



# Personal Transportation in 2054

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by Brad Touesnard

Faster,  
more efficient,  
more convenient



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## Objective

- To demonstrate that personal transportation vehicles of 2054 will be **faster, more efficient, and more convenient** than vehicles of 2004 by examining current influencing factors and changes of personal transportation in the past.

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## Outline

- Brief History
- Major Influencing Factors
  - Technology
  - Culture
  - Environment
  - Economy
- The State of Personal Transportation in 2054
  - Speed
  - Efficiency
  - Convenience
- Conclusion



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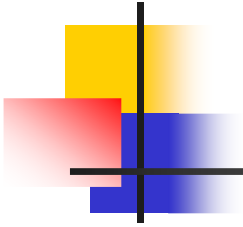
## Brief History

- 3500 BC - wheels on carts
- 2000 BC - horses domesticated
- 1790 – bicycle
- 1862 – automobile
- 1867 – motorcycle
- 1908 – assembly line



The History of Transportation

[http://inventors.about.com/library/inventors/bl\\_history\\_of\\_transportation.htm](http://inventors.about.com/library/inventors/bl_history_of_transportation.htm)



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## Major Influencing Factors

- Technology

- Revolutionizes

- Wheel
    - Internal Combustion Engine
    - What's next?

- Enhances

- Speed – e.g. first automobile 2mph
    - Efficiency – e.g. regenerative breaking
    - Convenience – e.g. electric car starter



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## Major Influencing Factors

### ■ Culture

- “[By 1910] the automobile was changing American life. It had already started to change the language: 'parking', 'necking', and 'petting' had made their way into the language.” (1)
- “...the Japanese--who live in a country where things are small, especially the roads--were stunned at how large the pickups in the lot were, and how many of them they saw.” (1)

(1) Automotive History – A Chronological History (Antique Automobile Club of America)

(2) Dan Lienert (Forbes)

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## Major Influencing Factors

### ■ Environment

- Public health and safety
- Environmentalist pressure
- Government regulations
  - California emission
  - Idling fines (noise and emissions)



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## Major Influencing Factors

### ■ Economy

- 1929 Great Depression
  - Vehicle production decrease
- 1973 Energy Crisis
  - "American Muscle Car"
  - Japanese imports gain sales



"Lexus decided to delay the release to accommodate burgeoning demand for the [hybrid] SUV...it has 9,500 confirmed orders for the RX 400h, 8,000 buyers on dealership waiting lists and about 46,000 potential purchasers...Pricing for the RX 400h hybrid has not been announced yet." – The Associated Press

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## 2054: Speed



- Satisfies cultural needs
- Limited by technology
- NASA's SATS Program <sup>(1)</sup>
  - Highway-In-The-Sky (HITS) with synthetic vision systems
  - Simplified software-based flight controls
  - Auto-land capability
  - Computational algorithms for automated traffic separation and collaborative sequencing
  - Airborne Internet communications
  - Comprehensive safety systems

(1) Small Aircraft Transportation System (NASA's Langley Aeronautics Research Center) – <http://sats.larc.nasa.gov>



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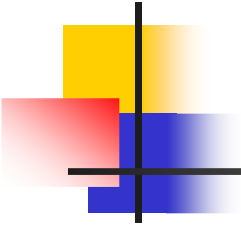
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## 2054: Efficiency

- Satisfies economic, environmental needs
- Limited by technology and culture
- Hydrogen Fuel Cell
  - Hydrogen production cost > delivered energy
  - Solar hydrogen
  - "...the people who develop the IP (intellectual property) that works will be the OPEC of the future." (1)
  - Infrastructure

(1) Christopher Sorrel, University of South Wales (from "Hydrogen Fuel Closer to Fruition." Wired News)



