



**Mike Johanns**  
**Governor**

## **Building a 21<sup>st</sup> Century Nebraska**

### **Metal Product Manufacturing**

- **Farm and Garden Equipment and Machinery**
- **Fabricated Metal Products**
- **Metal Stamping and Bending**

### **Introduction**

In 2000, a partnership composed of Fannie Mae, Nebraska Chamber of Commerce and Industry, Nebraska Department of Economic Development, Nebraska Development Network, Nebraska Diplomats, Nebraska Economic Developers Association, Nebraska Investment Finance Authority, Nebraska Municipal Power Pool, Nebraska Public Power District, and Omaha Public Power District commissioned Deloitte & Touche Fantus to conduct a targeted industry study for Nebraska. Deloitte & Touche Fantus was charged with identifying business clusters that make sense for Nebraska and meet four criteria:

- Have greater than average capital investments
- Are growth industries
- Have greater than average payroll and benefits
- Produce products or services that are high value-added

The Deloitte & Touche Fantus study, available on the Department of Economic Development web site ([www.neded.org](http://www.neded.org)) identifies six business clusters. Three of the clusters deal with maintaining existing Nebraska strengths: agribusiness, metal products manufacturing, and financial services. The other three provide areas of growth opportunity focused on the knowledge-based economy: biotechnology, electronics manufacturing, and information technology/software development.

For Nebraska to successfully develop the targeted industries, communities within the state must have the infrastructure to support growth. The Department of Economic Development's initiative encourages communities to develop an inventory of pre-zoned, ready-to-build sites and ready-to-occupy industrial and commercial buildings.

This publication is a guide for development of shovel-ready sites and ready-to-occupy or near ready-to-occupy buildings meeting the needs of **the metal product manufacturing industry**, primarily associated with farm and garden equipment and machinery, fabricated metal products, and metal stamping and bending industries. (See Nebraska Targeted Industries Study for background information regarding these industries.) Generic examples for this type of business range from combines to pipe fittings, including wheel tractors, combine harvesters, mowers and peripheral equipment, irrigation systems, metal buildings, automotive parts, food processing equipment, and the component parts to these products. These businesses tend to be electric power intensive, demanding reliable power at a competitive price. If painting is involved, natural gas

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usage will be significant. The industry is constantly moving toward more automation in the production process. This means large capital investments in automation and robotics, fewer employees, but more skilled rather than semi or unskilled workers. Reduction of inventories through just-in-time delivery of raw materials and parts is driving the component part suppliers to locate close to their major customers.

The Department of Economic Development's intent is to provide communities information which can be used when choosing what types of manufacturing sites or buildings to develop.

The availability of shovel-ready sites and near ready-to-occupy buildings is crucial to attracting metal manufacturing operations. To capture the opportunities offered by these targeted industries, Nebraska communities need to develop sites and facilities that meet the specific requirements of these business sectors. This publication is designed to help develop basic sites and facilities for **metal product manufacturers**. There is no denying that developing manufacturing sites and buildings translates into a substantial investment for communities. Beyond financing the site and building, there are carrying, finishing, and incentive costs that need to be factored into developing the overall financial package. However, equally important considerations are the long-term rewards that communities enjoy from attracting new manufacturers and employees, and the solid relationships that develop and grow as a result.

Warning: The farm and garden equipment industry has been in recession since 1998 with little optimism of improvement in 2001. During the fall of 2000 and into 2001, metal product manufacturing nationally has slipped into recession, primarily driven by a slow-down in the automobile industry. The general components industry is dependent upon the growth of the U.S. manufacturing base, with the automobile industry as the most important factor. Economic recovery in this industry is not anticipated in 2001. Most of Nebraska's success in metal product manufacturing will come from assisting existing manufacturers to expand and capture the supply chain components to major manufacturing operations, such as Caterpillar Claas and Case New Holland.

