

# **2023 BizCosts® Benchmarks**



## **MOTOR VEHICLE PARTS & EQUIPMENT MANUFACTURING COSTS IN 17 GLOBAL BENCHMARK CITIES**

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**The Boyd Company, Inc.**  
*Location Consultants*

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## **EXECUTIVE SUMMARY AND NOTES**

### **Introduction**

In the following BizCosts® analysis, major operating costs scaled to a representative motor vehicle parts & equipment manufacturing plant are presented for a series of 17 major global production hubs. Findings for these 17 industry benchmark cities are summarized in Exhibit I and show total annual operating costs ranging from a high of \$52.2 million in Fremont, California, to a low of \$21.1 million in Guanajuato, Mexico.

The following BizCosts® has been structured to be an authoritative cost-comparison tool for a broad segment of the motor vehicle parts and equipment industry in both gas-powered and EV sectors. In the gas-powered section this includes after-market and original equipment (OEM) manufacturers of automotive stampings, electrical and electronic equipment, harness and cable sets and various other aluminum, steel and plastic component parts.

The analysis is also a useful cost comparison tool for the expanding electric vehicle (EV) sector of the automotive industry, including battery production, the manufacture of EV charging stations, charging station equipment and parts and other aluminum, steel and plastic component accessories serving the growing EV industry.

Annual operating costs were projected solely for comparative purposes, with only major geographically-variable factors being considered. Those costs not varying significantly with geography, including relocation and start-up expenses, were not considered. The BizCosts® analysis focuses on those key geographically-variable cost elements most pivotal to the motor vehicle parts & equipment industry site selection process.

Overall costs were scaled to a hypothetical 350,000 sq. ft. production plant employing 500 hourly workers. The cost simulations are designed to provide an independent, third-party point of reference for motor vehicle company CFO's, venture capital and hedge fund managers and auto industry analysts' assessment of relative operating cost levels in each of the surveyed benchmark cities.

**Comparative Motor Vehicle Parts & Equipment Industry Hubs**

For purposes of comparative economic analysis, major geographically-variable operating costs have been projected for a series of 17 global motor vehicle industry production hubs. These industry benchmark locations and major companies operating there are detailed in the table below.

<b>Motor Vehicle</b>	
<b>Hub</b>	<b>Company</b>
Detroit, MI	Ford, GM, Fiat Chrysler
Chicago, IL	Fiat Chrysler, Owens-Illinois, SABIC Plastics
Toledo, OH	Chrysler Jeep, GM, Continental Plastics
Marysville, OH	Honda, Bulten, Alcorta
Louisville, KY	Ford, Siemens, Piston Automotive
Nashville, TN	Nissan, Hankook, Bridgestone, GM
Charlotte, NC	Daimler, Arrival, Teijin Automotive, SEM Products, Schaeffler Group
NC Auto/EV Corridor, NC	Drahtzug Stein, Urethane Innovators
Atlanta, GA	Kia, Hitachi Automotive, Honda
Greer, SC	BMW, Volvo
Birmingham, AL	Mercedes- Benz, Mobis, Honda
Canton, MS	Nissan, Kasai, Yazaki, Eaton, Valeo
Fremont, CA	Tesla, Futuris Automotive, Asteelflash
Wolfsburg, DE	Volkswagen, Audi, Lamborghini
Takaoka, JP	Toyota, Nippon, Aisin
Guanajuato, MX	Volkswagen, Mazda, Honda, GM
Ulsan, KR	Hyundai, Kia, Sejong

**Labor Costs**

Annual costs for labor, including direct and indirect production workers, are presented in Exhibit II. Costs are based on a representative mix of production, engineering, maintenance, material handling & transportation, I.T. and office/clerical job descriptions for the model 500-worker plant. Comparative labor costs for management staff were not included as these costs would tend not to vary as significantly by geography, but rather by individual company compensation practices. Fringe benefit costs are included as a percent of annual base payroll costs and are assumed to include all statutory benefits, pay for time not worked, and company-sponsored benefits.

### **Comparative Electric Power Costs and Natural Gas Costs**

Comparative electric power and natural gas costs are presented in Exhibit III. Annual costs reflect industrial rate schedules of the respective electric utilities serving each area. Natural gas costs reflect rates for industrial processing use.

### **Comparative Industrial Lease and Sales Tax Costs**

Exhibit IV presents comparative industrial lease costs in each of the 17 surveyed benchmark cities. Annual costs reflect effective asking rental rates scaled to a representative 350,000 sq. ft. manufacturing plant. Also presented are sales tax costs based on a fixed annual purchase of taxable supplies, materials, equipment and other taxable goods.

**Total Annual Operating Cost Ranking**

Taken from summary Exhibit I is an overall ranking of the 17 surveyed motor vehicle industry hubs.

