Work at Home Data Analysis of Pre, During, and Post-Pandemic

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SCAG MODELING TASK FORCE
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WWW.SCAG.CA.GOV
Objectives

Summarize work from home data and findings

Pre-pandemic data
  • ACS (American Community Survey), Travel Survey (CHTS, NHTS)

During & Post-pandemic data
  • ACS (to 2021)
  • U.S. Survey of Working Arrangements and Attitudes (SWAA)
  • UC Davis Transportation Survey
Work at Home (W@H) / Work from Home (WfH)

Model Input for Work at Home

Percentage of work-at-home trips on an average weekday (Mon-Fri)
  • Consider “Home” is one of the mode for work trip
  • Work at home for 2 days a week = 0.4 work trips at home

W@H Modes

1. Home office/Remote
   • No permanent work location
   • Working at home everyday

2. Telework/Hybrid
   • Has a permanent work location
   • Work at home 1-4 days per week
WORK AT HOME DATA BEFORE PANDEMIC
ACS - Home Office/Remote

ACS - Means of Transportation to Work

<table>
<thead>
<tr>
<th>Annual Data</th>
<th>% W@H</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>2.71%</td>
</tr>
<tr>
<td>2000</td>
<td>3.60%</td>
</tr>
<tr>
<td>2005</td>
<td>4.02%</td>
</tr>
<tr>
<td>2006</td>
<td>4.23%</td>
</tr>
<tr>
<td>2007</td>
<td>4.60%</td>
</tr>
<tr>
<td>2008</td>
<td>4.52%</td>
</tr>
<tr>
<td>2009</td>
<td>4.81%</td>
</tr>
<tr>
<td>2010</td>
<td>4.74%</td>
</tr>
<tr>
<td>2011</td>
<td>4.99%</td>
</tr>
<tr>
<td>2012</td>
<td>4.93%</td>
</tr>
<tr>
<td>2013</td>
<td>5.13%</td>
</tr>
<tr>
<td>2014</td>
<td>5.04%</td>
</tr>
<tr>
<td>2015</td>
<td>5.30%</td>
</tr>
<tr>
<td>2016</td>
<td>5.63%</td>
</tr>
<tr>
<td>2017</td>
<td>5.69%</td>
</tr>
<tr>
<td>2018</td>
<td>5.76%</td>
</tr>
<tr>
<td>2019</td>
<td>6.08%</td>
</tr>
<tr>
<td><strong>2020</strong></td>
<td><strong>16.77%</strong></td>
</tr>
<tr>
<td><strong>2021</strong></td>
<td><strong>19.30%</strong></td>
</tr>
</tbody>
</table>

Source: ACS
Home Office Workers Trend Projection

Linear regression: using data before pandemic
Travel Surveys - Telework/Hybrid

• Working for 1-4 days per week

• 2009 NHTS and 2017 NHTS (National Household Travel Survey)
  • SCAG region samples
  • 2009 NHTS: 5,633 sample workers
  • 2017 NHTS: 4,464 sample workers

• 2011 CHTS (California Household Travel Survey)
  • SCAG add-on survey
  • SCAG region: 2,806 sample workers
Key Assumptions and Analysis

1. % of workers who were allowed to telework
   * not include home-office workers
   • 2009 NHTS – 10.6%
   • 2017 NHTS – 12.5%

NHTS question

[DO YOU CAP] have the option of working from home or an alternate location instead of going into [YOUR THEIR] [PRIMARY] workplace?
Key Assumptions and Analysis

2. % actual telework (for those who were allowed telework)
   • 2009 NHTS – 70%
   • 2017 NHTS – 78%

3. # W@H days per week for teleworkers
   • 2009 NHTS – 1.10 days (22% of a week)
   • 2011 CHTS – 1.25 days (25% of a week)
   • 2017 NHTS – 1.35 days (27% of a week)
### Telework from Travel Survey

