



**COMPARATIVE
PLASTICS INDUSTRY
MANUFACTURING OPERATING COSTS**

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**COMPARATIVE OPERATING COST ANALYSIS:
EXECUTIVE SUMMARY AND NOTES**

Introduction

In the following analysis, major operating costs scaled to a representative plastics industry manufacturing plant are presented for a series of eight comparative production sites in the Northeast U.S. Findings are summarized in Exhibit I and show total annual operating costs ranging from a high of \$18.7 million in Long Island, NY, to a low of \$14.4 million in the Scranton/Wilkes Barre, PA, area.

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 independent Boyd analysis focuses on those key geographically-variable cost elements considered to be most pivotal to the corporate site selection process.

Overall costs were scaled to a hypothetical 175,000 sq. ft. plastics production facility employing 225 workers. The format of the cost exhibits will allow the tailoring of cost data and facility specifications to reflect alternate scales of operation and staffing. Geographically-variable operating cost differentials are based on latest third quarter 2016 figures.

Costs are germane to several key sectors of the plastics industry, including injection and blow molding, extrusion, thermoforming, reinforced plastics & composites and EPS foam.

Comparative Northeast Locations

For purposes of comparative economic analysis, major geographically-variable operating costs have been projected by Boyd for a series of eight metropolitan

areas in the Middle Atlantic states of New York, New Jersey and Pennsylvania housing current concentrations of the plastics and related light manufacturing operations.

The eight comparative locations included in the Boyd analysis are detailed below alphabetically by state.

- White Plains/Westchester County, NY
- Long Island, NY
- Rochester, NY
- New Brunswick, NJ
- Newark, NJ
- Philadelphia, PA
- Allentown/Bethlehem, PA
- Scranton/Wilkes Barre, PA

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, I.T., material handling/transportation and office/clerical job descriptions for the model 225-worker plastics industry 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 and Natural Gas Costs

Comparative annual electric power and natural gas costs are presented in Exhibit III. Annual costs reflect industrial rate schedules of the respective local electric

utilities serving each area. Natural gas costs are based on an assumed monthly consumption of industrial-use gas.

Comparative Land Acquisition and Construction Costs

Exhibit IV presents comparative costs for the purchase of industrially-zoned land and the construction of new light manufacturing space in each of the eight surveyed locations.

Comparative Ad Valorem and Sales Tax Costs

Exhibit V presents comparative ad valorem (property) tax costs in each of eight surveyed production sites scaled to the land and building specifications of the model plastic plant. Also presented in this exhibit are comparative local and state sales tax costs based on a fixed annual purchase of supplies, equipment, furnishings and other taxable goods associated with the plant.

Total Annual Operating Cost Rankings

Taken from summary Exhibit I are national cost rankings of the eight surveyed locations.

TOTAL GEOGRAPHICALLY-VARIABLE OPERATING COST RANKING: NATIONAL	
Regions	Total Annual Operating Costs
Long Island, NY	\$18,713,712
White Plains/Westchester County, NY	\$18,621,515
New Brunswick, NJ	\$18,084,608
Newark, NJ	\$18,036,921
Philadelphia, PA	\$17,024,142
Rochester, NY	\$16,109,702
Allentown/Bethlehem, PA	\$15,452,299
Scranton/Wilkes Barre, PA	\$14,448,952

About Boyd

Devoted exclusively to corporate mobility, The Boyd Company is recognized as one of the nation's premier authorities in comparative business cost analysis. Founded in 1975, Boyd (www.theboydcompany.com) provides independent site selection counsel to leading U.S. and overseas corporations. Advanced manufacturing clients of Boyd include the likes of Hewlett-Packard, Pratt & Whitney, Dell, Altera, Philips and other *Fortune 500* companies.

