The Adoption and Travel Impacts of Teleworking: Will it be Different This Time?

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It’s déjà-vu all over again!

- **Alvin Toffler (1980)**
  - “The Electronic Cottage”

- **Peter Drucker (1993)**
  - Commuting is obsolete: “It is now infinitely easier, cheaper and faster to do what the 19th century could not do: move information, and with it office work, to where people are.”

- **Frances Cairncross (1995, 1997)**
  - “The Death of Distance”
It’s déjà-vu all over again! (Yogi Berra)

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A typology of extreme events for which teleworking has been promoted

<table>
<thead>
<tr>
<th>Location of event</th>
<th>home, work, other bldg</th>
<th>transport network</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>planned</td>
<td>planned</td>
</tr>
<tr>
<td></td>
<td>either</td>
<td></td>
</tr>
<tr>
<td></td>
<td>unplanned</td>
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</tbody>
</table>
A typology of extreme events for which teleworking has been promoted

<table>
<thead>
<tr>
<th>Location of event</th>
<th>root cause</th>
<th>What is affected (\text{(unsafe, unfit, unavailable)})</th>
</tr>
</thead>
<tbody>
<tr>
<td>home, work, other bldg</td>
<td>planned</td>
<td>structures: natural, relocation</td>
</tr>
<tr>
<td>fire flood quake tornado blizzard hurricane</td>
<td>unplanned</td>
<td>asbestos failure accident attack unrest</td>
</tr>
<tr>
<td>transport network</td>
<td>planned</td>
<td>strike construction Olympics</td>
</tr>
<tr>
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root cause →

- fire
- flood
- quake
- tornado
- blizzard
- hurricane

- asbestos
- failure
- accident
- attack
- unrest
- pandemics
- strike
- construction
- Olympics
Examples...

• 1984 Los Angeles Olympics
• 1989 Loma Prieta (SF) quake
• 1992 Los Angeles riots
• 1992 flood in Chicago Loop
• 1993 NYC World Trade Center bombing
• 1994 Northridge (LA) quake
• 1995 Kobe (Japan) quake
• 1996 Atlanta Olympics
• 2002... NY... transit strike
• 2003 SARS pandemic
• 2004... blizzard (DC...)
• 2005 Hurricane Katrina

• 2007 MacArthur Maze fwy collapse, East Bay (SF)
• 2007 I-35W bridge collapse, Twin Cities
• 2008 Fix I-5 (Sacramento, CA)
• 2009 DC Metro crash
• 2011 Christchurch, NZ quakes
• 2011 Great East Japan earthquake
• 2012 London Olympics
• 2012 Hurricane Sandy
• 2016 Chilean earthquakes
• 2017 Atlanta I-85 bridge collapse
• 2020 Coronavirus pandemic
Telecommuting May Ease Chaos of a Transit Strike

Threat of Strike in New York City Puts Spotlight on Remote Access for Workers

By Stephanie Miles The Wall Street Journal Online
Updated Dec. 13, 2002 4:10 pm ET

https://www.wsj.com/articles/SB1039204370405654513

Los Angeles Times

Earthquake: The Long Road Back:
Telecommuting Takes Off After Quake:
Business: Building owners are converting unused spaces into work stations to meet the demand. Most employees welcome the change.


Move to telecommute may be an Olympic legacy

By Jeffrey Kagan
Oct 7, 1996, 12:00am EDT Updated Oct 7, 1996, 12:00am EDT

IN THIS ARTICLE
Now that Atlanta’s great Olympic telecommuting experiment has concluded, what have we learned? Many Atlanta businesses braced for Olympics-related gridlock by setting up telecommuting programs and business continuity plans to


Hurricane Sandy Forces Companies to Reconsider Telework

https://blog.shrm.org/workplace/hurricane-sandy-forces-companies-to-reconsider-telework

By Greg Wright | On November 26, 2012 | News Updates

2012

1996

2002
So (even pre-COVID-19) teleworking must be through the roof by now?

A lot depends on how you define it! “Working from home” includes

• Moonlighting (second jobs)
• Self-employment (blue-collar as well as white and pink)
• Farmers and live-in domestics
• Long-distance teleworkers
• Overtime (evenings/weekends)

as well as

• Salaried employees not commuting

Mokhtarian 1991; Mokhtarian et al. 2005; Mokhtarian & Tal 2013; Circella & Mokhtarian 2017
Transportation impacts differ markedly

“telework” more broadly

**reduce**
- salaried employees
- live-in domestics

**ambiguous**
- self-employment
- moonlighting
- long-distance telework

**neutral**
- overtime WAH

**increase**
- fieldwork
- working while traveling

Mokhtarian & Henderson 1998; Mishra 2017
How much \(^{(\text{pre-COVID-19})}\) working from home is there?

