Transportation from 2014 to 2040

enabled and improved by
***Connectivity*, *Automation*, *Intelligence*,**
Electrification*, and *Electronification

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Board Member, IEEE Standards Association Standards Board
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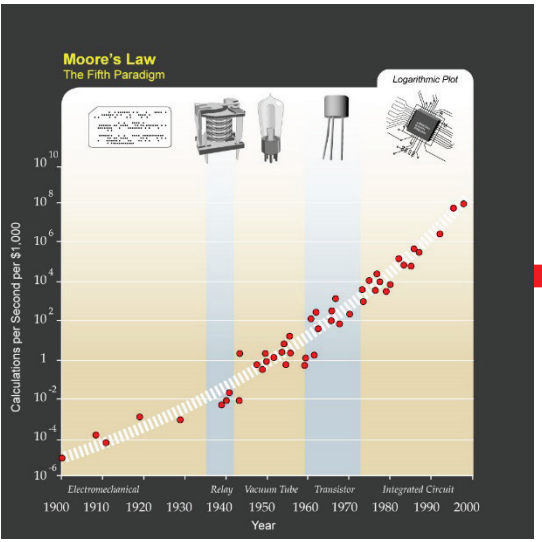
Disclaimer…

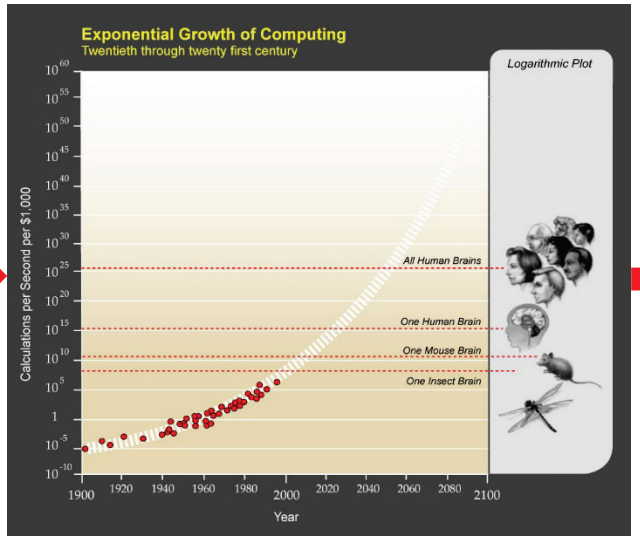
"At lectures, symposia, seminars, or educational courses, an individual presenting information on IEEE standards shall make it clear that his or her views should be considered the personal views of that individual rather than the formal position, explanation, or interpretation of the IEEE."

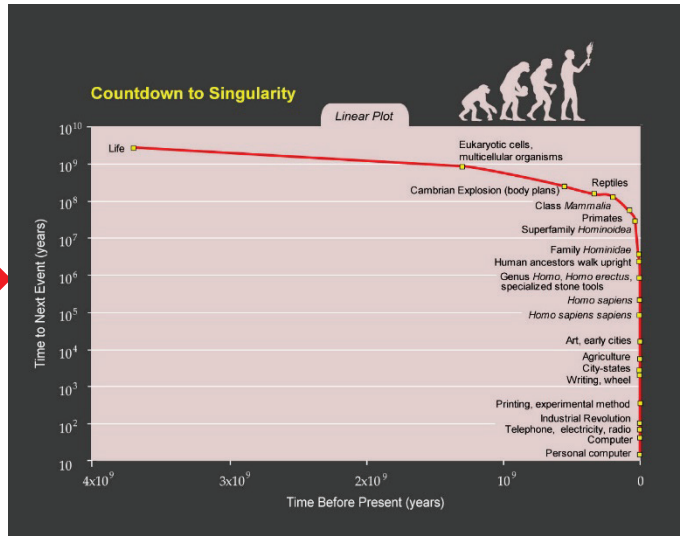
IEEE-SA Standards Board Operation Manual (subclause 5.9.3)

