

# Telecommunications and Travel Demand: A Typology of Roles

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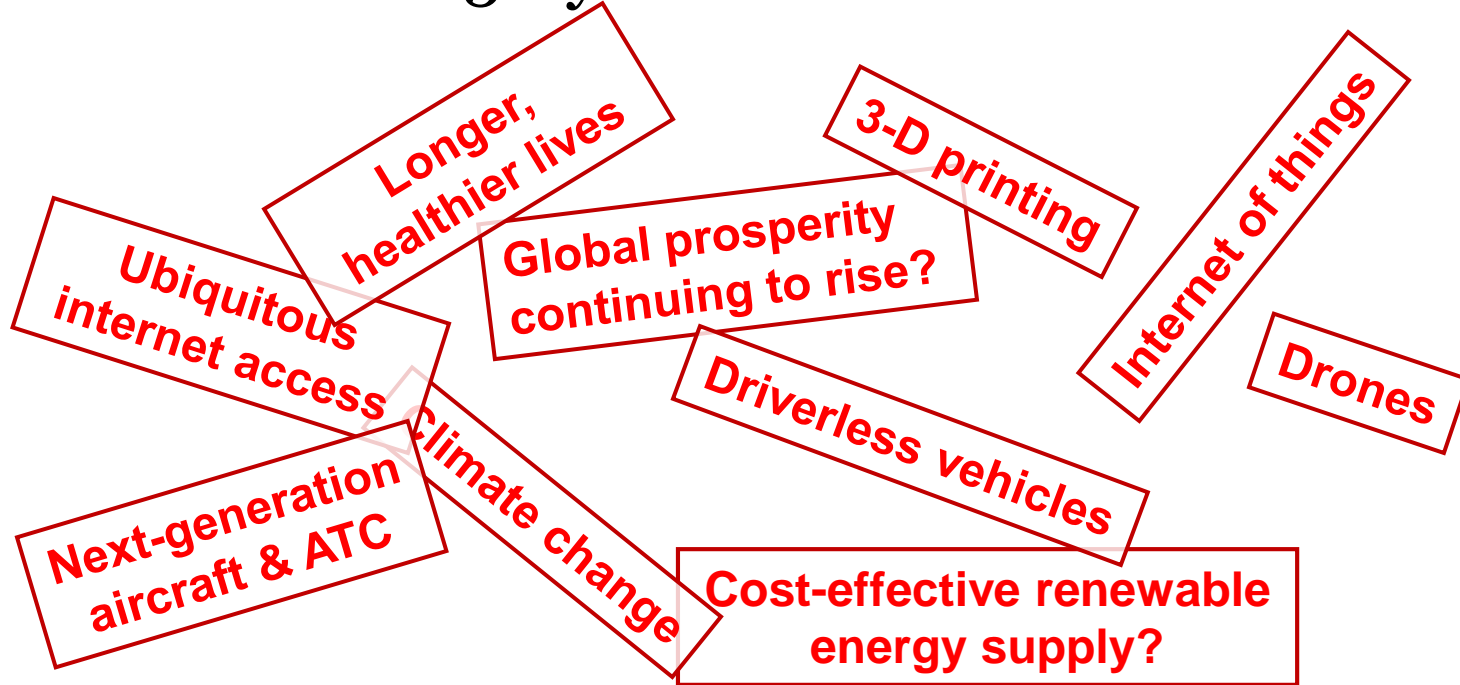
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# Introduction

- This brief overview will not focus on the specific nature of the social/ technological landscape over the next 50 years...



- ... all of which will influence interstate travel

# Introduction (cont'd)

- Rather, it will identify *conceptual mechanisms* by which ICT could influence travel, focusing on
  - Passenger travel
  - Longer-distance travel
- Expecting those mechanisms to be somewhat robust with respect to technological advances and social changes

# Outline

- Introduction
- Mechanisms by which ICT affects travel-related choices
- What do we know about their implications for intercity passenger travel?
- Conclusion

# **Mechanisms by which ICT influences travel- related choices**

← likelihood of reducing travel



likelihood of increasing travel →

**1. ICT-based v.  
traditional activity**  
*(replacement)*

**5. ICT as enabler/  
facilitator of other  
activities**

**3. Overlay of ICT activities  
onto other activities**  
*(multitasking)*

**2. Generation of new  
ICT activities**  
*(displacement)*  
- ICT *takes* time, \$

**4. ICT-enabled reallocation  
of time, \$ to other acts**  
- ICT *gives* time, \$

# 1. Choice between ICT-based and traditional activity (*replacement*)

- “Extreme commuting”, or long-distance telecommuting
- Teleconferencing instead of traveling to a meeting
- Remotely diagnosing and/or controlling
- Skyping instead of visiting friends/family
  
