Finding the Right Balance
An Evidence-Based Examination of
Flexible Work Arrangements

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Prism Economics and Analysis

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ONTARIO
SOCIETY OF
PROFESSIONAL
ENGINEERS

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Executive Summary

The purpose of this report is to provide evidence-based guidance on striking the right balance between the clear desire of employees for more flexibility and the needs of the organisations that employ them.[1]

Survey evidence and interviews with employers indicate that most organisations have some degree of potential flexibility. The survey of OSPE members undertaken for this report found that there was greater variation in working from home options *within* industries than *across* industries. This implies that management policy is at least as important, if not more important, than the technical potential for flexibility. Organisations that reject a work from home option on the grounds that "it is not practical" will often be contradicted by similar organisations that implement such options. Organisations that choose not to implement a work from home option risk being seen as a less desirable place to work with all the consequences that this may imply for employee morale, turnover, and the quality of new hires.

Interviews with employers indicate that, in some cases, senior management is reluctant to offer flexibility owing to concerns about eroding workplace culture, reducing individual or organisational productivity, and diminishing the opportunities to mentor junior staff.

This report draws two important conclusions from the evidence. The first is that there are potentially adverse consequences to organisations that do *not* offer some degree of flexibility. The second is that offering flexibility poses organisational challenges. These challenges need to be addressed concurrently with policies that allow for greater flexibility. All organisations can benefit from basing their policies on an objective consideration of the evidence and how it may pertain to their own circumstances.

In 2024, approximately one in four Canadians (24%) worked from their home at least part of the week. This compares to approximately 7% prior to COVID. Among office and professional employees, the proportion working from home at least part of the week is even higher than 24%. The 2024 survey of OSPE members found that approximately 70% of respondents have access to a work from home option for at least part of the week.

Average Days Worked from Home

0 days	30%
1 day	8%
2 days	21%
3 days	15%
4 days	8%
5 days	18%
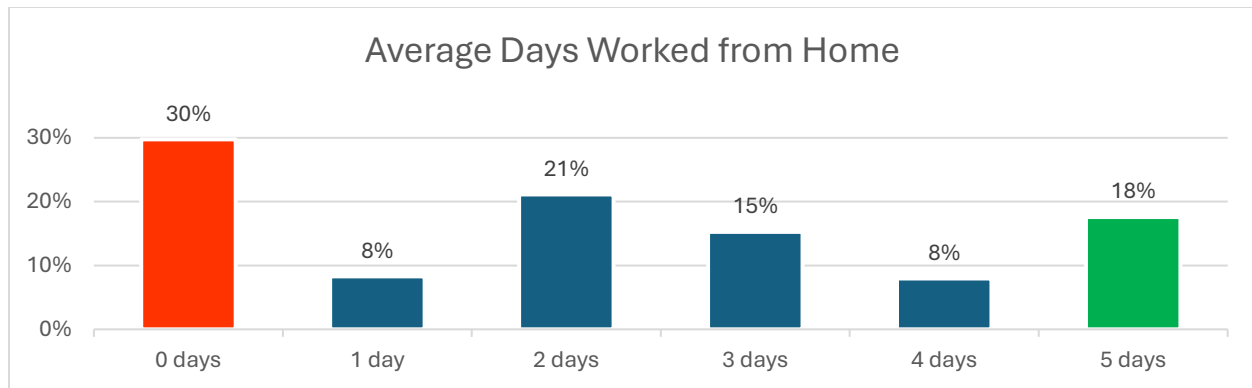
OSPE Membership Survey, 2024 (n=1,199)

Surveys consistently find that large majorities of employees value an increase in flexibility. In a 2024 survey, OSPE members cited improved work-life balance, reduced commuting time, fewer interruptions, and reduced personal expenses as the principal advantages of working from home. These findings applied regardless of age group or gender, although women consistently attached more value to a working from home option.

In contrast with the clear evidence of a strong employee desire for more flexibility, many organisations are reducing their work from home options or curtailing them altogether. A 2024 survey of CEOs by KPMG Canda found that 83% expected a full return to the office in the next three years. Based on the evidence, this report concludes that the implied intent to reverse existing flexible work arrangements is unsound and the expectation that this can be done without incurring a cost is unrealistic.
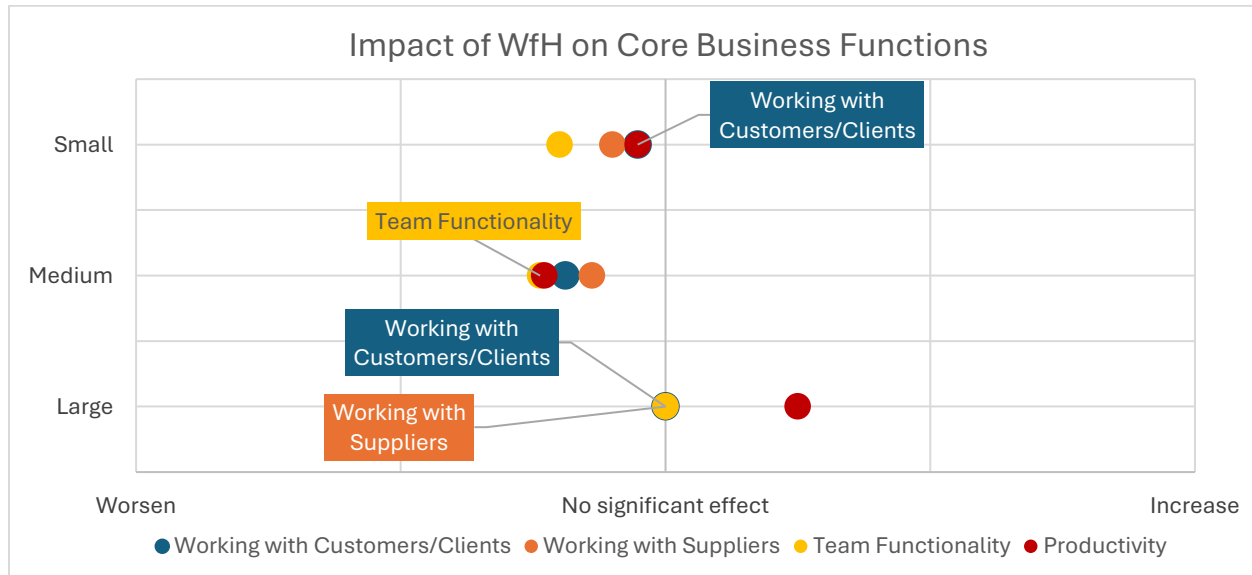
The Evidence on Individual Productivity

It is the overwhelming consensus among surveys that those who work from home report higher personal productivity. In OSPE's 2022 survey 54% of respondents reported increased personal productivity, while 34% reported no change. Fewer interruptions and reduced commuting time are the most frequently cited contributors to increased productivity when an engineer works from home. In the same survey, 37% of engineering supervisors reported increased productivity among those they supervised, and a further 44% reported no change – a lower, but still significant indicator of the impact of working from home on individual productivity.

Researchers at Stanford University conducted a study involving 1,600 employees at a Chinese software engineering firm. The employees were divided into two groups: one that worked exclusively in the office, and another that worked from home two days per week. The two-year study found no measurable difference in productivity for software engineers, nor any difference in performance evaluations, or likelihood of subsequent promotion. Comparable results have been found across similar studies.

The Evidence on Core Business Functions

In a survey of 100 engineering employers (84 in manufacturing) undertaken for this report, respondents reported that working from home had only a modest impact or no impact on the contribution of engineering and technology staff to four key business functions:

- engineering productivity,
- functioning of engineering teams,
- working with suppliers, and
- working with customers.

Impact of WfH on Core Business Functions

Survey of Engineering Employers, 2025 (n=100 of which manufacturing = 84)

The Evidence on Organisational Productivity

Organisational productivity includes individual productivity but also encompasses team outputs such as creative problem-solving and the workplace culture that fosters it. It is true that technology allows engineering teams to be composed of professionals who are in disparate locations. Indeed, this is a common practice in international engineering firms. However, studies find that clustering talent in one place facilitates communication, which is more frequent, of higher quality, and freer than is possible when people are geographically dispersed. This includes unexpected, unplanned, and unstructured interactions, through which tacit knowledge exchange can occur not just within, but between teams and departments. OSPE's 2022 survey of its members found that approximately one third of respondents experienced a deterioration in the quality of their interactions with colleagues during the period when working from home was the norm.

Organisations that replace co-located staff with staff who are remotely connected risk a potential loss of organisational productivity. Studies indicate that the loss is negligible when a hybrid model of working from home is implemented, but potentially more serious when interactions are always, or almost always, mediated by remote technology.

An influential study by Forsgren et al. defines the principal determinants of engineering productivity as:
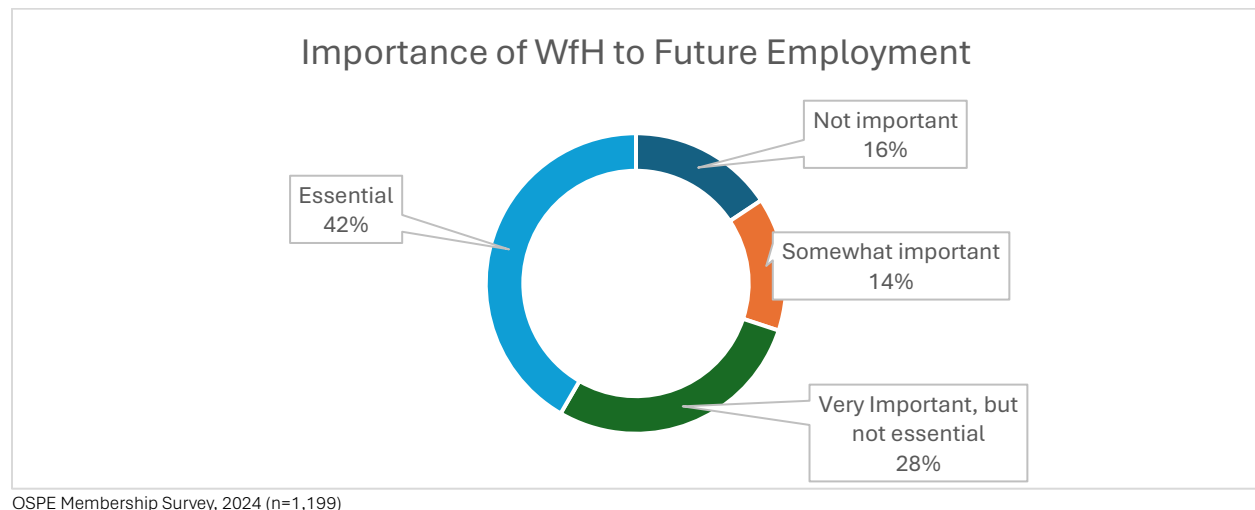- Job satisfaction
- Hours worked
- Communication and collaboration

- Efficiency, and
- Performance

Survey evidence finds that working from home options improve job satisfaction, increase hours worked, and improve efficiency by reducing interruptions. Communications and collaboration are not improved and may deteriorate depending on how organisations implement their working from home policies and support remotely connected teams. On balance, therefore, the evidence suggests that a working from home policy, if properly designed, can increase the productivity of engineering and technology staff, but steps must be taken to counter the risk of diminished communication and collaboration.