COMPARATIVE OPERATING COST EXHIBITS

**A COMPARTIVE OPERATING
COST ANALYSIS**

**PLASTICS INDUSTRY
SITE SELECTION**

**EXHIBIT I
COMPARATIVE ANNUAL OPERATING COST SIMULATION SUMMARY(1)**

	White Plains/ Westchester County NY Metro Area	Long Island NY Metro Area	Rochester NY Metro Area	New Brunswick NJ Metro Area	Newark NJ Metro Area	Philadelphia PA Metro Area	Allentown/ Bethlehem PA Metro Area	Scranton/ Wilkes Barre PA Metro Area
Nonexempt Labor (2)								
Weighted Average Hourly Earnings	\$21.32	\$21.75	\$19.98	\$21.97	\$21.58	\$20.89	\$19.10	\$17.99
Annual Base Payroll Costs	\$9,133,488	\$9,317,700	\$8,559,432	\$9,411,948	\$9,244,872	\$8,949,276	\$8,182,440	\$7,706,916
Fringe Benefits	\$3,470,725	\$3,540,726	\$3,252,584	\$3,576,540	\$3,513,051	\$3,400,725	\$3,109,327	\$2,928,628
Total Annual Labor Costs	\$12,604,213	\$12,858,426	\$11,812,016	\$12,988,488	\$12,757,923	\$12,350,001	\$11,291,767	\$10,635,544
Electric Power Costs (3)	\$1,034,460	\$796,754	\$613,800	\$702,120	\$702,120	\$422,412	\$495,444	\$495,444
Natural Gas Power Costs (4)	\$178,800	\$178,800	\$91,200	\$157,800	\$157,800	\$147,000	\$127,200	\$80,400
Amortization Costs (5)	\$2,861,482	\$2,738,715	\$2,101,469	\$2,615,287	\$2,695,341	\$2,480,775	\$2,218,555	\$2,055,555
Property and Sales Tax Costs (6)	\$1,942,560	\$2,141,017	\$1,491,217	\$1,620,913	\$1,723,737	\$1,623,954	\$1,319,333	\$1,182,009
Total Annual Geographically-Variable Operating Costs	\$18,621,515	\$18,713,712	\$16,109,702	\$18,084,608	\$18,036,921	\$17,024,142	\$15,452,299	\$14,448,952
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 III.								
(5) See Exhibit IV.								
(6) See Exhibit V.								

**A COMPARTIVE OPERATING
COST ANALYSIS**

**PLASTICS INDUSTRY
SITE SELECTION**

**EXHIBIT II
COMPARATIVE ANNUAL LABOR COSTS**

		White Plains/ Westchester County NY Metro Area	Long Island NY Metro Area	Rochester NY Metro Area	New Brunswick NJ Metro Area	Newark NJ Metro Area	Philadelphia PA Metro Area	Allentown/ Bethlehem PA Metro Area	Scranton/ Wilkes Barre PA Metro Area
Job Title	Number of Workers								
General									
Helper-Trainee	5	\$16.12	\$16.44	\$15.11	\$16.61	\$16.32	\$15.80	\$14.44	\$13.60
Porter/Janitor	2	\$15.60	\$15.91	\$14.62	\$16.08	\$15.79	\$15.29	\$13.98	\$13.16
Material Handler	5	\$21.19	\$21.61	\$19.86	\$21.83	\$21.45	\$20.77	\$18.98	\$17.88
Floor Person	3	\$18.50	\$18.87	\$17.34	\$19.06	\$18.73	\$18.13	\$16.57	\$15.61
Set-Up Person	4	\$19.87	\$20.27	\$18.62	\$20.47	\$20.11	\$19.47	\$17.80	\$16.76
Support Equipment Operator	6	\$18.03	\$18.39	\$16.90	\$18.57	\$18.25	\$17.67	\$16.15	\$15.21
Assembler	20	\$17.47	\$17.82	\$16.38	\$18.01	\$17.69	\$17.12	\$15.65	\$14.74
Inspector	5	\$22.34	\$22.79	\$20.94	\$23.02	\$22.62	\$21.89	\$20.01	\$18.85
Molding & Extrusion									
Injection Molding Operator	15	\$21.54	\$21.97	\$20.19	\$22.19	\$21.81	\$21.11	\$19.29	\$18.17
Extrusion Operator	15	\$21.01	\$21.43	\$19.69	\$21.65	\$21.27	\$20.59	\$18.82	\$17.72
Blow Molding Operator	15	\$21.29	\$21.72	\$19.96	\$21.94	\$21.55	\$20.86	\$19.07	\$17.96
Preform Compression Operator	10	\$22.12	\$22.56	\$20.74	\$22.80	\$22.40	\$21.68	\$19.82	\$18.67
Thermoforming									
In-Line Operator	20	\$22.34	\$22.79	\$20.94	\$23.02	\$22.62	\$21.89	\$20.01	\$18.85
Trim Press Operator	3	\$22.15	\$22.59	\$20.76	\$22.82	\$22.42	\$21.71	\$19.84	\$18.69
Reinforced Plastics									
Machine Operator	5	\$21.57	\$22.00	\$20.22	\$22.23	\$21.84	\$21.14	\$19.32	\$18.20
Fabricator	8	\$19.57	\$19.96	\$18.35	\$20.17	\$19.82	\$19.18	\$17.53	\$16.51
Pultruder Operator	3	\$22.34	\$22.79	\$20.94	\$23.02	\$22.62	\$21.89	\$20.01	\$18.85
Filament Winder Operator	2	\$22.68	\$23.13	\$21.26	\$23.37	\$22.96	\$22.23	\$20.32	\$19.13
EPS Foam									
Mold Operator	5	\$21.33	\$21.76	\$20.00	\$21.98	\$21.60	\$20.90	\$19.11	\$18.00
Insulation Technician	3	\$22.58	\$23.03	\$21.16	\$23.26	\$22.86	\$22.13	\$20.22	\$19.05
Foam Shop Operator	5	\$20.99	\$21.41	\$19.67	\$21.62	\$21.25	\$20.57	\$18.80	\$17.70