You have heard very different predictions

- Are they too conservative?
  - Every new car to be connected by 2025 [1]
  - Self-driving cars to be 9 percent of global auto sales in 2035 [2]
  - Nearly all cars to be autonomous by 2050 [3]
- Are they too aggressive?
  - The singularity is near [4]
  - Artificial intelligence is our biggest existential threat [5][6]
  - With artificial intelligence we are summoning the demon [5][6]
  - Computers are going to take over from humans [7]
  - The future of AI is scary and very bad for people [8]

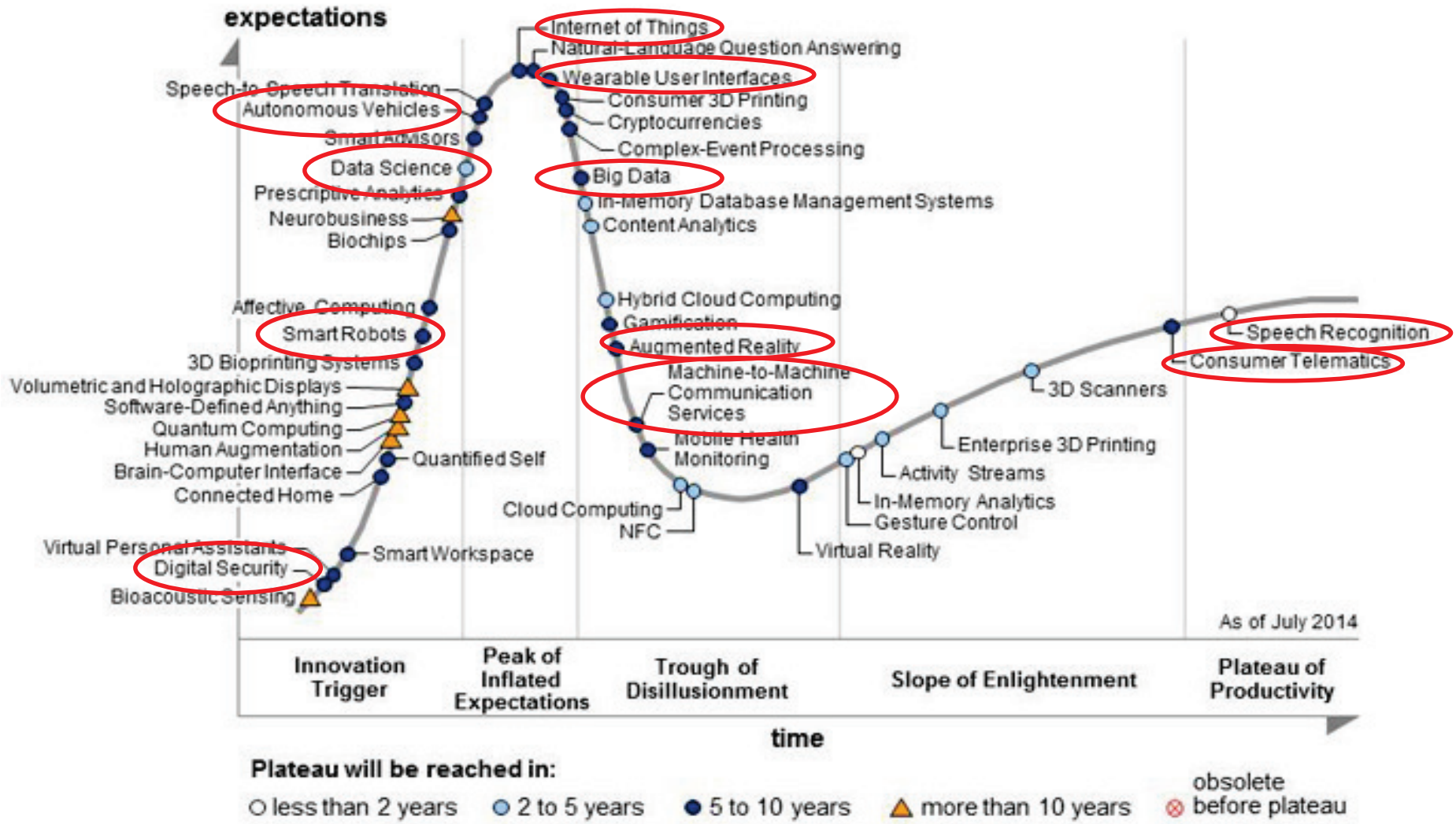




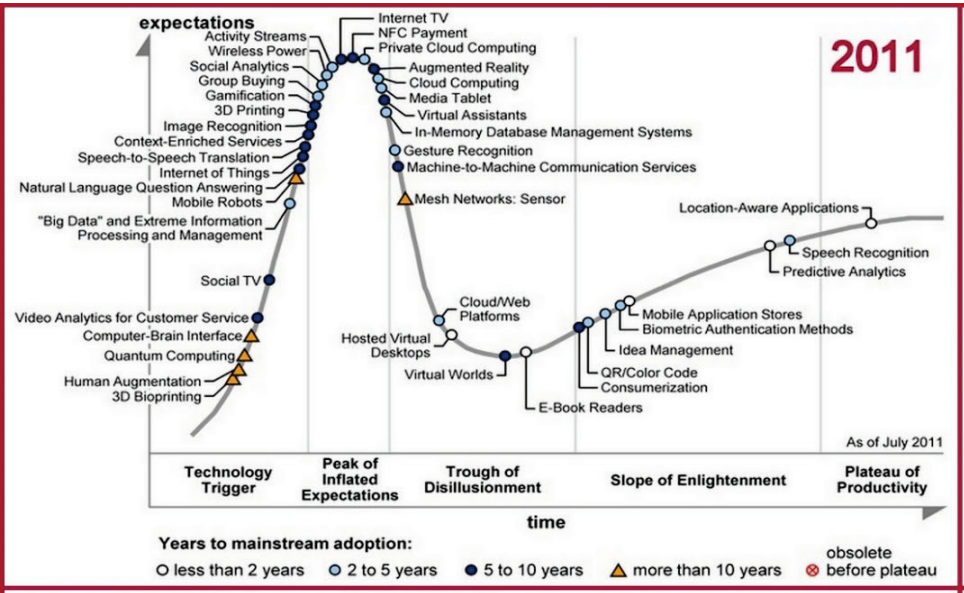


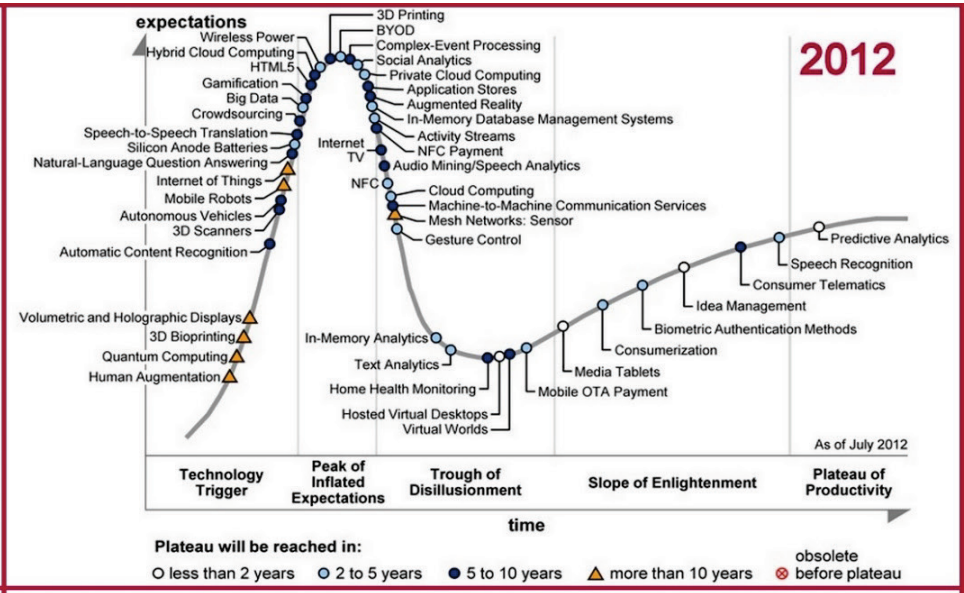
[1] http://www.gsma.com/connectedliving/wp-content/uploads/2012/03/gsma2025everycarconnected.pdf
[2] http://www.reuters.com/article/2013/12/31/us-autos-selfdriving-cars-idUSBRE9BU0HJ20131231
[3] http://www.autoblog.com/2014/01/02/all-cars-autonomous-self-driving-by-2050-study/
[4] http://www.singularity.com/
[5] http://www.theguardian.com/technology/2014/oct/27/elon-musk-artificial-intelligence-ai-biggest-existential-threat
[6] http://qz.com/335768/bill-gates-joins-elon-musk-and-stephen-hawking-in-saying-artificial-intelligence-is-scary/
[7] http://uk.businessinsider.com/steve-wozniak-artificial-intelligence-interview-humans-family-pets-2015-3?r=US
[8] http://www.entrepreneur.com/article/244236

