

# **Contribution of General Motors' Manufacturing Plants to the Economies of Ten States and the United States in 2013 and 2014**

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For UAW-General Motors Center for Human Resources



Kristin Dziczek  
Debbie Maranger Menk  
Yen Chen

3005 Boardwalk, Suite 200  
Ann Arbor, Michigan 48108

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## Executive Summary

This report estimates the contribution of General Motors' manufacturing plants to the United States economy and the economies of the 10 U.S. states in which the company's UAW-represented workforce manufactures vehicles, parts, and components.<sup>1</sup> The estimates produced are for these operations during calendar years of 2013 and 2014. In 2014, General Motors operated 40 manufacturing facilities in the United States—12 assembly plants, 12 powertrain manufacturing facilities, 10 stamping facilities, 4 component manufacturing plants, a tool & die facility, and a battery assembly plant. Michigan is home to the largest share of GM manufacturing facilities with 16, followed by Ohio with 6, Indiana with 4, Tennessee and New York with 3 each, Kansas, Missouri, and Texas with 2 each, and Kentucky and Maryland—each with 1 plant.<sup>2</sup> In calendar year 2014, GM manufactured nearly 2.1 million light vehicles in the United States, and sold nearly 2.9 million cars and light trucks in the U.S. market.

To generate estimates of the economic contribution of GM's UAW-represented manufacturing plants to the U.S. economy, as well as to each of the ten individual states in which the plants are located, CAR researchers customized a specially constructed regional economic contribution model using employment and compensation data provided by the company. GM reported nearly 50,700 direct hourly and salaried employees at its U.S. manufacturing facilities in 2013.<sup>3</sup> CAR estimates that GM's direct employment supported a total of nearly 438,300 jobs in the U.S. economy; this employment figure is in addition to the direct jobs at GM, and includes intermediate jobs at all suppliers to GM, and expenditure-induced spin-off jobs. CAR's analysis yields an employment multiplier of 9.6 in 2013—meaning that every GM assembly, powertrain, stamping, tool & die, and components manufacturing job supports another 8.6 jobs in the U.S. economy. GM's U.S. manufacturing employment produced an estimated \$34.4 billion in compensation in the U.S. economy in 2013. CAR researchers estimate that GM's U.S. Manufacturing activities supported over \$4.5 billion in transfer payments and social insurance contributions, and more than \$4.8 billion in federal personal income taxes in 2013.

In 2014, CAR estimates that GM's U.S. manufacturing facilities employed 51,600 direct hourly and salaried employees, and that these direct jobs supported another 431,300 jobs in the U.S. economy. The analysis yields a slightly lower employment multiplier of 9.4 in 2014, which is largely due to improving U.S. economic conditions which lead to higher demand in other sectors of the economy. CAR estimates GM's U.S. manufacturing employment produced an estimated \$36.2 billion in compensation, supported nearly \$4.8 billion in transfer payments and social insurance contributions, and generated more than \$5.3 billion in federal personal income taxes in 2014.

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<sup>1</sup> In February 2014, CAR issued a research memorandum on the contribution of General Motors' decision to reopen three "stand-by" manufacturing facilities—Orion Assembly (Michigan), Pontiac Metal Center (Michigan), and Spring Hill Assembly (Tennessee). This report updates and expands CAR's 2014 analysis.

<sup>2</sup> General Motors also operates a number of parts warehousing and distribution sites throughout the United States. While the UAW represents workers in these Customer Care and Aftersales locations, the economic contribution of these sites is not explicitly included in this report.

<sup>3</sup> The UAW represents only the hourly production and skilled trades workers in General Motors' manufacturing facilities.

## GM Automotive Manufacturing is at the Core of GM's Economic Contribution to the U.S. Economy

This study measures the contribution of General Motor's pure automotive manufacturing activities to the U.S. economy. To make these estimates, CAR researchers obtained GM's 2013 employment for the 40 GM manufacturing facilities located across 10 U.S. states. From CAR's past research in this area, we know that these 50,700 jobs generate the overwhelming share of GM's overall contributions to the U.S. economy for two reasons:

- First, automotive manufacturing activities are most vulnerable to import substitution. Imports comprise 29 percent of current U.S. light vehicle sales, and GM—like any global automaker—has the option of replacing its U.S. production with imports from many non-U.S. locations. That GM manufacturing is now globally competitive, and produces the company's highest per-unit profits of any region where the company operates demonstrates a dramatic turn-around from past performance. Many other profitable U.S. manufacturing firms base their administration and design & engineering activities in the United States but outsource their product manufacturing, and the examples of Apple and Nike are just a few sad reminders of the real reasons for the economic decline of the U.S. middle class in recent decades—the erosion of the U.S. manufacturing base. CAR's use of the REMI Inc. estimation model in this study estimates the impact on the U.S. economy if GM's U.S. manufacturing operations were instead located overseas—much like Apple's or Nike's.

