



Advanced Electronics & Controls

Take **Control** of Your Future





Oakland County Michigan Information

- ◆ More than one third of the state's R&D facilities are located in Oakland County
- ◆ Michigan ranks second in the nation in R&D spending
- ◆ Michigan companies file over 3,000 patents a year placing Michigan in the top 10 states for total number of patents granted
- ◆ **The auto industry, centered in Southeast Michigan, is the largest consumer of electronic components**

Organizations to Support You:

- ◆ Automation Alley - Southeast Michigan's Regional Technology Cluster
- ◆ Michigan's Technology Tri-Corridor
- ◆ Society of Manufacturing Engineers world headquarters
- ◆ Michigan Manufacturers Association
- ◆ Telecommunications Association of Michigan
- ◆ MMTC - Michigan Manufacturing Technology Center
- ◆ National Institute of Industrial Technology (NAIT)
- ◆ IEEE - Michigan chapter
- ◆ US Tank-Automotive and Armaments Command (TACOM)
- ◆ US Army Tank-Automotive Research, Development and Engineering Center (TARDEC)
- ◆ TARDEC's National Automotive Center (NAC)



Courtesy Autoliv



Oakland County's Advanced Electronics Industry is Focused on:

- Automotive electronics
- Consumer electronics
- Aerospace electronics
- Telecommunications
- Computer engineering
- Defense / military
- Biotechnology / medical devices

Workforce: Educated, Innovative & Motivated

- ◆ Over 40% of Oakland County residents have college degrees (national average is about 26%)
- ◆ **Oakland County has the third highest number of high-tech workers in the nation and twice the corporate R&D professionals compared to the national average**
- ◆ Population of Michigan workforce: 5.1 million
- ◆ 15 public universities, 50+ independent universities and colleges, 29 community colleges in Michigan
- ◆ Over 96,000 college degrees are granted every year in Michigan - almost twice as many as the national average
 - ◆ 2 ½ times the number of master's degrees were issued in Michigan than the national average
 - ◆ **Close to 1,500 Ph.D.s are granted in Michigan every year - that's almost twice the national average**

Michigan Universities: Research Centers

Kettering University

- ◆ Electricity & Solid-State Electronics Laboratory
- ◆ Circuits Laboratory
- ◆ Controls Laboratory
- ◆ Semiconductor Characterization Laboratory

Lawrence Technological University

- ◆ The Automotive Engineering Institute
- ◆ Power Electronics Laboratory

Michigan State University

- ◆ NSF Center for Sensor Materials
- ◆ Electronic and Biological Nanostructures Laboratory (EBNL)
- ◆ National Superconducting Cyclotron Laboratory (NSCL)
- ◆ Biomechanics Electronics Laboratory
- ◆ Advanced MicroSystems and Circuits (AMSaC) Laboratory
- ◆ Power Electronics Laboratory (PEL)

Michigan Tech University

- ◆ The Power & Energy Research Center (PERC)

Oakland Community College

- ◆ Customized Advanced Electronics Programs and Certificates

Oakland University

- ◆ Product Development and Manufacturing Center

University of Michigan

- ◆ Center for Research on High-Frequency Microelectronics
- ◆ Center for Ultrafast Optical Science
- ◆ Center for Wireless Integrated Micro Systems (WIMS)
- ◆ MURI Center for Intelligent Electronics
- ◆ Institute for Advanced Vehicle Systems (Dearborn)
- ◆ Solid State Electronics Laboratory
- ◆ Laboratory for Atomic-Scale Design of Electronic Materials
- ◆ Communications & Signal Processing Laboratory

Wayne State University

- ◆ SenSound - Visualization of 3D sound sources and paths
- ◆ Applied Optics Laboratory
- ◆ Laboratory for Materials, Device and Circuit Simulations
- ◆ Microelectronic and Photonic Materials Research Laboratory
- ◆ Smart Sensors and Integrated Devices
- ◆ Optoelectronics Research Laboratory
- ◆ Laboratory for Intelligent Structural Biology

Green - These universities are either located in Oakland County or have campuses in Oakland County

Access to Capital

Oakland County's Economic Development Team will help your company find potential sources of capital and financing.

Michigan Venture Capital Association - Established by venture capital and private equity investors in the state, the Michigan Venture Capital Association (MVCA) is the state's premier public policy advocate for the private equity/venture capital industry. MVCA works to promote entrepreneurship and private equity investment.

Venture Capital - In four years alone, over \$694 million in venture capital has been invested in 101 businesses in Michigan. For new emerging technology initiatives, Michigan has created the \$150 million Venture Michigan Fund to catalyze investment in early-stage firms operating in Michigan. With the matching requirement, this initiative will attract an additional \$450 million in capital to Michigan for investment in promising new companies.

