

Memorandum

To: Heather Rand, Director of Business and Economic Development, City of Duluth
 From: Neal Young, Economic Analysis Director, MN DEED
 RE: Economic Contribution of Aerospace-Related Activities in Duluth-Superior
 Date: June 2, 2017

As you requested, I have compiled two economic contribution estimates in this memo.

- The 3,210 direct jobs at the Duluth International Airport contribute 5,294 total jobs, a \$619.7 million increase in the size of the Duluth-Superior MSA economy (value added), \$1,022.3 million in sales, and \$307.5 million in labor income.
- The 3,451 direct jobs in all aviation-related activities contribute 5,669 total jobs, a \$646.5 million increase in the size of the Duluth-Superior MSA economy (value added), \$1,079.9 million in sales and \$325.2 million in labor income.
- These impacts aren't additive (they can't be added together for a larger impact).
- These impacts are expected to persist as long as the direct jobs persist.

Area	Direct Jobs	Total Jobs	Value Added to Duluth-Superior MSA Economy (\$, millions)	Output/Sales (\$, millions)	Labor Income (\$, millions)
Duluth International Airport	3,210	5,294	\$619.7	\$1,022.3	\$307.5
All Aviation-Related Activities in Duluth-Superior MSA	3,451	5,669	\$646.5	\$1,079.9	\$325.2

Key assumptions used in the analysis include:

- The geographic area considered is the Duluth Superior metropolitan area (Carlton and St. Louis Counties in Minnesota and Douglas County in Wisconsin).
- For the Duluth International Airport and Sky Harbor Airport, all businesses are included, whether or not they are directly aviation-related (such as car rental and restaurants located at the airports).
- The direct economic activity and employment in the Duluth-Superior MSA leads to an increase in spending by the direct companies, their suppliers and their employees in the MSA. As a result, the economic contribution of aviation-related activities is multiplied beyond direct impacts to include supplier and income impacts.

Please let me know if you have any questions about this analysis.

CC: Kevin McKinnon, Deputy Commissioner, MN DEED
 Tom Werner, Executive Director, Duluth Airport Authority

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Economic Contribution of Duluth International Airport

Inputs

According to the data provided by Duluth International Airport, businesses of all types at the airport currently have approximately 3,210 jobs. These inputs are entered into the IMPLAN model, split among the industries shown in Table 1.

Table 1: Direct Employment at Duluth International Airport

Sector	Employment
Military employment and payroll	1,147
Other aircraft parts	1,018
Support activities for transportation	410
Other new nonresidential construction	207
Local government employment and payroll	101
Federal government employment and payroll	77
Delivery services	62
Air transportation	50
Automotive rental	47
Machine shops	16
Maintenance construction	15
Education employment and payroll	13
Other*	47
Total	3,210

*Includes general merchandise stores, engineering services, management consulting, marketing services, security services, services to buildings, other educational services, equipment repair and maintenance, full service restaurants, and other personal services.

Source: Duluth International Airport.

Outputs

The economic contribution of the businesses at Duluth International Airport is estimated at 5,294 total jobs, a \$619.7 million increase in the size of the Duluth-Superior MSA economy (value added), \$1,022.3 million in sales, and \$307.5 million in personal income. These impacts are not additive; in other words, they can't be added together for a larger total impact. These impacts are expected to persist as long as the direct jobs persist.

Table 2: Economic Contribution of Duluth International Airport (2017)

Impact Type	Employment	Labor Income (\$, millions)	Value Added (\$, millions)	Output/Sales (\$, millions)
Direct Effect	3,210	\$214.9	\$471.6	\$742.5
Indirect Effect	698	\$37.5	\$51.5	\$103.4
Induced Effect	1,386	\$55.1	\$96.6	\$176.4
Total Effect	5,294	\$307.5	\$619.7	\$1,022.3

Note: totals may not sum due to rounding.

Source: IMPLAN-Online, Version 4.3. Analysis by Economic Analysis Unit, Policy Office, MN DEED.

Total Economic Contribution of Aviation-Related Activities on Duluth-Superior MSA

Inputs

According to the data provided by Duluth International Airport, businesses of all types at the Duluth Airport, Sky Harbor Airport, and off-airport aviation businesses currently have approximately 3,451 jobs. These inputs are entered into the IMPLAN model, split among the industries shown in Table 3.

Table 3: Direct Employment in Aviation-Related Activities within the Duluth-Superior MSA

Sector	Employment
Military employment and payroll	1,147
Other aircraft parts	1,038
Support activities for transportation	422
Other new nonresidential construction	207
Local government employment and payroll	102
Federal government employment and payroll	77
Machine shops	67
Delivery services	62
Air transportation	58
Wire manufacturing	56
Automotive rental	47
Repair and maintenance	29
Misc. electrical component manufacturing	20
Semiconductor manufacturing	19
Maintenance construction	15
Education employment and payroll	13
Printing	12
Other *	60
<i>Total</i>	<i>3,451</i>

*Includes general merchandise stores, engineering services, design services, management consulting, marketing services, security services, services to buildings, other educational services, equipment repair and maintenance, full service restaurants, limited service restaurants, other eating and drinking places, and other personal services.

Source: Duluth International Airport.

Outputs

The economic contribution of all aviation-related activities in the Duluth Superior MSA (Duluth International Airport, Sky Harbor Airport, and off-airport aviation businesses) is estimated at 5,669 total jobs, \$646.5 million increase in the size of the Duluth-Superior MSA economy (value added), \$1,079.9 in sales, and \$325.2 million in personal income. These impacts are not additive; in other words, they can't be added together for a larger total impact. These impacts are expected to persist as long as the direct jobs persist.

Table 4: Economic Contribution of Aviation-Related Activities in Duluth-Superior MSA (2017)

Impact Type	Employment	Labor Income (\$, millions)	Value Added (\$, millions)	Output/Sales (\$, millions)
Direct Effect	3,451	\$226.6	\$488.7	\$781.5
Indirect Effect	753	\$40.4	\$55.6	\$111.9
Induced Effect	1,465	\$58.3	\$102.1	\$186.6
<i>Total Effect</i>	<i>5,669</i>	<i>\$325.2</i>	<i>\$646.5</i>	<i>\$1,079.9</i>

Note: totals may not sum due to rounding.

Source: IMPLAN-Online, Version 4.3. Analysis by Economic Analysis Unit, Policy Office, MN DEED.

About Economic Impact Modeling/The IMPLAN Model

In what is often called either a ripple effect or multiplier effect, increased economic activity triggers additional spending. The total impact is the sum of the direct, indirect, and induced effects. The direct effect is the change that stimulates other activity, in this case the jobs, sales and investment in aviation-related activities in the Duluth-Superior MSA. The indirect effect results from industries purchasing supplies and equipment from other industries due to increased demand. The induced effects occurs from increased household wages and spending caused by the direct and indirect effects. The economic contribution estimates in this memo include all three effects.

IMPLAN (**IM**portant **P**lanning) is an economic impact modeling software used to create models of local economies. IMPLAN enables users to examine state, multi-county, county, and metropolitan regional economies. The model incorporates social accounting matrices (SAMs) – an extension of input-output accounts, and the resulting SAM multipliers.

IMPLAN was founded in 1993, thanks to a technology transfer agreement with the University of Minnesota. The model is an outgrowth of work begun at the university in 1984. This developmental work closely involved the U.S. Forest Service's Land Management Planning Unit in Fort Collins, and Dr. Wilbur Maki at the University of Minnesota.

Prepared by: Economic Analysis Unit, Policy Office, Minnesota Department of Employment and Economic Development, June 2017.