#### **Tax Climate:**

Incentives structured around capital investment are a major factor for primary industries, such as metal product manufacturers. The industry is capital intensive with significant start-up costs incorporated in construction and equipment. Property taxes will be more of an issue with this group than income taxes. In general, the Nebraska sales tax and regulatory climate toward the manufacturing industry has been very supportive. Nebraska's sales only factor for state income tax, and its personal property tax depreciation schedules to zero (no residual value) are benefits to this industry.

Businesses in the metal products manufacturing sector may qualify for state assistance of:

- Business Incentives
  - Statutory Incentives
    - The Nebraska Employment, Investment and Incentives Act

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- The Nebraska Growth and Investment Act
- Rural Economic Opportunities Act
- The Invest Nebraska Act
  - Details of the Statutory Incentives are available on the Department of Economic Development website ([www.neded.org](http://www.neded.org)).
- Job Training Assistance (minimum qualifying wages of \$8.25 per hour plus benefits).
- Community Development Block Grant Low-Interest Loan Program (up to \$500,000 – minimum qualifying wages of \$8.25 per hour plus benefits)

Communities may want to consider local incentives to improve their competitive posture. If so, local incentives to offset the cost of leasehold improvements or reduce the costs associated with leasing or purchasing the building are desirable. Community assistance in labor force recruitment is expected. Depending on the qualifications of the local workforce, incentives to supplement the state customized job training grant may be necessary.

Communities (with the exceptions of Omaha and Lincoln) developing near ready-to-occupy buildings for metal products manufacturing operations can apply Assistance through the:

- Department of Economic Development Spec. Building Program (up to \$250,000 per project)

### **General Site Information**

Metal product manufacturers tend to locate in mixed-use parks if the commercial side of the park is separated from the industrial and distribution uses, light industrial parks, and heavy industrial parks. In general, the area topography can be slightly rolling or gently sloped, but the sites must be level, sloped adequately for drainage but with little or no elevation change. The facility should be located in an industrial setting, buffered from residential and commercial uses. With few exceptions, metal product manufacturers prefer to own rather than lease facilities.

Site considerations for light manufacturing industrial parks include:

- Close proximity to related uses while buffered from unrelated uses, such as residential and retail. Local zoning ordinances generally protect this.
- Easy highway accesses. Highway access must be able to accommodate truck traffic delivering raw materials and distributing finished products.
- Rail availability
- Free of wetlands, 100-year flood plain, and other environmental issues.
- Site configuration in square or rectangular shapes. Odd-shaped sites are hard to use.
- If rail access is provided in the industrial park, at grade crossings should be avoided.
- The site/industrial park should not be in close proximity to waste water treatment plants, landfills, livestock confinement operations, or sewage lagoons.

Site design factors include:

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- Street minimum: 36 feet wide with 6" of 47(b) concrete curb and gutter.
- Sewer line minimum: 10" into a 15" collector system.
- Water line minimum: 10" with 60 psi in a looped system.
- Natural gas minimum: 4" line with 30 psi.
- Parcel size varies by the size of the community and availability of land. Industrial park parcels of less than 10 acres of land are generally not advisable because of the costs associated with providing city utility services, building entrances, and streets suitable for truck traffic.
- Individual sites within the industrial park are typically sized by one acre per every 10,000-square-feet. of building footprint. This allows adequate land for the building, parking, truck maneuvering, landscaping, and future building expansion. Building expansion capability is critical. It is not unusual for manufacturers to double their building size within a few years.

### **Building Specifications**

As is typical of most business decisions in today's economy, site and building searches happen quickly. In most cases, building availability becomes a key factor in the location decision. For a community to be considered for most metal product manufacturing location decisions, it must have a suitable, available building.

Metal product manufacturing buildings are typically either pre-manufactured metal buildings, tilt-up concrete, or a combination of the two. Factors to consider when sizing and configuring speculative buildings targeted for metal fabricators are:

- Typical buildings are 20,000-to-50,000 square feet.
- Design is as square as possible.
- Sidewalls are a minimum of 22 feet high, preferably 24 feet.
- Support column spacing is important, with manufacturers preferring as few columns as possible so as not to interfere with equipment layout and production flow. A clear span in the manufacturing area is ideal.
- The building should be designed for structure integrity so that at least one sidewall can be removed to accommodate future expansion. The building should be situated on the site so as to allow for future expansion.
- Office space is typically 10% of the overall square footage.
- One incoming and one outgoing dock are recommended for the first 20,000 square feet. Additional dock space should be considered.
- At least one drive-in door is recommended.