Angel Networks - Aimed at helping companies with early stage seed financing, Michigan is fortunate to have three active Angel Networks: The Great Lakes Angels, The Grand Angels and The Ann Arbor Angels.

Traditional and Non-Traditional Financing - Oakland County's Business Finance and Economic Development Corporations help companies with the SBA 504 Loan and with Tax-Exempt Revenue Bond programs. Through the Automation Alley Technology Center, emerging companies can be assisted with securing non-traditional and unique sources of financing and capital.

State Incentives / Tax Credits - Michigan has a wide variety of incentive programs and credits for companies that qualify.



Courtesy Siemens



Research Projects at Michigan Universities *(partial list):*

- ♦ An "intelligent control" software system when local power is interrupted
- ♦ Development of and integrated microsystems for biomedical electronics
- ♦ Telematics and vehicle infrastructure integration
- ♦ Wide bandgap semiconductors
- ♦ Nanoscale optics and photonic devices
- ♦ Solid state electronics
- ♦ MEMS
- ♦ Control systems and passive tracking
- ♦ Microcontroller applications, instrumentation and data acquisition
- ♦ Electronic Speckle Pattern Interferometer (ESPI) for packaging
- ♦ How drivers manage distractions and interact with vehicle telematics
- ♦ Analog and switching-capacitor filter design
- ♦ Low power-delay bistable logic topologies using resonant tunneling diodes
- ♦ Quantum-effect circuit noise, speed and power performance
- ♦ Micro actuators
- ♦ Wireless networks to assess the health or safety conditions of infrastructure
- ♦ Electromagnetic capabilities
- ♦ Vibration analysis and predictive maintenance
- ♦ Design of microcontroller-based systems
- ♦ System engineering approaches for large-scale system design
- ♦ An all-electric race car
- ♦ Physical electronics
- ♦ Zero-delay overhead SRAM self-repair scheme for memory compiler
- ♦ Quantum-effect circuit based system architecture prototypes
- ♦ Micropower systems
- ♦ Polymers and other semiconductor materials
- ♦ Nonlinear control, adaptive control, control of electric drives, singular perturbation methods

Advanced Electronics & Controls Companies

Accurate Technologies Inc.
Acer/Altos
Adco Circuits Inc.
Advanced Research Co. Inc.
Advanced Systems & Controls
Aeroflex Microelectronics Solutions Inc.
AISIN World Corporation of America
Alpine Electronics
Alps Automotive Inc.
Altair Engineering Inc.
American Systems Technology Inc.
Amtech USA
Animatronics Inc.
ArvinMeritor Inc.
Assembltech Inc.
Ati Systems Inc.
Audi of America
Autocam Corp.
Autoliv
Balance Technology Inc.
Balogh Tag Inc.
Behr America
BorgWarner
C E C Controls Co. Inc.
Circuit Controls Corp.
Clarion Corp.
Clark-Mxr Inc.
Code Blue Corp.
CogniTens
Computerized Security Systems
Controlled Power Co.
Corrsys-Datron Sensor Systems
Covansys Corp.
Custom Machines Inc.
DaimlerChrysler
Debron Industrial Electronics Inc.
Delphi Corp.
DENSO International America
Detroit Diesel Reman North Inc.
Deutsche Telekom
Dexter Research Center Inc.
Diamond Electric Manufacturing Corp.
Door-Man Manufacturing Co.
Durr Automation Inc.
EASi
Eaton Corp.
Ebw Electronics Inc.

(continued)

Advanced Electronics & Controls Companies *(continued)*

EDS

Ekstrom Industries Inc.
Electrical Design and Control Co.
Electro-Matic Products Inc.
Electronic Product Integration Corp.
Electro-Optics Technology Inc.
Elmos Inc.
Emerson Electric
Energy Conversion Devices Inc.
Excel Electrocircuits Co.
Excel Industrial Electronics Inc.
Federal Apd Inc.
Fema Corporation of Michigan
Fiat R&D USA
Ford Motor Co.
FUBA Automotive
Furukawa Electric
Futaba Corp.
Galco Industrial Electronics Inc.
GE Automotive
General Motors ONSTAR
General Signal Corp.
GHSP Corp.
Global Electronics Ltd.
Global ET
H & L Manufacturing Co. Inc.
H E L P Engineering Inc.
Haden International Group Inc.
Heco Industrial Service Groups
Hella Electronics Corp.
Hemlock Semiconductor Corp.
Hi-Lex Corp.
Honeywell
Hyundai Electronics
I D C Corp.
IEE Automotive
I I Stanley Co. Inc.
Imra America Inc.
Indicon Corp.
Infrared International Ltd.
Inmet Corp.
Integral Vision Inc.
Integrated Security Corp.
JAE Electronics
Jay Enn Corp.
Jervis B. Webb Co.
Jmr Holdings Inc.
Johnson Controls
Johnson Technology (GE)