- Second, the employment multiplier for automaker manufacturing is much larger than that of GM's other activities—such as administration, research & product development, or marketing. Manufacturing jobs at motor vehicle manufacturing firms are connected to the broadest and deepest set of supply chains associated with any final product industry, with at least 20 other major manufacturing and non-manufacturing industries each supplying billions of dollars to GM's final assembly and component plants. The list of industry and industry groups supplying GM spans the gamut from materials and utilities, transportation and warehouse services, to the vast auto parts manufacturing industry itself. In contrast, an automaker's non-manufacturing activities rely upon relatively few supplier sectors to provide services or materials; many of CAR's past economic contribution studies have illustrated this fact. The economic impact of GM's non-manufacturing operations is dwarfed by both the output of the company's manufacturing labor force and the output of its massive supplier network. Note that a company's contribution to the economy is correctly measured not just by its profitability, but also by the compensation paid to employees and suppliers as part of the enterprise's overall value-added to the U.S. economy.

GM's economic contributions to the U.S. economy are not just in the short run; as long as GM manufacturing remains globally competitive, it will continue to generate value added per hour worked and use resources at a far higher rate than any other economic activity in the United States where these labor or other resources could otherwise be employed.

Sean P. McAlinden, Ph.D.  
Executive Vice President for Research, Chief Economist  
Center for Automotive Research

## **GM's Presence in the United States**

General Motors (GM) has a 107-year history of designing, engineering, manufacturing, and selling motor vehicles and parts in the United States, and a 78-year history of collective bargaining with its workforce that is represented by the International Union, UAW.<sup>4</sup> GM's global headquarters are located in Detroit, Michigan, and the company manufactures motor vehicles under 10 brands in 30 countries worldwide, and also has significant investments in three joint venture subsidiaries in China, and one in Korea. In the U.S. market, GM manufactures and sells under the Cadillac, Chevrolet, Buick, and GMC brands. GM manufactured nearly 2.1 million cars and trucks in 2014, and sold over 2.9 million light vehicles in the United States that same year—which represents nearly 30 percent of the company's global vehicle deliveries.

For purposes of this study for the UAW-GM Center for Human Resources, CAR examined only the hourly and salaried employment and economic activity associated with GM's U.S. manufacturing facilities. The company employs an estimated 78,000 total U.S. employees; 50,700—or about two-thirds—of these employees work in GM's 40 manufacturing facilities in Indiana, Kansas, Kentucky, Maryland, Michigan, Missouri, New York, Ohio, Tennessee, and Texas. The remaining third of GM's employment represents the primarily salaried employees, who work at GM's headquarters, technical center, sales & marketing support, as well as hourly and salaried workers in the company's customer care & aftersales function; these facilities and employees are excluded from this analysis.

GM's hourly workers are represented by the United Automobile, Aerospace, and Agricultural Implement Workers union (UAW). The workers are covered by a national labor agreement that sets company-wide standards for pay, benefits, and conditions of work, as well as local contracts that cover work rules and other non-economic aspects of work at each facility. The UAW-GM Center for Human Resources (CHR) is a jointly-administered labor-management training and programs office that was established in 1984, and funded by a negotiated fund that the company contributed to for every hour worked by UAW-GM members.

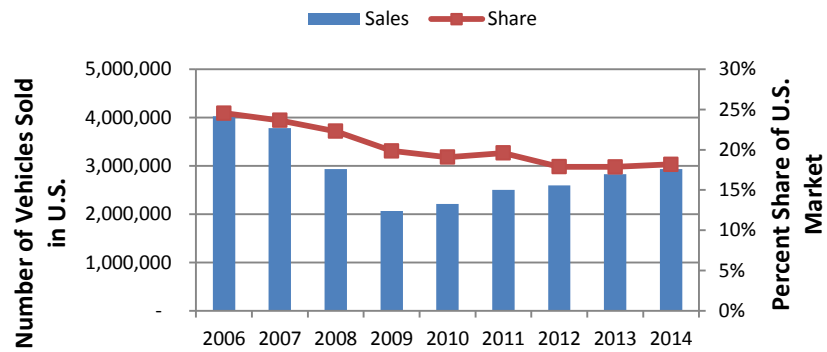
### ***GM's U.S. Sales and Market Share***

GM's U.S. sales of over 2.9 million cars and trucks represented an 18.2 percent share of the U.S. market in 2014. The company's market share has recently stabilized between 17 and 18.5 percent, after a decades-long period of decline. Vehicles such as the Chevrolet Silverado—the 2014 North American Truck of The Year, the Chevrolet Cruze—the U.S.'s top selling domestic small car, and the Chevrolet Volt—the first extended-range hybrid available in the U.S. market, demonstrate GM's appeal in the marketplace, the company's technological leadership, and GM and the UAW-represented workforce's commitment to quality.

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<sup>4</sup> The full name of the UAW is: "International Union, United Automobile, Aerospace, and Agricultural Implement Workers of America."

