

BIOGRAPHY



Mike Tracy, P.E.

Director of Lean Manufacturing
Chief of Munro Automation Group

Mike Tracy is one of the foremost authorities of Factory Design and Efficient Layout in the USA. Mike's experience is as extensive as it is broad with hundreds of successful implementations that he conceived, directed and managed in the US and abroad. Mike has both a strategic planning and a "hands on approach" to factory transformation and can be seen frequently on the customer's floor supervising the tradesmen or picking up a wrench to do it himself. A no nonsense practitioner of the Toyota Production System Mike is a perfectionist and leaves nothing to chance.

Mr. Tracy is experienced in most types of manufacturing processes. He also has strong implementation experience in manufacturing facilities, factory automation programs, flexible manufacturing systems, and material handling systems. Specialized projects include development of manufacturing strategic plans, development of manufacturing productivity improvement programs, automation simulation, and the development of CIM in engineering and manufacturing operations. He has also been qualified as an expert witness in and testified regarding:

- Automation systems planning, design, and construction.
- Automotive assembly plant, automotive fabrication plant, and automotive paint facility planning, design, and construction.
- Automotive related equipment design, installation, demolition and removal and the custom and usage of such equipment.
- Automotive assembly plant material handling systems planning, design, and construction.
- Corporate headquarters planning, design, and construction.

Mr. Tracy received his Bachelor of Science degree in Mechanical Engineering from Michigan Technological University and his MBA from the University of Michigan. He is a registered Professional Engineer in the State of Michigan. Mr. Tracy has published many technical papers and is a frequent speaker on technology issues. His numerous professional and business affiliations have included the National Society of Professional Engineers, the Society of Automotive Engineers, American Society of Heating, Refrigerating and Air-Conditioning Engineers, the Precision Metalforming Association, the Society of Manufacturing Engineers, the Institute of Industrial Engineers, the American Society of Mechanical Engineers, and the Engineering Society of Detroit.

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Below is a list of Mr. Tracy's extensive accomplishments.

Automotive OEM Programs

- Senior consultant to the project team adapting an existing automotive assembly plant for electric vehicle production. Determined manufacturing systems modification requirements and capital investment budgets.
- Senior consultant to the project team planning a new automotive assembly plant for electric vehicle production. Evaluated vehicle design and developed base manufacturing processes. Developed greenfield assembly plant facility design, including material handling systems and utilities systems requirements as well as capital investment budgets.
- Senior consultant to the project team planning a new automotive assembly plant in Asia. Evaluated alternative concepts, provided planning input for line layout, and recommendations for process, material handling, and IT systems improvements. Developed initial technical bid requirements document for paint shop.
- Program Manager for a vehicle quality improvement program. Responsible for leading team assessing current quality issues and developing comprehensive engineering plan for vehicle improvements.
- Program Manager and technical leader for multiple automated automotive sealant curing systems.
- Manufacturing Program Manager supporting an OEM in developing a major all new vehicle design with an all new vehicle assembly line.
- Program Manager for development of a complete Powertrain Competitive Evaluation, including design, process, and cost, for a manufacturer of automotive vehicles.
- Senior consultant assisting an automotive OEM in improving productivity and capacity in the proving ground vehicle R&D testing environment.
- Senior consultant assisting an automotive OEM in improving productivity and capacity at a major engine plant. Developed and prioritized multiple improvement projects.
- Senior consultant to the project team developing improved assembly processes and materials handling in an automotive assembly plant. Evaluated alternative concepts, provided planning input for line layout, and recommendations for material handling systems improvements.
- Senior consultant assisting an automotive OEM in a major expansion of vehicle assembly capacity.

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- Consultant for evaluation of automotive manufacturing technology. Provided technical assistance for valuation of special tooling for a major car platform.
- Industrial engineering team leader for the layout and material handling development of the Chrysler Belvidere Satellite Stamping Plant.
- Project Manager for the conceptual development of a plant for the manufacture of transmissions and other automotive components.
- Consultant for development of a feasibility study for an automotive sheet metal fabrication plant.
- Lead the fifteen man manufacturing engineering team responsible for the planning and engineering of the equipment installation contracts for the launch of the Chrysler C-Body production at the Belvidere Assembly Plant. Also responsible for supervising the development of the demolition contract package for the gutting of the existing facility.
- Project Manager for the conceptual development of two automotive stamping plants.
- Program Manager for development of Engine Components/Assemblies Competitive Evaluation for a manufacturer of automotive vehicles.
- Consultant for evaluation of diesel engine machining technology. Also provided benchmarking study of diesel engine manufacturing technology in North America.