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- Parking space should allow for 1.2 stalls per 1000-square-feet of building. Asphalt covering for the passenger vehicle parking is acceptable. Truck parking, trailer storage, and dock areas should be concrete.
- Communities building a spec. building should consider not pouring the manufacturing area floor until a tenant has been secured. Metal product manufacturing equipment is heavy. Floor design should accommodate a minimum of 6 inches of poured concrete.
- Building design should accommodate a five-ton overhead crane.

### **Utility Needs**

#### Electricity

- 3 phase, 240 kV electrical service
- Dual circuit feed preferred, but rarely a requirement
- Minimum amperage is:
  - 1600 amps for 10,000-square-feet
  - 2600 amps for 20,000-square-feet
  - 3000 amps for 50,000-square-feet

#### Natural Gas

- 4 inch line to building
- Minimum 30 psi

#### Water

- 10-inch main, 60 psi
- Municipal system preferred
- Looped or grid system preferred

#### Sewer

- Minimum 10-inch local line into a minimum 15-inch collector system.
- Municipal wastewater treatment system required.

#### Solid Waste Disposal

- Public or private contracting service required.

#### Telecommunications

- T1 service typically is adequate
- Capacity needs to accommodate e-business and electronic commerce, including Internet access.
- Dedicated voice and data line may be required.

### **Cost Factors:**

Costs for speculative buildings vary greatly depending on the type of construction, local prevailing costs, market and experience factors. Some typical construction costs for non-metropolitan Nebraska are:

- Unfinished shell building without floor - \$12 to \$15 per square foot (does not include the cost of the site).

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- Finishing costs will generally double shell costs.

Plumbing - \$2 to \$5 per square foot.

Heating and Air Conditioning - \$1.50 to \$2.50 per square foot.

Six-inch concrete floor - \$3 per square foot.

Electrical - \$3 to \$7 per square foot.

- **Total finished cost - \$28 to \$ 35 per square foot.**

### **Transportation Requirements**

- Good road access within the industrial park and good highway access outside the park are critical for the delivery of raw materials and transportation of finished products. Metal fabrication operations tend to be sensitive to transportation costs. Typically, transportation of raw materials is about 4% of sales. Large projects will require separate truck and passenger vehicle entrances and parking.
- Rail access can be an asset. Rail service is ideal for large shipments of raw materials into a facility and for large shipments of finished product to a single customer. Since rail shipments have longer en route times than ground service, business inventory costs tend to increase. Smaller volume shipments to multiple destinations can probably be served more cost effectively by ground transportation. Recent site searches for metal product manufacturers in Nebraska suggest that rail access on site is critical in one out of every 10 projects.
- Overnight package delivery services may be required.
- Private airport/commercial air service preferred.

### **Labor/Workforce Requirements**

As a rule of thumb, metal fabricators require about 800 square feet per employee working the busiest shift. Some examples of types of employees by size of operation include:

	<b>25 Employee Operation</b>	<b>50 Employee Operation</b>	<b>100 Employee Operation</b>
<b>Primary Cutting Operation</b>	1	3	14
<b>Secondary Forming Operations</b> (Punching, Stamping, Press Brakes, Machining, etc.)	2	5	42
<b>Joining Operations</b>	5	15	10

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(Bolting, Riveting, Welding, etc.)			
<b>Assembly Operations</b>	5	9	3
<b>Finishing Operations</b> (Painting, Plating, etc.)	3	2	3
<b>Packaging and Shipping</b>	2	1	7
<b>Management/Sales</b>	3	5	6
<b>Support</b> (Maintenance, Clerical, Engineering, Human Resources, Scheduling, Purchasing, Accounting)	4	10	15

As the industry moves to more automated, high-tech manufacturing, the labor requirements change. High-tech manufacturing requires a workforce with relatively high education, skill, and training levels. Semi-skilled labor will have some experience in manufacturing process, CNC equipment, and machinery maintenance. Skilled labor will have extensive training in technology, CNC equipment, robotics, and machinery maintenance. Large capital investments in automation tend to require a smaller workforce with higher technical skill levels. The more technical skill levels normally command higher wages.