Figure 1: General Motors' U.S. Sales and Market Share 2006-2014



Source: LMC Automotive

GM vehicles are performing well in the market, as well as on independent quality evaluations. The 2015 Consumer Reports' Annual Auto Survey ranked Buick seventh, making it not only the top domestic brand overall, but also the first domestic brand to crack into the top 10 on Consumer Reports' list. In addition, Buick has the highest proportion of its models earning high marks for reliability in the survey at 83 percent—more than any other brand (foreign or domestic). The Chevrolet Impala was Consumer Reports' top pick for the large car segment, and the Buick Regal was named the top sports sedan. The 2015 Consumer Reports Annual Automotive Reliability Survey also ranked Buick number 6 (up 10 places from 2014).<sup>5</sup> J.D. Power's Initial Quality Survey names 6 GM vehicles as tops in their segment based on the number of owner-reported problems during the first 90 days of new-vehicle ownership. The models that earned the top IQS rating in their segment include: Chevrolet Silverado HD—large heavy duty pickup, Chevrolet Suburban and GMC Yukon—large SUVs, GMC Terrain—compact SUV, Buick Encore—small SUV, and Chevrolet Malibu—midsize car.<sup>6</sup> In the most recent J.D. Power Vehicle Dependability Study all four GM brands—Buick, Cadillac, Chevrolet, and GMC—rank above average, and Buick and Cadillac captured 2 of the top 4 positions on the list.<sup>7</sup> The Vehicle Dependability Study tracks complaints from owners of 3-year-old vehicles, and is a key measure of manufacturing quality. Quality is the price of admission in today's competitive automotive market, and GM and the UAW have made great strides in improving the reliability and customer perceptions of quality of its products in recent years.

<sup>5</sup> <http://www.consumerreports.org/cro/magazine/2015/04/consumer-reports-10-top-picks-of-2015/index.htm>

<sup>6</sup> <http://autos.jdpower.com/ratings/quality.htm>

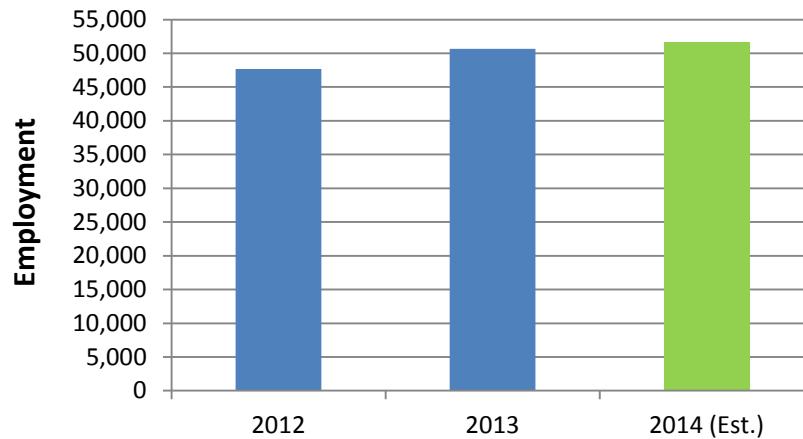
<sup>7</sup> <http://autos.jdpower.com/ratings/dependability.htm>



### GM's U.S. Manufacturing Employment and Production Sites

GM employed 50,700 hourly and salaried employees at the company's 40 manufacturing facilities in the United States in 2013, which represents a 6.3 percent increase over GM's 2012 U.S. manufacturing employment.

Figure 2: General Motors' U.S. Manufacturing Employment, 2012-2014



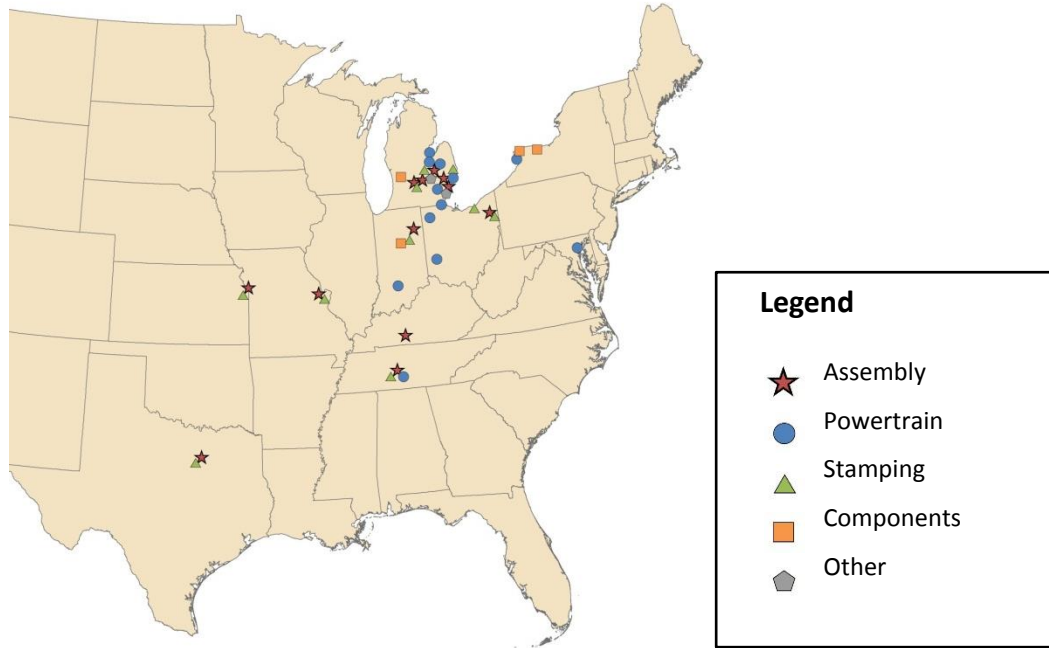
Source: Company data; Center for Automotive Research analysis

GM currently operates 12 vehicle assembly plants,<sup>8</sup> 12 engine and transmission plants, 10 stamping facilities, 4 component manufacturing plants, a tool & die facility, and a battery assembly plant in the United States<sup>9</sup>

<sup>8</sup> In addition, GM and the UAW agreed in 2009 to place four manufacturing plants on “stand-by” status; of these four, only one—an assembly plant in Janesville, Wisconsin—remains idle. The Janesville plant is not included in the analysis presented in this report.