Automotive Supplier Programs

- Senior consultant supporting technical and strategic aspects of multiple areas of the automotive market to support the strategic planning of a major automotive supplier.
- Program Manager and technical leader for five automated automotive induction curing systems.
- Program Manager and technical leader for an automated automotive front & rear roof weld / hem assembly cell.
- Program Manager for an automated automotive powertrain capacitive discharge welding assembly cell.
- Senior consultant for analysis of two Tier 1 metal fabrication plants for operational and real estate issues.
- Senior consultant for diagnosis and resolution of wheel paint system issues.

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- Consultant for technical evaluation of product design and manufacturing processes to support contract litigation.
- Senior consultant supporting supplier development. Evaluated manufacturing operations and provided recommendations for process, equipment, material handling, and IT systems improvements.
- Program Manager and technical leader for an automated automotive sun roof weld / hem assembly cell.
- Senior consultant to the supplier plant for developing improved assembly processes and materials handling for a series of major automotive modules for sale to several vehicle OEMs.
- Consultant for a major review of the business plan for an automotive stamping supplier.
- Senior consultant for development of alternative master plans of a automotive fabrication plant for to accommodate expansion, improve plant productivity, and facilitate future vehicle programs. Developed a comprehensive program for improvement.
- Senior consultant for development of alternative master plans to accommodate business expansion of an automotive fabrication plant in France.
- Industrial engineering team leader for development of manufacturing process documentation and work standards for composite automotive body panel manufacturing.
- Senior advisor for the development of a business plan for an automotive stamping supplier.
- Deputy Program Manager for development of the concept design of a turnkey, greenfield automotive engine manufacturing plant. The facility was designed to produce a range of 50,000 to 200,000 engines per year in phased expansion using advanced agile manufacturing concepts.
- Deputy Program Manager for development of the concept design of a turnkey, greenfield automotive vehicle assembly plant. The facility was designed to produce a range of 50,000 to 200,000 vehicles per year in phased expansion using lean manufacturing concepts.
- Project Manager for the material flow analysis and material handling integration for an automotive assembly plant new vehicle program.

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- Senior consultant for development of alternative master plans for an automotive sheet metal fabrication plant for improving plant productivity and competitiveness.
- Senior consultant for analysis of three powertrain, two metal fabrication, and two foundry plants for operational and real estate issues.
- Program Manager for the concept design of a new, greenfield automotive assembly plant. The program was designed to produce 100,000 vehicles per year using advanced agile manufacturing concepts.
- Project Manager for the manufacturing engineering team responsible for the integration planning and engineering for the Trim - Chassis - Final operations of the Chrysler ZJ-Body production at the new Jefferson North Assembly Plant.
- Project Manager for the material flow analysis and material handling integration for the Chrysler 98LH program for the Bramalea assembly plant.

Automotive Supplier Programs

- Industrial engineering team leader for the planning of an integrated manufacturing facility for automotive air bag inflator manufacturing.
- Industrial engineering team leader for the planning of a warehouse and administration facility to support automotive air bag inflator manufacturing.
- Project Manager for the conceptual design of a JIT coil steel warehouse.
- Program Manager for the planning and implementation of an automated weaving plant for automotive air bag cloth manufacturing.
- Program Manager for the planning of an improved technology machining line for automotive flywheel manufacturing.
- Consultant for the development of a market survey and evaluation the heavy truck industry for an automotive supplier. Conducted evaluations of the competitive market, truck technology trends, and the expected market for the client's products and services.
- Principal Engineer for design and development of OEM Carburetors. Mr. Tracy was responsible for customer accounts.
- Production Liaison Engineer responsible for engineering liaison to the manufacturing plants.
- Project team member for six major new product launches in design engineering and production engineering functions.