**Following are job title descriptions of three Nebraska firms:**

**Scenario 1: Metal Fabricated Products**

This company employs 35 people in a 34,000 square foot facility.

<b>Production</b>		<b>Office</b>	
Cutting & Punching	2	Inside Sales	3
Welding	6	Outside Sales	2
Cleaning and Grinding	2	Sales Drafting	1
Painting	2	Engineering	1
Assembling	5	Field Service	1
Plant Supervisor	1	Receptionist	1
Shipping	2	Accounting	2
Maintenance	1	Scheduler	1

**Scenario 2: Garden and Farm Equipment.**

This manufacturer of farm equipment has a 40,000-square-foot building with 50 employees. The building has 22-foot eaves and a 26-foot center height. Four five-ton overhead cranes are used. Lessons learned include: Do not under-design the electric system (very expensive to retrofit later); install more lights than are recommended; paint the red iron steel white for a brighter environment; site need to provide adequate room for semis to turn around easily; provide extra insulation between shop and office; consider

using radiant heat; install plenty of overhead doors; consider 3 to 5 positive psi for office area.

<b>Production</b>		<b>Office</b>	
Welders	15	Production Planning	1
Fabrication	5	Plant Manager	1
Assemblers	7	Shipping & Receiving	1
Painters	2	Office (including Engineering and Design)	13
Supervisors	5		

### Scenario 3: Metal Stamping & Bending

A manufacturer of metal stamping and high tolerance bearings. They begin their process with their foundry forming the basic castings that are later turned. They employ 81 people on two shifts in a 68,000-square-foot facility.

<b>Production</b>		<b>Office</b>	
Foundry/Castings	14	Office (including Sales, Human Resources, Scheduling, Engineering, Purchasing, Accounting, and General Administration)	20
Machinist on Automatic Line	12	General Laborer	11
CNC Machinists	6		
Manual Machinists	6		
Maintenance/Tool Room	8		
Shipping and Receiving	3		
Plating and Anodizing	1		
Packaging and Final Inspection	3		
Rework/Reconditioning	1		

Wage data for some metal products positions are:\*1

<b>Occupation</b>	<b>Nebraska Average Wage</b>	<b>Nebraska Wage Range (50% of Earners)</b>	<b>U.S. Average Wage</b>
Welder	\$24,804	\$18,492 - 28,661	\$29,066
Machinists	\$13.31/hr	\$10.33 - 16.38/hr	\$14.30/hr

<sup>1</sup> Sources: www.salaryexpert.com; Nebraska State-wide Data, March 15 & 30, 2001 yearly salaries; Nebraska Department of Labor, Labor Market Information, 1998 hourly wages; U.S. Department of Labor, Bureau of Labor Statistics, 1999 hourly wage averages.

Cutters –Hand Cutting/Slicing	\$11.02/hr	\$ 7.86 - 14.02/hr	\$9.78/hr
Machine Operators	\$10.60/hr	\$9.16 - 11.43/hr	\$10.87/hr
Press & Sheer Operators	\$10.62/hr	\$9.20 - 11.96/hr	\$11.44/hr
Tool & Die Makers	\$34,447	\$25,742 - 41,450	\$38,074
Maintenance Mechanical	\$25,789	\$15,842 - 27,682	\$27,264
Electrical Mechanics	\$16.46/hr	\$12.86 - 19.26/hr	\$17.15/hr
Spray Painter	\$11.80/hr	\$9.37 - 14.07/hr	\$10.86/hr
Lathe Operator	\$11.20/hr	\$9.30 - 13.01/hr	\$13.65/hr
Fork Lift Operator	\$26,426	\$18,894 - 32,741	\$25,789
Material Handler	\$9.33/hr	\$7.43 - 11.22/hr	\$9.50/hr
Fabricator	\$15.86/hr	\$ 9.64 - 22.19/hr	\$15.23/hr
Shipping/Receiving	\$23,205	\$16,771 - 26,046	\$23,723
Supervisors	\$15.96	\$11.36 - 19.10/hr	\$18.61/hr
Managers	\$21.96/hr	\$13.99 - 31.35/hr	\$27.23/hr
Accountants	\$37,649	\$28,941 - 44,761	\$41,513
Payroll Clerks	\$21,886	\$14,173 - 23,492	\$25,326
HR Clerks	\$21,767	\$15,842 - 26,138	\$23,915
Receptionist	\$17,125	\$13,666 - 19,693	\$19,418
Secretary	\$19,266	\$15,004 - 22,821	\$24,000
Janitors	\$17,977	\$13,506 - 20,674	\$19,284
Sales	\$36,555	\$25,464 - 41,409	\$39,379