<sup>9</sup> GM shuttered eight U.S. vehicle assembly, 5 engine & transmission, 7 stamping, and at least 10 components manufacturing plants and other facilities between 2006 and 2013. A number of the closed plants were transferred to the assets of Motors Liquidation Company (the former General Motors Corporation). The Revitalizing Auto Communities Environmental Response (RACER) Trust was created by the U.S. Bankruptcy Court to remediate, market, and sell these and other former GM properties.

Figure 3: General Motors' U.S. Assembly, Powertrain, Stamping, and Component Manufacturing Plants



Source: GM, Center for Automotive Research

GM also operates manufacturing facilities in Canada and Mexico—5 assembly and 3 engine and transmission facilities. These plants are not included in the economic contribution analysis in this report, but are included in the discussion of North American productive capacity that follows in the next section as large components such as engines and transmissions that are produced in the United States are exported to Canada and Mexico for final assembly into GM vehicles.

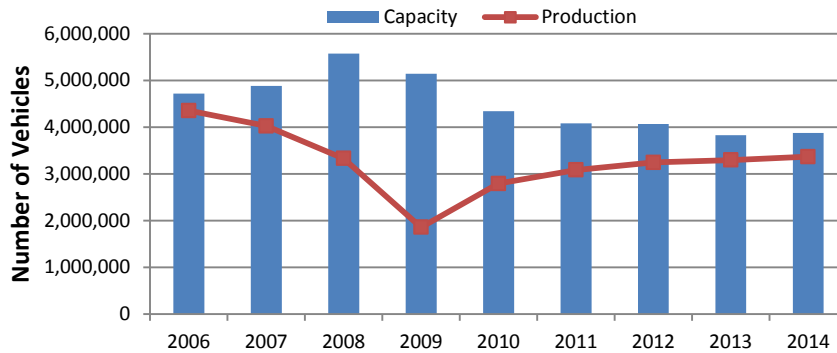
### GM's North American Capacity and Production

The company's Chapter 11 bankruptcy in 2009 provided an opportunity for the company to better align its productive capacity with current and future market demands for GM cars and trucks. As a result of actions taken during the bankruptcy, the company's productive capacity<sup>10</sup> in North America fell from 5.6 million vehicles in 2008 to 3.9 million vehicles in 2014. Lower capacity coupled with production gains improved GM's capacity utilization from 59 percent in 2008 to 87 percent in 2014—which represents a more efficient use of remaining factories. Nearly 80 percent of GM's 18 assembly plants in North America are currently running two or more shifts (or crews) to meet production demand, and many plants also routinely run overtime (extended daily and/or weekend production). Figure 4 shows GM's capacity and production between 2006 and 2014. While one might expect to see a jump in production capacity in 2011 (when Orion Assembly restarted production) and in 2012 (when Spring Hill Assembly restarted production), these additions to capacity were offset by the proportion of Wentzville

<sup>10</sup> Two-shift, straight-time capacity.

Assembly’s productive capacity that was off-line to retool for new small trucks.<sup>11</sup> The 2014 capacity increase was due to this portion of Wentzville coming back on-line.

**Figure 4: General Motors’ North American Capacity and Production, 2006-2014**



Source: LMC Automotive

### Assembly

GM produced 2,053,821 cars and trucks in 12 vehicle assembly plants in 8 U.S. states in 2014. Nearly 36 percent of all GM cars and trucks manufactured in the United States in 2014 were made in Michigan; Indiana ranks second with 16 percent of GM’s U.S. vehicle production; Texas ranks third with 14 percent; and Ohio ranks right behind Texas with almost 13 percent of GM’s U.S. vehicle production. The locations of each of GM’s assembly plants, 2014 models, and production volumes are shown in Table 1.

**Table 1: GM U.S. Vehicle Assembly Plants**

	PLANTS	MODELS PRODUCED IN 2014	2014 PRODUCTION VOLUME
CARS	Bowling Green, KY	Chevrolet Corvette Stingray; Performance Build Center (Engines)	46,727
	Detroit-Hamtramck, MI	Cadillac ELR; Chevrolet Impala, Malibu, and Volt; Opel Ampera	61,046
	Fairfax, KS	Buick LaCrosse; Chevrolet Malibu	174,823
	Lansing Grand River, MI	Cadillac ATS and CTS	40,720
	Lordstown, OH	Chevrolet Cruze	265,619
	Orion, MI	Buick Verano; Chevrolet Sonic	156,664
	TRUCKS	Arlington, TX	Cadillac Escalade and Escalade ESV; Chevrolet Suburban and Tahoe; GMC Yukon and Yukon XL
Flint, MI		Chevrolet Silverado; GMC Sierra	184,655
Fort Wayne, IN		Chevrolet Silverado; GMC Sierra	341,915
Lansing Delta Township, MI		Buick Enclave; Chevrolet Traverse; GMC Acadia	292,183
Spring Hill, TN		Chevrolet Equinox	43,981
Wentzville, MO		Chevrolet Colorado, Express; GMC Canyon, Savana	159,367

<sup>11</sup> Wentzville Assembly continued to produce full-size vans while the plant was retooling to produce GM’s new smaller trucks—the Chevrolet Colorado and the GMC Canyon.

