Legislative & Licensing
Automated Transport, and
Planning/Implementing/Enforcing Ordinances
Policy Issues Related to Self-Driving, or Autonomous, Vehicles
Laws as rules and as tools

But so does the broader social context!
# Technologies and applications

<table>
<thead>
<tr>
<th>SAE Level</th>
<th>Name</th>
<th>Narrative Definition</th>
<th>Execution of Steering/Acceleration/Deceleration</th>
<th>Monitoring of Driving Environment</th>
<th>Fallback Performance of Dynamic Driving Task</th>
<th>System Capability (Driving Modes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No Automation</td>
<td>the full-time performance by the human driver of all aspects of the dynamic driving task, even when enhanced by warning or intervention systems</td>
<td>Human driver</td>
<td>Human driver</td>
<td>Human driver</td>
<td>n/a</td>
</tr>
<tr>
<td>1</td>
<td>Driver Assistance</td>
<td>the driving mode-specific execution by a driver assistance system of either steering or acceleration/deceleration using information about the driving environment and with the expectation that the human driver perform all remaining aspects of the dynamic driving task</td>
<td>Human driver and system</td>
<td>Human driver</td>
<td>Human driver</td>
<td>Some driving modes</td>
</tr>
<tr>
<td>2</td>
<td>Partial Automation</td>
<td>the driving mode-specific execution by one or more driver assistance systems of both steering and acceleration/deceleration using information about the driving environment and with the expectation that the human driver perform all remaining aspects of the dynamic driving task</td>
<td>System</td>
<td>Human driver</td>
<td>Human driver</td>
<td>Some driving modes</td>
</tr>
<tr>
<td>3</td>
<td>Conditional Automation</td>
<td>the driving mode-specific performance by an automated driving system of all aspects of the dynamic driving task with the expectation that the human driver will respond appropriately to a request to intervene</td>
<td>System</td>
<td>System</td>
<td>Human driver</td>
<td>Some driving modes</td>
</tr>
<tr>
<td>4</td>
<td>High Automation</td>
<td>the driving mode-specific performance by an automated driving system of all aspects of the dynamic driving task, even if a human driver does not respond appropriately to a request to intervene</td>
<td>System</td>
<td>System</td>
<td>System</td>
<td>Some driving modes</td>
</tr>
<tr>
<td>5</td>
<td>Full Automation</td>
<td>the full-time performance by an automated driving system of all aspects of the dynamic driving task under all roadway and environmental conditions that can be managed by a human driver</td>
<td>System</td>
<td>System</td>
<td>System</td>
<td>All driving modes</td>
</tr>
</tbody>
</table>

SAE J3016 Levels of Driving Automation, summarized at cyberlaw.stanford.edu/loda
Legality

• What is not prohibited is permitted
• Audit state law for prohibitions/complications
• Do not just pass a law — but do listen
• Clarify enforcement discretion

Gabriel Weiner and Bryant Walker Smith, Automated Driving Legislation and Regulation, newlypossible.org
Regulation

• States already have regulatory authority
  — Vehicle registration
  — Traffic enforcement
  — Tort law

• Have the relevant technologies reached a demonstrated level of socially acceptable risk?
  — How safe is safe enough?
  — How is this safety demonstrated?
  — How confident is confident enough?
  — Who decides?
Data Access and Protection

• Approaches to the next data revolution
  — Do nothing
  — Address each specific technology/application
  — Address broader trends and values

• Privacy is relational: Vis-à-vis whom?

• Privacy is not neutral: Which values?
Policy Recommendations

• Inventory existing law
• Maintain infrastructure

• Identify a chain of public and private support
• Provide flexibility to developers and insurers

• Internalize the costs of driving
• Expect more from human drivers
How Governments Can Promote Automated Driving
Bryant Walker Smith, University of South Carolina School of Law | new.law.yale.edu | law.sc.edu/faculty/smith | cyberlaw.stanford.edu/bwsmith

Public officials frequently ask what their governments can do to promote and attract automated vehicles. This poster presents potential state and local strategies, some of which may also have national relevance. As the color coding below indicates, the different technologies and applications that constitute automated driving may demand different strategies:

Paths to fully automated driving

- **“Something Everywhere”**
  1) Increasing capability of advanced driver assistance systems (ADAS)
  2) Increasing capability of driverless vehicles

- **“Everything Somewhere”**
  3) Increasing capability of driverless vehicles

Primary promotes AEVS/ADAS
Primary promotes driverless vehicles
Primarily promotes all three pathways

For further discussion of each of the strategies below, please see Bryant Walker Smith, How Governments Can Promote Automated Driving, forthcoming at new.law.yale.edu.

