

Fabricated metalworking expansion

Region

Loudon County, TN

New Economic Activity

\$99,992,320 All other forging, stamping, and sintering

Local Purchasing Target

Buy local purchasing preference constrained by local industry expansion capacity.

Impact Summary

The total projected impact for this case is \$146.8 million in expanded regional output, \$61.5 million in gross regional product (value added), an expansion of 946 jobs, with an increase in \$32.2 million in household earnings. Broken down into component parts, the direct impact for this case includes regional expansion of 519 jobs, \$34.3 million in gross regional product, and \$19.3 million in household earnings. The industry life cycle back through the supply chain adds 161 jobs in the region, \$11.9 million in gross regional product, and \$6.2 million in earnings. The household life cycle forward through the spending of income adds 265 jobs, \$15.3 million in gross regional product, and \$6.7 million in earnings.

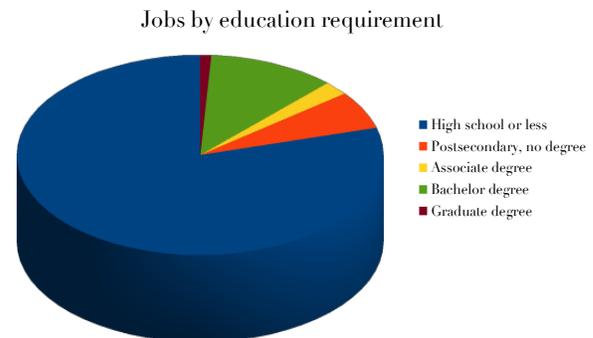
The pro forma economic impact statement is shown below. This statement lists the projected impacts for this economic development case, along with the direct effect and final demand multipliers. Direct effect multipliers use the direct impact as the denominator for each economic impact metric, while the final demand multipliers use the direct output impact as the denominator when calculating each multiplier.

Pro Forma Economic Impact Statement

Economic Impact	Output	Employment	Value Added	Earnings
Direct	\$99,992,320	519	\$34,347,360	\$19,274,808
Life Cycle				
Industry Supply (Indirect)	\$22,674,275	161	\$11,902,535	\$6,231,859
Household Spending (Induced)	\$24,102,035	265	\$15,280,362	\$6,709,522
Combined	<u>\$146,768,630</u>	<u>946</u>	<u>\$61,530,257</u>	<u>\$32,216,189</u>
Direct Effect Multipliers	1.47	1.82	1.79	1.67
Final Demand Multipliers	1.47	9.5	0.62	0.32

Workforce Impacts

Over half of the expansion in jobs by the *All other forging, stamping, and sintering* industry and back through its supply chain are entry level jobs requiring a high school diploma with no experience. Jobs requiring a college education account for about one in eight jobs created by the economic expansion. Of the 83 jobs requiring a bachelor's degree, 60 are created by the industry itself. Adding in the impact from the expansion in household spending does not significantly change the mix of occupation requirements. For the combined industry and household spending life cycles, 79% of the jobs require a high school diploma or less compared with 81% for just the industry life cycle. The projected expansion in self-employment is 33 jobs.



