

DESIGN GUIDE



STRATEGIC DESIGN SERVICES

THE MANAGEMENT OF MOTION®

About AHS

AHS, Inc. is a full-service provider of integrated supply chain solutions that help streamline processes, improve employee productivity, and increase return on investment. AHS is uniquely equipped with multiple service groups that provide the complete spectrum of supply chain services and products to develop the best solutions for clients.

About Strategic Design Services

Strategic Design Services offers full consulting services to integrate multiple technologies and systems into one productive operation. With more than 100 years of combined supply chain and logistics experience, Strategic Design Services is the ideal partner for clients who are extended beyond their expertise or resources in supply chain solutions. We provide strategic assistance to fill in the gaps wherever necessary to create or consult in the development of a supply solution. We can lead or support clients' efforts in integrating complex systems of hardware and software. In order to meet your needs you can utilize **FORWARD MOTION**, a comprehensive process for developing supply chain solutions, or simply select from our suite of individual service offerings.

About this Guide

This guide documents design parameters that AHS has established over 30 years of successful material handling solutions projects. The numbers offered here represent real numbers our clients obtain, but because every situation is unique, each section offers a low and a high value.

Use of Productivity Standards

The productivity standards in the table can be used to ascertain the estimated labor rates that are possible for the tasks listed. The productivity numbers, like the budget estimates, are derived from observed results of AHS' clients. Because of the considerable impact that individual locales exert on productivity, we offer a range of potential results in this guide.

Typical Results

Your actual rates may be affected by the performance of your internal systems and how you train, supervise, and utilize your associates. The rates cited in this guide are based on specific tasks and reflect direct labor only; indirect labor (which includes supervisors, managers, and maintenance) is not factored in. The listed ranges are representative of normal operations. Factors such as facility size, layout, and technologies utilized can drive your results within or beyond the stated ranges.

Your Productivity Estimates

AHS will work with you, and your particular circumstance, to help you drive your result to the highest point possible. If you need assistance using these estimates, please contact AHS at www.ahs1.com or 1.800.891.5504.

| LABOR RATES | | | |
|---|----------|--------------------------|---------------------------|
| PICKING | UOM/HOUR | EXPECTED RATE LOW END | EXPECTED RATE HIGH END |
| CASE PICK TO PALLET ON A WALKIE OR RIDER PALLET TRUCK | LINES | 40 | 120 |
| CASE PICK TO CONVEYOR | LINES | 150 | 400 |
| DEPALLETIZE WITH LABELING | CARTONS | 150 | 300 |
| DEPALLETIZE WITHOUT LABELING | CARTONS | 240 | 600 |
| CLUSTER PICK CART | LINES | 40 | 100 |
| BATCH SINGLES TO CART | LINES | 60 | 150 |
| CARTON FLOW RACK | | | |
| ORDER PICK TO TOTE/CARTON/PAPER | LINES | 50 | 150 |
| ORDER PICK TO TOTE/CARTON/LIGHT DIRECTED | LINES | 80 | 300 |
| ORDER PICK TO TOTE/CARTON/VOICE DIRECTED | LINES | 70 | 280 |
| ORDER PICK TO TOTE/CARTON/RF DIRECTED | LINES | 45 | 165 |
| SHELVING | | | |
| ORDER PICK TO TOTE/CARTON/PAPER | LINES | 40 | 120 |
| ORDER PICK TO TOTE/CARTON/LIGHT DIRECTED | LINES | 60 | 210 |
| ORDER PICK TO TOTE/CARTON/VOICE DIRECTED | LINES | 55 | 200 |
| ORDER PICK TO TOTE/CARTON/RF DIRECTED | LINES | 35 | 130 |
| PALLET RACK | | | |
| BROKEN CASE ON ORDER PICKER | LINES | 30 | 75 |
| FULL CASE ON ORDER PICKER | LINES | 35 | 105 |
| CAROUSEL | | | |
| ORDER PICK TO TOTE/CARTON — FOOT PEDAL | LINES | 80 | 180 |
| ORDER PICK TO TOTE/CARTON — LIGHT DIRECTED | LINES | 120 | 480 |
| TILT TRAY/CROSS BELT | | | |
| MANUAL INDUCT | UNITS | 850 | 1400 |
| REPLENISHMENT | UOM/HOUR | EXPECTED RATE LOW END | EXPECTED RATE HIGH END |
| TO CARTON FLOW RACK | CARTONS | 30 | 120 |
| TO SHELVING | CARTONS | 20 | 70 |
| TO CAROUSEL | CARTONS | 30 | 180 |