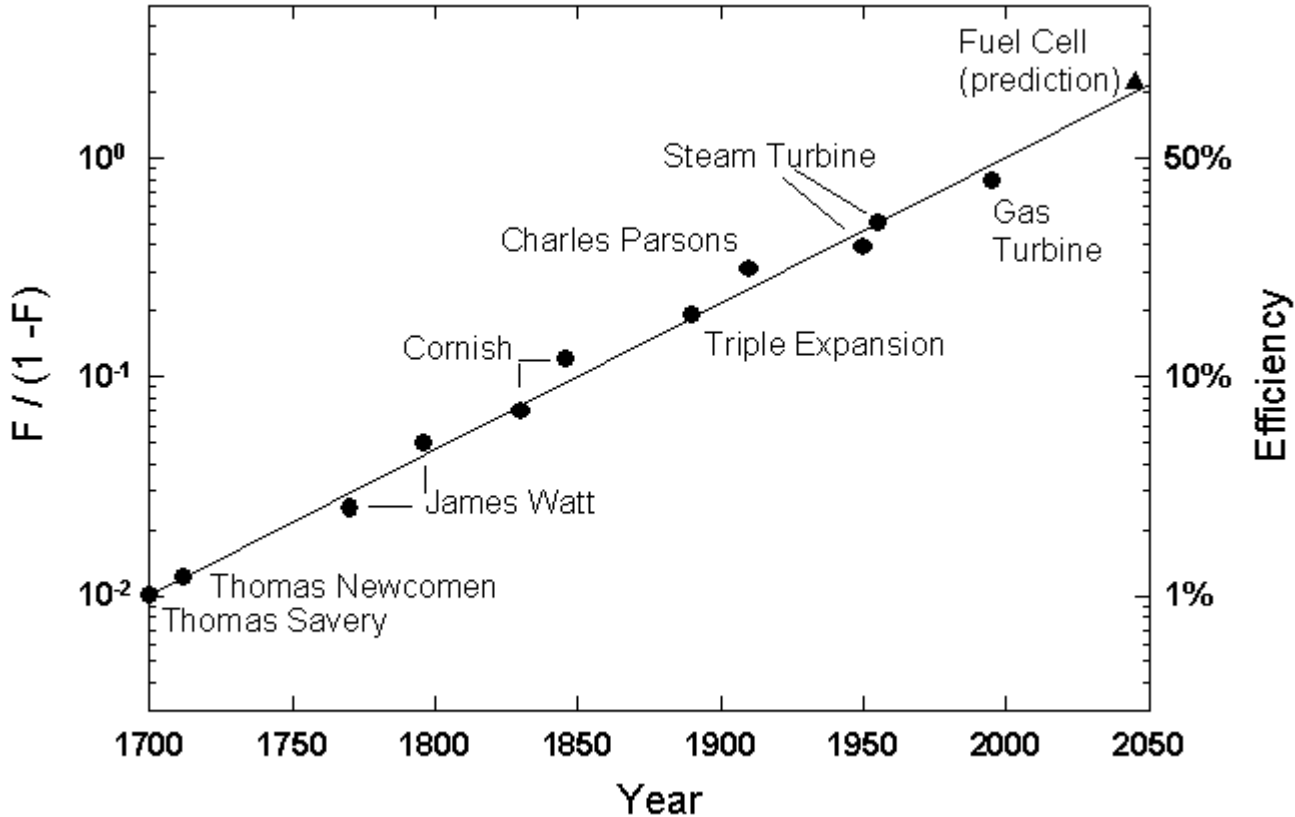
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## 2054: Efficiency

“Seventy percent efficient fuel cells, which are theoretically attainable, are due in 2050.” (1)

Improvement of the Efficiency of Motors



(1) Toward Green Mobility: the evolution of transport (Ausubel, Marchetti)

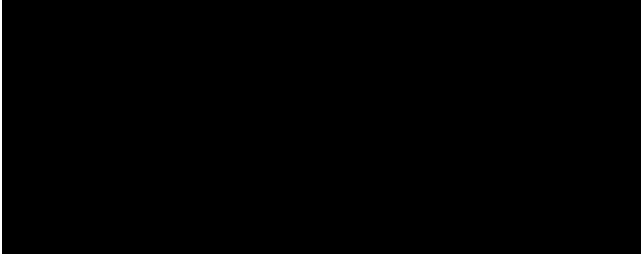


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## 2054: Convenience

- Satisfies cultural needs
  - Limited by economy
  - Segway
    - Alternative to walking or cycling
    - Used by U.S. Postal Service, Amazon.com
    - “Cities need cars like fish need bicycles.”<sup>(1)</sup> – Dean Kamen
    - “If enough people see this machine, you won't have to convince them to architect cities around it; it'll just happen.”<sup>(1)</sup> – Steve Jobs (co-founder of Apple Computers)
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(1) Heilemann, John. “Reinventing the Wheel.” Time.com. December 2001.



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## Conclusion

- Bright Future
- The Efficiency of Hydrogen power
  - Eliminate air pollution and smog in cities
  - Greatly reduce dependence on fossil fuels
- The Speed of Personal Aircraft
  - Cities increase in breadth
  - Increase commuter distance
- The Segway Convenience
  - Change city culture
  - Further increase of city bustling
  - Complement public transportation

“Prediction is extremely difficult. Especially about the future.” – Niels Bohr