Global Automakers of Canada (GAC)
Members’ economic contribution to Canada

- 2014: Sold over 1,019,000 vehicles = 55.1% market share
- 54% of sales = NAFTA region
- 77,000 Canadians employed directly and indirectly
- 40% of Canada’s vehicle production at 5 Honda and Toyota manufacturing facilities
- Mercedes-Benz fuel cell stack production – Burnaby
- Won majority of Natural Resources Canada’s ecoENERGY awards for fuel-efficient vehicles
- 60% of Canada’s 3,300+ new car and light truck dealers
Complexity of the Modern Automobile

Millions of Lines of Code

18,000 pages of text

Space Shuttle

= 1 million lines of code

Informationisbeautiful.net, 2015, Codebases v 0.9, Sept 24, 2015
Complexity of the Modern Automobile

Millions of Lines of Code

Mars Curiosity Rover
18,000 pages of text
Space Shuttle

Informationisbeautiful.net, 2015, Codebases v 0.9, Sept 24, 2015
Complexity of the Modern Automobile

 Millions of Lines of Code

- Boeing 787
- Mars Curiosity Rover
- 18,000 pages of text
- Space Shuttle

Informationisbeautiful.net, 2015, Codebases v 0.9, Sept 24, 2015
Complexity of the Modern Automobile

**Bar Chart: Millions of Lines of Code**

- **F-35 Fighter Jet**: 20 million lines
- **Boeing 787**: 15 million lines
- **Mars Curiosity Rover**: 5 million lines
- **18,000 pages of text**: 3 million lines
- **Space Shuttle**: 1 million lines

Informationisbeautiful.net, 2015, Codebases v 0.9, Sept 24, 2015
Complexity of the Modern Automobile

![Bar Chart: Millions of Lines of Code]

- Facebook: Millions of Lines of Code
- F-35 Fighter Jet
- Boeing 787
- Mars Curiosity Rover
- 18,000 pages of text
- Space Shuttle

Informationisbeautiful.net, 2015, Codebases v 0.9, Sept 24, 2015
Complexity of the Modern Automobile

Millions of Lines of Code

- Modern high-end car: 100,000
- Facebook: 60
- F-35 Fighter Jet: 20
- Boeing 787: 10
- Mars Curiosity Rover: 1
- 18,000 pages of text: 1
- Space Shuttle: 1

Informationisbeautiful.net, 2015, Codebases v 0.9, Sept 24, 2015
Complexity of the Modern Automobile

![Comparison of code complexity for various entities](https://informationisbeautiful.net/2015/09/24/millions-of-lines-of-code/)

- **Mouse DNA**: 120 million lines of code
- **Modern high-end car**: 100 million lines of code
- **Facebook**: 61 million lines of code
- **F-35 Fighter Jet**: 24 million lines of code
- **Boeing 787**: 14 million lines of code
- **Mars Curiosity Rover**: 5 million lines of code
- **18,000 pages of text**: 1 million lines of code
- **Space Shuttle**: 0.4 million lines of code

*Informationisbeautiful.net, 2015, Codebases v 0.9, Sept 24, 2015*
By 2020 the number of devices connected to the internet is expected to reach 50 billion (18 billion in 2015) or 10x the installed base of personal computers.
What are the “drivers” behind CVs & AVs

- 95% of road accidents caused by human error
- 8th leading cause of death globally: road accidents
- 2x increase in delay hours due to congestion by 2050
- 6.3 billion urban dwellers accounting for 70% of population by 2050

The benefits of a “connected car”?

- Improves Safety (V2V, V2I, V2X)
- Facilitates Automated Driving
- Driver Well-being
- Infotainment
- Vehicle Management
- Home Integration Links
- Mobility Management
Figure 3. Summary of responses (collapsed), by country, to Q3: “How likely do you think it is that the following benefits will occur when using connected vehicles?”

UMTRI, 2014, A Survey of Public Opinion about Connected Vehicles in the U.S., the U.K., and Australia
Figure 2. Summary of responses (collapsed), by country, to Q2: “What is your general opinion regarding connected vehicles?”

UMTRI, 2014, A Survey of Public Opinion about Connected Vehicles in the U.S., the U.K., and Australia
Importance of Internet Connectivity

Figure 6. Summary of responses, by country, to Q9: “How important is it to you that connected-vehicle technologies include Internet connectivity?”

UMTRI, 2014, A Survey of Public Opinion about Connected Vehicles in the U.S., the U.K., and Australia
Importance of Integrating Nomadic Devices

Figure 5. Summary of responses, by country, to Q8: “How important is it to you that connected-vehicle technologies are able to integrate with your personal communication device(s)?”

UMTRI, 2014, A Survey of Public Opinion about Connected Vehicles in the U.S., the U.K., and Australia
Interpretations of Future AV/CV

Nissan Intelligent Driving System (IDS) Concept

Honda Wander Stand concept
Make no mistake:
CV/AV technology is an industry disruptor

“Make no mistake:
CV/AV technology is an industry disruptor”

“In first Alphabet remarks, Larry Page hints self-driving cars a top priority”

“Make no mistake: CV/AV technology is an industry disruptor”

“The tech companies will take as much space as we are ready to abandon.”

- Carlos Ghosn, CEO
Nissan Motor Co.

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Concerns Raised by the Connected Car

UMTRI, 2014, *A Survey of Public Opinion about Connected Vehicles in the U.S., the U.K., and Australia*
Concerns Raised by the Connected Car

Cybersecurity & Privacy Concerns

“These threats undermine customer trust, a key success factor for automakers in the digital era. Consumers will steer clear of connected cars if they believe the new technologies put their personal information and safety at risk.

Thus, to realize the vast potential of digital automotive technology, automakers must convince consumers that they will be safe and secure in vehicles hitched to open electronic networks.”

PwC 2015, Connected Car Study: Racing ahead with autonomous cars and digital innovation
Concrete Privacy & Security Enhancement Measures from Automakers

In the U.S.

- Adoption a year ago of the Consumer Privacy Protection Principles

November 12, 2014

The Honorable Edith Ramirez
Chairwoman
U.S. Federal Trade Commission
600 Pennsylvania Avenue, N.W.
Washington, DC 20580

Dear Chairwoman Ramirez:

Re: Consumer Privacy Protection Principles for Vehicle Technologies and Services

On behalf of the Participating Members of the Alliance of Automobile Manufacturers, Inc. (“Alliance”) and the Association of Global Automakers (“Global Automakers”), we are submitting to you Consumer Privacy Protection Principles for Vehicle Technologies and Services. The Participating Members are publicly committing to implement these Principles.
Concrete Privacy & Security Enhancement Measures from Automakers

- Followed by establishment of an Auto – Information Sharing and Analysis Center (ISAC) this July to centralize intelligence on cyber threats and potential weaknesses in vehicle electronics.

Auto-ISAC announces Board of Directors

For Immediate Release
October 21, 2015

Contacts:
Wade Newton, Auto Alliance
202 326 5571

Annemarie Pender,
Association of Global Automakers
202 650 5548

Washington, DC - Automakers continue moving forward on collaborative efforts to advance cybersecurity protections with today’s announcement of the sector’s Information Sharing and Analysis Center (ISAC) board of directors.
In Canada,
- **PIPEDA and other privacy laws** have always applied to the automakers
  - **S-4 - Digital Privacy Act** requirements
  - Provisions of **CASL**
- **Updating of privacy policies** to reflect the increasing digitization of the automobile
- **On-going analysis of R&D on cybersecurity** - to make the automobile more secure

Taken together, these current protections and prospective measures make auto specific privacy regulation unnecessary
Contact us

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