### **Community Challenges**

- Labor availability, particularly in the skilled positions
- Availability of suitable buildings
- Location of suppliers
- Transportation costs, both rail and trucking
- Availability of worker training programs
- Environmental permitting
- Spousal jobs
- Local incentives
- Housing

For most communities, the availability of general labor is a challenge, but the lack of skilled positions, such as welders, machinists, and tool and die makers make it difficult for manufacturers to grow their businesses. While some utilize on-the-job training to develop a workforce, when new technology or products are developed, they may have difficulty in retraining a workforce that commands an understanding of the principles and theories associated with the particular work tasks. Ongoing training opportunities are needed.

The following table shows the Occupational Work Key Scores for the kinds of positions hired by metal fabricators.

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## Occupational Work Keys Scores

Position	Applied Math	Applied Technology	Listening	Locating Information	Reading for Information	Teamwork	Writing
Cutter	3	3	4	3	3	5	2
Fabricator	4	4	4	5	5	4	3
Machinists	5	4	4	5	4	4	3
Material Handler	4	4	3	4	4	4	3
Press/Shear Operator	4	5	2	4	4	4	2
Tool & Die	6	5	4	5	5	5	3
Welder	4	4	4	4	4	4	3
Human Resource	4		4	4	6	5	4
Mechanical Maintenance	5	5	4	5	5	4	3
Electrical Maintenance	5	5	3	5	5	4	3
Shipping/Receiving	4	4	4	4	4	4	3

Appendix A uses the machinist's scores as an example of what skills are required for the different levels.

### Support Services Preferred

- Transportation
  - Railroad
    - Direct access on site desirable for manufacturers using large quantities of raw materials inbound or large shipments to single users outbound.
    - Container loading/unloading facilities in relatively close proximity.
  - Motor Carrier
    - Full truckload and partial truckload contract carriers available.
    - The fabricated metals and farm equipment industries tend to produce large products. The availability of oversized loads contract carriers is a plus. Locations adjacent to four-lane and interstate highways are important to the portion of this industry that requires oversized loads transportation.
  - Next Day Parcel Delivery Service.
- Work Force training agencies, primarily community colleges, for skilled and unskilled employees.
- Contractors that provide ongoing support for industrial facilities, especially electrical contractors.
- Equipment and facility maintenance services and/or contractors.
- Tool & dye shops and machine shops.
- General business services such as janitorial, office/industrial supplies, staffing assistance.
- Professional services such as legal, accounting.
- Solid waste disposal contractors and facilities.

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**Musts**

- Available skilled and semi-skilled workforce.
- Quality, trainable workforce.
- Easy access to major markets (road and rail access).
- Site free of flood plain, wetlands and other environmental issues.
- Shovel-ready site (pre-zoned).
- Utility services properly sized and with adequate capacity.

**Wants**

- Competitive recurring costs.
- Competitive investment costs.
- Favorable site/building characteristics.
- Compatible surrounding land use.
- Ability to attract and train workers.
- Ability to attract and retain professional and technical employees (quality of life issues).
- Availability of local recruitment and training resources.
- Compatible surrounding land use.
- Limited competition from related industries for employees.
- Close proximity to supplier and customer base.