<b>TOTAL GEOGRAPHICALLY-VARIABLE OPERATING COST RANKING</b>	
<b>Motor Vehicle Industry Hub</b>	<b>Total Annual Operating Costs</b>
<b>Fremont, California</b>	\$52,229,404
<b>Wolfsburg, Germany</b>	\$45,336,470
<b>Detroit, Michigan</b>	\$44,955,559
<b>Chicago, Illinois</b>	\$44,773,715
<b>Toledo, Ohio</b>	\$41,302,029
<b>Marysville, Ohio</b>	\$41,122,677
<b>Atlanta, Georgia</b>	\$40,958,832
<b>Charlotte, North Carolina</b>	\$40,477,870
<b>Louisville, Kentucky</b>	\$39,921,397
<b>Nashville, Tennessee</b>	\$39,312,748
<b>NC Auto/EV Corridor</b>	\$38,941,338
<b>Birmingham, Alabama</b>	\$38,619,679
<b>Greer, South Carolina</b>	\$37,214,983
<b>Takaoka, Japan</b>	\$36,604,595
<b>Canton, Mississippi</b>	\$36,066,433
<b>Ulsan, South Korea</b>	\$27,260,008
<b>Guanajuato, Mexico</b>	\$21,080,489

**About BizCosts® About Boyd**

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**COMPARATIVE OPERATING COST SERIES I**



<b>SERIES I - EXHIBIT I</b>						
<b>COMPARATIVE ANNUAL OPERATING COST SIMULATION SUMMARY(1)</b>						
	<b>Detroit</b>	<b>Chicago</b>	<b>Toledo</b>	<b>Marysville</b>	<b>Louisville</b>	
	<b>Michigan</b>	<b>Illinois</b>	<b>Ohio</b>	<b>Ohio</b>	<b>Kentucky</b>	
Nonexempt Labor Costs (2)						
Weighted Average Hourly Earnings	\$30.68	\$29.45	\$28.35	\$27.61	\$27.19	
Annual Base Payroll Costs	\$29,207,360	\$28,036,400	\$26,989,200	\$26,284,720	\$25,884,880	
Fringe Benefits	\$11,098,797	\$10,653,832	\$10,255,896	\$9,988,194	\$9,836,254	
<b>Total Annual Labor Costs</b>	<b>\$40,306,157</b>	<b>\$38,690,232</b>	<b>\$37,245,096</b>	<b>\$36,272,914</b>	<b>\$35,721,134</b>	
<b>Energy Costs</b>						
Electric Power Costs (3)	\$600,210	\$679,590	\$523,260	\$497,340	\$562,950	
Natural Gas Costs (3)	\$851,692	\$1,047,643	\$904,923	\$904,923	\$667,313	
<b>Industrial Lease and Sales Tax Costs (4)</b>	<b>\$3,197,500</b>	<b>\$4,356,250</b>	<b>\$2,628,750</b>	<b>\$3,447,500</b>	<b>\$2,970,000</b>	
<b>Total Annual Geographically-Variable Operating Costs</b>	<b>\$44,955,559</b>	<b>\$44,773,715</b>	<b>\$41,302,029</b>	<b>\$41,122,677</b>	<b>\$39,921,397</b>	
NOTES:						
(1) Includes all major geographically-variable operating costs. Start-up and relocation costs not considered.						
(2) See Exhibit II.						
(3) See Exhibit III.						
(4) See Exhibit IV.						

<b>SERIES I - EXHIBIT II</b>						
<b>COMPARATIVE ANNUAL LABOR COSTS</b>						
	<b>Number of Workers</b>	<b>Detroit Michigan</b>	<b>Chicago Illinois</b>	<b>Toledo Ohio</b>	<b>Marysville Ohio</b>	<b>Louisville Kentucky</b>
<b>Job Title</b>						
<b>Production &amp; Maintenance Group</b>						
General Production Helper	44	\$17.94	\$17.22	\$16.58	\$16.15	\$15.89
Team Assembler	28	\$23.30	\$22.36	\$21.53	\$20.97	\$20.64
Assembler & Fabricator	30	\$33.70	\$32.34	\$31.14	\$30.33	\$29.86
CNC Operator (Metal/Plastic)	34	\$31.22	\$29.97	\$28.85	\$28.10	\$27.66
CNC Programmer	4	\$42.07	\$40.38	\$38.88	\$37.87	\$37.27
Lathe Operator (Metal/Plastic)	24	\$30.83	\$29.59	\$28.49	\$27.75	\$27.31
Grinding Machine Operator (Metal/Plastic)	16	\$26.07	\$25.03	\$24.09	\$23.46	\$23.10
Drilling Machine Operator (Metal/Plastic)	14	\$24.01	\$23.06	\$22.19	\$21.61	\$21.28
Punch Press Operator (Metal/Plastic)	20	\$24.88	\$23.88	\$22.98	\$22.39	\$22.04
Machinist	30	\$32.85	\$31.54	\$30.36	\$29.57	\$29.11
Tool & Die Maker	16	\$44.79	\$43.00	\$41.39	\$40.31	\$39.69
Mach. Tool Cutting Operator (Metal/Plastic)	30	\$30.90	\$29.66	\$28.55	\$27.81	\$27.37
Maintenance Mechanic	10	\$41.91	\$40.24	\$38.73	\$37.72	\$37.14
Welder, Solderer & Brazer	12	\$34.56	\$33.18	\$31.93	\$31.11	\$30.62
Plastics Molding/Extrusion Operator	20	\$28.57	\$27.42	\$26.40	\$25.71	\$25.31
Painter	8	\$26.47	\$25.41	\$24.46	\$23.83	\$23.45
<b>Engineering and I.T. Group</b>						
Industrial Engineer I	8	\$44.44	\$42.66	\$41.06	\$40.00	\$39.37
Industrial Engineer II	4	\$62.77	\$60.27	\$58.00	\$56.49	\$55.62
Electrical Engineer I	6	\$45.94	\$44.10	\$42.44	\$41.34	\$40.70
Electrical Engineer II	2	\$64.21	\$61.64	\$59.33	\$57.79	\$56.89
Mechanical Engineer I	4	\$45.49	\$43.67	\$42.04	\$40.94	\$40.30
Mechanical Engineer II	2	\$63.61	\$61.06	\$58.77	\$57.24	\$56.36
Software Engineer I	6	\$53.64	\$51.50	\$49.57	\$48.28	\$47.53
Software Engineer II	2	\$74.98	\$71.99	\$69.28	\$67.49	\$66.44