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| LABOR RATES (CONTINUED) | | | |
|--|----------|--------------------------|---------------------------|
| PACKING | UOM/HOUR | EXPECTED RATE LOW END | EXPECTED RATE HIGH END |
| MACHINE ASSISTED PACKING | | | |
| FEED TO COLD SEAL | ORDERS | 120 | 400 |
| ASSEMBLY LINE — CARTON/MANUAL | ORDERS | 40 | 120 |
| TRANSFER TO CARTON (LABOR ONLY AND PRE-MADE CARTON) | ORDERS | 100 | 270 |
| IN-LINE DUNNAGE FILL | ORDERS | 90 | 600 |
| TRADITIONAL PACK STATION | | | |
| SINGLE LINE ORDERS | ORDERS | 30 | 90 |
| MULTI LINE ORDERS | ORDERS | 20 | 60 |
| GIFT WRAP AND PACK | ORDERS | 10 | 30 |
| SLAPPER/SHIP ALONE | ORDERS | 150 | 300 |
| RECEIVING | UOM/HOUR | EXPECTED RATE LOW END | EXPECTED RATE HIGH END |
| UNLOAD TRAILER | PARCELS | 240 | 600 |
| PALLETIZE CARTONS FROM A GRAVITY CONVEYOR | CARTONS | 90 | 250 |
| UNLOAD CARTONS FROM PALLETS IN TRAILER | CARTONS | 90 | 300 |
| FORK TRUCK UNLOADING PALLETS | PALLETS | 20 | 55 |
| SHIPPING | UOM/HOUR | EXPECTED RATE LOW END | EXPECTED RATE HIGH END |
| BED LOADING | PARCELS | 200 | 500 |
| MANUAL MANIFEST | PALLETS | 20 | 60 |
| MANUAL STRETCH WRAPPINGS | PALLETS | 15 | 30 |
| PALLET LOADING | PALLETS | 25 | 60 |
| GENERAL LIFT TRUCK TRANSACTIONS (TRAVEL DISTANCE DEPENDENT) | UOM/HOUR | EXPECTED RATE LOW END | EXPECTED RATE HIGH END |
| PUT AWAY DOCK TO STOCK SELECTIVE PALLET RACK | PALLETS | 10 | 20 |
| PUT AWAY DOCK TO STOCK VNA W/WIRE GUIDANCE | PALLETS | 12 | 25 |
| PUT AWAY DOCK TO STOCK PUSHBACK RACK | PALLETS | 10 | 20 |

| MACHINE RATES | | | |
|--|----------|--------------------------|---------------------------|
| PICKING | UOM/HOUR | EXPECTED RATE LOW END | EXPECTED RATE HIGH END |
| A FRAME/ORDER DISPENSER | | | |
| REPLENISHMENT/LOADER | UNIT | 4,500 | 11,000 |
| TILT TRAY/CROSS BELT | | | |
| AUTO INDUCT | UNIT | 1,200 | 2,400 |
| SINGLE TRAY/CART CAPACITY (80% TRAY UTILIZATION) / INDUCT GROUPING | UNIT | 5,200 | 8,800 |
| SPLIT TRAY CAPACITY (80% TRAY UTILIZATION) / INDUCT GROUPING | UNIT | 10,400 | 17,600 |
| QUAD TRAY CAPACITY (80% TRAY UTILIZATION) / INDUCT GROUPING | UNIT | 20,800 | 35,200 |
| PACKING | UOM/HOUR | EXPECTED RATE LOW END | EXPECTED RATE HIGH END |
| ASSEMBLY LINE — COLD SEAL MACHINE | CARTONS | 960 | 1,800 |
| CARTON ERECTOR MACHINE | CARTONS | 400 | 700 |
| ASSEMBLY LINE — CARTON/MANUAL | CARTONS | 60 | 240 |
| IN-LINE TAPER | CARTONS | 240 | 720 |
| PRINT & APPLY (LOW END = 1 PRINT HEAD; HIGH END = 2 PRINT HEAD) | CARTONS | 600 | 1,200 |
| SHIPPING | UOM/HOUR | EXPECTED RATE LOW END | EXPECTED RATE HIGH END |
| IN MOTION SCALE | PARCELS | 3,600 | 7,500 |
| SLIDING SHOE SORTER | PARCELS | 5,400 | 9,000 |
| BOTTOM CONTACT SORTER | PARCELS | 2,400 | 3,600 |
| TRAY OR CROSS-BELT SORTER | PARCELS | 2,700 | 8,100 |
| AUTOMATIC STRETCH WRAPPING | PALLETS | 30 | 100 |
| SEMI-AUTOMATIC STRETCH WRAPPING | PALLETS | 25 | 45 |