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## Sample Building Designs

### York, Nebraska

#### 40,500-Square-Foot Industrial Building

##### **BUILDING SPECIFICATIONS**

Location: York Industrial Park, 25th & Lincoln Avenue  
Description: 40,500-square-foot metal building  
Year Built: Under construction; completed June 2001  
Pre-engineered metal building fabricated by Chief Industries; 25' x 60'  
Construction: Column spacing, no floor, ceiling height has 26 foot eaves; two loading docks (no levelers or ramps).  
Features: Industrial shell building; no interior finishes or HVAC; one 14' x 14' foot drive-in door, 2 dock doors  
Land: Nine acres of land. Site will accommodate 160,000 square foot building with additional adjacent land available  
Zoning: Industrial  
Former Use: New building on site

##### **UTILITIES**

Electricity: Nebraska Public Power District; 12.5 kv, 3 phase; transformer and service entry will be installed to suit tenant  
Natural Gas: Peoples Natural Gas; 2" main, 60 lbs. pressure at site; 4" main, 250 lbs. pressure adjacent to industrial park  
Water: City of York; 10" main, 55 lbs. pressure; adjacent to  
Sewer: City of York, 10" main; adjacent to industrial park  
Telecom: Alltel Communications; digital electronic switching, redundant fiber optics (SONET Ring) available; ADSL Internet available

##### **TRANSPORTATION**

U.S. Highway 81 (Pan-American Highway) adjacent to industrial park  
Highways: U.S. Highway 81 bypass within one mile of site (construction to begin 2004); Interstate 80 is 3 miles  
Railroads: Main line of the Burlington Northern Santa Fe serves city  
Air Service: York Municipal Airport; 5,900' x 100' paved and lighted runway. Nearest Commercial Airport is the Lincoln Municipal Airport, 45 miles (45 minutes)  
Service: Central Nebraska Regional Airport, 45 miles (45 minutes)

##### **OTHER**

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Owner: York County Development Corporation  
Price: \$625,000  
Phase I Environmental Study: Completed December 2000; no significant adverse findings.

### Contacts:

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## Columbus, Nebraska

### 32,000-Square-Foot Metal Building

#### Building Specifications

Location: Three miles east of Columbus adjacent to other industries.  
Description: 32,000 square foot metal building with 26' ceilings completed in the summer of 2001. Building is expandable to 80,000-square-feet. Building designed and fabricated by Behlen Mfg. Co.

Land: 10 acres with additional land available.  
Zoning: M-H General Industrial.  
Services: Fire insurance classification—Rural 4A, 24-hour police patrol, fire station within 6 miles.

#### Utilities

Electricity: Loup Public Power District; 12.5 kV; 120/240 single phase, dual feed from two substations.  
Natural Gas: Peoples Natural Gas Co.; 4" main, 65 lbs. Pressure; adjacent site.  
Water: City of Columbus; 12" main, 80 lbs. static pressure, 55 lbs. residual pressure, 1,440 gal. flow per minute; 8,000 gpm treatment plant with a rated capacity of 18 MGD.  
Sanitary Sewer: City of Columbus; 15" main, adjacent building; activated sludge treatment plant with a rated capacity of 4.5 MGD.  
Telecom: Citizens Communications, digital central office served by fiber, ADSL & DSL available, building one mile from central office; AT&T, MCI, Spring & Citizens long distance carriers.

#### Transportation

Highway: Columbus is served by U.S. Highways 30 and 81, Highway 81 designated as a four-lane highway, with segment from Columbus north to Norfolk completed.  
Railroads: Union Pacific Railroad main line within a half-mile; Burlington Northern Santa Fe and Nebraska Central Railroads also serve city.  
Air Service: Columbus Municipal Airport; 5,500 foot paved and lighted runway.  
Nearest Commercial  
Air Service: Lincoln Municipal Airport, 75 miles (75 minutes)  
Omaha Eppley Airfield, 84 miles (105 minutes)

#### Other

Owner: Columbus Economic Council  
Availability: Immediate  
Price: \$475,000

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