SERIES I - EXHIBIT II						
COMPARATIVE ANNUAL LABOR COSTS						
	Number of Workers	Detroit Michigan	Chicago Illinois	Toledo Ohio	Marysville Ohio	Louisville Kentucky
Job Title						
<b>Material Handling &amp; Transportation</b>						
Stock & Freight Mover	8	\$26.85	\$25.78	\$24.81	\$24.17	\$23.80
Machine Feeder & Offbearer	10	\$22.42	\$21.53	\$20.72	\$20.18	\$19.86
Packer & Packager, Hand	24	\$25.74	\$24.71	\$23.78	\$23.17	\$22.81
Industrial Truck Operator	10	\$29.58	\$28.39	\$27.33	\$26.62	\$26.21
Truck Driver, Tractor Trailer	8	\$40.76	\$39.12	\$37.66	\$36.68	\$36.11
Truck Driver, Light	4	\$23.37	\$22.43	\$21.59	\$21.03	\$20.71
<b>Office &amp; Clerical</b>						
Receptionist & Information Clerk	4	\$23.94	\$22.98	\$22.12	\$21.55	\$21.22
Bill & Account Collector	4	\$33.38	\$32.05	\$30.85	\$30.05	\$29.58
Accounting Clerk	10	\$29.01	\$27.84	\$26.80	\$26.10	\$25.70
Customer Service Representative	8	\$31.00	\$29.76	\$28.64	\$27.90	\$27.47
HR Assistant	4	\$33.40	\$32.07	\$30.87	\$30.07	\$29.60
Production Planning Clerk/Expeditor	6	\$38.68	\$37.13	\$35.73	\$34.81	\$34.27
Shipping & Receiving Clerk	10	\$25.75	\$24.72	\$23.80	\$23.17	\$22.82
Stock Clerk & Order Filler	6	\$32.75	\$31.44	\$30.26	\$29.47	\$29.02
Executive Secretary	2	\$33.28	\$31.95	\$30.75	\$29.95	\$29.48
Secretary	8	\$25.24	\$24.23	\$23.33	\$22.71	\$22.36
<b>Total Workers</b>	<b>500</b>					
Weighted Average Hourly Earnings (1)		\$30.68	\$29.45	\$28.35	\$27.61	\$27.19
Total Annual Base Payroll Costs (2)		\$29,207,360	\$28,036,400	\$26,989,200	\$26,284,720	\$25,884,880
Fringe Benefits (3)		\$11,098,797	\$10,653,832	\$10,255,896	\$9,988,194	\$9,836,254
<b>Total Annual Labor Costs</b>		<b>\$40,306,157</b>	<b>\$38,690,232</b>	<b>\$37,245,096</b>	<b>\$36,272,914</b>	<b>\$35,721,134</b>
NOTES:						
(1) For mature plant in third year of operation based on current wage rates and fringe benefits. Wage rates reflect Boyd field research, industry sources, and Boyd BizCosts® data bank placing firm in a competitive hiring position in each respective labor market. Job descriptions reflect a representative mix of key direct and indirect job functions for a hypothetical motor vehicle parts production facility employing 500 workers.						
(2) Assumes 1,904 hours worked per year per employee based on 12 paid holidays and a two-week vacation for mature plant.						
(3) Costs include all statutory benefits, pay for time not worked and company-sponsored benefits. Based on an estimated 38 percent of total annual base payroll costs for the U.S. locations and prevailing percentages for similar add-on costs in alternate surveyed countries.						

<b>SERIES I - EXHIBIT III</b>					
<b>ANNUAL ELECTRIC POWER AND NATURAL GAS COST COMPARISONS</b>					
					<b>Total Annual</b>
<b>Location</b>	<b>Electric Utility Company</b>	<b>Annual Electric Power Cost (1)</b>	<b>Annual Cost Per kWh (cents)</b>	<b>Annual Natural Gas Cost (2)</b>	<b>Electric Power and Natural Gas Costs</b>
<b>Detroit, Michigan</b>	DTE Energy	\$600,210	7.41	\$851,692	<b>\$1,451,902</b>
<b>Chicago, Illinois</b>	Commonwealth Edison	\$679,590	8.39	\$1,047,643	<b>\$1,727,233</b>
<b>Toledo, Ohio</b>	Toledo Edison Company	\$523,260	6.46	\$904,923	<b>\$1,428,183</b>
<b>Marysville, Ohio</b>	Dayton Power & Light	\$497,340	6.14	\$904,923	<b>\$1,402,263</b>
<b>Louisville, Kentucky</b>	Louisville Gas & Electric Company	\$562,950	6.95	\$667,313	<b>\$1,230,263</b>
NOTES:					
(1)	Based on an assumed annual use of 8.1 million kWh.				
(2)	Annual costs reflect an assumed annual use of 800,000 therms of natural gas for industrial process use.				