Since January 2009, GM has invested \$5.6 billion in its U.S. assembly plants; the investments included:

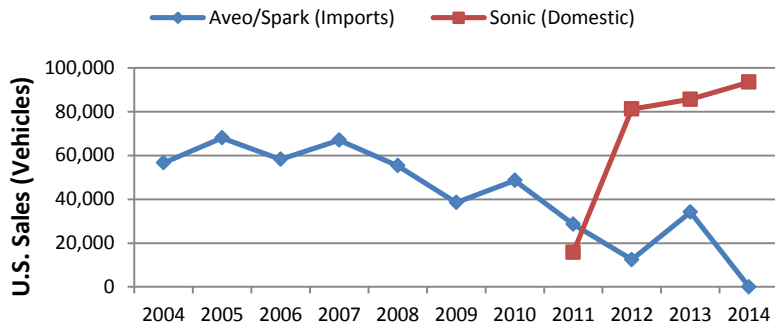
- Arlington Assembly—Retooling for Tahoe, Yukon, Escalade, and Suburban production
- Bowling Green Assembly—Consolidating Performance Build Center operations and retooling for the Chevrolet Corvette
- Detroit-Hamtramck Assembly—Facility upgrades to produce the Chevrolet Volt, Malibu, Impala, Cadillac ELR, and the redesigned next generation Chevrolet Volt, as well improvements to the plants logistics and transportation facilities
- Fairfax Assembly—Expansions to the paint shop, stamping facility, and retooling for Chevrolet Malibu and a hybrid model of Buick LaCrosse
- Flint Truck Assembly—A new paint shop, facility upgrades, and retooling to produce the new model heavy-duty pickup trucks
- Fort Wayne Assembly—Body shop additions
- Lansing Delta Township—Expansion of general assembly, body shop, and paint shop
- Lansing Grand River Assembly—Retooling for production of the Cadillac ATS, as well as for logistics upgrades and a new stamping facility
- Lordstown Assembly—Retooling for next generation Chevrolet Cruze—including a diesel model, updates to the trim shop and press room, as well as a 2.2 megawatt solar array
- Orion Assembly—Complete retooling for production of the Chevrolet Sonic<sup>12</sup> and Buick Verano, as well as upgrades to utilize more renewable fuels in the plant and recently-announced investment for production of an all-new Chevrolet electric vehicle
- Spring Hill Assembly—Retooling for flexible production system to produce the Chevrolet Equinox, as well as a future mid-sized vehicles
- Wentzville Assembly—Complete retooling to produce mid-sized pickup trucks—the Chevrolet Colorado and GMC Canyon, and addition of stamping capacity

Some of GM's investments have been to supplant imports with domestic production—which is also a goal of the UAW in its negotiations with the company. For instance, GM's small cars had previously been supplied to the U.S. market as Chevrolet-badged captive imports from Korea. The chart below shows how U.S. sales of the Chevrolet Aveo and Spark have fallen, while sales of the U.S.-produced Chevrolet Sonic have increased dramatically since the car's introduction in the 2012 model year.

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<sup>12</sup> The Sonic is the smallest car GM has assembled in the United States since the Chevrolet Chevette was produced in the years 1975-1987. Between 1987 and 2011 (when Sonic production began), GM rebadged and imported small cars from other manufacturers (Isuzu, Suzuki, and Toyota), as well as producing small Chevrolets in GM's Korea (formerly Daewoo) plants for import to the United States. There were a number of specific agreements between the UAW and GM regarding conditions necessary for this investment; most notably, the union and the company agreed that due to the competitiveness of the small car segment in the United States, "innovative labor agreement provisions" would be required to produce these small vehicles profitably. The key "innovative" labor provision was the composition of the workforce—with an eventual goal that the Orion Assembly workforce would be entirely entry level workers, who earn a starting wage and benefit package that costs roughly half that of the more senior union workers in the plant.

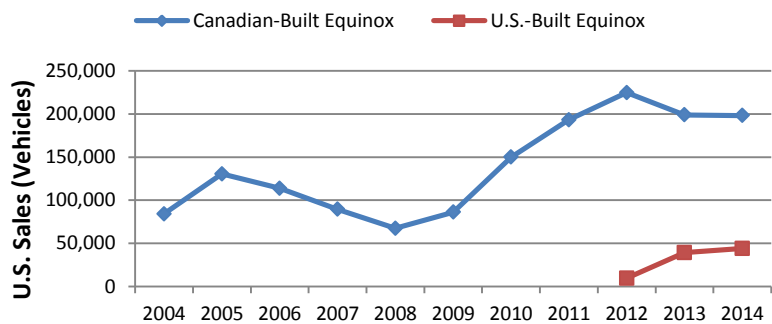
**Figure 5: General Motors' U.S. Small Car Sales: Korean-produced Chevrolet Aveo and Chevrolet Spark and U.S.-produced Chevrolet Sonic, 2004-2014**



Source: Automotive News Data Center

In late 2011, GM announced a \$61 million investment to restart Spring Hill Assembly as an ultra-flexible automotive assembly plant capable of building any GM car or cross-utility vehicle (CUV) that the market demands. An additional \$183 million investment was committed to Spring Hill Assembly for production of a future midsize vehicle. Production at Spring Hill Assembly restarted in third quarter of 2012 with the Chevrolet Equinox (which is also produced in two Canadian plants: CAMI Assembly plant in Ingersoll, Ontario, and Oshawa Assembly in Oshawa, Ontario). GM has committed to produce two additional models at the plant—including the next generation Cadillac SRX (the current model is produced in Mexico). The chart below shows how U.S. sales of the Canadian-built Equinoxes have fallen, while sales of U.S.-produced Equinoxes have increased.