- **Statistics** like “43% of employees work remotely” (2016) include all of those forms, plus just “away from their team members”
  
  [https://cloc.umd.edu/library/research/State%20of%20the%20American%20Workplace%202017.pdf](https://cloc.umd.edu/library/research/State%20of%20the%20American%20Workplace%202017.pdf)

- **Census/American Community Survey (ACS) journey-to-work numbers** give us the most consistent count for the US
  
  - “How did [you] usually get to work last week?”
  - “Worked from home”
    
    - **Includes** self-employed
    - **Excludes** less frequent teleworkers

[https://www2.census.gov/programs-surveys/acs/methodology/questionnaires/2020/quest20.pdf](https://www2.census.gov/programs-surveys/acs/methodology/questionnaires/2020/quest20.pdf)
What do the US Census numbers show?

- Work-at-home commute share has increased from 2.3% in 1980 to 5.3% in 2018
- It now exceeds the share of transit (4.9% in 2018)

"Usual commute mode" shares

~77% drive-alone share omitted

What do the US Census numbers show?

"Usual commute mode" shares in SW Idaho

- Work-at-home share has fluctuated between 6 and 8%
- Its share is 10-30 x that of transit

~80% drive-alone share omitted

Why aren’t the numbers higher?

- Not everyone’s job is suitable
- Not everyone whose job is suitable wants to
- Not everyone whose job is suitable and wants to is allowed to
- Not everyone who ... is allowed to does so on any given day
- People often don’t do it for very long

Mokhtarian & Salomon 1994, 1996a,b, 1997; Mokhtarian 1998; Varma et al. 1998
How many *can* work from home?

**Based on job**

- **56%** (non-self-employed, could partially, Global Analytics), [GlobalWorkplaceAnalytics.com](https://globalworkplaceanalytics.com/work-at-home-after-covid-19-our-forecast)
- **37%** (could entirely), Dingel & Neiman 2020

**Allowed to, available, eligible**

- **18%** (2017 National Household Travel Survey), [https://nhts.ornl.gov/assets/FHWA_NHTS_Report_3B_Final_021119.pdf](https://nhts.ornl.gov/assets/FHWA_NHTS_Report_3B_Final_021119.pdf)
How many *did* work from home (pre-COVID-19)?

- **5.3%** “usually” (2018 American Community Survey) ([link](https://data.census.gov/cedsci/table?q=S08&d=ACS%201-Year%20Estimates%20Subject%20Tables&tid=ACSST1Y2018.S0801))
- Non-self-employed: **8%** at least once/wk (could be weekends!), **2%** full-time (2017-18 American Time Use Survey) ([link](https://www.bls.gov/news.release/flex2.t03.htm))
- **12%** “usually” (2017 NHTS) ([link](https://nhts.ornl.gov/assets/NHTSBriefTelecommuting041719.pdf))

How many *do/have now* (during COVID-19)?

- **40%** (late March 2020, Pew) ([link](https://www.pewsocialtrends.org/2020/03/30/most-americans-say-coronavirus-outbreak-has-impacted-their-lives/))
- **50%** (Apr/May 2020, MIT) (Brynjolfsson et al., 2020, N = 50,000)
- **62%** (Gallup) ([link](https://news.gallup.com/poll/306695/workers-discovering-affinity-remote-work.aspx))
More recently, Gallup research revealed that the percentage of American workers who had worked from home [during the crisis, per https://news.gallup.com/poll/306695/workers-discovering-affinity-remote-work.aspx] doubled in the weeks between mid-March and early April 2020, to more than 60 percent. Three-fifths of people working from home said they'd like to keep doing so once the crisis is over.