<b>SERIES I - EXHIBIT IV</b>					
<b>ANNUAL LEASE AND SALES TAX COSTS</b>					
	<b>Detroit Michigan</b>	<b>Chicago Illinois</b>	<b>Toledo Ohio</b>	<b>Marysville Ohio</b>	<b>Louisville Kentucky</b>
<b>Building Lease Costs</b>					
Estimated Cost/Sq. Ft. (1)	\$7.85	\$10.25	\$5.85	\$8.35	\$7.20
Annual Lease Cost (2)	\$2,747,500	\$3,587,500	\$2,047,500	\$2,922,500	\$2,520,000
<b>Sales Tax Cost</b>					
Taxable Goods Purchases	\$7,500,000	\$7,500,000	\$7,500,000	\$7,500,000	\$7,500,000
Sales Tax Rate (Percent) (3)	6.00	10.25	7.75	7.00	6.00
Annual Sales Tax Cost	\$450,000	\$768,750	\$581,250	\$525,000	\$450,000
<b>Total Annual Lease and Sales Tax Costs</b>	<b>\$3,197,500</b>	<b>\$4,356,250</b>	<b>\$2,628,750</b>	<b>\$3,447,500</b>	<b>\$2,970,000</b>
NOTES:					
(1) Lease costs reflect net asking rates per sq. ft. per year.					
(2) Based on an assumed lease of 350,000 sq. ft. of modern industrial manufacturing space.					
(3) Based on prevailing sales, VAT and GST tax levies where applicable on taxable purchases of supplies, furnishings and other taxable goods. Value added tax levies assume an 85 percent reclamation rate on eligible VAT expenses.					

**COMPARATIVE OPERATING COST SERIES II**

<b>SERIES II - EXHIBIT I</b>							
<b>COMPARATIVE ANNUAL OPERATING COST SIMULATION SUMMARY(1)</b>							
	<b>Nashville</b>	<b>Atlanta</b>	<b>Charlotte</b>	<b>NC Auto/EV Corridor</b>	<b>Greer</b>	<b>Birmingham</b>	<b>Canton</b>
	<b>Tennessee</b>	<b>Georgia</b>	<b>North Carolina</b>	<b>North Carolina</b>	<b>South Carolina</b>	<b>Alabama</b>	<b>Mississippi</b>
Nonexempt Labor Costs (2)							
Weighted Average Hourly Earnings	\$26.20	\$27.19	\$26.65	\$25.74	\$25.74	\$26.38	\$24.64
Annual Base Payroll Costs	\$24,942,400	\$25,884,880	\$25,370,800	\$24,504,480	\$24,504,480	\$25,113,760	\$23,457,280
Fringe Benefits	\$9,478,112	\$9,836,254	\$9,640,904	\$9,311,702	\$9,311,702	\$9,543,229	\$8,913,766
<b>Total Annual Labor Costs</b>	<b>\$34,420,512</b>	<b>\$35,721,134</b>	<b>\$35,011,704</b>	<b>\$33,816,182</b>	<b>\$33,816,182</b>	<b>\$34,656,989</b>	<b>\$32,371,046</b>
<b>Energy Costs</b>							
Electric Power Costs (3)	\$577,530	\$565,380	\$460,080	\$524,070	\$528,930	\$557,280	\$539,460
Natural Gas Costs (3)	\$663,456	\$802,318	\$874,836	\$874,836	\$687,371	\$607,910	\$653,427
<b>Industrial Lease and Sales Tax Costs (4)</b>	<b>\$3,651,250</b>	<b>\$3,870,000</b>	<b>\$4,131,250</b>	<b>\$3,726,250</b>	<b>\$2,182,500</b>	<b>\$2,797,500</b>	<b>\$2,502,500</b>
<b>Total Annual Geographically-Variable Operating Costs</b>	<b>\$39,312,748</b>	<b>\$40,958,832</b>	<b>\$40,477,870</b>	<b>\$38,941,338</b>	<b>\$37,214,983</b>	<b>\$38,619,679</b>	<b>\$36,066,433</b>
NOTES:							
(1) Includes all major geographically-variable operating costs. Start-up and relocation costs not considered.							
(2) See Exhibit II.							
(3) See Exhibit III.							
(4) See Exhibit IV.							