**A COMPARTIVE OPERATING
COST ANALYSIS**

**PLASTICS INDUSTRY
SITE SELECTION**

**EXHIBIT II
COMPARATIVE ANNUAL LABOR COSTS**

		White Plains/ Westchester County NY Metro Area	Long Island NY Metro Area	Rochester NY Metro Area	New Brunswick NJ Metro Area	Newark NJ Metro Area	Philadelphia PA Metro Area	Allentown/ Bethlehem PA Metro Area	Scranton/ Wilkes Barre PA Metro Area
Job Title	Number of Workers								
Finishing									
Utility Man	4	\$18.04	\$18.40	\$16.91	\$18.59	\$18.26	\$17.68	\$16.16	\$15.22
Spray Paint Operator	3	\$21.57	\$22.00	\$20.22	\$22.23	\$21.84	\$21.14	\$19.32	\$18.20
Polishing & Buffing Operator	4	\$19.94	\$20.34	\$18.69	\$20.54	\$20.18	\$19.54	\$17.86	\$16.82
Printer Operator	2	\$23.50	\$23.97	\$22.03	\$24.22	\$23.79	\$23.03	\$21.05	\$19.83
Tumbling Operator	2	\$19.55	\$19.94	\$18.33	\$20.15	\$19.79	\$19.16	\$17.51	\$16.50
Shipping & Receiving									
Team Leader	2	\$29.30	\$29.89	\$27.47	\$30.20	\$29.67	\$28.71	\$26.25	\$24.72
Warehouse Material Handler	3	\$24.47	\$24.96	\$22.94	\$25.22	\$24.78	\$23.98	\$21.92	\$20.65
Warehouse Clerk	2	\$25.65	\$26.16	\$24.04	\$26.43	\$25.97	\$25.14	\$22.97	\$21.64
Packer	20	\$16.79	\$17.13	\$15.73	\$17.30	\$16.99	\$16.45	\$15.04	\$14.16
Maintenance & Tool Room									
Team Leader	2	\$35.89	\$36.61	\$33.64	\$36.98	\$36.33	\$35.17	\$32.15	\$30.28
Electrician	2	\$35.27	\$35.98	\$33.06	\$36.34	\$35.70	\$34.56	\$31.59	\$29.75
Maintenance Mechanic	3	\$32.77	\$33.43	\$30.72	\$33.77	\$33.18	\$32.11	\$29.36	\$27.65
Machinist	4	\$35.41	\$36.12	\$33.19	\$36.49	\$35.85	\$34.70	\$31.72	\$29.88
Mold Maker	2	\$32.39	\$33.04	\$30.36	\$33.37	\$32.79	\$31.74	\$29.01	\$27.32
Mold Repair Person	2	\$27.18	\$27.72	\$25.48	\$28.01	\$27.52	\$26.64	\$24.35	\$22.93
Office & Clerical									
Receptionist	1	\$20.38	\$20.79	\$19.10	\$21.00	\$20.63	\$19.97	\$18.25	\$17.19
General Clerk	3	\$18.92	\$19.30	\$17.73	\$19.50	\$19.15	\$18.54	\$16.95	\$15.96
Accounting Clerk	2	\$24.52	\$25.01	\$22.98	\$25.26	\$24.82	\$24.03	\$21.96	\$20.69
Secretary	2	\$22.02	\$22.46	\$20.64	\$22.69	\$22.30	\$21.58	\$19.73	\$18.58
Executive Secretary	1	\$33.39	\$34.06	\$31.30	\$34.41	\$33.81	\$32.72	\$29.91	\$28.17
Total Nonexempt Workers	225								
Weighted Average Hourly Earnings (1)		\$21.32	\$21.75	\$19.98	\$21.97	\$21.58	\$20.89	\$19.10	\$17.99
Total Annual Base Payroll Costs (2)		\$9,133,488	\$9,317,700	\$8,559,432	\$9,411,948	\$9,244,872	\$8,949,276	\$8,182,440	\$7,706,916
Fringe Benefits (3)		\$3,470,725	\$3,540,726	\$3,252,584	\$3,576,540	\$3,513,051	\$3,400,725	\$3,109,327	\$2,928,628
Total Annual Labor Costs		\$12,604,213	\$12,858,426	\$11,812,016	\$12,988,488	\$12,757,923	\$12,350,001	\$11,291,767	\$10,635,544