How many (say they) want to? (1)

- **59%** of those who WAH during COVID-19, “as much as possible”  
  (https://news.gallup.com/poll/306695/workers-discovering-affinity-remote-work.aspx)

- Of FT office wrkrs (co’s of ≥ 100 emps) who WAH during COVID-19:
  - 56% some of the time
  - 30% most of the time
  - 12% all the time  
N=1,000; “not representative of all commuters in the United States”
How many (say they) want to? (2)

- Of those who WAH during COVID-19, 54% primarily, 75% occasionally
  - But < 40% “feel strongly that their employer should provide employee opt-in remote work options when returning to normal operations”???

- Maybe I “want to, but know I really can’t, or shouldn’t”?
  - Only 37% of those who could and wanted to actually did
How often did they telework (pre-COVID-19)?

- **American Time Use Survey (2017-2018)**
  (https://www.bls.gov/news.release/flex2.t03.htm)
  - Main job only, excludes self-employed
  - “Worked at home”
    - *Excludes* telework center
    - *Includes* evenings
  - “Worked exclusively at home”
    - *Excludes* home+coffee shop
    - *Includes* weekends

- Ave. frequency ~1.7 days/wk
  → ~5% non-self-empl workers exclusively WAH on any given weekday

- Never WAH (75.2%)
  - Exclusively WAH ≤ 2 x/mo (6.6%)
  - Exclusive WAH 1-2 x/wk (4.1%)
  - Exclusive WAH 3-4 x/wk (1.9%)
  - Exclusive WAH 5+ x/wk (2.1%)
  - Never have exclusive WAH days (10.1%)
There’s an *optimum level* of teleworking

- The optimum level will differ from person to person, and over time for the same person.
- On average, *job satisfaction* plateaued at around 15 hours/week of teleworking – i.e. at about 2 *days/week*.
- The optimum level differed by job and person characteristics.

*Allen et al. 2015*
**How long did they telework (pre-COVID-19)?**

- An under-researched question!

- **After the 1989 Loma Prieta (SF) quake** *(Pratt 1991):*
  - Only half the teleworkers *(N = 32)* were still doing so 2-6 mos later

- **Across three 2-year pilot projects** *(Varma et al. 1998):*
  - 60-70% *(N=773)* were still doing so at the end

- **In one study of telecenter users** *(Varma et al. 1998):*
  - 50% *(N=274)* had stopped teleworking within 9 months

- Constraints more important than preferences
Why wouldn’t we want to work from home?

- Saves time (commuting, getting dressed?)
- Saves money (commuting, grooming?)
- Better work-family balance
- Higher productivity
- Less stress
- Safer neighborhoods (eyes on the street)
- Job retention, access
- Good for the environment
- Less contagion!!!!
Why *would* we want to work from home?

domestic abuse

lack of workspace amenities

too little "me" time

tooc little social interaction

work-family collision!

screen fatigue

substance abuse

fear of missing out

not enough exercise

screen fatigue

hobbies / refrigerator / pets

not enough exercise

hobbies / refrigerator / pets

not enough exercise

hobbies / refrigerator / pets
Pluses and minuses of remote work during Covid-19

What has been your biggest challenge while working from home?

- Lack of in-person collaboration with colleagues: 21%
- It's hard to unplug at the end of the day: 17%
- More distractions and interruptions: 13%
- It's too easy to raid the fridge: 12%
- Juggling both my work and my children's schoolwork: 12%
- Increased workload: 9%
- Technology woes: 9%
- Other: 4%

What has been the best part of working from home?

- Reduced commuting time: 44%
- Better ability to balance home and work responsibilities: 14%
- Getting to spend more time with those who live with me: 14%
- Flexible hours: 9%
- Fewer distractions and interruptions: 9%
- Increased productivity: 5%
- Other: 2%
- Decreased workload: 0%

Source: © 2020 Society for Human Resource Management, KNOWABLE MAGAZINE
Why wouldn’t managers want their staff to work from home?