SERIES II - EXHIBIT II									
COMPARATIVE ANNUAL LABOR COSTS									
	Number of	Nashville	Atlanta	Charlotte	NC Auto/EV Corridor	Greer	Birmingham	Canton	
	Workers	Tennessee	Georgia	North Carolina	North Carolina	South Carolina	Alabama	Mississippi	
Job Title									
<b>Production &amp; Maintenance Group</b>									
General Production Helper	44	\$15.32	\$15.89	\$15.57	\$15.04	\$15.05	\$15.43	\$14.40	
Team Assembler	28	\$19.90	\$20.64	\$20.23	\$19.54	\$19.54	\$20.03	\$18.71	
Assembler & Fabricator	30	\$28.78	\$29.86	\$29.26	\$28.27	\$28.27	\$28.97	\$27.06	
CNC Operator (Metal/Plastic)	34	\$26.67	\$27.66	\$27.11	\$26.19	\$26.20	\$26.85	\$25.07	
CNC Programmer	4	\$35.92	\$37.27	\$36.52	\$35.28	\$35.30	\$36.18	\$33.78	
Lathe Operator (Metal/Plastic)	24	\$26.32	\$27.31	\$26.76	\$25.85	\$25.86	\$26.51	\$24.75	
Grinding Machine Operator (Metal/Plastic)	16	\$22.27	\$23.10	\$22.64	\$21.87	\$21.87	\$22.42	\$20.94	
Drilling Mach. Operator (Metal/Plastic)	14	\$20.51	\$21.28	\$20.85	\$20.14	\$20.14	\$20.65	\$19.28	
Punch Press Operator (Metal/Plastic)	20	\$21.25	\$22.04	\$21.60	\$20.87	\$20.87	\$21.39	\$19.98	
Machinist	30	\$28.06	\$29.11	\$28.53	\$27.56	\$27.56	\$28.26	\$26.38	
Tool & Die Maker	16	\$38.25	\$39.69	\$38.90	\$37.58	\$37.59	\$38.52	\$35.97	
Mach. Tool Cutting Operator (Metal/Plastic)	30	\$26.38	\$27.37	\$26.82	\$25.91	\$25.93	\$26.57	\$24.81	
Maintenance Mechanic	10	\$35.80	\$37.14	\$36.40	\$35.16	\$35.16	\$36.05	\$33.65	
Welder, Solderer & Brazier	12	\$29.52	\$30.62	\$30.01	\$28.99	\$29.00	\$29.72	\$27.75	
Plastics Molding/Extrusion Operator	20	\$24.40	\$25.31	\$24.80	\$23.96	\$23.97	\$24.56	\$22.94	
Painter	8	\$22.60	\$23.45	\$22.98	\$22.20	\$22.20	\$22.77	\$21.26	
<b>Engineering and I.T. Group</b>									
Industrial Engineer I	8	\$37.95	\$39.37	\$38.58	\$37.27	\$37.28	\$38.22	\$35.68	
Industrial Engineer II	4	\$53.61	\$55.62	\$54.51	\$52.66	\$52.67	\$53.99	\$50.41	
Electrical Engineer I	6	\$39.23	\$40.70	\$39.89	\$38.53	\$38.54	\$39.51	\$36.89	
Electrical Engineer II	2	\$54.84	\$56.89	\$55.75	\$53.85	\$53.87	\$55.22	\$51.56	
Mechanical Engineer I	4	\$38.84	\$40.30	\$39.49	\$38.15	\$38.17	\$39.12	\$36.52	
Mechanical Engineer II	2	\$54.32	\$56.36	\$55.23	\$53.35	\$53.36	\$54.70	\$51.07	
Software Engineer I	6	\$45.81	\$47.53	\$46.58	\$45.00	\$45.01	\$46.13	\$43.08	
Software Engineer II	2	\$64.03	\$66.44	\$65.11	\$62.90	\$62.91	\$64.49	\$60.22	



<b>SERIES II - EXHIBIT II</b>									
<b>COMPARATIVE ANNUAL LABOR COSTS</b>									
		<b>Number of</b>	<b>Nashville</b>	<b>Atlanta</b>	<b>Charlotte</b>	<b>NC Auto/EV Corridor</b>	<b>Greer</b>	<b>Birmingham</b>	<b>Canton</b>
		<b>Workers</b>	<b>Tennessee</b>	<b>Georgia</b>	<b>North Carolina</b>	<b>North Carolina</b>	<b>South Carolina</b>	<b>Alabama</b>	<b>Mississippi</b>
<b>Job Title</b>									
<b>Material Handling &amp; Transportation</b>									
Stock & Freight Mover		8	\$22.93	\$23.80	\$23.32	\$22.53	\$22.53	\$23.10	\$21.56
Machine Feeder & Offbearer		10	\$19.15	\$19.86	\$19.46	\$18.80	\$18.81	\$19.28	\$18.00
Packer & Packager, Hand		24	\$21.99	\$22.81	\$22.35	\$21.59	\$21.60	\$22.14	\$20.66
Industrial Truck Operator		10	\$25.26	\$26.21	\$25.69	\$24.82	\$24.81	\$25.44	\$23.75
Truck Driver, Tractor Trailer		8	\$34.81	\$36.11	\$35.39	\$34.19	\$34.20	\$35.05	\$32.73
Truck Driver, Light		4	\$19.96	\$20.71	\$20.30	\$19.61	\$19.60	\$20.09	\$18.76
<b>Office &amp; Clerical</b>									
Receptionist & Information Clerk		4	\$20.45	\$21.22	\$20.80	\$20.09	\$20.08	\$20.59	\$19.23
Bill & Account Collector		4	\$28.51	\$29.58	\$28.99	\$28.00	\$28.01	\$28.71	\$26.81
Accounting Clerk		10	\$24.77	\$25.70	\$25.19	\$24.33	\$24.34	\$24.95	\$23.30
Customer Service Representative		8	\$26.48	\$27.47	\$26.92	\$26.00	\$26.01	\$26.67	\$24.90
HR Assistant		4	\$28.53	\$29.60	\$29.01	\$28.02	\$28.03	\$28.72	\$26.82
Production Planning Clerk/Expeditor		6	\$33.03	\$34.27	\$33.58	\$32.44	\$32.45	\$33.26	\$31.05
Shipping & Receiving Clerk		10	\$22.00	\$22.82	\$22.36	\$21.60	\$21.60	\$22.14	\$20.68
Stock Clerk & Order Filler		6	\$27.97	\$29.02	\$28.44	\$27.47	\$27.48	\$28.16	\$26.30
Executive Secretary		2	\$28.42	\$29.48	\$28.89	\$27.91	\$27.92	\$28.62	\$26.73
Secretary		8	\$21.56	\$22.36	\$21.91	\$21.17	\$21.17	\$21.70	\$20.27
<b>Total Workers</b>		<b>500</b>							
Weighted Average Hourly Earnings (1)			\$26.20	\$27.19	\$26.65	\$25.74	\$25.74	\$26.38	\$24.64
Total Annual Base Payroll Costs (2)			\$24,942,400	\$25,884,880	\$25,370,800	\$24,504,480	\$24,504,480	\$25,113,760	\$23,457,280
Fringe Benefits (3)			\$9,478,112	\$9,836,254	\$9,640,904	\$9,311,702	\$9,311,702	\$9,543,229	\$8,913,766
<b>Total Annual Labor Costs</b>			<b>\$34,420,512</b>	<b>\$35,721,134</b>	<b>\$35,011,704</b>	<b>\$33,816,182</b>	<b>\$33,816,182</b>	<b>\$34,656,989</b>	<b>\$32,371,046</b>
NOTES:									
(1) For mature plant in third year of operation based on current wage rates and fringe benefits. Wage rates reflect Boyd field research, industry sources, and Boyd BizCosts® data bank placing firm in a competitive hiring position in each respective labor market. Job descriptions reflect a representative mix of key direct and indirect job functions for a hypothetical motor vehicle parts production facility employing 500 workers.									
(2) Assumes 1,904 hours worked per year per employee based on 12 paid holidays and a two-week vacation for mature plant.									
(3) Costs include all statutory benefits, pay for time not worked and company-sponsored benefits. Based on an estimated 38 percent of total annual base payroll costs for the U.S. locations and prevailing percentages for similar add-on costs in alternate surveyed countries.									