Statement of workforce employment by occupation requirements

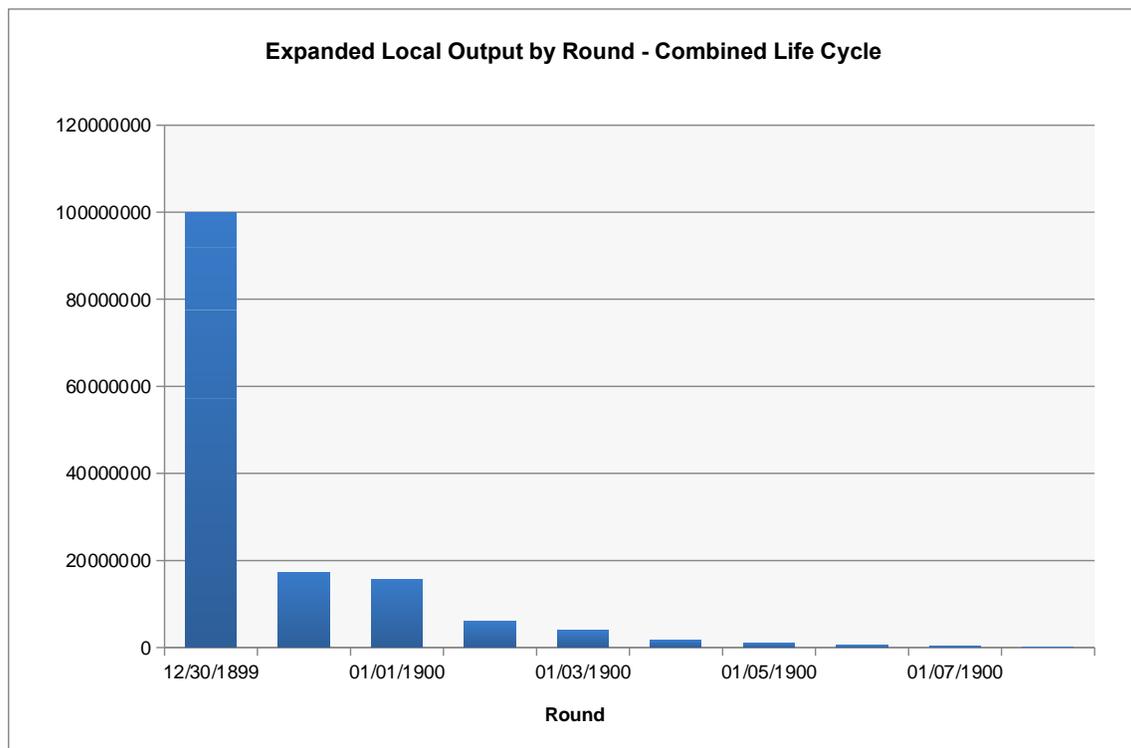
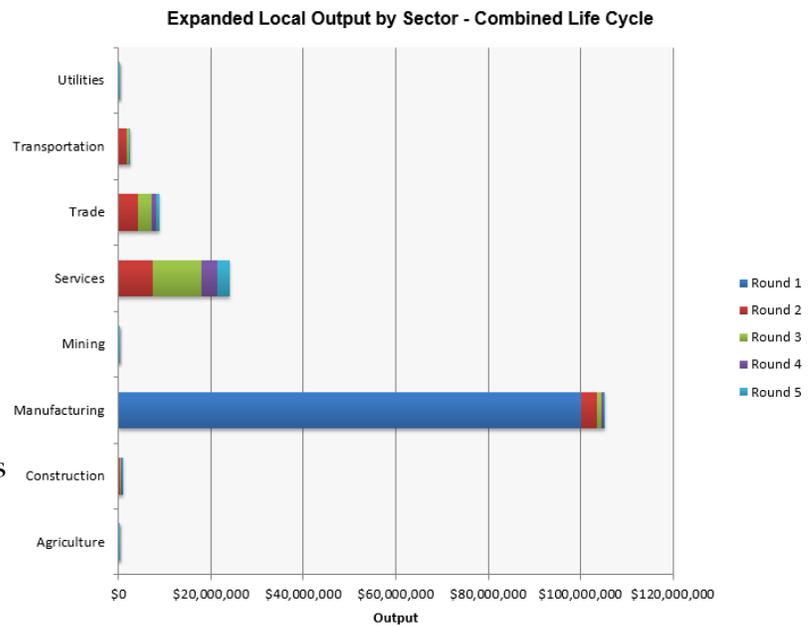
Industry Life Cycle Workforce Employment

Occupation Requirements (Education - Experience - OTJ Training)