The Evidence on Turnover and Retention

Both survey and experimental evidence find that allowing employees to work from home, at least part of the week, reduces turnover. One study finds a reduction in turnover of one-third. When engineers explore alternative employment, 70% view a working from home option, for at least part of the week, as either "essential" (42%) or "very important, but not essential" (28%). Women are substantially more likely to feel that working from home is "essential" (53%) or "very Important" (29%) than men (38% and 28% respectively). This finding implies that organisations that do not offer a working from home option are likely to lose women professionals and will face greater difficulty in recruiting them.

Importance of WfH to Future Employment

Not important 16%

Somewhat important 14%

Essential 42%

Very Important, but not essential 28%

OSPE Membership Survey, 2024 (n=1,199)

The Evidence on Mentoring of Junior Staff

The U.S.-based National Academies of Sciences, Engineering, and Medicine stresses the importance of mentorship for early and mid-career professionals. Studies also indicate that mentorship is an important factor in retaining women in the engineering profession. Most mentorship is informal. Consequently, when organisations introduce a working from home option, there is a concomitant reduction in the opportunities for informal interaction between junior and senior staff and, as a result, mentorship suffers. Interviews confirm that diminished mentorship was one of the adverse consequences of working from home during the pandemic. Studies suggest that this problem

becomes significant when employees work from home more than half the time, but is manageable if working from home one or two days per week is combined with a more formal approach to mentorship. It is notable, therefore that a study undertaken by IPSOS for TD Canada Trust found that *formal* mentorship programs are more common in companies that have adopted a hybrid approach to working from home.

Finding the Right Balance

Organisations that eliminate a working from home option should expect reduced job satisfaction on the part of their employees, increased turnover, and greater challenges in recruiting talent. They should expect that increase in turnover to be especially evident among staff members who are women. Similarly, they should expect recruitment challenges to be more pronounced when seeking to hire women professionals. Likely, firms that eliminate a working from home option will see an overall reduction in the role of women in their organisation. Organisations that eliminate a working from home option will also likely forego a potential productivity gain. Of the five factors that underpin engineering productivity, three (Job satisfaction, hours worked and individual efficiency) are strengthened by offering a working from home option. Of the remaining two, Performance is highly context specific, and thus demands case by case analysis. Communication and collaboration is the only determinant of productivity which is weakened, but this can be mitigated through thoughtful policies. Organisations that eliminate or plan to eliminate a working from home option likely under-estimate the costs and consequences. These organisations also appear to under-estimate the success of working from home during the pandemic and how that experience has reshaped employee attitudes and expectations.

At the same time, proponents of working from home often fail to appreciate the costs of this option to organisations. There is potential for a reduction in mentorship opportunities for junior staff. Organisational productivity, as opposed to individual productivity, may also be reduced.

The evidence indicates that the costs of a working from home option increase when more than two days are permitted and when there is complete discretion over which days an employee will work from home.

For most organisations, a hybrid model which allows employees to work from home on two scheduled days appears to balance the needs of employees and the needs of organisations. However, these hybrid models must be accompanied by proactive steps to foster communications and collaboration and to formalize mentorship support for junior staff. Organisations that adopt these best practices can expect an increase in employee satisfaction, reduced turnover, advantageous recruitment, and an increase in employee productivity. These organisations will also see support for greater diversity in their workforce, including, but not restricted to, more women professionals.

Contents

I
Introduction

This report was prepared for the Ontario Society of Professional Engineers (OSPE). Financial support for the study was provided by the Federal Department of Women and Gender Equity. The report builds on previous research undertaken by OSPE which was financed by the Future Skills Centre.[2] The previous study examined the continuing prevalence of work from home arrangements after COVID-related restrictions were lifted. That report found widespread support for flexible work arrangements regardless of gender and age, although the report noted that among women support for working from home, at least part of the week, was especially strong. The report also noted two emerging concerns of employers. The first of these was the potential loss of problem-solving creativity and innovation that many employers associated with in-person interaction by members of engineering teams. The second was the reduced opportunity for informal mentoring of junior engineering staff. Since the publication of the first study, there has been a clear trend of employers instituting return-to-office policies that require partial or complete attendance at the office during the regular work week.

The purpose of this report is to provide evidence-based guidance on striking the right balance between the clear desire of employees for more flexibility and the needs of organisations. There is, of course, no "one size fits all" solution. The needs of organisations vary across industries. The ability of organisations to offer flexible work arrangements also varies depending on the role that employees play within the organisation. However, all organisations can benefit from basing their policies on an objective consideration of the evidence and how it may pertain to their own circumstances.

Chapter II of this report summarizes the key findings of the research.

Chapter III summarizes recent scholarly and other research literature on working from home. This chapter also describes regulatory initiatives in Canada and how they compare to those in peer jurisdictions.

Chapter IV reviews the results of a survey of 1,199 members of OSPE. The survey was administered between November and December of 2024.

Chapter V summarizes the results of a survey of 100 engineering and other major employers. The survey was administered in January of 2025 by IPSOS Public Affairs.

Chapter VI reports the results of interviews with 15 engineering and engineering affiliated employers on their policies and experiences with working from home.

Chapter VII assesses the implications of the evidence for finding the right balance between the needs of employees and the needs of organisations.

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[2] Prism Economics and Analysis. (2022). New Barriers in Engineering and Technology Jobs – The Uneven Impact of Working-at-Home on Recent Graduates, Women, and Newcomers. Ontario Society of Professional Engineers. https://ospe.on.ca/advocacy/advocacy-publications/research-reports/new-barriers-in-engineering-and-technology-jobs/

II
Key Findings

Literature Review[3]

1. **Marked Increase in Incidence of Working from Home**
   Prior to COVID, Statistics Canada estimated that only 7% of Canadians worked from home either full-time or part-time during their regular work week. In November of 2024 - well after COVID shelter-at-home restrictions were lifted - Statistics Canada estimated that the proportion of Canadians who work from their home either full-time or part-time had increased to 24%. This proportion is higher among office workers.

2. **Employee Preference**
   Surveys consistently find that majorities of Canadians would prefer to work from home some or all of the time.

   - In 2022, the Future Skills Centre found that 78% of Canadian employees preferred working from home at least part of the week.
   - A 2024 survey by LinkedIn found that 58% of Canadian respondents preferred to work from home some or all of the time.
   - A United Kingdom survey by IPSOS found that fewer than a quarter of employees wanted to spend five days per week at the office, despite this having been the default working arrangement for decades.

3. **Employee Views on Working from home**
   Among those employees who favour having a work from home option for at least part of the week, the principal advantages cited are:

   - improved work-life balance,
   - reduced commuting time,
   - fewer interruptions, and
   - lower personal costs (commuting, lunch, wardrobe, etc.)

   Survey evidence shows that these advantages are valued by a large majority of employees, regardless of age or gender, although women, in all age groups, generally value these advantages more than men.

   Some employees, however, report that their home situation is unsuited to working from home.

   A minority of employees point to isolation and reduced social interaction as important drawbacks when working from home. Some employees also fear an adverse effect on career progression. Employees under age 35 noted the reduced opportunities for mentorship.

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[3] To facilitate summarizing the literature, citations have been omitted. Readers are referred to Chapter III for a fuller discussion of the literature and the relevant sources.

4. **Changing Employer Policies**

    While a large number of employers currently allow many employees to work from home at least part of the week, both survey and anecdotal evidence from media reports indicate that more employers are seeking to reduce working from home options or curtail those options altogether. A 2024 survey of CEOs by KPMG Canada found that 83% expected a full return to the office in the next three years.

5. **Impact of Working from home on Individual Productivity**

    Survey Findings:
    - It is the overwhelming consensus among surveys that those who work from home report higher personal productivity.
    - In OSPE's 2022 survey 54% of respondents reported increased personal productivity, while 34% reported no change.
    - Fewer interruptions and reduced commuting time are the most frequently cited contributors to increased productivity when an engineer works from home.
    - In the same survey, 37% of engineering supervisors reported increased productivity among those they supervised, and a further 44% reported no change – a lower, but still significant indicator of the impact of working from home on individual productivity.

    Experimental Evidence:
    - To date, the largest and most comprehensive experiment involved 1600 employees of a Chinese software company, who were divided into two groups. One group worked at the office five days per week. The second group had a hybrid arrangement working at the office three days per week and from home, two days per week. The 1,600 employees included those working in marketing, accounting, finance and software engineering. The two-year study found no measurable difference in productivity for software engineers, nor any difference in performance evaluations, or the likelihood of subsequent promotion.
    - Similar studies have drawn comparable conclusions.

6. **Organisational Productivity**

    In organisations, the whole is greater than the sum of its parts. Organisational productivity includes individual productivity but also encompasses team outputs such as creative problem-solving. The success of international engineering firms demonstrates that engineering teams can succeed while being remotely linked. However, in-person interaction remains an important aspect of the work undertaken by engineering teams. Studies find that clustering talent in one place facilitates communication, which is more frequent, of higher quality, and freer than is possible when people are geographically dispersed. While the quality of interactions among engineering team members is important, it must also be borne in mind that a significant amount of engineering work must be carried out autonomously and with as few interruptions as possible.

7. **Working from home and the Determinants of Engineering Productivity**

    Forsgren et al. provides one of the more frequently cited discussion of the determinants of engineering productivity. The authors describe five key factors:

- Job satisfaction,
- Hours worked,
- Communication and collaboration,
- Efficiency, and
- Performance

Survey evidence finds that working from home options improve job satisfaction, increase hours worked and improve efficiency by reducing interruptions. Communications and collaboration are not necessarily improved and may deteriorate depending on how organisations implement their working from home policies and support remotely connected teams. Performance is highly context specific making generalisations impractical. On balance, the evidence implies that a working from home policy, if properly designed, can increase the productivity of engineering and technology staff, but steps must be taken to counter the risk of diminished communication and collaboration.