<b>SERIES II - EXHIBIT III</b>					
<b>ANNUAL ELECTRIC POWER AND NATURAL GAS COST COMPARISONS</b>					
					Total Annual
		Annual Electric	Annual Cost	Annual Natural	Electric Power and
Location	Electric Utility Company	Power Cost (1)	Per kWh (cents)	Gas Cost (2)	Natural Gas Costs
<b>Nashville, Tennessee</b>	Nashville Electric Service	\$577,530	7.13	\$663,456	<b>\$1,240,986</b>
<b>Atlanta, Georgia</b>	Georgia Power	\$565,380	6.98	\$802,318	<b>\$1,367,698</b>
<b>Charlotte, North Carolina</b>	Duke Energy Carolinas	\$460,080	5.68	\$874,836	<b>\$1,334,916</b>
<b>NC Auto/EV Corridor, North Carolina</b>	Duke Energy Progress	\$524,070	6.47	\$874,836	<b>\$1,398,906</b>
<b>Greer, South Carolina</b>	Dominion Energy South Carolina	\$528,930	6.53	\$687,371	<b>\$1,216,301</b>
<b>Birmingham, Alabama</b>	Alabama Power	\$557,280	6.88	\$607,910	<b>\$1,165,190</b>
<b>Canton, Mississippi</b>	Mississippi Power	\$539,460	6.66	\$653,427	<b>\$1,192,887</b>
NOTES:					
(1)	Based on an assumed annual use of 8.1 million kWh.				
(2)	Annual costs reflect an assumed annual use of 800,000 therms of natural gas for industrial process use.				

SERIES II - EXHIBIT IV							
ANNUAL LEASE AND SALES TAX COSTS							
	Nashville	Atlanta	Charlotte	NC Auto/EV Corridor	Greer	Birmingham	Canton
	Tennessee	Georgia	North Carolina	North Carolina	South Carolina	Alabama	Mississippi
<b>Building Lease Costs</b>							
Estimated Cost/Sq. Ft. (1)	\$8.45	\$9.15	\$10.25	\$9.20	\$4.95	\$5.85	\$5.65
Annual Lease Cost (2)	\$2,957,500	\$3,202,500	\$3,587,500	\$3,220,000	\$1,732,500	\$2,047,500	\$1,977,500
<b>Sales Tax Cost</b>							
Taxable Goods Purchases	\$7,500,000	\$7,500,000	\$7,500,000	\$7,500,000	\$7,500,000	\$7,500,000	\$7,500,000
Sales Tax Rate (Percent) (3)	9.25	8.90	7.25	6.75	6.00	10.00	7.00
Annual Sales Tax Cost	\$693,750	\$667,500	\$543,750	\$506,250	\$450,000	\$750,000	\$525,000
<b>Total Annual Lease and Sales Tax Costs</b>	<b>\$3,651,250</b>	<b>\$3,870,000</b>	<b>\$4,131,250</b>	<b>\$3,726,250</b>	<b>\$2,182,500</b>	<b>\$2,797,500</b>	<b>\$2,502,500</b>
NOTES:							
(1)	Lease costs reflect net asking rates per sq. ft. per year.						
(2)	Based on an assumed lease of 350,000 sq. ft. of modern industrial manufacturing space.						
(3)	Based on prevailing sales, VAT and GST tax levies where applicable on taxable purchases of supplies, furnishings and other taxable goods. Value added tax levies assume an 85 percent reclamation rate on eligible VAT expenses.						