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 plastics production plant employing 225 nonexempt 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) Based on an estimated 38 percent of total annual base payroll costs. Costs include all statutory benefits, pay for time not worked and company-sponsored benefits.

**EXHIBIT III
ANNUAL ELECTRIC POWER AND NATURAL GAS COST COMPARISONS**

Location	Electric Utility Company	Annual Electric Power Cost (1)	Annual Cost Per kWh (cents)	Annual Natural Gas Cost (2)	Total Annual Electric Power and Natural Gas Costs
White Plains/Westchester County, NY	Consolidated Edison	\$1,034,460	13.26	\$178,800	\$1,213,260
Long Island, NY	Long Island Power Authority	\$796,754	10.21	\$178,800	\$975,554
Rochester, NY	Rochester Electric & Gas	\$613,800	7.87	\$91,200	\$705,000
New Brunswick, NJ	PSE&G	\$702,120	9.00	\$157,800	\$859,920
Newark, NJ	PSE&G	\$702,120	9.00	\$157,800	\$859,920
Philadelphia, PA	PECO Energy	\$422,412	5.42	\$147,000	\$569,412
Allentown/Bethlehem, PA	PPL	\$495,444	6.35	\$127,200	\$622,644
Scranton/Wilkes Barre, PA	PPL	\$495,444	6.35	\$80,400	\$575,844
NOTES:					
(1) Based on assumed monthly demand of 1,000 kW and 650,000 kWh monthly consumption. Annual costs reflect comparative industrial general service rates.					
(2) Annual costs reflect an assumed monthly use of 50,000 therms of natural gas. Gas prices reflect latest two-year city gate annual averages for 2016 and 2015 for each of the surveyed locations. Not included are city gate to plant site meter charges which would vary by utility district schedules and the local plant site location.					

