biking paths. Reliability will also be enhanced with the introduction of local

mass-transit routes being modified to serve the airport route, thus lessening the traffic on the access road. Emergency services will also see increased reliability in the transportation system as they will have more accessibility to areas they serve on and around the airport.

Baseline Assumptions

Cost estimates and benefits are focused on the 2012-2023 time period (20 years). Years 2012 and 2013 are design and construction years. The analysis incorporates assumptions about growth in the area in terms of traffic, economic, and population growth. These projections are based on historical patterns and are projected as linear continuations of long-term trends.

Alternatives

The alternative of “no action” of this project has the potential causing significant capacity constraints at the airport. These capacity constraints will ultimately decrease use of the airport and limit access to air service which is supporting the expansion of the oil industry in North Dakota.

Given property use surrounding the airport, the proposed alignment of the access road is only alignment that can be completed in a timely manner and will provide more efficient access to the improved terminal facilities.

Basically, there are no alternatives to this project to support the overall terminal expansion program. It must be completed to ensure continued economic development within the City of Minot and the surrounding oil industry in the region.

Affected Populations and Types of Impacts

The primary populations benefitting from an expanded access road to the Minot International Airport include: personal vehicle users, mass-transit users and bicycle/pedestrian.

Quantified Benefits:

- Reduced travel time, and resulting value of time savings
- Reduced auto emissions due to lower congestion and idling
- Reduced auto emissions due to increased bicycle/pedestrian traffic
- Reduced auto emissions due to increased use of mass-transit system
- Costs include construction costs. Construction costs are best available estimates for 2012.

Unquantified Benefits:

- Improved economic competitiveness from improved regional access
- Improved safety as the expanded access road will stop airport traffic from potentially blocking public safety service providers from accessing the airport, recreational facilities and residential areas adjacent to the airport
- Benefits from expansion of transportation mode choices from development of bicycle/pedestrian paths and a bus stop

Quantified Costs and Benefits: Long-Term Outcomes

The most significant benefits are witnessed in the area of travel time savings. Travel time saved accounts for approximately 99 percent of total benefits.

Project Costs

The engineer's preliminary opinion of cost completed by Kadrmas, Lee & Jackson projects the cost of the project to be \$3,650,500 in 2012 dollars. A 40 percent non-federal investment of \$1,460,200 has been committed and will be generated through Passenger Facility Charges (PFC). Over 90% percent of the project budget will be used for construction.

State of Good Repair

MOT is coordinating the planning efforts for this project through a Terminal Area Study funded in part by the FAA through AIP funding. The planning process involves the North Dakota Aeronautics Commission, City of Minot Council, Airport Committee, city departments and airport tenants and user groups.

During Stage 2 construction, the project will expand the current access road from two to four-lanes, allow transit access lanes at the terminal, and create a paved pedestrian trail system to the airport terminal extending the existing trail system. If the current two-lane access road is not expanded traffic bottlenecks will compound access issues to the airport and airport users and pedestrians using non-motorized vehicles will be forced to use the road at their own risk.

Airport funding is being provided through a number of sources. A Passenger Facility Charge (PFC) that applies to tickets sold is collected by airlines and is part of the funding mechanism for local share not covered by FAA or North Dakota Aeronautics Commission funded grants. MOT and the City may also be required to issue a general obligation bond or receive a loan to provide the financial stability needed to ensure a fluid construction process through the overall project.

The terminal area project as a whole will be partially funded through a bond issue or loan by the City of Minot that would be paid off with funds derived from the next PFC program. That amount is currently projected at approximately \$20,000,000 and would extend for a 20-year period.

The current roadway was constructed in 1989 and project to accommodate the terminal facility to a peak of 90,000 enplaned passenger per year. Since that time the activity has increased dramatically as noted elsewhere in this application. Standard design criteria typically projects a maintenance effort to include an overlay to improve ride and strength within a ten year period of the initial construction. The roadway has not yet received that service but it is a need that would be considered if not moving forward with the terminal project and the Access Road Project.

Economic Competitiveness Benefits

This project will **enhance the community's economic competitiveness** by expanding accessibility to ground transportation options for low-income populations, non-drivers, senior citizens and people with disabilities. The benefit in travel time savings results in reductions in lost wages and productivity for those utilizing Minot International Airport as their aviation transportation hub.

Environmental Sustainability Benefits

The primary focus on environmental sustainability is the reduction of greenhouse gas emissions. The introduction of walking and biking paths along with mass-transit access to the airport will all reduce the amount of CO2 emitted from personal travel to the airport.

There are four hotels within one mile of the airport that have a combined total of 396 rooms. If just five percent of hotel guests use the walking/bike path as an alternate method of transportation, 8,265 pounds of CO2 would be saved annually.

By increasing the capacity of the access road, the average vehicle travel/idol time on the access road would be reduced from 10 minutes to five minutes, saving nearly 131 metric tons of CO2.

This project will also **support the existing community and preserve the local environment** by recycling the existing asphalt and road construction materials to a feasible extent and incorporating the recycled materials in the construction of the new access road.

Safety Benefits

The access road will provide additional capability for handling nearly four times the number of vehicles the original road was planned for, which will stop airport traffic from potentially blocking public safety service providers from accessing the airport, recreational facilities and residential areas adjacent to the airport. Finally, pedestrians will have a safe and maintained walking and biking path connecting to Highway 83 providing direct access to the airport and recreational facilities.

Short-Term Impacts on Employment and Economic Growth

The jobs impact in the construction year, 2013, is expected to be 35 according to the REMI economic model. The increase to personal income is estimated to be \$1,651,866 in that year.

Temporary Jobs Created Due to Construction		
	Number of Jobs Created on Project	Total Estimated Salary Due to Construction
Construction (2012-2013,1 year)	35	\$ 1,651,866