**COMPARATIVE OPERATING COST SERIES III**

<b>SERIES III - EXHIBIT I</b>						
<b>COMPARATIVE ANNUAL OPERATING COST SIMULATION SUMMARY(1)</b>						
	<b>Fremont California</b>	<b>Wolfsburg Germany</b>	<b>Takaoka Japan</b>	<b>Guanajuato Mexico</b>	<b>Ulsan South Korea</b>	
Nonexempt Labor Costs (2)						
Weighted Average Hourly Earnings	\$32.68	\$32.09	\$20.53	\$8.10	\$18.22	
Annual Base Payroll Costs	\$31,111,360	\$30,549,680	\$19,544,560	\$7,711,200	\$17,345,440	
Fringe Benefits	\$11,822,317	\$8,553,910	\$8,404,161	\$8,867,880	\$4,856,723	
<b>Total Annual Labor Costs</b>	<b>\$42,933,677</b>	<b>\$39,103,590</b>	<b>\$27,948,721</b>	<b>\$16,579,080</b>	<b>\$22,202,163</b>	
<b>Energy Costs</b>						
Electric Power Costs (3)	\$870,750	\$2,400,030	\$1,883,250	\$1,518,750	\$881,280	
Natural Gas Costs (3)	\$1,023,727	\$700,100	\$1,280,624	\$387,659	\$714,565	
<b>Industrial Lease and Sales Tax Costs (4)</b>	<b>\$7,401,250</b>	<b>\$3,132,750</b>	<b>\$5,492,000</b>	<b>\$2,595,000</b>	<b>\$3,462,000</b>	
<b>Total Annual Geographically-Variable Operating Costs</b>	<b>\$52,229,404</b>	<b>\$45,336,470</b>	<b>\$36,604,595</b>	<b>\$21,080,489</b>	<b>\$27,260,008</b>	
NOTES:						
(1) Includes all major geographically-variable operating costs. Start-up and relocation costs not considered.						
(2) See Exhibit II.						
(3) See Exhibit III.						
(4) See Exhibit IV.						

<b>SERIES III - EXHIBIT II</b>						
<b>COMPARATIVE ANNUAL LABOR COSTS</b>						
	<b>Number of Workers</b>	<b>Fremont California</b>	<b>Wolfsburg Germany</b>	<b>Takaoka Japan</b>	<b>Guanajuato Mexico</b>	<b>Ulsan South Korea</b>
<b>Job Title</b>						
<b>Production &amp; Maintenance Group</b>						
General Production Helper	44	\$19.10	\$18.76	\$12.00	\$4.73	\$10.66
Team Assembler	28	\$24.81	\$24.37	\$15.59	\$6.15	\$13.84
Assembler & Fabricator	30	\$35.89	\$35.25	\$22.55	\$8.89	\$20.02
CNC Operator (Metal/Plastic)	34	\$33.25	\$32.66	\$20.88	\$8.25	\$18.54
CNC Programmer	4	\$44.80	\$44.00	\$28.14	\$11.11	\$24.99
Lathe Operator (Metal/Plastic)	24	\$32.83	\$32.24	\$20.62	\$8.13	\$18.31
Grinding Machine Operator (Metal/Plastic)	16	\$27.77	\$27.27	\$17.44	\$6.88	\$15.49
Drilling Machine Operator (Metal/Plastic)	14	\$25.57	\$25.12	\$16.07	\$6.34	\$14.27
Punch Press Operator (Metal/Plastic)	20	\$26.49	\$26.02	\$16.64	\$6.56	\$14.78
Machinist	30	\$34.99	\$34.36	\$21.98	\$8.67	\$19.51
Tool & Die Maker	16	\$47.70	\$46.85	\$29.96	\$11.82	\$26.60
Mach. Tool Cutting Operator (Metal/Plastic)	30	\$32.91	\$32.32	\$20.68	\$8.15	\$18.36
Maintenance Mechanic	10	\$44.64	\$43.84	\$28.04	\$11.07	\$24.90
Welder, Solderer & Brazier	12	\$36.81	\$36.15	\$23.12	\$9.12	\$20.53
Plastics Molding/Extrusion Operator	20	\$30.43	\$29.88	\$19.12	\$7.54	\$16.97
Painter	8	\$28.18	\$27.68	\$17.71	\$6.99	\$15.72
<b>Engineering and I.T. Group</b>						
Industrial Engineer I	8	\$47.33	\$46.49	\$29.73	\$11.73	\$26.40
Industrial Engineer II	4	\$66.85	\$65.67	\$42.00	\$16.58	\$37.28
Electrical Engineer I	6	\$48.92	\$48.05	\$30.73	\$12.13	\$27.29
Electrical Engineer II	2	\$68.38	\$67.16	\$42.95	\$16.95	\$38.14
Mechanical Engineer I	4	\$48.44	\$47.58	\$30.43	\$12.01	\$27.02
Mechanical Engineer II	2	\$67.75	\$66.53	\$42.56	\$16.80	\$37.78
Software Engineer I	6	\$57.13	\$56.11	\$35.89	\$14.16	\$31.87
Software Engineer II	2	\$79.86	\$78.44	\$50.16	\$19.79	\$44.54