**A COMPARTIVE OPERATING
COST ANALYSIS**

**PLASTICS INDUSTRY
SITE SELECTION**

EXHIBIT IV PLANT CONSTRUCTION AND AMORTIZATION COSTS								
	White Plains/ Westchester County NY Metro Area	Long Island NY Metro Area	Rochester NY Metro Area	New Brunswick NJ Metro Area	Newark NJ Metro Area	Philadelphia PA Metro Area	Allentown/ Bethlehem PA Metro Area	Scranton/ Wilkes Barre PA Metro Area
Site Acquisition: No. of Acres	25	25	25	25	25	25	25	25
Cost per Acre (1)	\$425,500	\$317,500	\$83,500	\$382,500	\$410,500	\$294,500	\$154,500	\$79,500
Site Improvement Cost (2)	--	--	--	--	--	--	--	--
Total Land Cost	\$10,637,500	\$7,937,500	\$2,087,500	\$9,562,500	\$10,262,500	\$7,362,500	\$3,862,500	\$1,987,500
Construction Cost (3)	\$19,652,168	\$20,194,568	\$14,845,163	\$16,400,370	\$17,107,283	\$16,236,366	\$15,127,928	\$14,138,250
Machinery and Equipment	\$20,000,000	\$20,000,000	\$20,000,000	\$20,000,000	\$20,000,000	\$20,000,000	\$20,000,000	\$20,000,000
Total Project Investment	\$50,289,668	\$48,132,068	\$36,932,663	\$45,962,870	\$47,369,783	\$43,598,866	\$38,990,428	\$36,125,750
Project Amortization								
Cost of Funds (Interest)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Payment Factor (4)	0.0569	0.0569	0.0569	0.0569	0.0569	0.0569	0.0569	0.0569
Total Annual Amortization Cost	\$2,861,482	\$2,738,715	\$2,101,469	\$2,615,287	\$2,695,341	\$2,480,775	\$2,218,555	\$2,055,555
NOTES:								
(1) Boyd estimate only. Actual negotiated costs would vary by site specifics, including location, access, visibility, etc. Costs reflect fully serviced industrially-zoned land within a controlled industrial park setting.								
(2) Land preparation costs limited to normal grading and held constant for purposes of analysis.								
(3) Based on construction of fully equipped 175,000 sq. ft. industrial building. Geographic differentials in building costs are based on latest BizCosts® construction cost index data.								
(4) Assumes 25-year level amortization payments at 3.0 percent.								

**A COMPARTIVE OPERATING
COST ANALYSIS**

**PLASTICS INDUSTRY
SITE SELECTION**

EXHIBIT V								
AD VALOREM AND SALES TAX COSTS								
	White Plains/ Westchester County NY Metro Area	Long Island NY Metro Area	Rochester NY Metro Area	New Brunswick NJ Metro Area	Newark NJ Metro Area	Philadelphia PA Metro Area	Allentown/ Bethlehem PA Metro Area	Scranton/ Wilkes Barre PA Metro Area
Real Property Tax Cost								
Land Cost (1)	\$10,637,500	\$7,937,500	\$2,087,500	\$9,562,500	\$10,262,500	\$7,362,500	\$3,862,500	\$1,987,500
Building Cost (2)	\$19,652,168	\$20,194,568	\$14,845,163	\$16,400,370	\$17,107,283	\$16,236,366	\$15,127,928	\$14,138,250
Total	\$30,289,668	\$28,132,068	\$16,932,663	\$25,962,870	\$27,369,783	\$23,598,866	\$18,990,428	\$16,125,750
Effective Tax Rate	\$29.55	\$37.76	\$29.01	\$28.73	\$31.01	\$26.44	\$29.98	\$26.79
Real Property Tax Cost (3)	\$895,060	\$1,062,267	\$491,217	\$745,913	\$848,737	\$623,954	\$569,333	\$432,009
Sales Tax Cost								
Taxable Goods Purchases	\$12,500,000	\$12,500,000	\$12,500,000	\$12,500,000	\$12,500,000	\$12,500,000	\$12,500,000	\$12,500,000
Sales Tax Rate (Percent)	8.38	8.63	8.00	7.00	7.00	8.00	6.00	6.00
Total Annual Sales Tax Cost (4)	\$1,047,500	\$1,078,750	\$1,000,000	\$875,000	\$875,000	\$1,000,000	\$750,000	\$750,000
Total Annual Ad Valorem and Sales Tax Costs	\$1,942,560	\$2,141,017	\$1,491,217	\$1,620,913	\$1,723,737	\$1,623,954	\$1,319,333	\$1,182,009
NOTES:								
(1) See Exhibit IV.								
(2) See Exhibit IV.								
(3) Based on nominal real property tax rate and assessment practices at each location based on \$1,000 of valuation. Petitions for abatements and lower assessments not considered. Effective tax rates are considered representative property tax levy amounts. Actual rates will vary based on alternate municipal, school, fire and special assessment districts within each surveyed metropolitan area.								
(4) Based on prevailing local and state sales tax levies on taxable purchases of supplies, furnishings, equipment and other taxable goods.								