Prepare government
- Identify a single point of contact
- Learn from credible sources
- Account for automation in planning processes
- Allocate resources commensurate with expectations

Prepare physical and digital infrastructures
- Maintain roadways
- Review design, operation, and maintenance policies
- Ensure these policies are followed
- Strengthen and standardize data management
- Update vehicle registration databases
- Coordinate with US DOT on DSRC

Prepare society
- Educate the public on the dangers of driving today
- Develop a break-the-glass plan for automation incidents
- Recognize broader technological and social changes
- Develop strategies for structural, un- and underemployment

What say you are doing?

Who will respond, pivotal to a crash and how? What relationships will be essential to effective coordination? What evidence and information will need to be preserved, and how? How will officials have prepared the potential systems for automation?

What actions will they address any learning that results from high-profile crash, regardless of where it occurs? How many addresses those issues properly and effectively today? How does credibility and a sentinel technology?

Developing a project proposal, maintained in the particular conditions or the particular community can help to attract and focus local attention. At some point, the project proposal could be joined to an FTA grant application or an FTA project for automated systems.

Identities localities and constituencies
- Identify local activity centers (e.g., campuses, CIDs, ports)
- Promote unique community attributes
- Develop private projects (public/private, local/other)

Deploy public resources strategically
- Preference safety systems in fleet procurement, service contracts, and concessions
- Reduce subsidies for private vehicle ownership
- Seek the creative use of HOV/HOT lanes, sidewalks, living streets, traffic signals, etc.

More for information, please see the materials at HowGovernmentsCanPromoteAutomatedDriving.org.
R&D and Testing Low Speed Electric Vehicles
Smart Transportation/Internet of Things Applications
Schneider Electric, the global specialist in energy management and automation

- **€25 billion**
  - FY 2014 revenues

- ~**5%**
  - of revenues devoted to R&D

- ~**170,000**
  - people in 100+ countries

**Diversified end markets** – FY 2014 revenues

- Non-residential & Residential Buildings: 33%
- Data Centers & Networks: 14%
- Industrial & Machines: 27%
- Utilities & Infrastructure: 26%

**Balanced geographies** – FY 2014 revenues

- North America: 25%
- Western Europe: 28%
- Asia Pacific: 28%
- Rest of World: 19%
Schneider Electric Global Business In over **100 Countries**

- **North America**
  - 33,700 Employees
  - 38 Factories
- **Western Europe**
  - 47,600 Employees
  - 92 Factories
- **Asia Pacific**
  - 61,500 Employees
  - 77 Factories
- **Rest of the World**
  - 34,100 Employees
  - 38 Factories

1: Published figures in billion € restated to reflect country-market view;  
2: Billion € pro-forma basis including LTM Sep 2014 revenue for Invensys;  
3: Including Invensys, excluding Delixi and Fuji.

**Financial Figures (in billions €):**

- **2003**
  - 2.3
  - 4.1
  - 1.2
  - 1.2
- **2014**
  - 6.3
  - 6.7
  - 7
  - 4.8
Schneider Electric commitment to a high investment in technology for innovation

**A TECHNOLOGY COMPANY**

- c. 11,000 R&D engineers, c. 10,000 application and software engineers
- 20,000 patents active or in application worldwide, >500 filed in 2014
- With recognized innovations

Recognized highest ranking DCIM solution in Gartner Magic Quadrant (Oct 2014)

**M580**: World’s first ePAC with built-in ethernet & Machine Solution – NEXT Controller Generation

**R&D INVESTMENT**

- ~5% of sales devoted to R&D

**AN ECOSYSTEM FOR OPEN INNOVATION**

- Partnering with 50+ best-in-class public and private organisations
- Leading global projects for intelligent buildings, renewables, Homes, Minalogic, Smart Electricity
- Boosting Standardisation Zigbee, IEC, NEMA
- Funding start-ups Aster Capital fund
- Demand response, software breakthrough
Sustainability is critical on our agenda

Solutions for Efficiency
- Active Energy efficiency, Energy management & Sustainability services
- Smart grid (renewable, flexible distribution, electric vehicle, demand response)
- Smart cities

Ethics & Responsibility
- Business practices
- Products and sites
- Employees
- Communities

Solutions for energy gap
- Fostering energy access
- Spreading access to reliable, affordable and clean energy through a combined approach of training, offers, business models and investment
- Fighting fuel poverty

A measured commitment:
The Planet & Society Barometer
- Measuring sustainability
- Communicating quarterly
- Auditing annually by a third party

#9 in the Global 100 Sustainable Corporations in the world in 2015
... and **Schneider Electric** is uniquely positioned to make demand efficient and connected

**Integration of Energy, Automation and Software**

Simpler, more scalable and flexible industrial architectures, leveraging the best of IT technologies

**INTERNET OF THINGS**
- Number of connected objects expected to double in the next 5 years

![Graph showing exponential growth in connected people and connected objects from 1995 to 2020](image)

1. Source Cisco IBSG April 2011 / Internet World Statistics