<b>SERIES III - EXHIBIT II</b>						
<b>COMPARATIVE ANNUAL LABOR COSTS</b>						
	<b>Number of Workers</b>	<b>Fremont California</b>	<b>Wolfsburg Germany</b>	<b>Takaoka Japan</b>	<b>Guanajuato Mexico</b>	<b>Ulsan South Korea</b>
<b>Job Title</b>						
<b>Material Handling &amp; Transportation</b>						
Stock & Freight Mover	8	\$28.60	\$28.09	\$17.96	\$7.09	\$15.95
Machine Feeder & Offbearer	10	\$23.88	\$23.45	\$15.00	\$5.92	\$13.32
Packer & Packager, Hand	24	\$27.41	\$26.93	\$17.22	\$6.79	\$15.29
Industrial Truck Operator	10	\$31.50	\$30.94	\$19.79	\$7.81	\$17.57
Truck Driver, Tractor Trailer	8	\$43.41	\$42.63	\$27.27	\$10.76	\$24.21
Truck Driver, Light	4	\$24.89	\$24.44	\$15.63	\$6.17	\$13.88
<b>Office &amp; Clerical</b>						
Receptionist & Information Clerk	4	\$25.50	\$25.04	\$16.02	\$6.32	\$14.22
Bill & Account Collector	4	\$35.56	\$34.92	\$22.33	\$8.81	\$19.83
Accounting Clerk	10	\$30.89	\$30.34	\$19.41	\$7.65	\$17.23
Customer Service Representative	8	\$33.02	\$32.43	\$20.74	\$8.18	\$18.42
HR Assistant	4	\$35.58	\$34.94	\$22.35	\$8.82	\$19.84
Production Planning Clerk/Expeditor	6	\$41.19	\$40.46	\$25.88	\$10.21	\$22.97
Shipping & Receiving Clerk	10	\$27.42	\$26.94	\$17.22	\$6.80	\$15.30
Stock Clerk & Order Filler	6	\$34.88	\$34.26	\$21.91	\$8.64	\$19.46
Executive Secretary	2	\$35.44	\$34.81	\$22.27	\$8.79	\$19.77
Secretary	8	\$26.88	\$26.41	\$16.89	\$6.67	\$15.00
<b>Total Workers</b>	<b>500</b>					
Weighted Average Hourly Earnings (1)		\$32.68	\$32.09	\$20.53	\$8.10	\$18.22
Total Annual Base Payroll Costs (2)		\$31,111,360	\$30,549,680	\$19,544,560	\$7,711,200	\$17,345,440
Fringe Benefits (3)		\$11,822,317	\$8,553,910	\$8,404,161	\$8,867,880	\$4,856,723
<b>Total Annual Labor Costs</b>		<b>\$42,933,677</b>	<b>\$39,103,590</b>	<b>\$27,948,721</b>	<b>\$16,579,080</b>	<b>\$22,202,163</b>
<b>NOTES:</b>						
(1) For mature plant in third year of operation based on current wage rates and fringe benefits. Wage rates reflect Boyd field research, industry sources, and Boyd BizCosts® data bank placing firm in a competitive hiring position in each respective labor market. Job descriptions reflect a representative mix of key direct and indirect job functions for a hypothetical motor vehicle parts production facility employing 500 workers.						
(2) Assumes 1,904 hours worked per year per employee based on 12 paid holidays and a two-week vacation for mature plant.						
(3) Costs include all statutory benefits, pay for time not worked and company-sponsored benefits. Based on an estimated 38 percent of total annual base payroll costs for the U.S. locations and prevailing percentages for similar add-on costs in alternate surveyed countries.						

<b>SERIES III - EXHIBIT III</b>					
<b>ANNUAL ELECTRIC POWER AND NATURAL GAS COST COMPARISONS</b>					
					<b>Total Annual</b>
<b>Location</b>	<b>Electric Utility Company</b>	<b>Annual Electric Power Cost (1)</b>	<b>Annual Cost Per kWh (cents)</b>	<b>Annual Natural Gas Cost (2)</b>	<b>Electric Power and Natural Gas Costs</b>
<b>Fremont, California</b>	PG&E	\$870,750	10.75	\$1,023,727	<b>\$1,894,477</b>
<b>Wolfsburg, Germany</b>	LSW Energie	\$2,400,030	29.63	\$700,100	<b>\$3,100,130</b>
<b>Takaoka, Japan</b>	Takaoka Toko	\$1,883,250	23.25	\$1,280,624	<b>\$3,163,874</b>
<b>Guanajuato, Mexico</b>	Comisión Federal de Electricidad	\$1,518,750	18.75	\$387,659	<b>\$1,906,409</b>
<b>Ulsan, South Korea</b>	KEPCO	\$881,280	10.88	\$714,565	<b>\$1,595,845</b>
NOTES:					
(1) Based on an assumed annual use of 8.1 million kWh.					
(2) Annual costs reflect an assumed annual use of 800,000 therms of natural gas for industrial process use.					



<b>SERIES III - EXHIBIT IV</b>						
<b>ANNUAL LEASE AND SALES TAX COSTS</b>						
	<b>Fremont</b>	<b>Wolfsburg</b>	<b>Takaoka</b>	<b>Guanajuato</b>	<b>Ulsan</b>	
	<b>California</b>	<b>Germany</b>	<b>Japan</b>	<b>Mexico</b>	<b>South Korea</b>	
<b>Building Lease Costs</b>						
Estimated Cost/Sq. Ft. (1)	\$18.95	\$8.34	\$15.37	\$6.90	\$9.57	
Annual Lease Cost (2)	\$6,632,500	\$2,919,000	\$5,379,500	\$2,415,000	\$3,349,500	
<b>Sales Tax Cost</b>						
Taxable Goods Purchases	\$7,500,000	\$7,500,000	\$7,500,000	\$7,500,000	\$7,500,000	
Sales Tax Rate (Percent) (3)	10.25	19.00	10.00	16.00	10.00	
Annual Sales Tax Cost	\$768,750	\$213,750	\$112,500	\$180,000	\$112,500	
<b>Total Annual Lease and Sales Tax Costs</b>	<b>\$7,401,250</b>	<b>\$3,132,750</b>	<b>\$5,492,000</b>	<b>\$2,595,000</b>	<b>\$3,462,000</b>	
NOTES:						
(1) Lease costs reflect net asking rates per sq. ft. per year.						
(2) Based on an assumed lease of 350,000 sq. ft. of modern industrial manufacturing space.						
(3) Based on prevailing sales, VAT and GST tax levies where applicable on taxable purchases of supplies, furnishings and other taxable goods. Value added tax levies assume an 85 percent reclamation rate on eligible VAT expenses.						

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