Occupation Requirements (Education - Experience - OTJ Training)	Current Local Employment	Expanded Local Employment	Expanded State Employment
Associate's degree -- Total	414	9.22	18.51
Bachelor's degree - 5 years or more - None	199	20.2	33.11
Bachelor's degree - Less than 5 years - Internship/residency	0	0	0
Bachelor's degree - Less than 5 years - Moderate-term on-the-job training	0	0.01	0.35
Bachelor's degree - Less than 5 years - None	368	19.73	36.04
Bachelor's degree - Less than 5 years - Short-term on-the-job training	3	0.05	0.2
Bachelor's degree - None - Internship/residency	36	0.14	0.39
Bachelor's degree - None - Long-term on-the-job training	7	0.07	0.19
Bachelor's degree - None - Moderate-term on-the-job training	144	5.42	11.9
Bachelor's degree - None - None	651	36.99	75.15
Bachelor's degree - None - Short-term on-the-job training	9	0.11	0.71
Bachelor's degree -- Total	1417	82.72	158.04
Doctoral or professional degree -- Total	148	0.78	2.27
High school diploma or equivalent - 5 years or more - Long-term on-the-job training	1	0	0
High school diploma or equivalent - 5 years or more - Moderate-term on-the-job training	2	0.08	0.24
High school diploma or equivalent - 5 years or more - None	138	0.92	3.34
High school diploma or equivalent - Less than 5 years - Long-term on-the-job training	0	0	0.09
High school diploma or equivalent - Less than 5 years - Moderate-term on-the-job training	23	1.64	5.94
High school diploma or equivalent - Less than 5 years - None	711	17.3	36.05
High school diploma or equivalent - Less than 5 years - Short-term on-the-job training	0	0	0
High school diploma or equivalent - None - Apprenticeship	259	9.03	16.11
High school diploma or equivalent - None - Long-term on-the-job training	855	80.16	124.68
High school diploma or equivalent - None - Moderate-term on-the-job training	2150	296.85	441.59
High school diploma or equivalent - None - None	84	1.81	4.71
High school diploma or equivalent - None - Short-term on-the-job training	1730	59.85	135.18
High school diploma or equivalent -- Total	5953	467.64	767.93
Less than high school -- Total	4651	80.03	155.05
Master's degree -- Total	92	0.12	0.45
Postsecondary non-degree award -- Total	1235	36.17	63.1
Some college, no degree -- Total	57	1.44	4.28
Grand Total	13967	678.12	1169.63

Industry Impacts

Most of the industry impacts are concentrated in the manufacturing, services, and trade sectors. The chart shows the impact by round back through the supply chain and forward through the spending of household earnings. In most cases, these first five rounds capture almost all of the impact. In this specific case, regional output and earnings decay quickly after the third round, suggesting that for this case a lot of the supply chain requirements are being supplied outside of the region. This decay is shown by round in the chart below.



The table below lists the industries in which local output is projected to expand more than \$500,000.¹

List of projected expanded output by industry

Sector	Industry	Current Local Output	Expanded Local Output
Manufacturing - Fabricated metal products	All other forging, stamping, and sintering	\$0	\$91,932,260
Wholesale and retail trade	Wholesale trade	\$154,035,000	\$6,231,723
Manufacturing - Primary metals	Iron and steel mills and ferroalloy manufacturing	\$0	\$6,204,770
Finance, insurance, real estate, leasing	Housing	\$124,006,500	\$4,239,839
Finance, insurance, real estate, leasing	Other real estate	\$124,006,500	\$1,922,932
Wholesale and retail trade	Other retail	\$74,790,100	\$1,795,503
Finance, insurance, real estate, leasing	Monetary authorities and depository credit intermediation	\$68,904,000	\$1,605,003
Transportation and warehousing	Truck transportation	\$114,359,000	\$1,584,867
Educational services, health care, and social assistance	Hospitals	\$56,100,000	\$1,514,131
Manufacturing - Primary metals	Secondary smelting and alloying of aluminum	\$106,882,500	\$1,422,309
Professional and business services	Management of companies and enterprises	\$6,327,200	\$1,265,440
Finance, insurance, real estate, leasing	Securities and commodity contracts intermediation and br	\$5,316,000	\$1,063,200
Educational services, health care, and social assistance	Offices of physicians	\$26,091,900	\$1,002,319
Arts, entertainment, recreation, accommodation, and food	Limited-service restaurants	\$44,410,800	\$937,140
Finance, insurance, real estate, leasing	Nondepository credit intermediation and related activities	\$17,539,200	\$886,323
Information	Wired telecommunications carriers	\$13,366,600	\$843,124
Professional and business services	Services to buildings and dwellings	\$22,682,200	\$785,226
Manufacturing - Primary metals	Primary smelting and refining of copper	\$6,148,500	\$749,801
Arts, entertainment, recreation, accommodation, and food	Full-service restaurants	\$39,769,800	\$740,098
Government	Other state and local government enterprises	\$0	\$696,225
Other services, except government	Automotive repair and maintenance	\$19,135,200	\$667,287
Construction	Nonresidential maintenance and repair	\$10,543,794	\$655,162
Professional and business services	Legal services	\$6,962,900	\$649,867
Professional and business services	Architectural, engineering, and related services	\$3,088,900	\$617,780
Transportation and warehousing	Rail transportation	\$7,535,077	\$595,146
Manufacturing - Fabricated metal products	Machine shops	\$12,554,500	\$558,194
Professional and business services	Other support services	\$7,897,500	\$520,078
Wholesale and retail trade	General merchandise stores	\$39,300,800	\$515,092