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Use of Budget Estimates

The budget estimates on the following pages include engineering, materials, controls, and installation labor. Freight and taxes should be considered outside of the costs stated. These values work best for projects where the expected total cost exceeds \$200,000. For smaller projects, we advise you add an additional 10%.

Freight

Freight can be estimated by dividing the total project cost by \$50,000 to establish the estimated number of truckloads. Then multiply this value by \$1,500 to \$2,500 per truckload, depending on market conditions and project location relative to suppliers.

Taxes

Taxes will be specific based upon the installation location. Check your local tax codes for specifics.

Your Project Estimates

AHS will gladly assist you with your specific project to provide potential productivity and investment numbers based on your specific circumstances. If you need help using these estimates or information related to an unlisted item, please contact AHS at www.ahs1.com or 1.800.891.5504.

Budget Estimate

| CONVEYOR | UOM | EXPECTED RATE LOW END | EXPECTED RATE HIGH END |
|---|--------------|--------------------------|---------------------------|
| GRAVITY | LINEAR FT. | \$30.00 | \$36.00 |
| CONTROL FLOW GRAVITY | LINEAR FT. | \$275.00 | \$330.00 |
| BELT (LEVEL) | LINEAR FT. | \$200.00 | \$240.00 |
| BELT (INCLINE/DECLINE) | LINEAR FT. | \$225.00 | \$270.00 |
| LIVE ROLLER | LINEAR FT. | \$215.00 | \$258.00 |
| ZERO PRESSURE ACCUMULATION (PHOTO EYE) | LINEAR FT. | \$350.00 | \$420.00 |
| ZERO PRESSURE ACCUMULATION (24 VOLT) | LINEAR FT. | \$600.00 | \$720.00 |
| ZONED BELT ACCUMULATION | LINEAR FT. | \$600.00 | \$720.00 |
| TRASH BELT | LINEAR FT. | \$250.00 | \$300.00 |
| CHAIN DRIVEN LIVE ROLLER CONVEYOR | LINEAR FT. | \$500.00 | \$600.00 |
| ENCLOSED TRACK (OVERHEAD LESS CARRIERS) | LINEAR FT. | \$125.00 | \$108.00 |
| ENCLOSED TRACK CARRIERS | CARRIES | \$35.00 | \$42.00 |
| CONVEYOR ACCESSORIES | UOM | EXPECTED RATE LOW END | EXPECTED RATE HIGH END |
| GRAVITY CURVE | EACH | \$350.00 | \$420.00 |
| LIVE ROLLER CURVES/SPURS | EACH | \$2750.00 | \$3,300 |
| BELT CURVE (90 DEGREE) | EACH | \$9,000 | \$10,800 |
| MERGE TABLE | EACH | \$3,500.00 | \$4,200.00 |
| MEGA BELT MERGE (PER # OF INFEED LANES) | INFEED LANES | \$15,000.00 | \$18,000.00 |
| COLUMNIZER | EACH | \$4,500.00 | \$5,400.00 |
| BRAKE BELT | EACH | \$2,500.00 | \$3,000.00 |
| BRAKE SPACER BELT (NOT FOR SORTATION) | EACH | \$6,500.00 | \$7,800.00 |
| POP UP STOP AIR | EACH | \$1,250.00 | \$1,500.00 |