8. **Retention and Turnover**
   Both survey and experimental evidence find that allowing employees to work from home, at least part of the week, reduces turnover. One study finds a reduction in turnover of one-third. For engineering and technology staff, the cost of turnover increases with the experience and specialized skills of the departing staff. Estimates of the cost to organisations of replacing engineering and technology employees typically exceed one third of annual salary and are often significantly higher.

   The increase in turnover is most notable with women. This is consistent with surveys that find that women attach greater value to the work-life balance improvements that are associated with working from home at least part of the week.

9. **Lower Occupancy Costs**
   Organisations that allow employees to work from home at least part of the week often find that they can reduce their overall space requirements.

10. **Reduced Pressure on Compensation**
    Studies find that employees will accept a moderately lower salary in exchange for the option to work from home part of the week. However, the survey evidence for this finding may be unreliable since it is based on hypothetical circumstances, rather than actual employee decisions.

11. **Diminished Opportunities for Mentorship / Need to Formalize Mentorship**
    A report by the U.S.-based National Academies of Sciences, Engineering, and Medicine stressed the importance of mentorship for early and mid-career professionals. While some organisations formalize their mentorship programs, most mentorship is informal. Studies of remote working undertaken prior to COVID concluded that the reduced frequency and quality of interactions weakened mentorship, especially when mentorship was largely informal. Survey evidence confirms that diminished mentorship was one of the adverse consequences of working from home during the pandemic. Studies suggest that this problem becomes significant when employees work from home more than half the time but is manageable if working from home one or two days per week is combined with a more formal approach to mentorship. A study undertaken by IPSOS

for TD Canada Trust found that formal mentorship programs are more common in companies that have adopted a hybrid approach to working from home.

Regulatory Scan

A number of jurisdictions have passed legislation defining an employee's rights as they relate to flexible working arrangements, including working from home. Most commonly, such legislation provides for the right to request a flexible working arrangement or accommodation. Jurisdictions that have passed such legislation include, but are not limited to:

- The United Kingdom
- Ireland
- Australia
- The Netherlands
- Singapore

The Government of Canada has also passed similar legislation. However, employees working in federally regulated workplaces represent only 10% of working Canadians. At time of writing no province has passed legislation enshrining a right to request flexible working arrangements, although human rights codes typically include a duty to accommodate persons with a disability.

Right to flexible working legislation varies across jurisdictions, but typically provides for the right to make a request for flexible working, an obligation on the part of the employer to consider such a request in good faith, and an obligation to provide a legitimate reason for refusing such a request.

The UK extends the right to make such requests to virtually all workers under all circumstances. Australia limits this right to specific groups, such as expecting mothers, and to persons who have at least one year of tenure with their employer.

In Canada, the right to request flexible work applies to anyone working for a federally regulated employer, and who has been with the same employer for at least six months.

Survey of OSPE Members (n=1,199)

1. Approximately 70% of engineers have access to a work from home option.

   - Roughly 1 in 5 engineers (18%) have the option to work from home all regular workdays.
   - Somewhat more than half (52%) of engineers have the option to work between 1 and 4 days from home, thus making "hybrid" arrangements the most common organisational policy.
   - 30% of engineers are required to work from their office or other work site on all days during the regular work week.

Average Days Worked from Home

Bar chart showing:
- 0 days: 30%
- 1 day: 8%
- 2 days: 21%
- 3 days: 15%
- 4 days: 8%
- 5 days: 18%
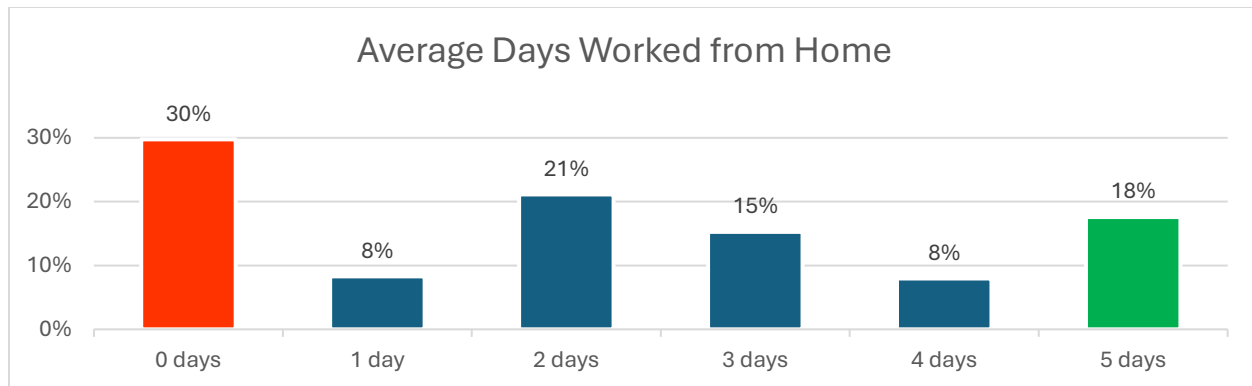
2. Of those engineers who have access to a work from home option, approximately a quarter reported that their employer has announced an intention to increase requirements for office or on-site attendance.

3. Differences in access to working from home options varied much more within industries than across industries. This suggests that in some organisations, technical requirements to be on-site, such as the need for process control, may be less important than managerial preferences for on-site attendance.

Work-from-Home Days by Industry

Stacked bar chart by industry (Utilities, Transportation, Telecom or IT Services, Resources, Public Administration, Other, Manufacturing, Education, Consulting) with legend: 0 days, 1 day, 2 days, 3 days, 4 days, 5 days.
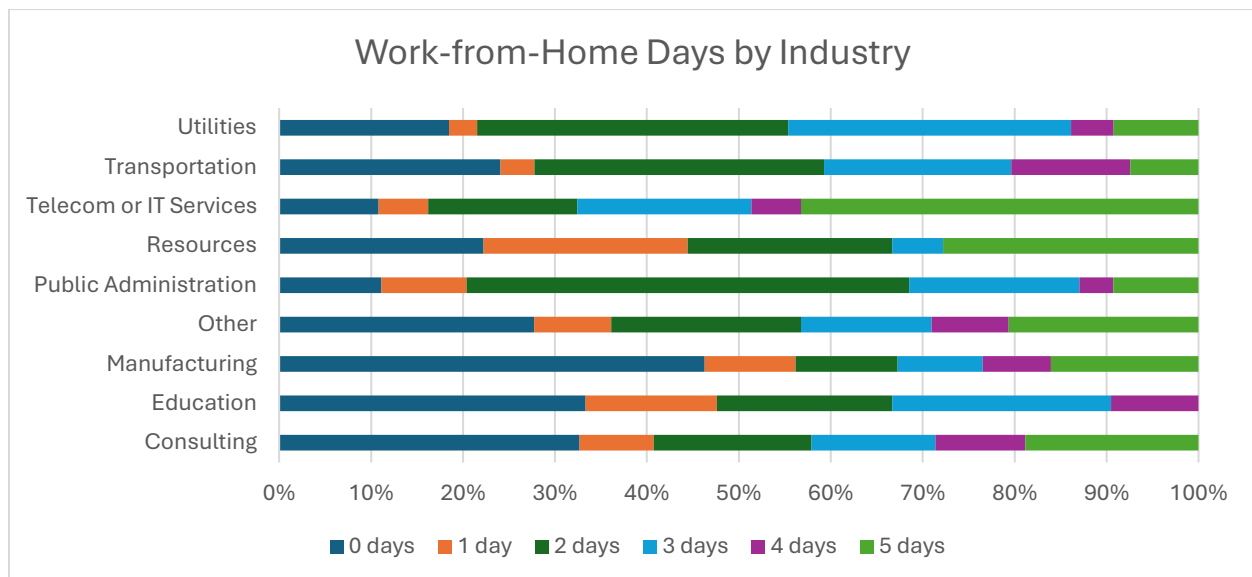
4. There is strong support among all engineers, regardless of gender or age, for at least a partial work from home option. Satisfaction with their organisation's policy increases with the number of days an engineer can work from home.

WfH Days and Policy Satisfaction

Average Days WfH

- Dissatisfied: Average WfH 1.3, Median WfH 0
- Somewhat Dissatisfied: Average WfH 1.5, Median WfH 2
- Neither Satisfied nor Dissatisfied: Average WfH 1.5, Median WfH 1
- Somewhat Satisfied: Average WfH 2.2, Median WfH 2
- Very Satisfied: Average WfH 2.8, Median WfH 3