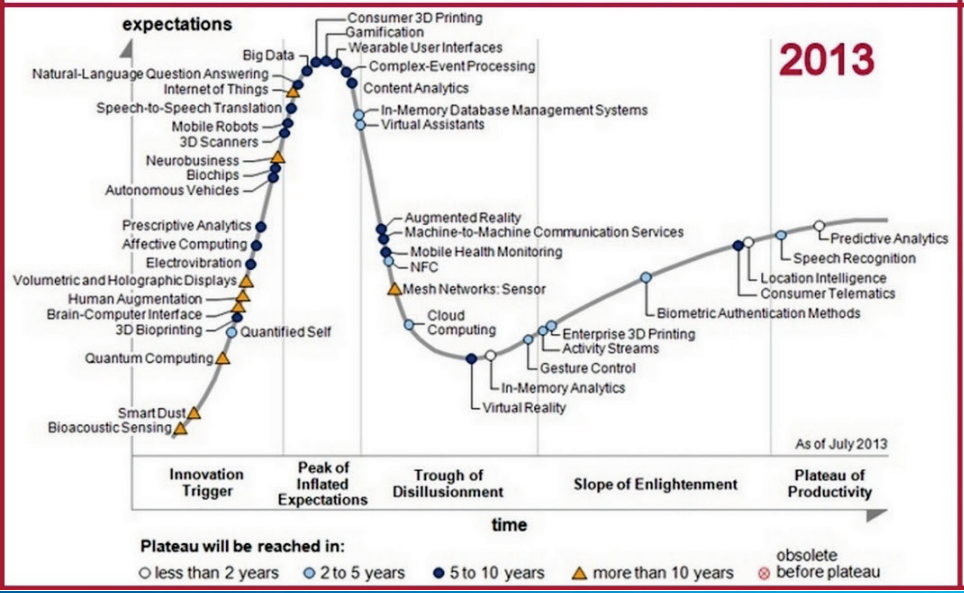
Transportation Related Technologies in Gartner's Hype Cycle

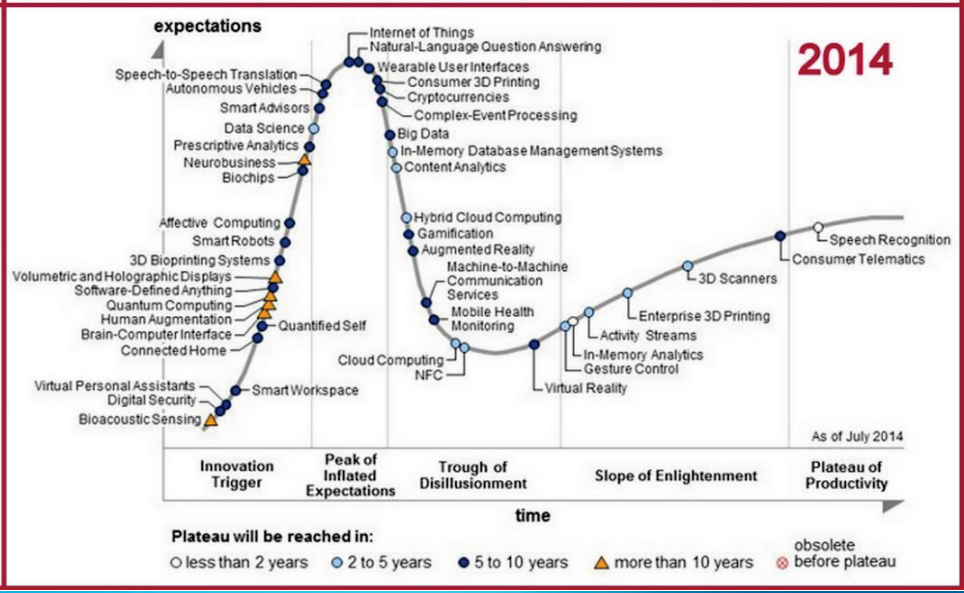


Gartner's Hype Cycle 2011-2014









What predictions about the future of transportation will become true?

