

# R&D in the Automotive Sector

## *- fast, expensive and fun!*

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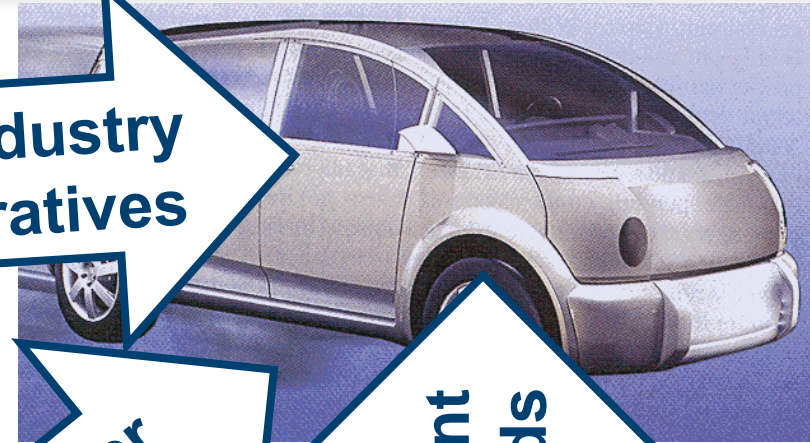
*Re\$earch Money Conference  
Ottawa – May 16, 2012*





- Quality
- Reduced Cost
- Speed
- Production Flexibility
- Tight Capital & Infrastructure

**Industry Imperatives**



**Consumer Desires**

**Government Demands**

***Better Value***  
**= *Performance ÷ Price***

*(quality, on-road performance, durability, fun to drive, cool features, new styling, carrying capacity...)*

- Environmental
- Safety
- Good Jobs





# Downloading Responsibility for RDT&E





## R&D in the auto industry:

- Due to cost and scale, progress is evolutionary & methodical rather than revolutionary & transformational;  
(so don't bet too much on inventing a new light bulb)
- Fiscal discipline, focus and accountability are mandatory;
- Speed & reliability of program response and of project execution, and security are crucial business case factors;
- R&D can be done anywhere regardless of loyalties based on national boundaries or corporate ownership;
- R&D will be done where the business case is strongest and Canada sometimes falls down on that score (*due to weak performance on some of the above factors*).



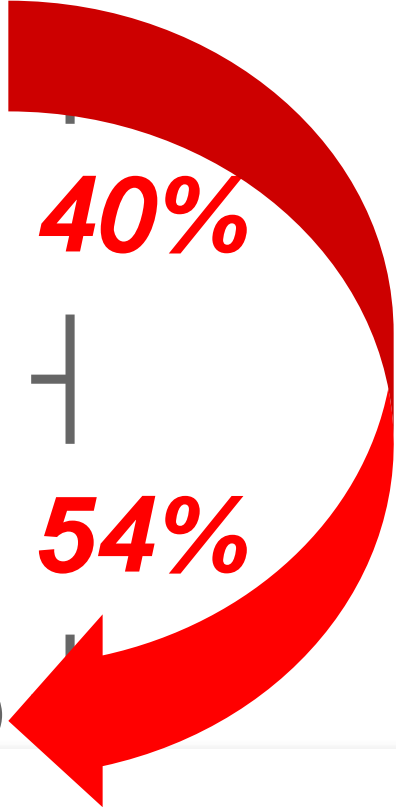
# The Key Driver: Corporate Average Fuel Economy (CAFE) Standards

■ 2010 CAFE: ~ 9.26 l/100 km (25 mpUSg)

■ 2016 CAFE: ~ 7.8 l/100 km (35 mpUSg)

■ 2025 CAFE: ~ 4.3 l/100 km (> 54 mpUSg)

**115% change in average fuel economy in 15 years!**







## Some Key Auto Sector Numbers

- Total automotive industry R&D in Canada ~ \$ 500 M / annually  
*(NOTE: that includes a lot of R&D done in assembly and parts plants that is not documented or has SR&ED credits applied to it)*

### HQP & Production Statistics:

- Number of auto workers: ~ 140,000 direct employees (2/3 in parts sector);
- Number of engineers in auto sector: ~ 2-4,000;
- Career cost of an engineer: ~ \$10M (salary + benefits + overhead);
- Value of an engineer's work: ~ \$20-50M (goods & services / career);
- Number of employees in an assembly plant ~ 6-7000 people
- Spin-off jobs elsewhere in the economy ~ 7-8 per assembly plant job
- Value of production: ~ 1600 veh./day x \$30-35K each = \$48-56M / day
  - = \$290-336M / week
  - = \$1.12-1.34B / month
  - = \$12.9-15.4B / year



The auto industry follows a highly disciplined Product Development Process (PDP)....



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**Typical Automotive OEM  
Program Engineer**

**Typical Automotive OEM  
Program Manager**



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