- By definition, these involve *substitution* of ICT for travel (*reduction*)

# 3. Overlay of ICT onto other activities (*multitasking*)

- Using MP3 player on trips (*neutrality*)
- Ability to work productively while traveling permits more travel to occur (*generation*)
- Ability to keep in touch with family and friends while traveling reduces the psychic cost (*disutility*) of travel (*generation*)



<http://www.autoguide.com/auto-news/2016/04/one-in-four-drivers-would-sleep-in-a-self-driving-car-survey.html>

[https://www.google.com/search?q=google+self+driving+car&newwindow=1&espv=2&biw=1745&bih=900&source=lnms&tbm=isch&sa=X&ved=0ahUKEwjuyevHut\\_fQAhUTzCYKHRRoCM4Q\\_AUICCGD#imgrc=s4m8zEG9MBR\\_7M%3A](https://www.google.com/search?q=google+self+driving+car&newwindow=1&espv=2&biw=1745&bih=900&source=lnms&tbm=isch&sa=X&ved=0ahUKEwjuyevHut_fQAhUTzCYKHRRoCM4Q_AUICCGD#imgrc=s4m8zEG9MBR_7M%3A)

[http://opinionator.blogs.nytimes.com/2013/07/23/driving-sideways/?\\_r=2](http://opinionator.blogs.nytimes.com/2013/07/23/driving-sideways/?_r=2)



## 4. ICT-enabled reallocation of resources to other activities (gives time/money)

- Making more business trips with the time/money saved by teleconferencing (*generation*)
- Online travel bargains prompt new trips, and/or permit traveling farther for the same amount of money (*generation*)

**Hotwire**

“By booking with Hotwire, I saved enough to swing **both** trips!”



## 4. ICT-enabled reallocation of resources to other activities (*gives time/money*)

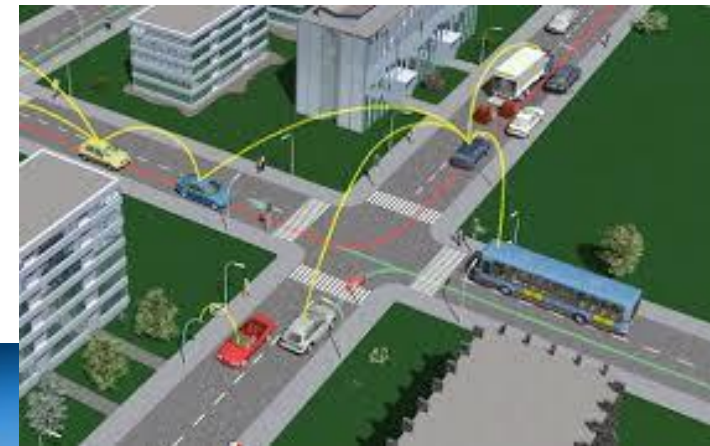
- Making more business trips with the time/money saved by teleconferencing (*generation*)
- Online travel bargains prompt new trips, and/or permit traveling farther for the same amount of money (*generation*)
- ITS applications reduce the (effective) cost of travel, making it more attractive (*generation*)

# ITS applications

ICT increases effective capacity of the system

Travel is effectively “cheaper”, therefore more attractive

Demand for travel increases





# 5. ICT as enabler/ facilitator/ modifier of activities

- Information about places, people & activities stimulates desire to go there, and makes it easier to arrange (*generation*)
  - ❖ I.e., *ICT as inspiration*



## 5. ICT as enabler/ facilitator/ modifier of activities (cont'd)

- Info re places, people & activities stimulates desire to go there, and makes it easier to arrange (*generation*)
- Provides information on alternatives; comparisons relatively easily made (*generation*)
  - Reduces the burden of trip planning & uncertainty associated with the trip (important costs of travel)
  - Thus, at the margin, decreases the disutility of travel
  - I.e., ***ICT as information provider***

# 5. ICT as enabler/ facilitator/ modifier of activities (cont'd)

- Enables efficient (lower-cost) connection of buyers and sellers (*generation*)



U B E R



# 5. ICT as enabler/ facilitator/ modifier of activities (cont'd)

- Enabling the radical transformation of some segments of travel (*generation*)

A Plane You Can Park in the Garage:  
The **ICON A5**



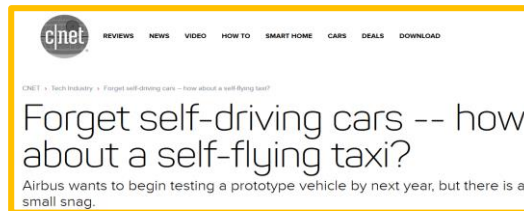
## The Fantastical, Highly Questionable, Totally Exciting Future of the Flying Car

We've been writing about flying cars since 1906. This time is different. Maybe.



