The Automotive Landscape:
Navigating New Waters

Automotive News Canada Congress – February 17th, 2017
Michael Robinet, Managing Director, Automotive Advisory Solutions
Industries We Serve

Financial Markets
Energy
Chemical
Automotive

Aerospace, Defense & Security
Product Design
Technology, Media & Telecom
Maritime & Trade
US: Light Vehicle Sales Forecast

Market Dynamics Shifts – Conquest & Loyalty is Critical, Mix Shifts and More Players/Nameplates

Market peaks in mid-2017 – weaker buying conditions, slower job creation, rising oil prices start next cycle. Some return to ‘cars’ likely next decade.

Pre-Crash 40 year trend: +140k annually

Model Count: 2010 2016 2023

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2016</th>
<th>2023</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count</td>
<td>335</td>
<td>371</td>
<td>409</td>
</tr>
</tbody>
</table>

Source: IHS Markit Automotive, current light vehicles sales forecast

© 2017 IHS Markit. All Rights Reserved.

Auto News Canada Congress/February 2017
# NA Regional Shift
## Logistics and Supply Structure Under Pressure

### Midwest/Ontario

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>5.6</td>
<td>5.4</td>
<td>4.8</td>
<td>4.6</td>
<td>4.6</td>
<td>4.7</td>
<td>4.6</td>
<td>4.5</td>
<td>4.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2.4</td>
<td>2.4</td>
<td>2.4</td>
<td>2.4</td>
<td>2.3</td>
<td>2.2</td>
<td>2.2</td>
<td>2.2</td>
<td>2.2</td>
</tr>
</tbody>
</table>

- Mix towards D/E-segment and Full Frame
- Detroit 3 still account for +60 of MW/ONT volume by 2023

### Southeast

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.8</td>
<td>0.9</td>
<td>1.0</td>
<td>0.8</td>
<td>0.9</td>
<td>0.9</td>
<td>0.8</td>
<td>0.8</td>
<td>0.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.9</td>
<td>0.9</td>
<td>1.0</td>
<td>1.0</td>
<td>0.9</td>
<td>0.9</td>
<td>0.9</td>
<td>0.9</td>
<td>0.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2.7</td>
<td>2.8</td>
<td>2.8</td>
<td>2.8</td>
<td>2.8</td>
<td>2.8</td>
<td>2.9</td>
<td>2.9</td>
<td>2.9</td>
</tr>
</tbody>
</table>

- Remarkable stability – newer facilities w/export focus
- Higher concentration on C & D-segment CUVs

### Mexico

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.5</td>
<td>0.4</td>
<td>0.6</td>
<td>0.7</td>
<td>0.9</td>
<td>0.9</td>
<td>0.9</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1.6</td>
<td>1.6</td>
<td>1.9</td>
<td>2.0</td>
<td>2.1</td>
<td>2.2</td>
<td>2.2</td>
<td>2.1</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1.1</td>
<td>1.3</td>
<td>1.4</td>
<td>1.5</td>
<td>1.6</td>
<td>1.6</td>
<td>1.6</td>
<td>1.6</td>
<td>1.6</td>
</tr>
</tbody>
</table>

- Mid-Mexico now accounts for ~70% of Mex volume
- Rise of B & C-segment products with increasing luxury focus for export
Divergent Trajectories – NA LV Production
Detroit Three Volume Leveled in 2016

Total Volume | 17.5 | 17.9 | 17.6 | 18.0 | 18.4 | 18.7 | 18.7 | 18.7 | 18.6

Honda Supplier Conference/ February 2017
NHTSA CAFE History - We’ve Only Just Begun …..

- Two key milestones for the future are the 2016 requirement and then the more difficult 2022-2025 requirement

- Congress establishes CAFE 1978-1985
- DOT sets truck standard to max feasible 1979-1996
- DOT relases car standard 1986-1989
- DOT sets car standard to 27.5 mpg 1990-2010
- Congress freezes truck standards at 20.7 1997-2001
- Bush Administration sets new truck targets 2005-2007
- EISA changes CAFE to new footprint standard 2008- present
- Obama Administration sets new car & truck standards 2012-2016
- Obama Administration sets new car & truck standards 2017-2025
Automated Driving Expectations

- **L5**
  - Limited drive via remote driver control
  - Waymo
  - Details or timeline unclear

- **L4**
  - Many incremental and evolutionary steps within Level 2
  - Honda Supplier Conference/ February 2017

- **L3**
  - Wide variety of systems bordering L2

- **L2**
  - IHS Level 4: Fully autonomous with driver controls
  - IHS Level 5: Fully autonomous without driver controls

**LEVEL OF AUTOMATION**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
As a result of legislation, vehicle technology is changing quickly!

- US engines are reducing engine displacement and the number of cylinders, while adding boosting, Start/Stop, direct injection, and hybrid technologies, light weighting, material changes and more……

Average engine displacement drops more than -500cc by 2024

Alternative propulsion technology is increasing from 4% today to 13.5% in 2024

Plug-in hybrids and pure electric vehicles grows to capture just under 750K units per year in 2024

Total stop/start market potential of nearly 11M units by 2024

3 cylinder engines re-enter the market and grow to 1.5M or 10% of the market by 2024

4 cylinder engines grow to 10M units per year or 60% of the market by 2024

…..other initiatives will be required!
Summary

At A Plateau ....

• Volumes plateauing in North America
  > Success is predicated on optimizing mix, global scale, technology integration and flexibility

• Risk is rising – Planning is critical – Understand your markets
  > Risk abatement/mitigation, Plausible scenarios and Competitive actions
  > Visioning: What is your market in 5 years, 10 years?

• Changes in mix alter the landscape
  > OEMs feeling the pressure of increased incentives – enhanced productivity requests
  > Existing suppliers begin to cannibalize as new suppliers enter the market

• The New Differentiators
  > Ability to anticipate and benefit from major shifts – electrification, automated driving, lightweighting, logistics, packaging efficiency, performance and the hard/soft part shift
  > ACES – Autonomous, Connected, Electrified and Shared
Thank You

Michael Robinet
Managing Director, IHS Markit Automotive Advisory Services
michael.robinet@ihsmarkit.com

IHS Markit Customer Care:
Americas: +1 800 IHS CARE (+1 800 447 2273); CustomerCare@ihs.com
Europe, Middle East, and Africa: +44 (0) 1344 328 300; CustomerSupport@ihs.com
Asia and the Pacific Rim: +604 291 3600; SupportAPAC@ihs.com

COPYRIGHT NOTICE AND DISCLAIMER
© 2017 IHS. All rights reserved. No portion of this presentation may be reproduced, reused, or otherwise distributed in any form without prior written consent of IHS. Content reproduced or redistributed with IHS permission must display IHS legal notices and attributions of authorship. The information contained herein is from sources considered reliable, but its accuracy and completeness are not warranted, nor are the opinions and analyses which are based upon it, and to the extent permitted by law, IHS shall not be liable for any errors or omissions or any loss, damage, or expense incurred by reliance on information or any statement contained herein. In particular, please note that no representation or warranty is given as to the achievement or reasonableness of, and no reliance should be placed on, any projections, forecasts, estimates, or assumptions, and, due to various risks and uncertainties, actual events and results may differ materially from forecasts and statements of belief noted herein. This presentation is not to be construed as legal or financial advice, and use of or reliance on any information in this publication is entirely at your own risk. IHS and the IHS logo are trademarks of IHS.

© 2017 IHS Markit. All Rights Reserved.