■ Average WfH ■ Median WfH
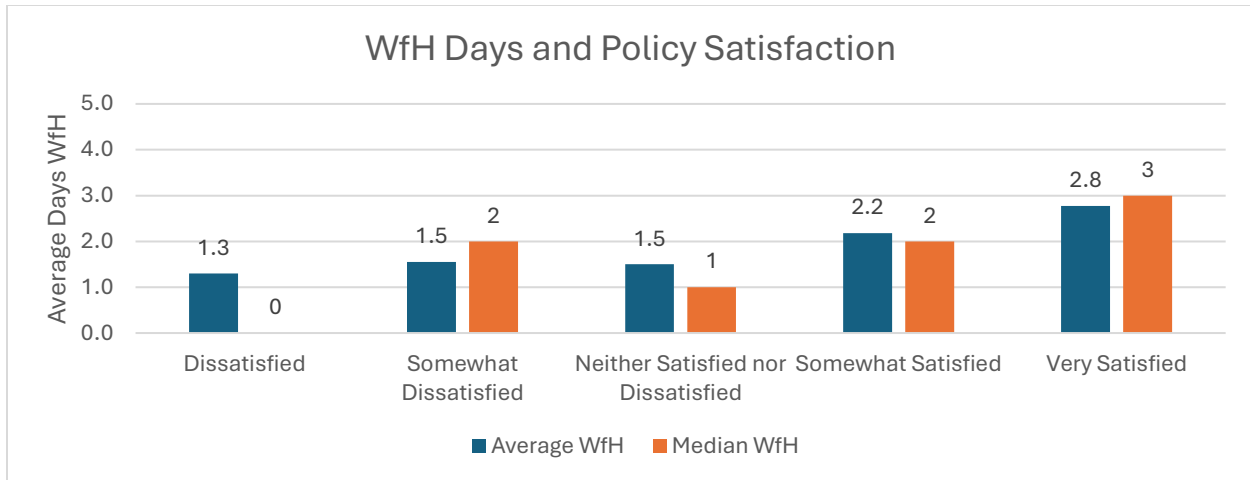
5. The most important advantages cited by engineers for a work from home option are reduced commuting time and improved work-life balance. While these advantages are valued by all engineers, women attach greater value to these advantages. The value of improved work-Life Balance peaks in importance in the 35 to 44 age range.
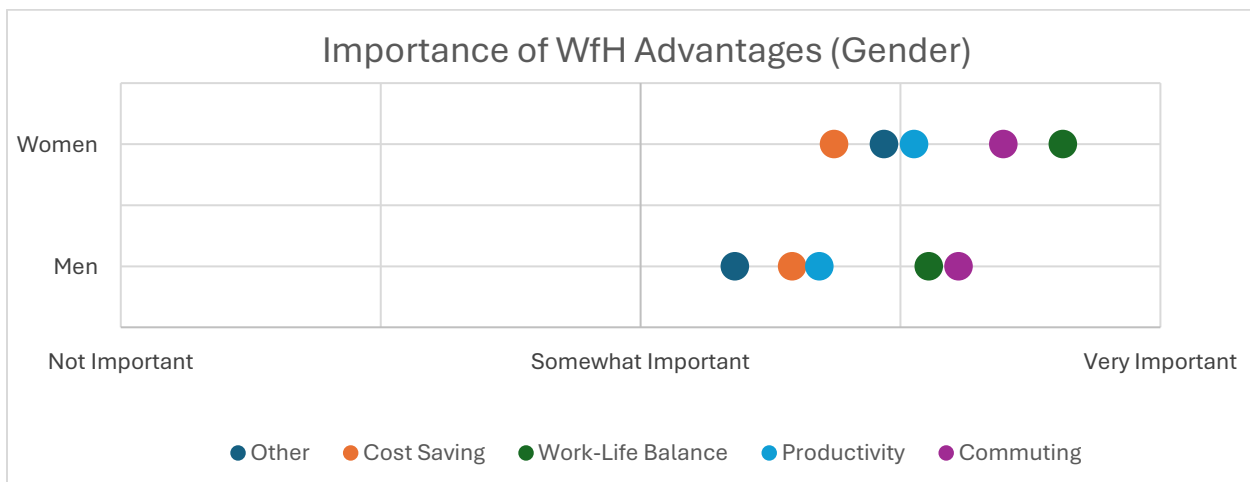
Importance of WfH Advantages (Gender)

Women / Men — scale from Not Important, Somewhat Important, to Very Important

● Other ● Cost Saving ● Work-Life Balance ● Productivity ● Commuting

6. When engineers explore alternative employment, 70% view a working from home option, for at least part of the week, as either "essential" (42%) or "very important, but not essential" (28%). Women are substantially more likely to report that working from home is "essential" (53%) or "very Important" (29%) than men (38% and 28% respectively).

Importance of WfH to Future Employment

- Not important 16%
- Somewhat important 14%
- Very Important, but not essential 28%
- Essential 42%
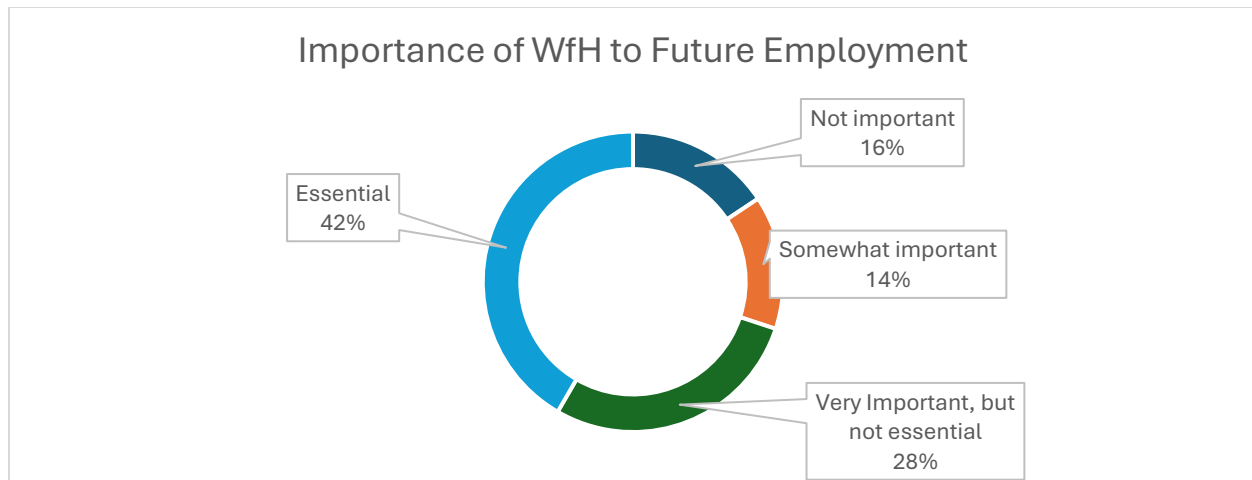
7. Across all age groups and both genders, the disadvantages of working from home are ranked as significantly less important than the advantages. The disadvantages identified in order of their average rating of importance by respondents are:

- Reduced interaction with colleagues / loneliness,
- Reduced mentorship opportunities,
- Reduced team productivity / creativity / problem-solving,
- Blurred personal & professional boundaries / longer hours / burnout,
- Reduced promotion opportunities,
- Reduced personal productivity,
- Other, and
- Inadequate work from home environment / cost.

Engineering Employer and Engineering Recruiter Interviews (n=15)

1. There is no consensus on the most appropriate work from home policy. Employers are still experimenting, although a large majority now allow their employees more flexibility than was the case prior to the COVID-19 pandemic and the implementation of mandatory work from home protocols. Prior to COVID, working from home was either not permitted or was rare.

2. Since the lifting of COVID-related restrictions, only 3 of the 15 employers interviewed have implemented a full return to office policy. Two-thirds of the organisations (9/15) currently operate hybrid policies whereby employees are allowed to work from home for part of the regular work week. One fifth of employers (3/15) are fully remote or allow employes complete discretion over when and if they work from the office. Employers that allow full or partial discretion to employees often also encourage attendance at the office as much as practical.

3. Somewhat fewer than half of the employers interviewed developed and administered their working from home policy at the executive level. A somewhat larger number of employers developed and administered their working from home policies at the departmental or team level.

4. Organisations that implemented a partial or complete return to the office believed or observed that working from home was associated with:
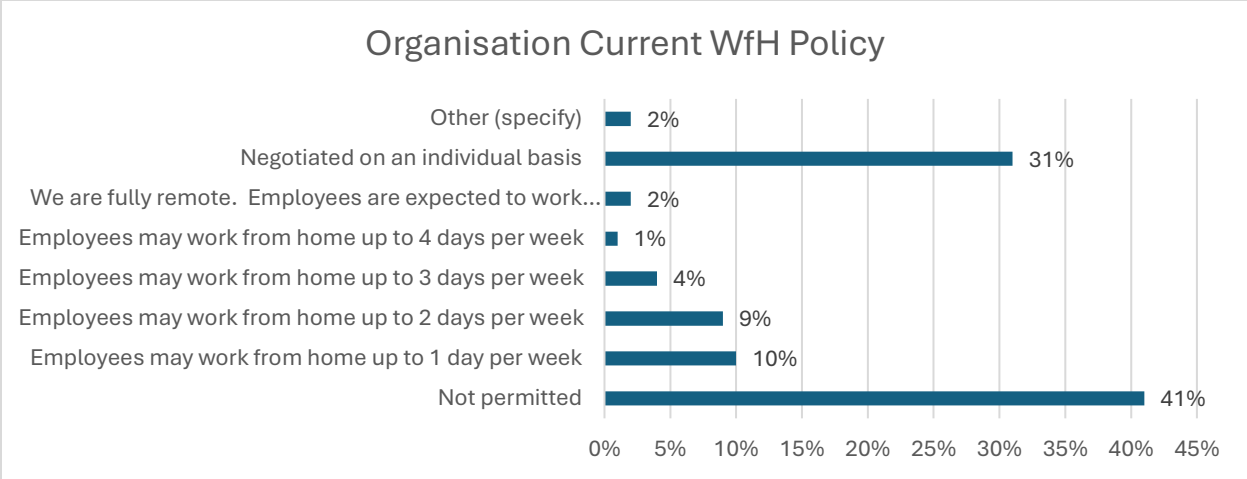
   - lower organisational productivity,
   - reduced creative problem solving,
   - reduced communication,
   - difficulty in maintaining and over-arching organisational culture,
   - increased departmental segregation or siloing, and
   - difficulties in mentoring junior employees.

   Every employer, either directly or indirectly, raised the adverse impact of working from home on young engineers as being among their greatest concerns, and a major consideration in the development of their respective working from home policies.

5. Employers made an important distinction between *individual* productivity and *organisational* productivity. Employers generally (though not universally) agreed that *individual* productivity was not diminished by working from home arrangements. Employers' concern, however, was with *organisational* productivity which they saw being diminished or jeopardized by too great a reliance on working from home.

6. Some employers reported that access to working from home arrangements was commonly raised during recruitment interviews. Others did not find this to be the case. Engineering recruiters suggest that a self-selection process may have emerged. Engineers wishing to have working from home options do not apply to organisations where they understand such options either to be unavailable or to be discouraged.

7. Organisations that implemented a partial or full return to office reported a moderate increase in attrition, especially among women.

Engineering Employer survey (n=100; manufacturing = 84)

1. Prior to the COVID-19 pandemic, 30% of respondent organisations allowed at least some of their engineers or technical staff to work from home on some occasions. During the COVID restrictions, 64% of respondents implemented working from home protocols for their engineering and technical staff; for 36% of employers, working from home was not feasible.

2. Current policies vary considerably, although the largest bloc of employers (41%) do not permit working from home. This likely reflects the large number of manufacturing establishments in the survey sample. Among those employers that permit working from home, half negotiate these arrangements on an individual basis, rather than offering an across-the-board entitlement to working from home.