**Figure 6: General Motors' U.S. Chevrolet Equinox Sales: Canadian vs. U.S.-produced Vehicles, 2004-2014**



Source: Automotive News Data Center (2004-2011) and General Motors (2012-2014)

## Powertrain

GM operates 12 powertrain plants in the United States:

*Table 1: GM U.S. Powertrain Plants*

Baltimore Transmission, MD	Romulus Powertrain, MI
Bay City Powertrain, MI	Saginaw Metal Casting Operations, MI
Bedford Foundry, IN	Spring Hill Engine, TN
Defiance Foundry, OH	Toledo Transmission, OH
DMAX-Moraine, OH	Tonawanda Engine, NY
Flint Engine, MI	Warren Transmission, MI

Since January 2009, GM has invested roughly \$4.8 billion in its U.S. powertrain operations, including:

- Baltimore Transmission—Expansion for production of vehicle electrification components
- Bay City Powertrain—Retooling for components for a new V6 engine and the small Ecotec
- Bedford Foundry—Retooling and expansion for 6-, 8-, and 10-speed transmissions and powertrain castings
- DMAX Engine—Design changes to meet future emissions requirements
- Defiance Foundry—Part, components, and precision sand-cast blocks for the Ecotec 1.4L engine, and V8 components
- Flint Engine South—Expansion and retooling for V-6 engines, small Ecotec gasoline engines, and a new line of fuel-efficient engines for use in GM’s small cars
- Romulus Powertrain—Retooling for a new V-6 engine and a new 10-speed transmission
- Saginaw Metal Casting Operations—Retooling to produce castings for next generation engine programs
- Spring Hill Engine—Retooling for Ecotec engine program and new small displacement gasoline engine
- Toledo Transmission—Adding a new 8-speed transmission, and expanding capacity for 6-speed transmissions
- Tonawanda Engine—Retooling for a 4.3L V6, 5.3L V-8, and two variants of a 6.2L V-8
- Warren Transmission—Retooling to shift production of the Chevrolet Volt’s electric drive unit from Mexico to Michigan

## Stamping

GM operates 10 stamping facilities in the United States—including stand-alone Metal Centers and facilities that are contiguous to an assembly plant:

*Table 2: GM U.S. Stamping Facilities*

<b>Metal Centers</b>	<b>Contiguous Stamping Operations</b>
Flint, MI	Arlington, TX
Marion, IN	Fairfax, KS
Parma, OH	Lansing Regional Stamping, MI
Pontiac, MI	Lordstown, OH
	Spring Hill, TN
	Wentzville, MO

Since January 2009, GM has invested approximately \$700 million in its U.S. stamping facilities, including:

- Retooling Fairfax, Flint, Lansing Regional Stamping, Lordstown, Marion, Parma, Pontiac, Spring Hill, and Wentzville
- Opening new contiguous stamping operations in Arlington and Lansing Grand River

## Other GM Manufacturing Facilities

GM operates 6 other manufacturing facilities, including 4 components plants, a battery assembly plant, and a tool and die operation. The components plants (Grand Rapids, Kokomo, Lockport, and Rochester) had once been part of old GM's components business that was spun off to form Delphi Automotive in 1994, but were re-integrated into GM's operations in 2007 as the result of a Memorandum of Understanding between GM, Delphi, and the UAW.

*Table 3: Other GM U.S. Manufacturing Facilities*

<b>Components Holding Facilities</b>	<b>Other</b>
Grand Rapids, MI	Brownstown Battery Assembly, MI
Kokomo, IN	Flint Tool & Die, MI
Lockport, NY	
Rochester, NY	

Since January 2009, GM has invested nearly \$180 million in its other U.S. manufacturing operations, including:

- Brownstown Battery Assembly—expansion to produce more lithium-ion batteries for the Cadillac ELR, Chevrolet Volt, and Opel Ampera
- Flint Tool & Die—retooling for Chevrolet Volt
- Investments in component production at Grand Rapids and Rochester

## Methodology

CAR's utilizes a specially constructed regional economic impact model (REMI<sup>13</sup>), and customizes the analysis using proprietary company data on employment and compensation for each region, as well as publicly available data on investments. The model is used to generate estimates of the economic contribution associated with GM's manufacturing operations in the United States, as well as in the 10 states in which the company manufactures vehicles, engines, transmissions, stampings, batteries, and other components.

The REMI model has been fully documented and peer-reviewed, and was designed for the type of analyses required for this report. The model has been used by CAR and other organizations for over two decades. The version of the model used in this analysis represents the economy of the United States, as well as the states of Indiana, Kansas, Kentucky, Maryland, Michigan, Missouri, New York, Ohio, Tennessee, and Texas. CAR's approach permitted simulation of the interaction among the regional economies, as well as with the rest of the nation, providing for an accounting of interregional trade and migration. The model can simulate economic impacts that occur in any one region resulting from changing GM's level of activities in any or all of the regions.