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Budget Estimate

| CARTON SORTATION COMPONENTS | UOM | EXPECTED RATE LOW END | EXPECTED RATE HIGH END |
|---|-----------------|--------------------------|---------------------------|
| INDUCTION BELT | EACH | \$12,000.00 | \$14,400.00 |
| LINE SCANNER | EACH | \$6,000.00 | \$7,200.00 |
| MINI X (OMNI) | EACH | \$12,000.00 | \$14,400.00 |
| SCAN TUNNEL | EACH | \$80,000.00 | \$96,000.00 |
| IN MOTION SCALE (LESS THAN 50 CPM) | EACH | \$20,000.00 | \$24,000.00 |
| IN MOTION SCALE (GREATER THAN 50 CPM) | EACH | \$125,000.00 | \$150,000 |
| 2 POSITION DEFLECTOR (ADD FOOTAGE OF BELT CONVEYOR) | EACH | \$5,500.00 | \$6,600.00 |
| PUSHER (ADD FOOTAGE OF BELT CONVEYOR) | EACH | \$6,500.00 | \$7,800.00 |
| URETHANE BELT TRANSFER (STANDARD) | EACH | \$6,500.00 | \$7,800.00 |
| URETHANE BELT TRANSFER (ERS MODULE) | EACH | \$12,500.00 | \$15,000.00 |
| H.S.W.D. WITH SPUR (ADD FOOTAGE OF BELT CONVEYOR) | EACH | \$11,000.00 | \$13,200.00 |
| NBS 30 OR 90 (PER DIVERT) | DIVERT | \$18,000.00 | \$21,600.00 |
| SLIDING SHOE SORTER (PER DIVERT MINIMUM 3 DIVERTS) | DIVERT | \$75,000.00 | \$90,000.00 |
| STORAGE EQUIPMENT | UOM | EXPECTED RATE LOW END | EXPECTED RATE LOW END |
| MEZZANINE | SQUARE FT. | \$15.00 | \$18.00 |
| SELECTIVE RACK | PALLET POSITION | \$40.00 | \$48.00 |
| SHELVING | # OF BAYS | \$125.00 | \$150.00 |
| CARTON FLOW RACK | # OF BAYS | \$1,500.00 | \$1,800.00 |
| PALLET FLOW/RACK | PALLET POSITION | \$90.00 | \$120.00 |
| PUSHBACK/RACK | PALLET POSITION | \$240.00 | \$300.00 |
| LIGHTING | SQUARE FT. | \$3.00 | \$3.60 |
| SPRINKLERS | SQUARE FT. | \$3.00 | \$3.60 |

Budget Estimate

| CONVEYOR ACCESSORIES (CONTINUED) | UOM | EXPECTED RATE LOW END | EXPECTED RATE HIGH END |
|---|--------------|--------------------------|---------------------------|
| POP UP STOP MANUAL | EACH | \$500.00 | \$600.00 |
| MERGE-A-FLOW (TRAFFIC COPS) | EACH | \$800.00 | \$960.00 |
| GRAVITY GATE | EACH | \$750.00 | \$900.00 |
| POWERED CONVEYOR GATE | EACH | \$3,500.00 | \$4,200.00 |
| CROSS OVER | EACH | \$800.00 | \$960.00 |
| POWERED BELT LOADER/UNLOADER (53FT. TRAILER) | EACH | \$55,000.00 | \$66,000.00 |
| FLEXIBLE — (53FT. TRAILER — 40FT. POWER & 24FT. GRAVITY) | EACH | \$17,500.00 | \$21,000.00 |
| BEST FLEX — GRAVITY (60FT.) | EACH | \$5,500.00 | \$6,600.00 |
| SPIRAL BELT INCLINE/DECLINE | FOOT OF LIFT | \$7,000.00 | \$8,400.00 |
| CONTINUOUS VERTICAL LIFT | EACH | \$35,000.00 | \$42,000.00 |
| CAROUSELS | UOM | EXPECTED RATE LOW END | EXPECTED RATE HIGH END |
| BINS | EACH | \$1,500.00 | \$1,800.00 |
| PICK LIGHT TREES/PICK DIRECTOR | EACH | \$10,000.00 | \$12,000.00 |
| PUT LIGHT TREES | EACH | \$10,000.00 | \$12,000.00 |
| SOFTWARE | PACKAGE | \$85,000.00 | \$100,000.00 |
| UNIT SORTATION COMPONENTS | UOM | EXPECTED RATE LOW END | EXPECTED RATE HIGH END |
| AUTO INDUCT | STATION | \$52,000.00 | \$91,000.00 |
| MANUAL INDUCT (NOT INCL. MEZZ.) | STATION | \$1,600.00 | \$3,900.00 |
| MECHANICAL TILT TRAY SORTER | LINEAR FT. | \$3,400.00 | \$5,100.00 |
| ELECTRONIC TILT TRAY SORTER | LINEAR FT. | \$3,500.00 | \$5,500.00 |
| CROSS BELT SORTER | LINEAR FT. | \$3,600.00 | \$5,600.00 |
| TILT TRAY OR CROSS BELT SORTER CHUTE — SINGLE | CHUTE | \$1,300.00 | \$3,900.00 |
| TILT TRAY OR CROSS BELT SORTER CHUTE — DOUBLE | CHUTE | \$3,300.00 | \$5,200.00 |
| TILT TRAY OR CROSS BELT SORTER CHUTE — DOUBLE-DOUBLE | CHUTE | \$3,900.00 | \$9,100.00 |