By Alexander George Mar 15, 2016

<http://www.popularmechanics.com/technology/a19708/future-of-the-flying-car/>



<https://www.cnet.com/news/forget-self-driving-cars-how-about-a-self-flying-taxi/>

ALEX DAVIES TRANSPORTATION 10:27:10 10:00 AM

## INSIDE UBER'S PLAN TO TAKE OVER THE SKIES WITH FLYING CARS

<https://www.wired.com/2016/10/uber-flying-cars-elevate-plan/>



by Ashlee Vance and Brad Stone  
June 9, 2016, 8:00 AM EDT

<https://www.bloomberg.com/news/articles/2016-06-09/welcome-to-larry-page-s-secret-flying-car-factories>



<http://www.aeromobil.com/#s-about>



## 5. ICT as enabler/ facilitator/ modifier of activities (cont'd)



- Globalization of manufacturing and retailing ops, which require travel to maintain (*generation*)
- Distributed teamwork – requires intermittent co-presence or temporary geographical proximity (*generation*)
- Facilitates a shift to decentralized land use patterns (*generation*)



# ICT facilitates a shift to decentralized land use patterns

- Well... it also facilitates *concentration*
- And... influences are numerous and complex
- But, it does permit greater dispersal of residences and jobs
  - Relocations are at longer distances, may involve “distributed locations”
  - Promotes travel between old and new locations

# In sum: Key mechanisms affecting intercity travel demand

- Choice between ICT-based and travel-based alternative (#1)
- Reduction of the effective cost of travel, via
  - Productive/pleasant use of travel time, connectedness while traveling (#3)
  - Improved system-level management (ITS) (#4)
  - Information provision (#5)
- “Inspiration” role of ICT (#5)
- Radical technological innovations (#5)
- Longer-term, “background” effects (globalization, spatial redistribution) (#5)

# Choice between ICT- and travel-based alternatives

- The choice is influenced by
  - technological capabilities
  - pricing, availability, ease of use, effectiveness, side benefits of the ICT and transportation alternatives
  - social norms
  - personal attitudes, preferences, & SED traits
- These types of choices have been modeled a lot

# What about the rest of those mechanisms?

- As a simplification, we can consider changes in ***trip generation*** (TG), ***mode choice*** (MC), or ***both*** simultaneously (TG×MC):
  - Reduction of the effective cost of travel, via
    - Productive/pleasant use of travel time, connectedness while traveling
    - Improved system-level management (ITS)
    - Information provision
  - “Inspiration” role of ICT
  - Radical technological innovations
  - Longer-term, “background” effectscan all have TG, MC, and/or TG×MC impacts

# Well, we know a little something about TG & MC too...

- **TG** is influenced by
  - income, HH size/type, other SED traits
  - attitudes (toward travel, technology, etc.)
  - transportation system attributes: pricing, availability, ease of use, etc.
- **MC** is influenced by
  - income, HH size/type, other SED traits
  - attitudes (toward various modes, etc.)
  - relative pros and cons of the alternatives: time, cost, availability, **ability to use the time**, etc.