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Aerospace Programs

- Senior consultant to the project team providing technical review and assistance with the final assembly for the F35 Joint Strike Fighter program. Evaluated alternative concepts, provided planning input for line layout, and recommendations for process, material handling, and IT systems improvements.
- Senior consultant for manufacturing planning and lean manufacturing implementation to support doubling of the production rate for Cirrus Design. Supported improvements in composites fabrication, assembly, and paint operations.
- Senior consultant for lean manufacturing planning for a supplier of landing gear components.
- Technical lead for the assessment of DFA&S improvement opportunities for the Boeing C-17.
- Project Manager for the planning and design of an integrated, multi-phased FMS facility for turbine engine components.
- Consultant for office and manufacturing layouts for a 75,000 sf expansion of an existing R&D facility.
- Project Manager for conceptualization, design, and specification of an integrated system composed of two AS/RS systems linked with an AGV system, all of which are integrated into the manufacturing operations on a real time basis.
- Assistant Project Manager for conceptualization, design and implementation of a 500,000 sq. ft. composite materials integrated production facility.
- Assistant Project Manager for the conceptual development, preliminary design, and specification of the state-of-the-art, automated non-destructive testing cells for a new turbine engine blade and disk manufacturing plant.
- Project Manager for the planning and design of an integrated facility for turbine engine components.
- Design consultant for development of standardized material handling containers for the turbine engine components manufacturing operations.
- Project Manager for the conceptualization and planning of a 50,000 sf specialized phenolic core machining facility.
- Project Manager for the manufacturing requirements analysis for an integrated material processing facility. Processes included welding, cleaning, die penetrate, paint spraying, copper etching, and vacuum deposition of materials.

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- Consultant for control systems planning for an integrated material handling system consisting of a four aisle AS/RS and fifteen vehicle AGVS, linking together multiple material handling/processing work cells.
- Project Manager for the conceptual development, preliminary design, and specification of an automated chemical processing cell, including dichromate, anodize, and FPI processes. Special positioning and part manipulation fixtures are handled using robotics and electrified monorail to assure process integrity.

Heavy Equipment Programs

- Senior consultant to the project team providing technical assistance for the combine final assembly line redesign / re-layout to support lean manufacturing.
- Senior consultant to the project team providing technical assistance for the full redesign and implementation of two combine assembly feeder lines for lean manufacturing.
- Senior consultant to a defense equipment components manufacturing plant for improving plant productivity and competitiveness.
- Consultant for development of a manufacturing improvement plan for a manufacturer of heavy vehicles and equipment.
- Provided the time phased machine tool requirements for a new plant, utilizing the computer based capacity models he developed.
- Consultant for implementation of agile manufacturing concepts and techniques for a manufacturer of military ordnance.
- Assistant Project Manager for the Phase I IPI study of the General Dynamics Land System Division.
- As a consultant with the manufacturing strategic planning task force, Mr. Tracy developed comprehensive capacity analysis utilizing his own computer assisted planning techniques.
- Consultant assisting in the development of a long-range strategic plan for manufacturing agricultural implements in the client's United States and Canadian manufacturing plants.
- Project Engineer surveying the existing production plant, then developing the material flow analysis, storage analysis, paint systems requirements, and assisting in the overall plant layout development for the required production level. He assisted in the cost estimation for the proposed plant, which was to be located in Europe.

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Other Programs

- Consultant for the planning of conceptual layout, material handling systems, and facilities requirements for the expansion of a plant producing bulk chemical products.
- Project Manager for the planning and implementation of a reorganization of a \$25 million professional services firm in a turnaround situation.
- Industrial engineering team leader for the material handling development and layout for expansion of a chemical products process plant.
- Program Manager for implementation of an industrial waste water treatment plant.
- Provided expert witness testimony in support of multiple ad-valorem valuation actions. Subjects of testimony included manufacturing planning, manufacturing and material handling technology, facilities planning and design, and manufacturing operations.
- Project Manager responsible for development of a plan to consolidate five (5) existing warehouse locations into one warehouse location.
- As a member of the Computer Systems Strategic Planning Task Force, developed a three year, \$4,000,000 plan for complete implementation of computer integrated systems, including CAD/CAE, office automation, and integrated management systems. Plan implementation included major systems expansion and distributed processing linked by local area networks.
- Consultant for space planning methodology and software system analysis and development for the occupancy planning for a new office building.
- Project Manager for development of a manufacturing asset optimization program for a manufacturer of tillers, and other garden equipment.
- Project Manager for the development of facility alternative use concepts for three heavy manufacturing facilities being vacated.
- Special consultant for the material handling study for new refrigerator production systems.
- Project Manager responsible for development of a plan to consolidate an existing warehouse into another warehouse location.
- Consultant for space planning methodology and software system analysis and development for the long term space planning for municipal and county functions.