Consideration was paid to the potential of double-counting activities between suppliers and the various GM assembly and manufacturing plants. Within the framework of the REMI model, there is an inter-industry input-output table that calculates demand for intermediate inputs used in the production of finished goods. By first running the simulation for GM's direct U.S. manufacturing operations, and then discounting the calculated demand for parts supplied by GM manufacturing operations, the CAR research team was able to adjust for systemic double counting, and calculate only the net employment effects for the 40 GM manufacturing plants that are the subject of this report. Since initial efforts were made to avoid double counting between segments of the industry (automaker and parts supply), the results for each of these segments can be added together to arrive at the total economic contribution of GM's U.S. manufacturing operations. Employment at GM's powertrain, stamping, battery, and components plants are counted as direct GM employment, but the indirect employment is adjusted to account for the fact that these jobs are not in vehicle final assembly.

The general analytical methodology is to run baseline simulations for each region's economy, then subtract GM activities in each of the regions and run another set of simulations. The difference between the simulations represents GM's impact on each region. The results represent the current size of GM's 40 U.S. manufacturing facilities, and the economic contribution of these plants to the U.S. economy, as well as the economies of Indiana, Kansas, Kentucky, Maryland, Michigan, Missouri, New York, Ohio, Tennessee, and Texas. Impacts are estimated for calendar 2013 and 2014.

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<sup>13</sup> Supplied and constructed specifically for this analysis by Regional Economics Models, Inc. (REMI) of Amherst, Massachusetts.



## Results

The analysis shows that GM's direct U.S. manufacturing employment of nearly 50,700 hourly and salaried employees in 2013 supported an estimated 186,100 intermediate jobs (at facilities that directly supply or service GM's manufacturing plants in the United States), and roughly 252,200 spin-off jobs (jobs that were created by the result of expenditures of GM's U.S. employees at the company's manufacturing facilities). The result is a U.S. employment multiplier of 9.6—in other words, every direct GM job in its manufacturing plants supported 8.6 jobs in the rest of the U.S. economy in 2013. GM's employment at the company's U.S. manufacturing plants produced an estimated \$34.4 billion in total compensation in the U.S. economy, \$4.5 billion in government transfer payments and social insurance contributions, and \$4.8 billion in federal personal income taxes paid. Table 4 details the 2013 estimates for GM's economic contribution to the United States as a whole, as well as for each of the states in which GM manufactures vehicles, engines, transmissions, stampings, parts, and components.

*Table 4: Total Contribution of General Motors' U.S. Manufacturing Operations to the Private Sector Economy in the United States, Including Detail for Indiana, Kansas, Kentucky, Maryland, Michigan, Missouri, New York, Ohio, Tennessee, and Texas—2013 Estimates*

Geographic Region	Direct Employment	Indirect & Spinoff Employment	Total Compensation (Billions)	Contributions for Government Social Insurance (Billions)	Personal Income Taxes (Billions)
<b>U.S.*</b>	50,690	438,300	\$34.4	\$4.5	\$4.8
<b>Indiana</b>	7,160	27,220	\$2.2	\$0.3	\$0.3
<b>Kansas</b>	3,620	8,770	\$0.8	\$0.1	\$0.1
<b>Kentucky</b>	840	9,700	\$0.6	\$0.08	\$0.09
<b>Maryland</b>	250	4,190	\$0.3	\$0.04	\$0.06
<b>Michigan</b>	16,870	80,210	\$7.1	\$1.0	\$1.0
<b>Missouri</b>	2,050	12,690	\$1.0	\$0.1	\$0.1
<b>New York</b>	4,220	17,050	\$2.0	\$0.3	\$0.4
<b>Ohio</b>	9,690	46,120	\$3.7	\$0.5	\$0.6
<b>Tennessee</b>	1,990	13,860	\$1.0	\$0.1	\$0.1
<b>Texas</b>	4,000	32,640	\$2.6	\$0.3	\$0.3
<b>Rest of U.S.</b>	0	185,830	\$12.9	\$1.6	\$1.7

\*Totals may not sum exactly due to rounding errors.

CAR estimates that GM's 2014 direct U.S. manufacturing employment was 51,610—a 1.8 percent increase over 2013 employment levels. GM's direct employment was estimated to support a total of 431,290 jobs—184,900 intermediate and roughly 246,400 spin-off jobs. The result is a U.S. employment multiplier of 9.4 in 2014—which is slightly lower than the 2013 multiplier; this is not an unexpected result. Between 2013 and 2014, the U.S. economy has continued its recovery, which means that other sectors outside of automotive manufacturing are creating more demand for intermediate and spin-off goods and services. GM's 2014 manufacturing employment supports an estimated \$36.2 billion in total compensation in the U.S. economy, \$4.8 billion in government transfer payments and social insurance contributions, and \$5.3 billion in federal personal income taxes paid. Table 5 details the 2014 GM

economic contribution estimates for the U.S. and for each of the 10 states where the company operates manufacturing facilities.