Organisation Current WfH Policy

Category	Percentage
Other (specify)	2%
Negotiated on an individual basis	31%
We are fully remote. Employees are expected to work...	2%
Employees may work from home up to 4 days per week	1%
Employees may work from home up to 3 days per week	4%
Employees may work from home up to 2 days per week	9%
Employees may work from home up to 1 day per week	10%
Not permitted	41%

3. Regardless of size, employers reported that, with respect to engineering and technology staff, working from home made it more difficult to manage, train, mentor and foster corporate culture. Of these four human resource functions, on average, mentorship was rated as being made more difficult most often, although this was not true of large businesses.

WfH Impact on Engineers and Technicians (HR Functions)

Legend: Culture, Mentorship, Training, Management

Axis: More Difficult — No Difference — Less Difficult

Categories: Small, Medium, Large
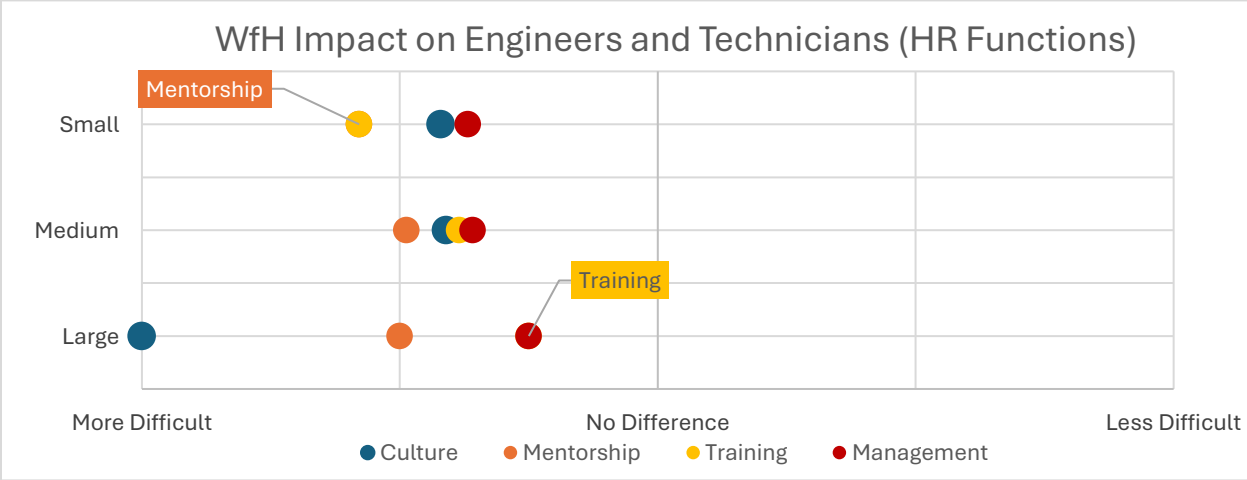
4. Respondents reported that the impact of working from home on the contributions of engineering and technology staff to the following four key business functions were either modest or non-existent.

- engineering productivity,
- functioning of engineering teams,
- Working with suppliers, and
- Working with customers.

WfH Impact on Engineers and Technicians (Business Functions)
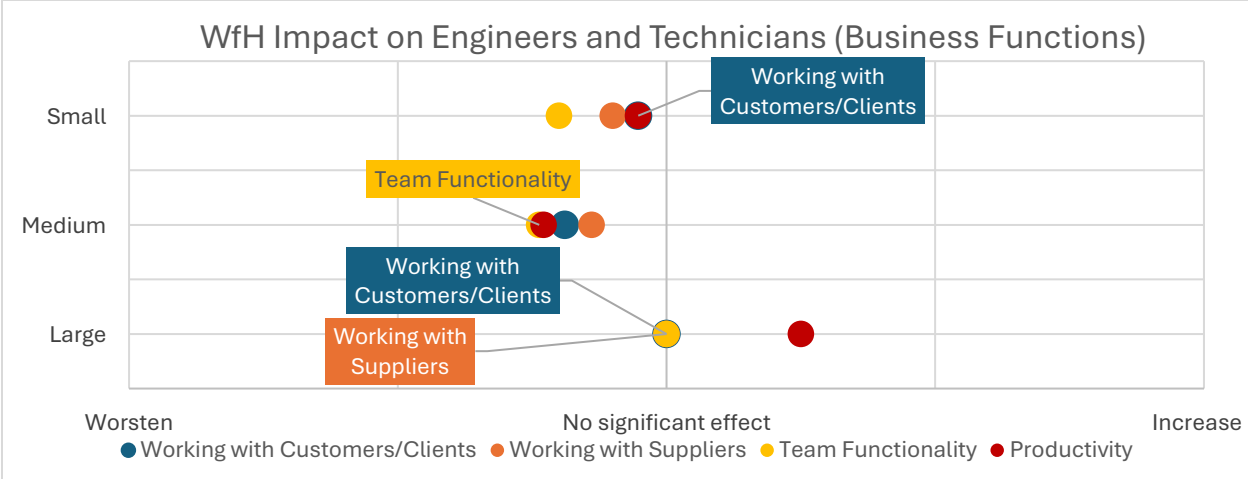
III

Evidence from the Literature and an Environmental Scan

OSPE first began to investigate the impact of working from home on its members in 2022. Prior to the COVID-19 pandemic, working from home was a niche topic, and much of the research that had been conducted was severely limited in scope. As a result, previous research on the subject relied on a great deal of extrapolation from often imperfect studies and scholarly sources. Additionally, any contemporaneous sources consulted would have been strongly influenced by the abnormal social and economic conditions of the pandemic.

In 2025, while working from home remains fairly novel in absolute terms, there is now widespread familiarity with the practice across employers and employees. This has resulted in a proliferation of increasingly reliable survey data and literature. Additionally, sufficient time has elapsed that observational and experimental research on the effects of working from home conducted in the post-COVID economic paradigm have begun to emerge.

What follows is a comprehensive review of the extant literature on the subject of working from home. Where possible, focus is placed on research which takes into account the unique perspectives and experiences of those in the engineering profession, and especially women in the engineering profession.

Summary

The COVID-19 pandemic and subsequent lockdowns set in motion a worldwide experiment in the potential of working from home. OSPE has previously conducted research on the impacts of working from home on engineers, with special emphasis placed on groups within engineering such as women. Since the previous round, which was conducted near the peak of the pandemic and lockdowns, the economic landscape has changed considerably, necessitating additional research. The purpose of this literature review is to build upon the findings of OSPE's previous research projects, integrating new developments that have become available in the intervening years, and expanding the base upon which future research can be conducted.

The literature reveals that working from home has become the "new normal" in the economy at large, and among engineers in particular. Though the share of Canadians working from home has fallen from its April 2020 peak of 40%, Statistics Canada estimates that as of November 2024, 12.5% of Canadians worked exclusively from home, and 11.5% worked in a hybrid arrangement. In 2024 Robert Half estimated that 37% of Canadian job postings were advertised as being either hybrid or fully remote. The average Canadian has been estimated to work between 1.7 and 2.2 days per week from home. This is among the highest rates in the world.

Working from home is also immensely popular among workers. Surveys from a wide variety of sources find that majorities, and often super majorities of Canadians find enormous value in working from home. This was also the case for engineers based on findings in OSPE's previous and current working from home surveys. When asked, working from home is often described as being "essential" by Canadians and engineers.

There are a wide range of benefits to working from home, which are experienced differently across demographics and between employees and employers. For employers, surveys consistently show that employees who work from home report increased personal productivity. This is primarily attributed to fewer distractions and the reallocation of time dedicated to commuting and other similar tasks that is otherwise 'wasted'. The literature offers moderate experimental and observational support for this claim, though there is ample room for further study. Employers can also benefit from improved and expanded recruitment and retention. This is especially the case for employers seeking to hire and retain women, who quit at substantially elevated rates when working from home is reduced or rescinded. A study by KPMG found that 38% of mothers would reduce their work hours or quit in response to a reduction in working from home. Finally, employers can use reductions in office space associated with working from home to reduce costs.

For employees, working from home offers increased flexibility. Additional flexibility is associated with a variety of second order benefits, most notably improved mental health. Relatedly, working from home is associated with improved work-life balance among employees. This is often channelled towards improving sleep, increasing recreation, and spending more time with children.

Working from home can also come with drawbacks. The effects of working from home on mentorship are not yet well understood, but the literature, as well as OSPE's interviews and employer survey suggest that they may be severe for young and early career engineers. Women engineers, who benefit disproportionately from mentorship may also be adversely affected in this regard. The lack of in-person collaboration may also result in reduced creative problem solving and idea generation. Finally, for those employers that have substantial physical assets, a move to a working from home arrangement may result in them becoming stranded.

For employees, working from home can be associated with poorer interpersonal relationships, which can in turn have negative career and mental health implications. It can also weaken mentorship and career progression by compromising an employee's organisational visibility and availability. Finally, employees without access to a sufficient environment to support working from home may suffer if their organisation reduces their access to an office working environment.

Women's relationship with working from home is complicated. Women generally express strong preferences for working from home, and report that working from home can help in balancing their career and personal obligations. However, working from home can also result in greater work-family conflict as boundaries between personal and professional lives become blurred. This can be especially the case if working from home is not paired with the expected but not guaranteed improvements in flexibility with which it is commonly associated. The stated preferences of women towards working from home can also work against their long-term career prospects. While this can be true of all employees who choose to work from home, research indicates that women benefit disproportionately from mentorship, and can suffer disproportionate career harm from reduced organisational visibility. Working from home may therefore exacerbate gender differences in career outcomes among engineers unless policy is crafted such that women aren't in effect being punished for working from home.

State of Working from Home

Prevalence

Since the beginning of the COVID-19 pandemic, the concept of remote working has undergone a transformational evolution. In January of 2020, an estimated 7% of Canadians worked from home either part time or full time (Statistics Canada, 2024). By April of the same year, this had risen to 40% (Statistics Canada, 2024).

Originally seen as a short-term solution, and expected to end with the lockdowns, remote work has instead become a permanent fixture of work culture in Canada and globally. As of November 2024, Statistics Canada reported that 12.5% of Canadians worked exclusively from their homes, and a further 11.5% worked in a hybrid arrangement (Statistics Canada, 2024). While this is a reduction in the share of Canadians working from home relative to the pandemic peak, it still represents a more than three-fold increase in the prevalence of working from home in the span of less than 5 years. Put another way, relative to its historical trend, the global prevalence of working from home underwent a half-century of growth in only four years (Bloom, Barrero, Buckman, & Davis, 2025). Relatedly, in 2024 an estimated 37% of Canadian job postings were advertised as being either hybrid or fully remote (Robert Half, 2025).