- **Saves a ton of money**
  - On *real estate* (*if* eliminating assigned offices)
  - Potentially on *wages* (*hiring* from lower cost-of-living areas)
- **Improves recruitment**
- **Improves retention**
- **Reduces absenteeism**
- **Increases productivity**
- **Virtue signaling** (*care about environment, employees*)
Why *don’t* managers want their staff to work from home? *(if they don’t have to)*

- Management resistance is still perhaps the strongest barrier, often for good reasons...
  - Value of in-person communication
  - Greater “overhead” of remote management

- ... and often for weaker ones
  - “How will I know they’re really working?”
  - “I don’t want to let Susie do it but not Joe”

Why *don’t* managers want their staff to work from home? (if they don’t have to)

- Management resistance is still perhaps the strongest barrier, often for good reasons...
  - Value of in-person communication
  - Greater “overhead” of remote management
- ... and often for weaker ones
  - “How will I know they’re really working?” (How do you know now?)
  - “I don’t want to let Susie do it but not Joe” (should be able to defend those decisions, but it takes time and can be a hassle)

Won’t it be different this time?

- Well, we’ve heard that before …
- But technology’s so much better now…
  - And it will get even better!
  - But technology is not the main barrier
    - Considering that tech-based companies such as Yahoo (2013), Reddit (2014), and IBM (2017) had previously cut back or withdrawn teleworking programs…

Some key reasons for the slow adoption of working from home have not gone away

- Value of in-person communication
- Weak employee preferences
- Home, internal constraints
The boring (likely) truth

- We will neither snap back to the status quo ante
- Nor will “everything” be different now
- We will be somewhere in between
Pat’s probabilistic prediction

probability of $x$

pre-COVID-19  post-COVID-19 levels of teleworking, $x$  COVID-19
Closing thoughts (1)

- We used to ask how to increase the adoption of teleworking
- A pandemic has taken care of that for us
  - Arguably under less than ideal circumstances
  - But with lots of time to adjust...
- So organizations and employees alike should have an adequate idea of its pros and cons
- Let’s see what happens!
Closing thoughts (2)

- Some research needs...
  - Measurement of amounts of various types of telework, with careful and consistent definitions!
  - Frequency, duration, reasons for starting, quitting, re-entry
  - Impacts on residential location
  - Carbon footprint of long-distance teleworkers
  - Impact differences between opt-in and involuntary programs

- Don’t forget the ~40% who cannot telework
Selected references: Adoption, frequency


Selected references: Adoption, frequency (2)

Selected references: Transportation and air quality impacts (1)


Selected references: Transportation and air quality impacts (2)

Selected references: Residential/location impacts, cost-benefit analysis

*Residential Location Impacts of Telecommuting*


*Cost-Benefit Analysis of Telecommuting*

Selected references: Responses to congestion/system disruption (1)


Selected references: Responses to congestion/system disruption (2)


- “Personal Travel Management: The Adoption and Consideration of Travel-Related Strategies” by Michael J. Clay and Patricia L. Mokhtarian. *Transportation Planning and Technology* 27(3) (June), 2004, 181-209.


TCing as a response to extreme events

TCing as a response to extreme events (2)


TCing as a response to extreme events (3)

TCing as a response to extreme events (4)

- 11/26/2012: [https://blog.shrm.org/workplace/hurricane-sandy-forces-companies-to-reconsider-telework](https://blog.shrm.org/workplace/hurricane-sandy-forces-companies-to-reconsider-telework)
Recent-ish (pre-COVID-19) setbacks for TCing (1)


- **2/20/2019:** Virginia’s Telework Expenses Tax Credit program eliminated after it was found to return only 4 cents per dollar invested ([http://jlarc.virginia.gov/pdfs/reports/Rpt506.pdf](http://jlarc.virginia.gov/pdfs/reports/Rpt506.pdf); pp. 49ff): [https://blog.arlingtontransportationpartners.com/the-virginia-telework-tax-credit-expired](https://blog.arlingtontransportationpartners.com/the-virginia-telework-tax-credit-expired)

Recent-ish (pre-COVID-19) setbacks for TCing (2)


- 2013: Yahoo terminates its TCing program
Other useful sources (1)

- https://www.brookings.edu/blog/up-front/2020/04/06/telecommuting-will-likely-continue-long-after-the-pandemic/
- https://bfi.uchicago.edu/working-paper/how-many-jobs-can-be-done-at-home/
- https://www.newyorker.com/culture/annals-of-inquiry/can-remote-work-be-fixed?
Other useful sources (2)

- https://inrix.com/blog/2020/05/covid19-us-traffic-volume-synopsis-10/
- https://clark.com/employment-military/companies-long-term-remote-work/