<table>
<thead>
<tr>
<th></th>
<th>Year</th>
<th>2009 NHTS</th>
<th>2011 CHTS SCAG add-on</th>
<th>2017 NHTS</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Home Office Workers</td>
<td>of All Workers</td>
<td>4.8%</td>
<td>5.0%</td>
<td>5.7%</td>
<td>ACS</td>
</tr>
<tr>
<td>% Non Home Office Workers</td>
<td>of All Workers</td>
<td>95.2%</td>
<td>95.0%</td>
<td>94.3%</td>
<td>calculate</td>
</tr>
<tr>
<td>% Workers Allowed Telework</td>
<td>of Non Home Office Workers</td>
<td>10.6%</td>
<td>11.1%</td>
<td>12.5%</td>
<td>NHTS*</td>
</tr>
<tr>
<td>% Teleworker</td>
<td>of Workers Allowed Telework</td>
<td>70%</td>
<td>72%</td>
<td>78%</td>
<td>NHTS*</td>
</tr>
<tr>
<td>% Teleworking of a Weekday</td>
<td>of Teleworkers</td>
<td>22%</td>
<td>25%</td>
<td>27%</td>
<td>NHTS &amp; CHTS</td>
</tr>
<tr>
<td>% Teleworks of a weekday</td>
<td>of All Workers</td>
<td>1.54%</td>
<td>1.94%</td>
<td>2.44%</td>
<td></td>
</tr>
</tbody>
</table>

* Using NHTS 2009 and 2017 to interpolate 2011 data

Average annual growth rate = 5.9% (2009 and 2017 NHTS)
Telework Growth Rate Estimate

• **Annual Average Growth Rate for Telework: 4.73%**
  - NHTS: 5.90%
  - ACS for Information, Finance, Business Service: 3.57%

• **2019 Base Year projection = 2.67%**
Baseline/Trend Projection for Work at Home (without pandemic influence)
Baseline/Trend Projection for Work at Home (combined) (without pandemic influence)
WORK AT HOME DATA DURING & POST-PANDEMIC

- U.S. SURVEY OF WORKING ARRANGEMENTS AND ATTITUDES (SWAA)
- UC DAVIS TRANSPORTATION SURVEY
U.S. Survey of Working Arrangements and Attitudes (SWAA)

• WFH (Work From Home) Research and the SWAA were founded in May 2020 in response to the dramatic impact of COVID-19 on working arrangements.

• The SWAA is a monthly online survey run jointly by the University of Chicago, ITAM (Mexico), MIT, and Stanford University.

• Results, micro data, survey instruments, and more are freely available at www.WFHresearch.com

SWAA Data

• Monthly online survey since 2020.

• Target population:
  • U.S. residents, 20-64, who earned ≥ $10K in 2019
  • 140K samples
  • Weighted to match 2010-2019 CPS worker shares in age-sex-education-earnings

SWAA March 2023 Updates 1 Jose Maria Barrero, Nicholas Bloom, Shelby Buckman, and Steven J. Davis 6 March 2023
### SWAA Work from Home – During Pandemic

- The survey asks work status for each day of a week
  - `workstatus_monday` “Monday of last week, did you work a full day (6+ hours), and if so where?”
    - 1) Did not work, 2) Worked from home, 3) Worked on employer or client premises

- For modeling purpose, we focus on weekday (Mon-Fri) analysis

<table>
<thead>
<tr>
<th>Day of the week</th>
<th>Did not work 6 or more hours</th>
<th>Worked from home</th>
<th>Worked at employer or client site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Tuesday</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>Wednesday</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>Thursday</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>Friday</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>Saturday</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Sunday</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

For each day _last week_, did you _work a full day (6 or more hours)_ and if so _where_?
A question asks surveyed workers about their "Employer's planned number of paid WFH days after COVID".
Analysis Approach

• % of workers by WfH modes (Remote/Hybrid)
• Number of WfH days per week for hybrid workers
• % of work trips by WfH Modes

• During Pandemic:
  • data between 11/2021 ~ 01/2023
• After Pandemic
  • data between 10/2022 ~ 01/2023

• Analyze the data by 3 geographic areas (US, CA, LA), industry, and income
% Workers by WfH Modes During the Pandemic (US)
Average WfH Days per Week (Mon.-Fri.) for Hybrid Workers
% Work Trips by WfH Modes
% Workers by Work Modes – by 3 Geographic Areas

Comparing U.S. with the samples from California and Los Angeles:

• CA and LA tend to have a higher % of hybrid workers and total WfH workers

• % of Remote workers is consistent with ACS
  • SCAG: 16.8% (2020); 19.3% (2021)
% Work Trips by WfH Modes – by 3 Geographic Areas

- Average number of WfH days per week for hybrid workers is similar across the U.S., CA, and LA
  - about 2.2 days per week

- % of Hybrid and Total WfH trips is higher in CA and LA than in the U.S.
% Workers by WfH Modes – After Covid (AC)