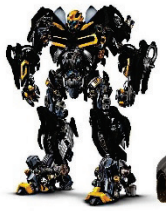
The best way to predict the future is to create it.

-- Dennis Gabor, Alan Kay, Steven Lisberger, Peter Drucker, and many others [1]

[1] http://quoteinvestigator.com/2012/09/27/invent-the-future/

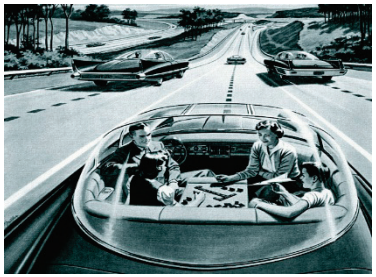
The Future of Transportation

to be more connected, automated, intelligent, electric and electronic



As smart as or even smarter than a human driver

Intelligence



Automation

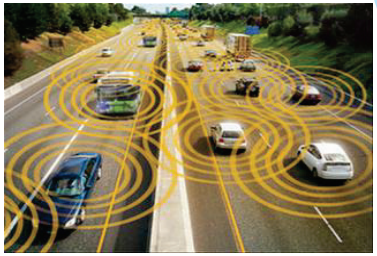
From driver assistance to driverless

Electronification

Faster evolution, easier production, easier maintenance, more applications, …

TRANSPORTATION

to be safer, faster, cheaper, cleaner, …



Connectivity

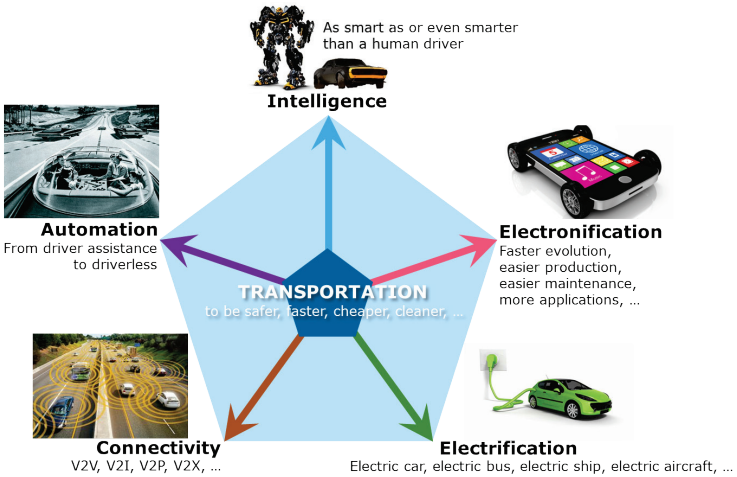
V2V, V2I, V2P, V2X, …

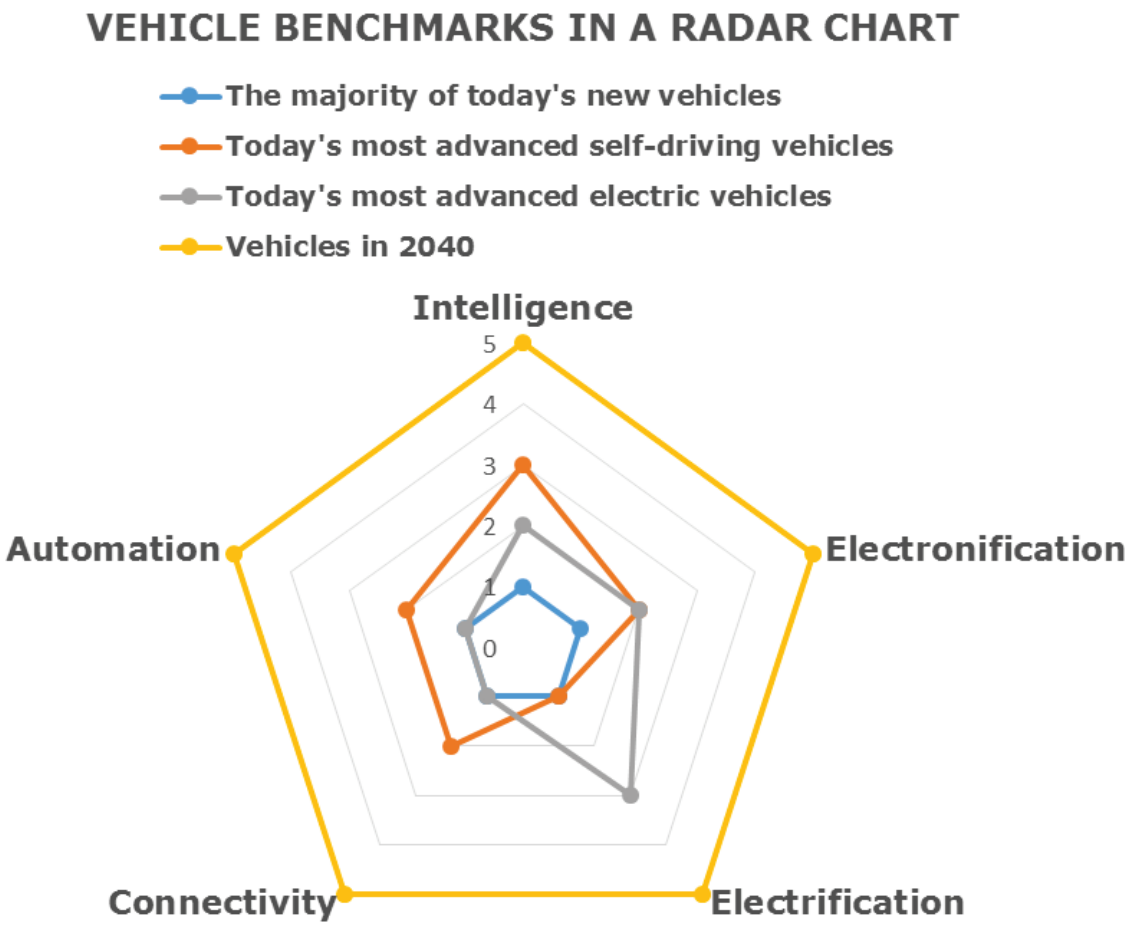
Electrification

