4TU Binnenhofcollege:
Slimme mobiliteit
0 fatalities, 0 emissions, 0 congestion

Maurice Geraets
Co-CEO NXP Netherlands

NXP Secure Connections for a Smarter World
NXP SEMICONDUCTORS

30+ COUNTRIES
Headquartered in Eindhoven, The Netherlands

~30,000
Employees

9,000
Patent families

$8.6B
2020 annual revenue

60+
Year history

~9,000
R&D engineers
FACTS & FIGURES DUTCH AUTOMOTIVE INDUSTRY

OEMS: TRUCKS, BUSSES AND CARS
MAJORITY BUSINESS FROM SUPPLIERS

TOTAL TURNOVER
€20 BILLION

Suppliers Major Business
- Export 88%
- Internal market 12%

Export COUNTRIES
- Germany 44%
- UK 10%
- USA 5%
- Belgium 8%
- France 4%
- China 3%
- Other 26%
- Other 26%

RAI Automotive Industry NL
AVG VEHICLE TODAY HAS ~ 1,000 SEMICONDUCTORS (VALUE $470 GLOBALLY)
BY 2030 GROWTH > 1,400 SEMICONDUCTORS AT $800

Source: Strategy Analytics, Jan’2021 for 2019 figures, NXP CMI
Tomorrow’s Vehicles: Self Driving, Connected Robots

SENSE
- Radar
- Vision
- Secure V2X

THINK
- Processing
- Sensor Fusion
- Security

ACT
- Powertrain
- Chassis
- Braking

BIG DATA
- Digital Networking
- Infrastructure
- Security
Mega Trends Transforming Mobility … and the Automotive Industry
Enabled by electronics

Connectivity
One hour per day in the vehicle

Autonomy
1.3 million global road fatalities every year

Electrification
US mandates 163 grams / mile and 54.5 MPG by 2025

Safe and Secure Mobility
An incredible opportunity and an incredible responsibility
Mega Trends Transforming Mobility ... and the Automotive Industry
Enabled by electronics

Connectivity
+50$ Cellular 4/5G
+50$ e-Cockpit

Autonomy
+400$ Level 3
+700$ Levels 4&5

Electrification
+350$ Hybrid
+700$ Full Electric

Safe and Secure Mobility
Semi value/car more than doubles through next 10 years
#1 The Netherlands

A winning combination: The Netherlands has comparatively high electronic vehicle sales, a very good EV charging infrastructure and a strong interest in autonomous driving.

**EV charging stations top five**

<table>
<thead>
<tr>
<th>Country</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Netherlands</td>
<td>29.73</td>
</tr>
<tr>
<td>Norway</td>
<td>22.14</td>
</tr>
<tr>
<td>Sweden</td>
<td>21.14</td>
</tr>
<tr>
<td>Belgium</td>
<td>20.31</td>
</tr>
<tr>
<td>Austria</td>
<td>18.66</td>
</tr>
</tbody>
</table>


**Country ranking**

<table>
<thead>
<tr>
<th>Overall rank</th>
<th>Country</th>
<th>Total score</th>
<th>Policy and legislation</th>
<th>Technology &amp; innovation</th>
<th>Infrastructure</th>
<th>Consumer acceptance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The Netherlands</td>
<td>27.73</td>
<td>3</td>
<td>7.89</td>
<td>4</td>
<td>5.46</td>
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<tr>
<td>2</td>
<td>Singapore</td>
<td>26.08</td>
<td>1</td>
<td>8.49</td>
<td>8</td>
<td>4.26</td>
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<tr>
<td>3</td>
<td>United States</td>
<td>24.75</td>
<td>10</td>
<td>6.38</td>
<td>1</td>
<td>6.97</td>
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<tr>
<td>4</td>
<td>Sweden</td>
<td>24.73</td>
<td>8</td>
<td>6.83</td>
<td>2</td>
<td>6.44</td>
</tr>
<tr>
<td>5</td>
<td>United Kingdom</td>
<td>23.99</td>
<td>4</td>
<td>7.55</td>
<td>5</td>
<td>5.28</td>
</tr>
</tbody>
</table>
TRUCK PLATOONING

Declaration of Amsterdam

Cooperation in the field of connected and automated driving

14-15 April 2016
Autonomous Driving at a High Level requires Artificial Intelligence

Monitoring and Modeling the Environment

- Sensors mix
- Semantic abstraction and levels of complexity
- Interoperability over heterogeneous solutions

Behavioral Policy and Actuation

- Decision frameworks and algorithms
- Safe and secure decision
- Scalability of application and actuation

Model Planning
Auto chip sales dropped dramatically in 1H 2020 due to cancelled/reduced orders.

At the same time, sales in other major customers segments increased to meet demand for work/school/play from home during the height of the pandemic.

Source: World Semiconductor Trade Statistics (WSTS)
**MANUFACTURING CYCLE TIME IN EXISTING CAPACITY**

<table>
<thead>
<tr>
<th>Component</th>
<th>Cycle Time (WEEKS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microcontrollers</td>
<td>16</td>
</tr>
<tr>
<td>Processors</td>
<td>16</td>
</tr>
<tr>
<td>Digital Tuners</td>
<td>12</td>
</tr>
<tr>
<td>Radar Sensors</td>
<td>14</td>
</tr>
</tbody>
</table>

**ADDITIONAL CAPACITY IN QUALIFIED CLEAN ROOM**

- **18-24 MONTHS**

**NEW CLEAN ROOM CAPACITY ADDITION**

- **24 MONTHS**

**NEW FAB BUILD (TSMC CHANDLER EXAMPLE)**

- **5 YEARS | $35 BILLION**

Source: Report: TSMC plans to now spend $35B in Arizona fab, Electronics360, March 16, 2021

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