Kamco

Kendall Electric Inc.
Key Safety Systems Inc.
Kostal of America Inc.
L-3 Avionics Systems
Lake Michigan Wire Technologies Inc.
Laser Access Inc.
Laser Mechanisms Inc.
Lear Corp.
Lebow Products Inc.
Leco Corp.
Legend Mobile Inc.
Long USA Inc.
Lotus International Co.
Mabuchi North America
Marelco Power Systems Inc.
Matsuchita Electric Industrial
Mectron Engineering Co.
Meidensha Corp.
Memtron Technologies Co.
Meridian Automotive Systems
Micro Craft Inc.
Microheat
Midwest Microwave Inc.
Miller, R A Industries Inc.
Mitsubishi Electric
Murata Electronics North America
N.S. International Ltd.
Nartron Corp.
NEC Electronics
NGK Spark Plugs (U.S.A.) Inc.
Nissan Research and Development
Novi Industries Inc.
Odyssey Electronics Inc.
Oleco Inc.
O
Optrex America Inc.
Otb International
Oxford Automotive Inc.
Patriot Antenna Systems Inc.
Perceptron Inc.
Phillips Electronics / Semiconductors
Pilz Industrial Electronics
Pioneer Electronics
Precitec
Prestolite Electic LLC.
Prestolite Wire Corp.
Progressive Dynamics Inc.
Q-Das Inc.

R H K Technology Inc.

Rapp & Sons Inc.
Raytheon
Robert A Denton Inc.
Robert Bosch
Rockwell Automation Inc.
Rofin-Sinar Technologies Inc.
Rohm Electronics
Roush Industries
Safari Technologies Inc.
Safety Research and Development Laboratory
Saline Electronics Inc.
Samsung Electronics
Sandston Corp.
Saturn Electronics Corp.
Selcom
Sensor Developments Inc.
Siemens
Sine Systems Corp.
Smiths Aerospace
Sparton Corp.
Square D
Ssi Technology Inc.
STM Power Inc.
Superior Controls
S-Y Systems Technologies America LLC.
T E Technology Inc.
Tengam Engineering Inc.
Test Products Inc.
TKS Industrial Co.
Trans-Industries Inc.
Tri-Con Industries Ltd.
TRW
Tyden Group Inc.
Ulysses Systems Inc.
USA Switch Inc Systems Inc.
Ventech
Veri-Tek International Corp.
Versus Technology Inc.
Visteon Corp.
Welform Electrodes Inc.
Wellington Industries Inc.
Yazaki North America Inc.
Yokogawa Electric

Green - Oakland County Companies

Blue - Southeast Michigan Companies

Black - Michigan Companies

Contact us with any additions or changes to this list.

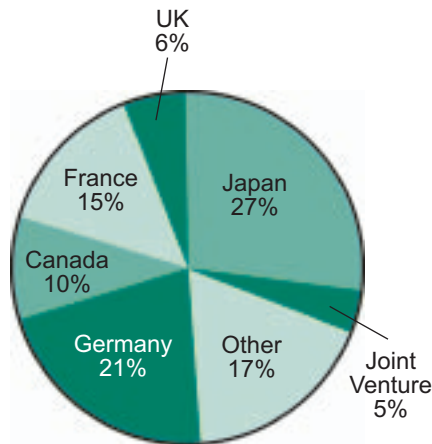
Oakland County Can Help Your Business

Our Economic Development Team offers free and confidential assistance in:

- Site location
- Financing
- Tax incentive
- Liaison with state and local agencies
- Workforce development
- Business Assistance Center (business consulting)
- Information products - to ensure you make the right decision for your company's location

Oakland County is an International Hub

Foreign firms make the strategic decision to locate in Oakland County because of the highly skilled workforce, strong educational systems and the international support services available to them.



- 653 foreign-owned firms from 24 countries are in Oakland County
- 259 of these firms came to Oakland County in the last 12 years-that's an average of two foreign companies a month opening a location in Oakland County

Oakland County is Strategically Located



- Centrally located between Chicago, Toronto and Cleveland, Oakland County is strategically positioned to capture the entire Midwest market
- The Michigan-Ontario border is the busiest U.S.-Canada crossing in the country, making this area an ideal location to reach the United States and the Canadian markets. Ontario, less than an hour's drive from Oakland County, generates some 40% of Canada's total gross domestic product



L. Brooks Patterson,
Oakland County Executive

*With the support of
The Oakland County Board
of Commissioners*



Contact us today for more information:

**Oakland County Department of Economic Development & Community Affairs
Planning & Economic Development Services**

2100 Pontiac Lake Road, Building 41 West
Waterford, MI 48328
Phone: (248) 858-8706 | Fax: (248) 975-9555

Website: www.emergingsectors.org

Oakland County's Automotive R&D
Contact: **Chuck Holmes**
Email: holmesca@oakgov.com