Electric car, electric bus, electric ship, electric aircraft, …

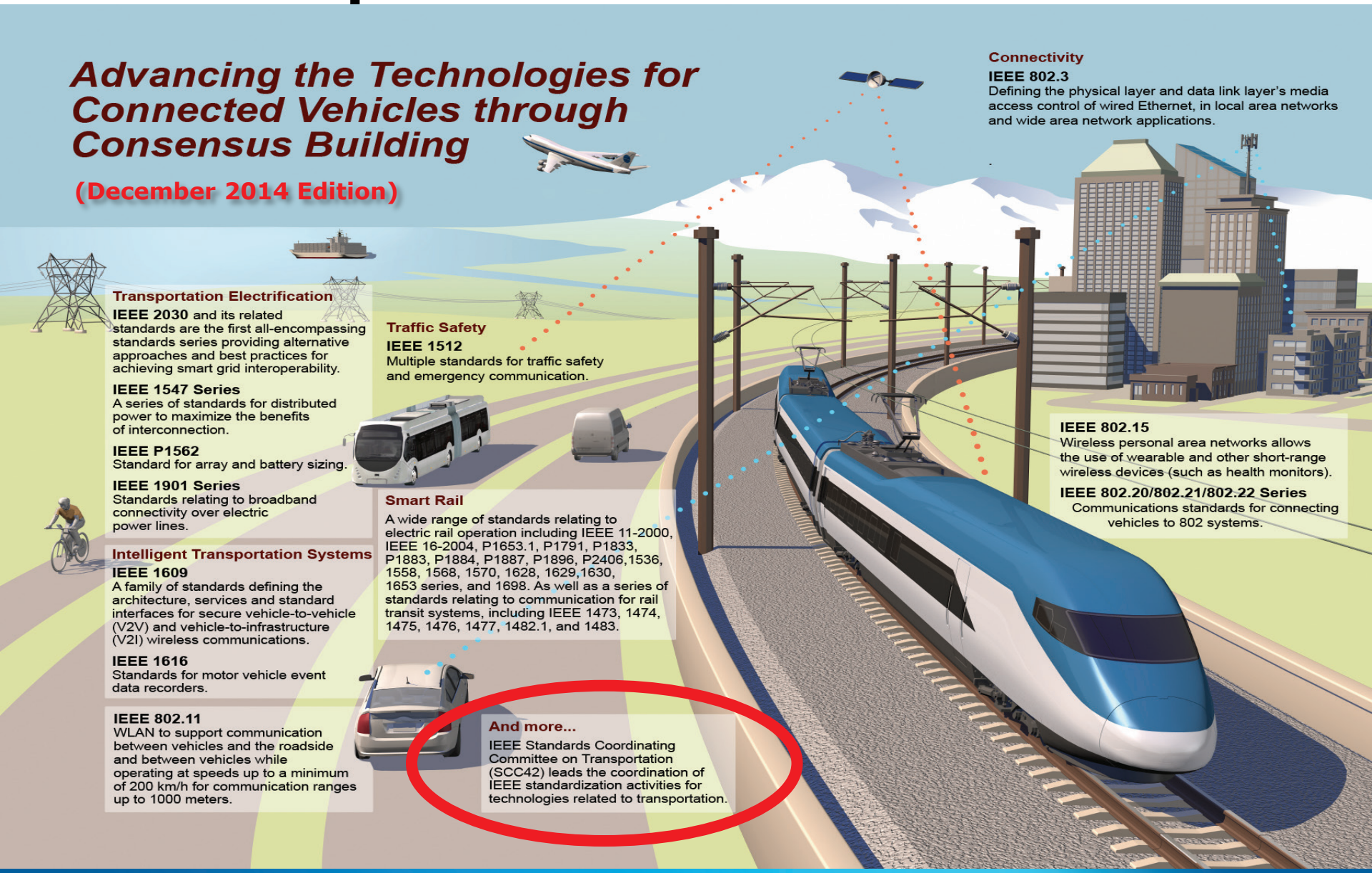
The Future of Transportation

Vehicles in a radar chart view





IEEE Transportation Standards



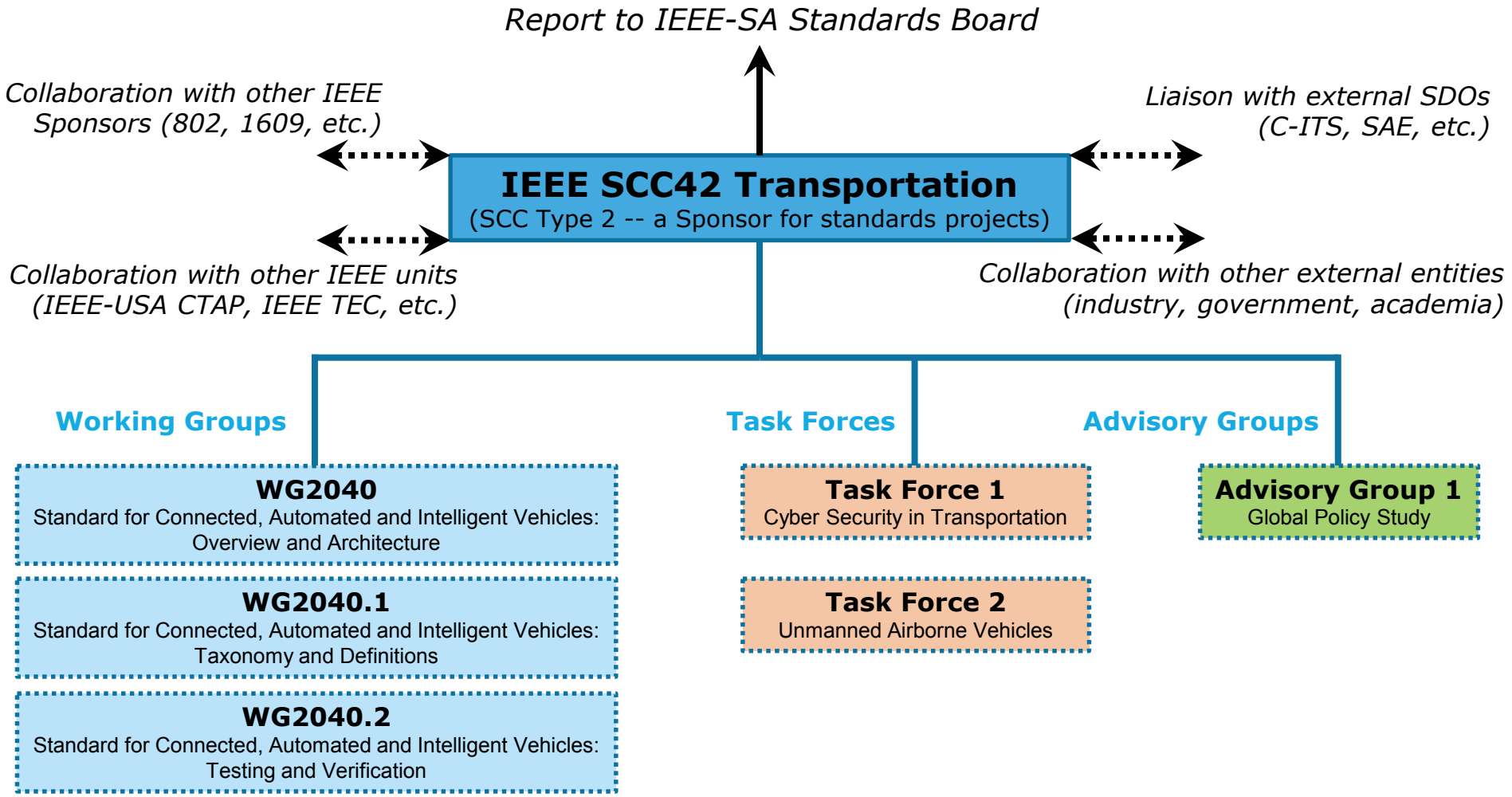
IEEE SCC42 Transportation

(IEEE Standards Coordinating Committee on Transportation)

- On Aug 21, 2014, the IEEE-SA Standards Board established a new committee -- **IEEE SCC42 Transportation** (IEEE Standards Coordinating Committee on Transportation). Being supported by over 30 IEEE Societies and Councils, IEEE SCC42 Transportation leads the coordination of IEEE standardization activities for technologies related to transportation, especially in the areas of connected vehicles, autonomous/automated vehicles, inter- and intra-vehicle communications, and other types of transportation electrification. These technologies include