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- Project Engineer for development of the Division's manufacturing strategic plan, including capital budgeting projections.
- Project engineer for five major new product launches with responsibility to develop all processing, design and/or procurement of all tooling and equipment required.

Mr. Tracy is a frequent publisher and lecturer. Some of his publications and presentations are:

Society of Manufacturing Engineers

Computer Technology Solutions Conference, 1999.
"Using Modular Design / Modular Supply in Lean Manufacturing".

Powertrain Machining Conference, 1997.
"Trends in Powertrain Machining".

Powertrain Machining Conference, 1996.
"Trends in Powertrain Machining".

Manufacturing '96 Conference, 1996.
"Integrating Product Data into Manufacturing".

AUTOFACT '95 Conference, 1995.
"Paperless" Design - Concept to Build".

Manufacturing '94 Conference, 1994.
Tutorial - "Global Competitiveness".

AUTOFACT West '94 Conference, 1994.
Tutorial - "Manufacturing Cells - What Are They and How Do You Implement Them".

AUTOFACT '93 Conference, 1993.
Seminar - "Achieving Agile Manufacturing".

WESTEC '93 Conference, 1993.
"Justifying Flexible Manufacturing Programs - It Doesn't Have To Be By Faith Alone".

AUTOFACT '92 Conference, 1992.
Seminar - "Developing a Flexible Manufacturing Program".

Fundamentals of Cellular Manufacturing for Sheet Metal Fabrication Clinic, 1992.
"Plant Layout for Cells".

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AUTOFACT '90 Conference, 1990.
Seminar - "Material Handling for Flexibility".

International Machine Tool Conference, 1990.
"Material Handling for Flexible Systems and Cells".
Tutorial - "Specification of Equipment".

AUTOFACT '89 Conference, 1989.
"Justification of Advanced Manufacturing Technology".

AUTOFACT '89 Conference, 1989.
Tutorial - "Practical CIM".

FABTECH INTERNATIONAL '89 Conference, 1989.
"Succeeding With Limited Resources - A Practical Approach to Prioritizing
Capital Projects".

AUTOFACT '88 Conference, 1988.
"Implementing CIM: Top Down Integration or Bottom Up Islands of Automation".

AUTOFACT '87 Conference, 1987.
"Concept Development and Planning of Integrated Material Handling Systems In
An FMS Environment - A Case Study".

Simulation in Manufacturing Conference, 1986.
"Simulation of Integrated Material Handling Systems in an FMS Environment".

**Turnaround Management Association & Federal Bar Association – Eastern
District of Michigan (Bankruptcy Section)**

2009 Automotive Conference.
"Technology Trends and Implications".

Precision Metalforming Association

Southeast Michigan District, 2002.
"Making Money in Stamping".

International Quality & Productivity Center (ISPC)

Outsourcing Opportunities Conference, 1994.
"Identifying Core Competencies Workshop".

American Society of Mechanical Engineers (ASME)

National Manufacturing Week '01 Conference, 2001.
"Design for Machining".

National Manufacturing Week '00 Conference, 2000.
"Design of Machined Parts".

National Manufacturing Week '99 Conference, 1999.
"Design for Machining".

Automotive Industry Action Group (AIAG)

AUTO-TECH '97 Conference, 1997.
"Lessons Learned in Planning, Executing, and Launching Major Modules".

AUTO-TECH '96 Conference, 1996.
"Integrating Product Data into Manufacturing".

AUTO-TECH '95 Conference, 1995.
"Agile Manufacturing for Tier 2 Suppliers".

AUTO-TECH '94 Conference, 1994.
"Agile Manufacturing - The Next Revolution?".

International Society for Productivity Enhancement (ISPE)

Cars & FOF '88 Conference, 1988.
"Factory Automation Programs - Problems and Pitfalls".

Society of Automotive Engineers

Automotive Engineering Magazine, November & December 1994.
"Achieving Agile Manufacturing in the Automotive Industry".

Engineering Society of Detroit

International Computer Graphics Conference, 1987.
"Facility and Equipment Engineering Quality Assurance through CAD".

Engineering Society of Detroit

Automotive Computer Graphics Conference, 1985.
"Integrated Facilities Design for the Factory of the Future".