*Table 5: Total Contribution of General Motors' U.S. Manufacturing Operations to the Private Sector Economy in the United States, Including Detail for Indiana, Kansas, Kentucky, Maryland, Michigan, Missouri, New York, Ohio, Tennessee, and Texas—2014 Estimates*

Geographic Region	Direct Employment	Indirect & Spinoff Employment	Total Compensation (Billions)	Contributions for Government Social Insurance (Billions)	Personal Income Taxes (Billions)
<b>U.S.*</b>	51,610	431,300	\$36.2	\$4.8	\$5.3
<b>Indiana</b>	7,730	28,090	\$2.4	\$0.4	\$0.4
<b>Kansas</b>	3,880	9,120	\$0.9	\$0.1	\$0.1
<b>Kentucky</b>	930	9,990	\$0.7	\$0.09	\$0.1
<b>Maryland</b>	260	4,060	\$0.4	\$0.04	\$0.07
<b>Michigan</b>	16,120	77,870	\$7.1	\$1.1	\$1.1
<b>Missouri</b>	2,470	13,570	\$1.1	\$0.2	\$0.2
<b>New York</b>	4,360	15,980	\$2.1	\$0.3	\$0.5
<b>Ohio</b>	9,710	46,130	\$3.9	\$0.5	\$0.6
<b>Tennessee</b>	2,340	14,730	\$1.2	\$0.2	\$0.1
<b>Texas</b>	3,810	31,820	\$2.8	\$0.3	\$0.3
<b>Rest of U.S.</b>	0	179,940	\$13.6	\$1.6	\$1.8

\*Totals may not sum exactly due to rounding errors.

## Conclusion

General Motors' manufacturing operations have long been, and continue to be a major driver of economic activity in the United States. GM's direct hourly and salaried manufacturing employment supports nearly ten times as many total jobs in the U.S. economy, billions in compensation and tax revenues, contribute to output growth in the economy, and support a vast supplier network that reaches nearly every state in the union. In recent years, GM and the UAW have worked together to vastly improve vehicle quality and the competitiveness of the business, and the results of this partnership are being recognized in the market. The ongoing success of large manufacturing operations such as GM's are critical to the continued vitality of the nation's economy, and are integral to the economies of the states and communities in which they operate. As long as GM and the UAW remain competitive in the business of manufacturing cars and trucks in the United States, the company will continue to be an important driver of economic output and activity in the U.S. economy.

## Appendix

The following two tables detail the industry sectors that contribute to the 2013 and 2014 induced (indirect and spin-off) employment estimates supported by GM's U.S. direct manufacturing employment. The largest contributing sectors to the U.S. induced employment estimates are manufacturing, administrative services, wholesale trade, and professional and technical services.

*Table 6: Types of Indirect and Spin-Off Jobs Supported by GM's U.S. Manufacturing Operations, 2013\**

Industry Sector	All U.S.	
	Intermediate Employment	Spin-Off Employment
<b>Manufacturing</b>	50,000	22,300
<b>Primary Metal</b>	2,500	1,150
<b>Fabricated Metal Products</b>	9,600	2,500
<b>Plastics, Rubber Products</b>	3,100	2,200
<b>Electrical or Computer Products</b>	500	550
<b>Motor Vehicle Parts Manufacturing</b>	26,000	2,400
<b>Other Manufacturing</b>	8,300	13,500
<b>Non-Manufacturing</b>	136,100	229,900
<b>Professional and Technical Services</b>	21,000	15,000
<b>Administrative and Services</b>	28,300	6,900
<b>Wholesale Trade</b>	25,400	9,850
<b>Retail Trade</b>	5,800	32,450
<b>Transportation and Warehousing</b>	6,800	13,550
<b>Finance and Insurance</b>	9,700	14,950
<b>Management of Companies</b>	5,100	10,350
<b>Other Services</b>	27,150	85,750
<b>Other Non-Manufacturing</b>	6,850	41,100
<b>TOTAL</b>	186,100	252,200

\*Non GM jobs; totals may not sum exactly due to rounding errors.

*Table 7: Types of Indirect and Spin-Off Jobs Supported by GM's U.S. Manufacturing Operations, 2014 Forecast\**

Industry Sector	All U.S.	
	Intermediate Employment	Spin-Off Employment
<b>Manufacturing</b>	49,700	21,100
<b>Primary Metal</b>	2,450	1,100
<b>Fabricated Metal Products</b>	9,600	2,550
<b>Plastics, Rubber Products</b>	3,150	2,150
<b>Electrical or Computer Products</b>	500	450
<b>Motor Vehicle Parts Manufacturing</b>	25,950	2,450
<b>Other Manufacturing</b>	8,050	12,400
<b>Non-Manufacturing</b>	135,200	225,300
<b>Professional and Technical Services</b>	20,900	15,450
<b>Administrative and Services</b>	28,250	6,700
<b>Wholesale Trade</b>	25,600	9,600
<b>Retail Trade</b>	6,000	30,300
<b>Transportation and Warehousing</b>	6,800	13,450
<b>Finance and Insurance</b>	9,350	13,850
<b>Management of Companies</b>	4,900	10,200
<b>Other Services</b>	26,650	81,100
<b>Other Non-Manufacturing</b>	6,750	44,650
<b>TOTAL</b>	184,900	246,400

\*Non GM jobs; totals may not sum exactly due to rounding errors.

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*Note: The research staff of the Center for Automotive Research performed a few of these studies while employed by the University of Michigan's Office for the Study of Automotive Transportation.*