The table below lists the industries in which imports to the region are projected to increase by at least \$500,000. These industries represent opportunities for further regional development of the supply chain, thereby increasing the impact from this initial expansion.

List of projected expanded imports by industry

Sector	Industry	Expanded Industry Demand - Industry LC	Expanded Local Output - Industry LC	Expanded Imports - Industry LC
Manufacturing - Primary metals	Iron and steel mills and ferroalloy manufacturing	\$19,543,558	\$6,204,770	\$13,338,788
Manufacturing - Primary metals	Nonferrous metal (except copper and aluminum) rolling, dr	\$10,980,487	\$408,010	\$10,572,477
Manufacturing - Fabricated metal products	All other forging, stamping, and sintering	\$98,441,090	\$91,932,260	\$6,508,830
Manufacturing - Primary metals	Steel product manufacturing from purchased steel	\$2,343,411	\$123,170	\$2,220,241
Utilities	Natural gas distribution	\$1,729,755	\$0	\$1,729,755
Manufacturing - Primary metals	Ferrous metal foundries	\$1,568,670	\$38,490	\$1,530,180
Utilities	Electric power generation, transmission, and distribution	\$1,481,154	\$0	\$1,481,154
Manufacturing - Primary metals	Alumina refining and primary aluminum production	\$1,493,896	\$123,170	\$1,370,726
Manufacturing - Petroleum and coal products	Petroleum refineries	\$868,121	\$0	\$868,121
Manufacturing - Machinery	Special tool, die, jig, and fixture manufacturing	\$772,768	\$0	\$772,768
Professional and business services	Management of companies and enterprises	\$1,841,582	\$1,265,440	\$576,142
Professional and business services	Employment services	\$651,918	\$81,180	\$570,738
Finance, insurance, real estate, leasing	Lessors of nonfinancial intangible assets	\$559,220	\$0	\$559,220
Mining	Coal mining	\$553,731	\$0	\$553,731
Professional and business services	Business support services	\$772,147	\$228,400	\$543,747

1 The iron and steel mills industry shows no local capacity yet is projected to increase local output by \$6.2 million. This output results from the input-output model that breaks the initial increase in economic activity into the industries that make the commodity. In this particular case, the \$6.2 million would be produced by a new facility locating in the region, with the primary industry designation for this facility being *Other forging, stamping, and sintering*. The government industry shown in the table also shows output with no current capacity. In this case, we do not list current "output" for government industry; instead we assume that local government expands as required to serve the new expansion.

Top Connections

The statement of potential top connections presents a listing of opportunities for professionals working in local recruiting and retention. This list provides supply chain opportunities for firms that currently exist in the region, and opportunities to recruit new capacity to meet local production require where no capacity exists.

In this particular case, the region lacks local capacity to take advantage of the top industry supply chain connections with iron and steel mills, nonferrous metal rolling and drawing, and intra-industry demand with all other forging, stamping, and sintering manufacturing. The largest local connection is between the direct expansion in forging, stamping, and sintering manufacturing and the demand for labor. Other significant connections are between the industry and wholesale trade, electric power utilities, and truck transportation. A listing of the top 30 potential local connections is provided below.