Efforts to explain the persistence of working from home are ongoing. However, current research has settled on three key contributors:
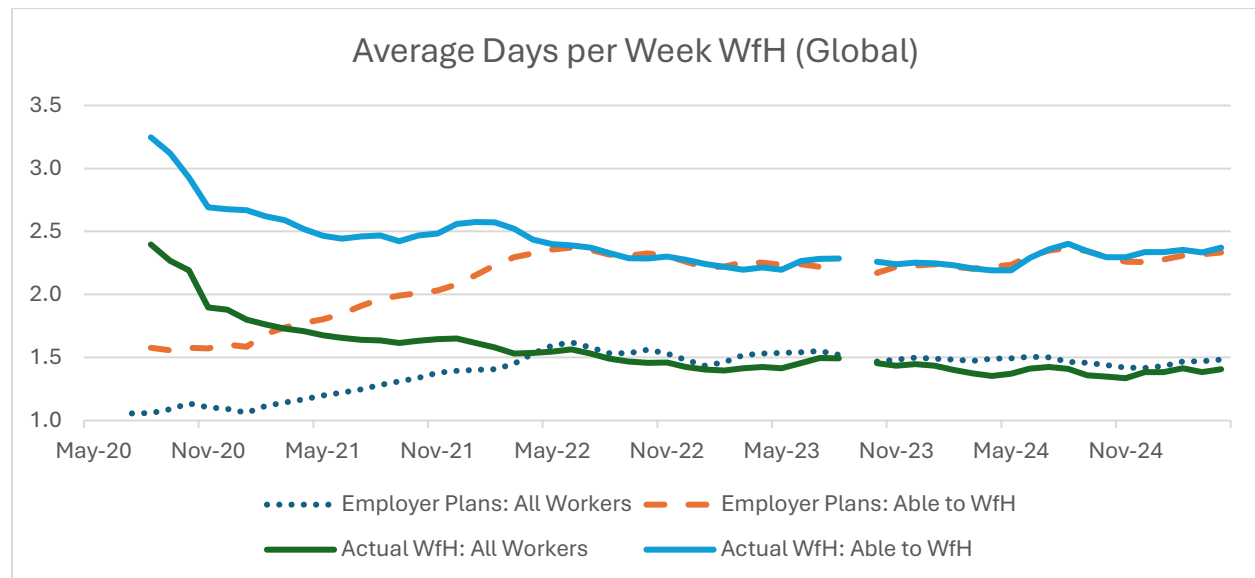
1) The simultaneous and global shift to working from home undid much of the stigma that had been traditionally associated with the practice.
2) Organisations made significant investments in technology, infrastructure, training, and procedures to support working from home, which have persisted beyond the pandemic.
3) Understandings of what could be effectively accomplished while working from home have expanded significantly, and were reaffirmed as restrictions were lifted and reimposed.

More granular analysis reveals that, at a national level, the average number of days that employees work from home is strongly correlated with the severity and duration of pandemic lockdowns (Bloom, et al., 2022). This helps to explain the robustness of working from home in Canada. Global surveys have tended to find that Canadians, on average, work from home more often than most, if not all other nations. The Survey of Working Arrangements and Attitudes (SWAA) found that, between 2021 and 2022, Canadians worked from home an average of 2.2 days per week - more often than all countries surveyed other than India (2.6) and Singapore (2.4) (Bloom, et al., 2022). More recently, a June 2023 survey by the IFO Center for Macroeconomics and Surveys, found that Canadians worked from home 1.7 days per week, compared to an average among the 34 countries surveyed of 0.9 (Aksoy, et al., 2023).

While the severity and duration of lockdowns varied across the country, Canadian jurisdictions are now known to have had among the longest COVID related lockdowns and restrictions in the developed world. By some measures, Toronto, Canada's largest city, underwent the longest lockdown period of any major city in the world (Levinson-King, 2021). It should therefore be no surprise that working from home has proven durable in Canada.

For employers, the number of days they planned to allow employees to work from home was strongly predicted by "productivity surprises". The number of days that employers intended to allow employees to work from home increased with the extent to which they underestimated the efficacy of working from home prior to and earlier in the pandemic (Bloom, et al., 2022).

Globally, this is reflected in an increase in the number of work from home days an employer intends to offer rising from 1.6 days per week in July of 2020 to 2.2 days per week in January 2025 (Bloom, Barrero, Buckman, & Davis, 2025).

Average Days per Week WfH (Global)

Legend:
- Employer Plans: All Workers (dotted)
- Employer Plans: Able to WfH (orange dashed)
- Actual WfH: All Workers (green solid)
- Actual WfH: Able to WfH (blue solid)

Data provided by WFHResearch

Before July 2022, there was a significant gap between the number of days employers *allowed* employees to work from home and the number of days they *planned* to allow. This gap closed as allowed work from home days decreased from 3.2 to 2.4 days per week, while planned work from home days increased from 1.6 to 2.4 days per week.

Although the number of planned and allowed work from home days are broadly in alignment for employers, there is still a meaningful gap between these values, and the number of working from home days that employees would prefer.

Average Days per Week WfH
Desired, Actual, & Employer Plans for 1+ Year Ahead

Worker Desires — Actual WfH — Employer Plans
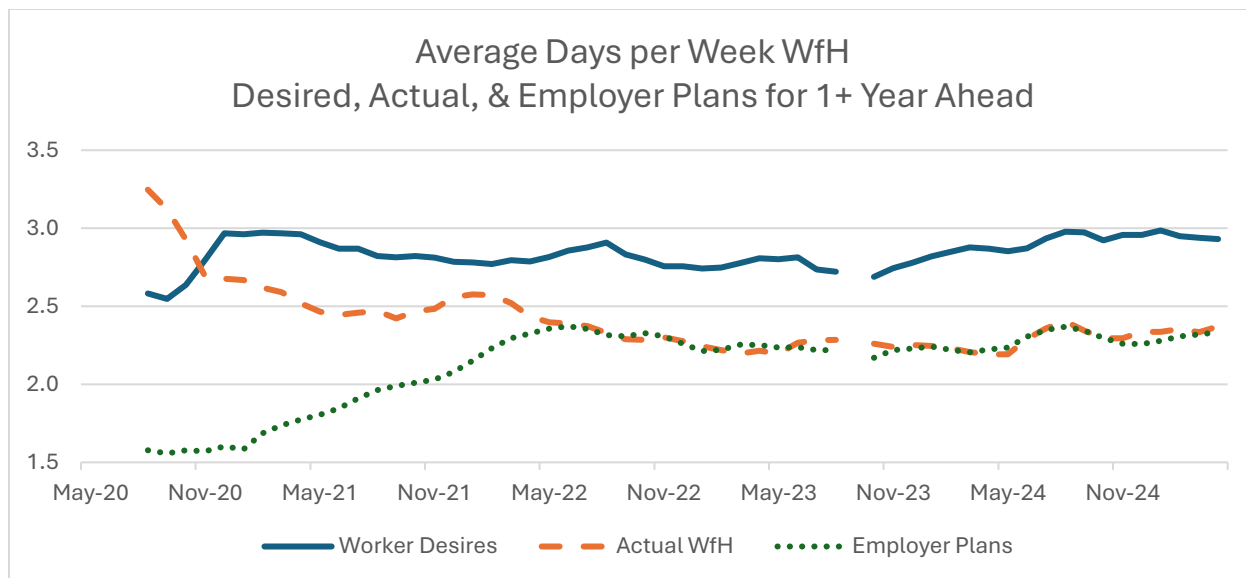
Data provided by WFHResearch

This divergence has persisted since the pandemic began. The gap has shrunk from a peak of 1.5 days in late 2020 to 0.7 days in January of 2025. The reduction in the size of this gap is due almost entirely to employers adjusting the number of days that they plan to allow employees to work from home upward. Employees have remained largely consistent in desiring between 2.7 and 3 days worked from home per week.

Popularity

For many, the COVID-19 pandemic was their first exposure to working from home as a career option. Since then, it has become clear that working from home is enormously popular among the general public.

Surveys have consistently found that majorities of Canadians would prefer to work from home some or all of the time. In 2022 the Future Skills Centre found that 78% of Canadian employees preferred working from home and wanted to be allowed to work from home at least some of the time following the pandemic (Future Skills Centre, 2022). In a more recent 2024 survey, LinkedIn found that 58% of Canadian respondents preferred to work from home some or all of the time (Benefits Canada, 2024).

The prevalence of working from home also informs the preferences of those who do not have access to it. Another survey conducted by Ipsos in the United Kingdom found that among those who reported a mismatch between their preferred number of in-office and work from home days, most wanted to spend less time at their employer's location. This was especially the case for those spending five days in-office (Karian, 2023). The survey further found that less than a quarter of full-time office workers wanted to spend 5 days per week at their employer's location, despite this having been the default working arrangement for decades and until only a few years ago (Karian, 2023).

The popularity of working from home is also found to go beyond being a minor preference. A 2022 poll conducted by the ADP Research Institute surveying more than 32,000 workers from multiple continents found that 64% of respondents had already or would consider looking for a new job if their

employer began to push for a full return to the office (Richardson & Antonello, 2022). In 2023, Robert Half reported that 25% of Canadian workers would accept a pay cut in exchange for the ability to work from home. Among those Canadians, the average of the pay cut they reported being willing to accept was 16% (Levick, 2023). Globally, an employee is estimated to value the ability to work from home between two and three days per week at 5% of their salary (Zarate, et al., 2022).

These findings are in keeping with the results of OSPE's previous working from home survey. When asked, 64% of respondents reported preferring to work from home for a majority of their work week when the pandemic ended, compared to only 9% who preferred a full return to the office (Prism Economics and Analysis, 2022). Relatedly, 45% of respondents reported that whether or not they remained with their employer would depend on the continuation of at least a partial work from home option, and 66% reported that a work from home policy would be an important consideration in choosing a future job (Prism Economics and Analysis, 2022). However, only 17% of respondents said that they would accept a lower salary in exchange for a working from home option (Prism Economics and Analysis, 2022).