but are not limited to Mobile Apps, Sensor Networks, and Communications that allow human to vehicle, vehicle to vehicle, vehicle to infrastructure, vehicle to platform, and vehicle to everything exchange of information and data. Where standardization needs exist, the SCC will develop guides, recommended practices, standards, and common definitions of terms.
- IEEE-SA press release on Oct 14, 2014:
  - http://standards.ieee.org/news/2014/ieee_scc42_transportation.html
- *Contact: Dr. Yu Yuan* y.yuan@ieee.org

IEEE SCC42 Transportation

Current committee structure and ongoing work



ICCVE 2015

The 4th International Conference on Connected Vehicles and Expo

19-23 Oct 2015, Shenzhen, China

www.iccve.org/2015

- **About the conference**
  - The world's most searched connected vehicles conference on Google
  - Cosponsored by over 20 organizations including multiple IEEE Societies and Councils, TRB, SAE, ACM, IFAC, etc.
  - Enjoy and benefit from the cross-disciplinary community that ICCVE conferences uniquely offer: civil engineers meet with computer scientists, mechanical engineers talk to electronic engineers, ...
  - IEEE SCC42's face-to-face committee and working group meetings will be held in conjunction with the conference
- **About the Shenzhen city**
  - The capital of electronics industry in China
  - One of the four Tier-1 modern cities in China
    - Modern infrastructure and facilities
    - Convenient transportation to/from all major cities in China
  - Authentic dim sum and Cantonese cuisine
  - Adjoins Hong Kong and Macau
    - Attendees can visit three famous cities and experience diverse cultures in one trip

Thanks

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