Statement of potential top connections

Potential Top Local Connections

Industry	Commodity	Round	Local Production Requirements	Local Expansion Capacity
All other forging, stamping, and sintering	Compensation of employees	0	\$20,964,383	\$235,957,300
All other forging, stamping, and sintering	Iron and steel mills and ferroalloy manufacturing	0	\$14,033,579	\$0
All other forging, stamping, and sintering	Nonferrous metal (except copper and aluminum) rolling, dr	0	\$11,416,764	\$0
All other forging, stamping, and sintering	All other forging, stamping, and sintering	0	\$7,005,569	\$0
All other forging, stamping, and sintering	Wholesale trade	0	\$3,514,000	\$30,807,000
All other forging, stamping, and sintering	Alumina refining and primary aluminum production	0	\$2,714,006	\$0
All other forging, stamping, and sintering	Natural gas distribution	0	\$1,876,622	\$0
All other forging, stamping, and sintering	Ferrous metal foundries	0	\$1,472,893	\$0
All other forging, stamping, and sintering	Management of companies and enterprises	0	\$1,383,167	\$1,265,440
Wholesale trade	Compensation of employees	1	\$1,332,982	\$235,957,300
All other forging, stamping, and sintering	Electric power generation, transmission, and distribution	0	\$1,091,585	\$0
Iron and steel mills and ferroalloy manufacturing	Iron and steel mills and ferroalloy manufacturing	0	\$920,249	\$0
All other forging, stamping, and sintering	Special tool, die, jig, and fixture manufacturing	0	\$912,143	\$0
All other forging, stamping, and sintering	Truck transportation	0	\$882,237	\$22,871,800
All other forging, stamping, and sintering	Securities and commodity contracts intermediation and brc	0	\$755,141	\$1,063,200
All other forging, stamping, and sintering	Architectural, engineering, and related services	0	\$695,320	\$617,780
All other forging, stamping, and sintering	Business support services	0	\$695,320	\$228,400
Iron and steel mills and ferroalloy manufacturing	Scrap	0	\$639,993	\$0
Management of companies and enterprises	Compensation of employees	1	\$631,760	\$235,957,300
Iron and steel mills and ferroalloy manufacturing	Compensation of employees	0	\$562,588	\$235,957,300
Iron and steel mills and ferroalloy manufacturing	Wholesale trade	0	\$537,072	\$30,807,000
Iron and steel mills and ferroalloy manufacturing	Coal mining	0	\$519,247	\$0
All other forging, stamping, and sintering	Employment services	0	\$471,024	\$81,180
All other forging, stamping, and sintering	All other chemical product and preparation manufacturing	0	\$456,076	\$0
All other forging, stamping, and sintering	Machine shops	0	\$448,593	\$2,510,900
All other forging, stamping, and sintering	Services to buildings and dwellings	0	\$448,593	\$4,536,440
All other forging, stamping, and sintering	Lessors of nonfinancial intangible assets	0	\$441,119	\$0
All other forging, stamping, and sintering	Other support services	0	\$418,687	\$1,579,500
All other forging, stamping, and sintering	Petroleum refineries	0	\$411,213	\$0
All other forging, stamping, and sintering	Investigation and security services	0	\$366,350	\$83,040

Regional System Impacts

This expansion case represents a 3.7% increase in industry output in the region. In terms of supporting resilience, regeneration, and occupational variety in the regional system, this case adds a projected \$34.7 million in output in industries that play a resilience role, a projected \$23.3 million in industries that play a regeneration role; and a projected 26 jobs in occupations that are under-represented in the local economy. Resilience capacity helps the local economy recover from disasters, regeneration capacity helps the local economy sustain itself, and occupational variety helps sustain the local labor market as more young people can find work locally that matches their interests.

Preparer's Notes

The region currently has no production capacity in *Other forging, stamping, and sintering*, but has capacity in other fabricated metals industries, as well as significant capacity in non-ferrous primary metals manufacturing. So while this expansion case has some gaps in current supply chain capacity to meet the production requirements for this industry, we would classify this opportunity in the Expand Industry Opportunity Quadrant.

Expansion into this metals industry may leverage labor capabilities developed in metal industries that are present in the region. Tapping into this trained labor in the region may benefit industry, especially if there is anticipated growth in this labor pool over the planning period.

The enclosed workbook [dcg20180730105620381005.xlsx](#) accompanies this brief. See this workbook for more details, as only selected worksheets have been presented in this brief. The workbook also contains definitions for life cycle accounting terms used in this brief.