Ongoing Developments

Despite the drastic increase and prevalence and popularity of working from home since the end of the COVID-19 pandemic, many organisations have signalled a desire to reduce or entirely rescind their remote working arrangements. A by no means exhaustive list of some of the highest profile organisations reducing or eliminating their working from home policies can be found below:

Public Sector[4]	Private Sector[5]
- Government of Canada	- Amazon
- Government of Nova Scotia	- UPS
- Government of Toronto	- Tesla
- Canadian Armed Forces	- JPMorgan Chase

It is notable that, although many organisations often frame return to office orders as a means to improve operations, it is also common for them to be discussed as a means of economic development. This was, for example, an explicit part of Mayor Olivia Chow's discourse on the subject, stating that "It's important to make sure our financial district is vibrant…" in reference to her ongoing support for major Toronto companies to bring workers back into the office full time (Pereira, 2024). While defensible in political terms, these are not concerns that this paper considers to be relevant to the working from home discussion. The working from home policies of engineers or their employers should not be contingent on the performance of other businesses.

More broadly, surveys of North American corporations and business leaders tend to find high levels of support for a greater or total return to the office. A 2024 survey of 764 companies found that:

- 64% of respondents currently require some or all employees to work from the office some or all of the time

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[4] In descending order: (Government of Canada, 2024), (Laroche, 2024), (Pereira, 2024), (Department of National Defence, 2024)
[5] In descending order: (Frost, 2024), (Kolodny, 2022), (Black, 2024), (Allen, 2025)

- 23% intended to implement a return to office plan of some kind in 2025
- A further 7% planned to implement a return to office plan in 2026
- Only 6% had no plans to require employees to return to the office

This shows 94% of respondents intending to bring employees back to the office at least some of the time. Furthermore, 32% of companies that had already returned to office reported planning to increase the number of in office days required. Overall, while a majority of companies were operating under a hybrid working model, 30% had returned to the office full time. The data also implies that this percentage is likely to increase (Resume Builder, 2024).

Similar sentiments were found in a survey by FlexIndex, which reported that although hybrid or flexible working models are by far the most common arrangement among Fortune 500 companies (82%), a small but growing minority of them (18%) required full time in office work (Flex Index, 2023).

A survey by KPMG found that 83% of Canadian CEOs expected a full return to office in the next three years (KPMG, 2024). Unlike many other surveys cited, KPMG's research made distinctions between large, medium, and small businesses, and found that a desire for a full return to the office was primarily a concern among larger businesses. Among small and medium sized businesses, only 20% expected to return to office full time in the next three years (KPMG, 2024).

Legislative Environment

In the wake of the COVID-19 pandemic, governments around the world have begun to introduce working from home and flexible working legislation. Most commonly, this legislation involves enshrining into law the right of employees to request flexible working accommodations such as the ability to work from home at least some of the time.

Prominent jurisdictions which have enacted such legislation at time of writing include[6]:

- The United Kingdom	- Australia	- Singapore
- Ireland	- The Netherlands	

Such rights also exist in Canada as part of The Canada Labour Code. However, this legislation applies only to those working in federally regulated workplaces, which, at time of writing, represents only 10% of the Canadian workforce. The vast majority of Canadians work in provincially regulated workplaces. At time of writing, no Canadian province or territory has enacted equivalent legislation. However, accommodations for those with disabilities are a standard part of provincial labour codes.

The precise structure of right to work flexibility legislation varies considerably between jurisdictions. However, there are several key characteristics which appear to represent a developing consensus among them.

1) Employees have the right to request a flexible working arrangement
2) An employer must, in good faith, consider the employee's request and respond to an employee in a timely manner

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[6] Citations from right to left: (legislation.gov.uk, 2023), (legislation.gov.au, 2009), (Ministry of Manpower, 2024), (Irish Statute Book, 2023), (Overheid.nl, 2025)

3) An employer must provide a legitimate reason for refusing an employee's request

Under these and similar pieces of legislation, "flexible working" typically encompasses most or all of the following arrangements:

- Part-time work
- Flex-time

- Compressed hours
- Remote working

- Job sharing

Jurisdictions tend to differ over who is afforded this right, and when they are allowed to exercise it. The UK's Employment Relations (Flexible Working) Act 2023 is among the world's most employee friendly. Under this law:

- flexible working can be requested by any/all employees,
- employees can submit a request for flexible work twice per year,
- employees do not need to take into account how their request will impact their employer when making it,
- employers must respond within two months of the request,
- employers must consult with and provide a reason to the employee before rejecting their request.

Other jurisdictions such as Australia, which has among the more restrictive rights to request flexible work, limit those who can make such a request to people who have been with the same employer for at least one year, and are members of a set list of group(s) such as carers, people with disabilities, people experiencing domestic violence, etc.

In Canada, the right to request flexible work applies to anyone working for a federally regulated employer, and who has been with the same employer for at least six months.

Understanding Working Arrangements

Advantages and Limitations of Working Arrangements

An organisation's working arrangement exists in conversation with its operations. Whether an organisation uses a fully on-site, fully remote, or hybrid working model influences the ways in which that organisation pursues and achieves its goals, and the goals of an organisation help to determine which working arrangement is appropriate. For this reason, before delving into the specific advantages and disadvantages of a given model, it is first important to understand the contexts in which they are most beneficial.

For engineers, the primary benefit of in-office working arrangements is the ability to connect with others. Agglomeration effects, and their positive impact on engineering have long been well understood (Bolter & Robey, 2020). Concentrating and clustering talent in one place facilitates communication, which is more frequent, of higher quality, and freer than is possible when people are geographically dispersed (Brail & Vinodrai, 2024). This includes unexpected, unplanned, and unstructured interactions, through which tacit knowledge exchange can occur not just within, but between teams and departments. These support the exchange of ideas, which in turn supports innovation and the synthesis of novel solutions to problems and can be critical to the success of

engineering teams (Sailer, 2011; Cecchi, et al., 2022; Mascitelli, 2003). The success of international engineering firms demonstrate that engineers and their teams can collaborate and succeed without being entirely co-located. Nonetheless, the benefits of in-person interaction in engineering should not be understated.

In office and on-site working arrangements can also provide access to specialised tools and technologies that may be necessary for the completion of certain tasks (Ferguson, Faidi, Lai, & Chen, 2022). More broadly, offices can offer higher quality infrastructure and furnishings such as high speed internet and ergonomic furniture which employees may not have access to in their homes (Ferguson, Faidi, Lai, & Chen, 2022).

Finally, in office environments benefit from the inertia of having been the default means of working throughout modern history. This inertia manifests in the training and experience of employees and managers. Most people working today will be familiar with working in the office and will not require additional training to facilitate or optimise it.

Working from home arrangements are well-suited to tasks which require long periods of autonomous or individual effort. Among the most common work-related benefits cited by people who work from home is the lack of interruptions. While in office environments allow for and encourage frequent, informal communication, this can be disruptive for engineering tasks which require prolonged periods of focus and 'flow' (Forsgren N. , et al., 2021).

Working from home is also beneficial for situations in which a talent pool is dispersed or otherwise geographically inaccessible. In person working arrangements are necessarily limited by the ability of employees to appear on site (Ardi, Cahyadi, Meilani, & Pramono, 2024). In fields where there are shortages of qualified candidates, and for situations in which a candidate is otherwise qualified, but relocation is infeasible due to costs or other factors, working from home can benefit all parties by reducing or removing geography as a barrier to employment (Urbaniec, Małkowska, & Włodarkiewicz-Klimek, 2022).

Working from home arrangements are also beneficial in circumstances where fixed costs relating to working on site are low. As mentioned in the previous section, larger organisations appear to be more likely than smaller ones to seek a partial or full return to the office. This may in part be explainable by larger companies' investments in real estate, equipment, and other fixed costs. A survey of 900 business leaders by Resume.org found that one third of respondents were implementing a return to office because of office lease agreements (Resume.org, 2024). The comparatively minor financial commitments of small and medium sized businesses may therefore make working from home a less difficult option to implement.

Comparing Arrangements

Much of the current discourse comparing working on site, working from home, and hybrid working arrangements suffers from a lack of nuance. Prescriptions on which arrangement is "best" tend to be overly broad, and too often fail to understand that arrangements can be complementary or serve distinct purposes.

For those who express overwhelming preference for in-person working arrangements, there is a tendency to understate the scale of the success of working from home, especially compared to what

was thought possible only a few years ago. There is also a tendency to privilege existing ways of working, minimising the capacity for businesses to adapt and evolve, and downplaying the extent to which commitments to existing systems and obligations may be obscuring the development of new working models.

On the other hand, many who support working from home speak as if it can be implemented cleanly and without issue in all cases. There is a tendency to leave unacknowledged the estimated 60% of North American jobs which cannot be done remotely (Dingel & Neiman, 2020). There is also often an impulse to overstate the extent to which digital communication can act as a substitute for in person interaction.

This section will summarise and build upon research conducted in the previous iteration of the WAGE report, which examined the strengths and weaknesses of working from home in general and as it relates to engineers. It will also engage with the advantages and disadvantages of in person and remote working models as they relate to both employers and employees.

Pros of Working from Home – Employers

Productivity

Individual and Organisational Productivity

Improving worker productivity is among the highest priorities of any human resource policy. Absent a compulsion by legislation, organisations cannot be expected to implement a working from home policy which they believe will reduce the productivity of their workers.

Here it is important to acknowledge the distinction between *personal* and *organisational* productivity in the working from home and engineering discourse. While this distinction did not feature prominently in the initial working from home research conducted in the early stages of the pandemic, research conducted throughout this project, especially in the interview and employer survey sections, make clear that it is a matter of growing importance. An individual's productivity can often be thought of as revolving around the completion of specific tasks, and can be conceptualised in terms of outputs such as billable hours, lines of code committed, etc. An organisation's productivity is often defined by more strategic and nebulous objectives such as "innovation". While the productivity of employees and organisations are often correlated, they can also come into conflict. An employee that is highly efficient in completing their assigned tasks can still fail to contribute to or even undermine the productivity of their broader organisation if those tasks are not aligned with the strategic objectives of the enterprise.

Successful human resource policies will seek to align the productivity of their workers with the productivity of their organisations. At present, much of the survey and scholarly research on the subject of working from home has focused on self-reported, individual productivity. However, the success of engineering firms can also hinge on measures of organisational productivity that emerge from higher level concepts such as collaboration and communication. Early evidence suggesting similar effects at the organisational level are also referenced, and will no doubt become more common as time passes, but at present, remain relatively rare.

Productivity in Engineering

It is the overwhelming consensus among surveys that those who work from home report higher or unchanged personal productivity (Deloitte, 2024). This was also true of OSPE's previous working from home survey, in which 54% of respondents reported an increase, and a further 34% reported "no change" in their personal productivity when working from home (Prism Economics and Analysis, 2022). Across all industries, the largest share of respondents reporting a decrease in productivity when working from home were those employed in Communications, at 16%.