US
- Remote: 15.7%
- Hybrid: 35.7%
- Total WfH: 51.3%

US (AC)
- Remote: 8.7%
- Hybrid: 39.8%
- Total WfH: 48.6%

CA
- Remote: 17.0%
- Hybrid: 45.0%
- Total WfH: 62.0%

CA (AC)
- Remote: 7.7%
- Hybrid: 52.2%
- Total WfH: 59.9%

LA
- Remote: 16.3%
- Hybrid: 48.8%
- Total WfH: 65.0%

LA (AC)
- Remote: 7.4%
- Hybrid: 55.8%
- Total WfH: 63.2%
Average WfH Days for Hybrid Workers

During Pandemic  |  After Pandemic
--- | ---
US | 2.20 (During), 2.42 (After)
CA | 2.18 (During), 2.47 (After)
LA | 2.18 (During), 2.47 (After)
% Work Trips by WfH Modes – After Covid (AC)
% Work Trips by WfH Modes by Industry

Lower % WfH trips: accommodation/food, transportation, manufacturing, retail
Higher % WfH trips: professional services, information, finance/real estate
% of Work Trip by WfH Modes by Income
SWAA Summary: % Work Trips by WfH Modes
UC Davis Transportation Survey

• SCAG joined UD Davis travel survey data collection
  • During 2020-2021

• The survey includes questions for working at home:
  How often did you generally work at Home or at Primary Workplace
  • Prior to the pandemic (before March 2020)
  • During the pandemic – 2021 (survey)
  • After to the pandemic (a year from now)
6. In the **months just prior to the pandemic (before March 2020)**, please indicate how often you generally went to each of the following places for work or school.

<table>
<thead>
<tr>
<th>Just prior to the pandemic, I used to work/study at…</th>
<th>Never</th>
<th>Less than once a month</th>
<th>1-3 times a month</th>
<th>1-2 times a week</th>
<th>3-4 times a week</th>
<th>5 or more times a week</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. … primary workplace/school location</td>
<td>□<em>0</em></td>
<td>□<em>1</em></td>
<td>□<em>2</em></td>
<td>□<em>3</em></td>
<td>□<em>4</em></td>
<td>□<em>5</em></td>
</tr>
<tr>
<td>b. … other workplace/school location/customer location</td>
<td>□<em>0</em></td>
<td>□<em>1</em></td>
<td>□<em>2</em></td>
<td>□<em>3</em></td>
<td>□<em>4</em></td>
<td>□<em>5</em></td>
</tr>
<tr>
<td>c. … home</td>
<td>□<em>0</em></td>
<td>□<em>1</em></td>
<td>□<em>2</em></td>
<td>□<em>3</em></td>
<td>□<em>4</em></td>
<td>□<em>5</em></td>
</tr>
<tr>
<td>d. … temporary locations (e.g., coffee shops, parks, public library)</td>
<td>□<em>0</em></td>
<td>□<em>1</em></td>
<td>□<em>2</em></td>
<td>□<em>3</em></td>
<td>□<em>4</em></td>
<td>□<em>5</em></td>
</tr>
</tbody>
</table>
Analysis Approach

• Using Summer 2021 Survey (SCAG samples)
  • 2,533 sample workers

• This survey tends to over-represent workers that are able to work remotely
  • The issue was addressed by research team.

• Our analysis focuses on W@H patterns
  • Comparing trends of work at home between during and post-pandemic.
Workers/Work Trips by WfH Modes

% Workers by WfH Modes on Average Weekday

% Trips by WfH Modes on Average Weekday
Approach and Assumptions

• **Before Covid (2019)**
  • Remote: ACS (6.1%); Hybrid: NHTS (2.7%)

• **During Covid (2021)**
  • Remote: ACS (19.3%)
  • Hybrid: UCD survey (and SWAA WfH days)

• **After Covid**
  • Remote: ACS data & UCD survey trends
  • Hybrid: UCD survey (and SWAA WfH days)
UCD Survey Summary: % Work Trips by WfH Modes
Final Data Summary: % Work Trips by WfH Modes
Summary/Conclusion

- As a result of the pandemic, many workers were transitioned from working in offices to working remotely from home, either as fully remote or hybrid workers.

- As the pandemic subsides, it is expected that remote workers will return to the office as hybrid workers.

- Notably, the percentage of workers who work from home is much higher post-pandemic than pre-pandemic.