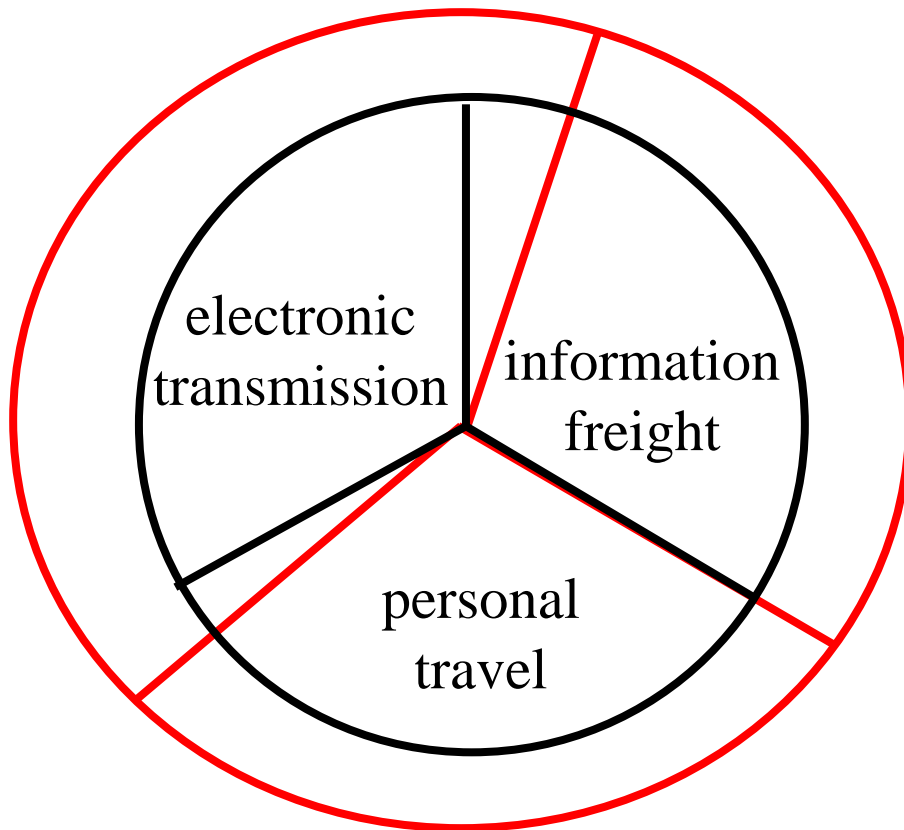
# So...

- We certainly don't know the future, but
- We're not totally clueless, either
- But our models will need some serious refinements if they are to be useful in helping us predict responses to rapidly changing developments
  - Better understanding of motivations for traveling
  - Inclusion of new and/or transformed modes
- It doesn't help that TG and MC may counteract each other

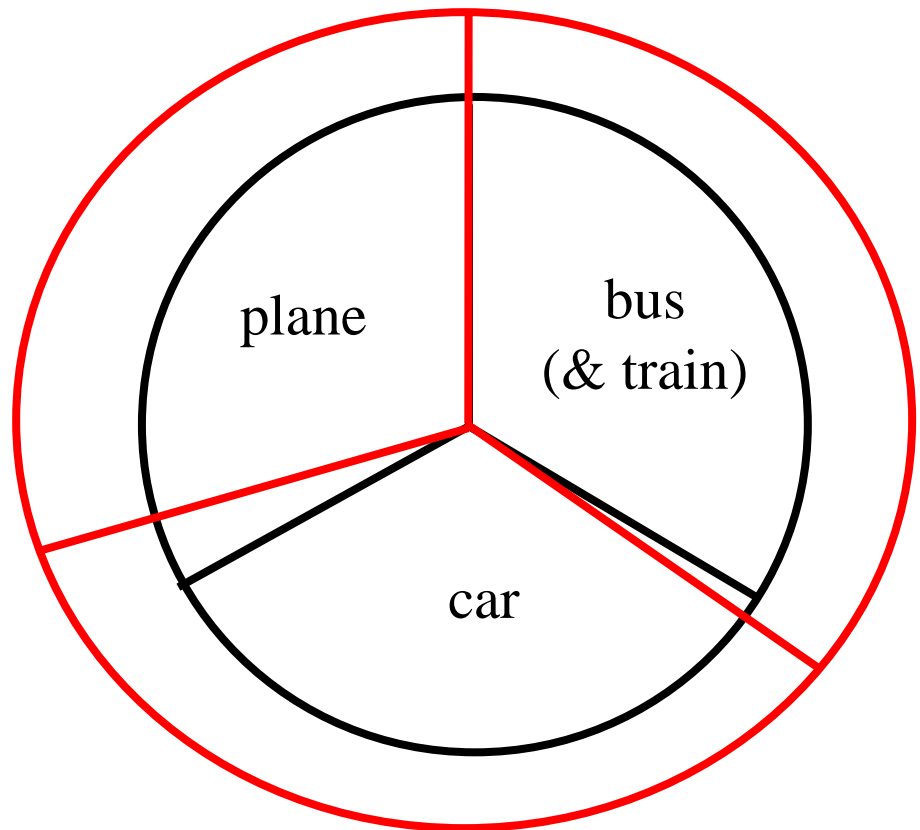


# Counteracting effects: Simultaneous reduction and generation of travel

Choice between ICT & physical travel



Choice among modes of interstate travel?



# In conclusion

- It's complicated!
- But if you ask me...
  - Travel will continue to grow (barring extreme price rises, regulation, or other constraints), in good measure stimulated by ICT
  - Mode choice for intercity trips depends heavily on technological and institutional developments



# Some references

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