Budget Estimate

| PICK MODULE | UOM | EXPECTED RATE LOW END | EXPECTED RATE HIGH END |
|--|-------------------|--------------------------|---------------------------|
| STATIC PALLET POSITIONS | PALLET POSITION | \$50.00 | \$60.00 |
| DECKED SURFACE | SQUARE FT. | \$12.00 | \$14.40 |
| SHELVING | # OF BAYS | \$320.00 | \$384.00 |
| FLOW RACK | # OF BAYS | \$1,500.00 | \$1,800.00 |
| STAIRS | LEVEL | \$7,500.00 | \$9,000.00 |
| VERTICAL LIFT (FREIGHT LIFT) | EACH | \$65,000.00 | \$75,000.00 |
| PICK TO LIGHT | POSITION | \$125.00 | \$150.00 |
| LIGHTING | SQUARE FT. | \$3.00 | \$3.60 |
| SPRINKLERS | SQUARE FT. | \$3.00 | \$3.60 |
| OTHER PRODUCTS | UOM | EXPECTED RATE LOW END | EXPECTED RATE HIGH END |
| ERGONOMIC WORK STATION | EACH | \$1,250.00 | \$1,500.00 |
| MANIFEST STATION (EXCLUDES SCALE) | EACH | \$1,750.00 | \$2,100.00 |
| LASER PRINTER AT PACK STATION | EACH | \$2,500.00 | \$3,000.00 |
| HIGH WAY GUARDRAIL | LINEAR FT. | \$25.00 | \$30.00 |
| SEMI AUTOMATIC BOTTOM AND/ OR TOP CASE SEALER | LINEAR FT. | \$7,500.00 | \$9,000.00 |
| DUNNAGE MACHINE | EACH | \$5,000.00 | \$6,000.00 |
| COLD SEAL MACHINE | EACH | \$120,000.00 | \$144,000.00 |
| PRINT & APPLY (1) PRINT HEAD (ADD PC SYSTEM) | EACH | \$30,000.00 | \$36,000.00 |
| PC SYSTEM CONTROLS | EACH | \$150,000.00 | \$180,000.00 |
| CARTON DIMENSIONER AT RECEIVING (CUBISCAN) | EACH | \$17,500.00 | \$21,000.00 |
| CARTON DIMENSIONER AT SHIPPING (WINDOW FRAME) | EACH | \$50,000.00 | \$60,000.00 |
| AIR COMPRESSOR — REDUNDANT | PER HORSEPOWER | \$1,500.00 | \$1,800.00 |
| AIR HEADER (3/4") | LINEAR FT. | \$10.00 | \$12.00 |



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Move your business *forward!*

Partner with AHS to deliver your product to your client faster, easier, and most cost-effectively.

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