However, self-reports are an imperfect method by which to assess an employee's productivity and can lead to conflicting results based on the perceptions of the respondent. For example, in OSPE's previous working from home survey, supervisors were almost 13% less likely to report an increase in productivity among their staff compared to non-supervisors (Prism Economics and Analysis, 2022). This finding was in line with other studies and surveys (Brail & Vinodrai, 2024). It is therefore important to augment survey findings, wherever possible, with experimental and observational research to confirm that survey data accurately reflect the real world.

Studies on working from home as it relates to the productivity of engineers remain somewhat rare. Nonetheless, a growing body of research suggests that, at a minimum, a hybrid working model in which engineers work from home two days per week, where feasible, may not be harmful to overall productivity.

In what is to date, one of the largest and most comprehensive experiments of its kind, Stanford University's Nicholas Bloom partnered with a large Chinese tech company to conduct a randomised trial studying the impacts of working from home on more than 1,600 employees. These employees included those in marketing, accounting and finance, and most importantly for the purposes of this report, *software engineering*.

The study found that software engineering employees that were allowed to work from home two days per week had no observed difference in productivity as measured by lines of code written compared to employees who remained in office full time. Moreover, employees that were allowed to work from home saw no difference in their performance evaluations, or their likelihood of being promoted two years after the study period (Han, Liang, & Bloom, 2024). Multiple similar studies have replicated this finding regarding software engineers across different organisations and methodologies (Šmite, Moe, Klotins, & Gonzalez-Huerta, 2023; Bao, et al., 2022).

Research on the intersection of working from home, productivity, and engineering remains scant in non-software specialisations. However, preliminary inferences can be drawn by applying more general research on working from home to existing research on the drivers of productivity in engineering.

Many studies have attempted to provide a precise definition of the components of engineering productivity. Forsgren et al. provide a framework consisting of 5 components.

- Job satisfaction and wellbeing
- Communication and collaboration
- Performance
- Activity
- Efficiency and flow

Though it was originally designed for the analysis of software development, it is one of the more widely cited frameworks of its kind, and its underlying structure is adaptable to application to other schools of engineering. The literature suggests that working from home can, to varying degrees, support or coexist with each of these components.

Job satisfaction and wellbeing

Increased job satisfaction is one of the most consistent findings across remote working research (Chatterjee, Chaudhuri, & Vrontis, 2022). There is also robust evidence showing a correlation between worker productivity and job satisfaction (Forsgren N. , et al., 2021). There is also a growing body of scholarly research to support that this generalises to product engineers and engineers in manufacturing (Čavar, Bulian, & Dubreta, 2023; Ferguson, et al., 2022).

Activity

While not a perfect proxy, hours worked can be assumed to be roughly analogous to work activity. There is abundant evidence that those who work from home work more hours (ADP, 2021). This is often attributed to factors such as the reallocation of time that would otherwise have been commuting, and the blurring of work and home boundaries allowing for longer overall workdays (Wray, 2024). OSPE's previous survey suggested that this held true for engineers, as a majority of respondents reported working longer hours when working from home (Prism Economics and Analysis, 2022).

Additionally, in the case of software engineers, for whom there are studies on operationalised definitions of activity, this finding is borne out directly. "Activity", when understood as the number of lines of code committed, and controlling for errors and revisions, is found to rise or remain the same when working from home (Šmite, Moe, Klotins, & Gonzalez-Huerta, 2023; Bao, et al., 2022).

Communication and collaboration

Communication and collaboration is the aspect of engineering productivity over which there is the greatest controversy. It is well known that virtual communication is a less effective means of establishing and maintaining trust, encouraging creativity, and several other core aspects of collaboration in engineering (Sailer 2011, Cecchi et al. 2022, Mascitelli 2000). This has downstream effects for engineering productivity in that creative and evidence-based problem solving, novel idea generation, and other core engineering competencies rely directly or indirectly on high quality and consistent communication (Brucks & Levav, 2022). OSPE's previous survey found that more than one in three respondents felt working from home reduced the quality of their interactions with colleagues, and that they would miss interacting with them (Prism Economics and Analysis, 2022). 26% also agreed that working from home reduced the quality of interaction with their managers (Prism Economics and Analysis, 2022).

However, there is reason to believe that this represents an oversimplification of how communication and collaboration interact with working from home. In their research on product engineering and its relationship with remote working, Ferguson et al. emphasise that different types of communication can serve different purposes. Using previous research on Media Richness and Synchronicity Theory, they note that "[T]eams should use asynchronous tools when conveying information and synchronous tools when converging on ideas and decisions" (Ferguson, et al., 2022).

They point to research conducted by the Massachusetts Institute of Technology (M.I.T.) which supports the idea that when used appropriately and in conjunction with in-person communication, virtual communication can support greater creativity in organisations by allowing more members to participate in meetings simultaneously, increasing flexibility, and improving transparency (Thompson, 2020). This does not negate the drawbacks of an over reliance on virtual communication for creative tasks. However, it does suggest that communication is a multifaceted consideration which may warrant a more refined approach to working arrangements.

Efficiency and flow

In the case of efficiency and flow, surveys and research often point to an increased ability to focus as being among the core benefits of working from home (Šmite, Moe, Klotins, & Gonzalez-Huerta, 2023; Laumer & Maier, 2021). While spontaneous interaction can be highly beneficial for allowing the free flow of information, it can also be disruptive at times when intense and prolonged concentration is warranted. However, this is only the case so long as organisations properly organise their virtual communications such that virtual meetings do not become overly disruptive in place of in-person meetings (Yang, et al., 2022). The research finds support across multiple fields of engineering that working from home allows more frequent and longer lasting flow states (Šmite, Moe, Klotins, & Gonzalez-Huerta, 2023; Ferguson, et al., 2022).

Performance

Performance refers to the underlying quality of the output of an engineering process. In the case of software development, for which this model of engineering efficiency was initially developed, it refers to the degree to which code is "performant" – a term describing code which executes efficiently, makes effective use of resources, and is both reliable and fast. How each engineering discipline conceptualises its equivalent definition of performance will be different. For this reason, direct inferences cannot be drawn in this short section.

Retention and Recruitment

Employee turnover represents a major expense to businesses. Estimates of the replacement cost of an employee range from one third and two times the original employee's salary (SHRM.org, 2019; McFeely & Wigert, 2019). Engineers, especially those who are highly specialised, in demand, or long tenured, will tend to command high replacement costs.

Companies that implement working from home see meaningful reductions in turnover. In Nicholas Bloom's previously discussed experiment it was found that those who were allowed to work from home two days per week, including software engineers, were one third less likely to quit (Han, Liang, & Bloom, 2024). This is consistent with existing research which finds that remote working arrangements support retention, and can enhance recruitment (Ardi, Cahyadi, Meilani, & Pramono, 2024).

The inverse has also been found to be true. Rescinding the ability to work from home, in part, or especially in full, results in significant employee attrition (Tsipursky, 2024). Employees that leave under these circumstances are disproportionately likely to be younger and female (Tsipursky, 2024). Our previous engineer survey found that a near majority (45%) of respondents believed that staying at their then current job was contingent on some level of working from home remaining (Prism

Economics and Analysis, 2022). A majority (66%) further stated that working from home would be a major consideration in choosing a future job (Prism Economics and Analysis, 2022).

Cost Reduction

One of the major benefits of a shift toward partial or full time working from home for employers is an expected reduction in overall costs. The largest cost savings are expected to come either directly or indirectly from reductions in real estate expenditures. This can include the shrinking of an organisation's real estate footprint, but also reductions in the use of utilities and equipment. Studies which empirically quantify the size and scope of these savings remain few and far between. However, the emerging literature suggests that cost savings may be substantial.

A survey conducted by Global Workplace Analytics found that a switch to a full working from home arrangement results in average organisational real estate savings of $10,000 per employee, per year (Global Workplace Analytics, 2021). The Financial Post has previously reported that Canadian employers that adopt a hybrid working model may see savings in the range of $400,000 per year through reduced spending on real estate, office supplies, equipment, and utilities (Paglinawan, 2024).

However, working from home can also generate employer savings in other areas. Surveys consistently find that employees are willing to accept a lower rate of compensation in exchange for the ability to work from home at least some of the time. What share of employees feel this way – and whether this reflects actual behaviour when presented with the choice remains to be seen. Polls by Ipsos have found that 36% of Canadians would accept lower pay in exchange for the ability to work from home (Simpson, 2022). However, in OSPE's previous survey this was only 17% of engineers (Prism Economics and Analysis, 2022). Globally, an average employee reports being willing to accept a 5% pay cut to be able to work from home some of the time (Azpúrua, 2025). A survey by Robert Half found that of the 25% of Canadian workers who would accept a pay cut in exchange for the ability to work from home, the average amount was a 16% reduction in pay (Robert Half, 2023).

Cons of Working from Home – Employers

Mentorship

There are very serious concerns regarding the impact of working from home on mentorship. These concerns are well founded, as mentorship can have an enormous influence on the development of early and mid career engineers, their retention, and their subsequent contributions to their employer (Byars-Winston & Dahlberg, 2019).

Research published prior to COVID broadly supports the conclusion that remote working is detrimental to the establishment and efficacy of workplace mentorship. Fully remote working is associated with reductions in information exchange and inhibition in the development of organisation specific language, schemas, and narratives (Fonner & Roloff, 2010; Taskin & Bridoux, 2010). Additionally, remote communication can reduce the build up of trust, and the frequency of interactions, which can, in turn, undercut the effectiveness of mentorship (Termini, et al., 2021).

However, in their meta-analysis of 46 telecommuting studies, Gajendran and Harrison found that while high-intensity (2.5 days or more) telecommuters experienced harm to their workplace relationships, there were no associated negative effects for those below that range (Gajendran & Harrison, 2007). A survey conducted by TD Canada Trust in conjunction with Ipsos found that formal

mentorship programs were actually more common in companies with hybrid working models (Pantelidou & Simpson, 2024).

On the balance, the current research suggests that working from home complicates organisational mentorship. Full time working from home likely has negative impacts on mentorship. Hybrid working models may be able to facilitate high quality mentorship provided they enjoy organisational support (Ensher, Johnson, & Smith, 2022). This may include adopting a more explicit approach in which mentorship is part of a formal program rather than an informal arrangement as is often traditional. Other such accommodations may include scheduling in office days such that mentors or mentor aged figures are on site at the same time as younger employees (Ensher, Johnson, & Smith, 2022). What strategies will be necessary to strike this balance remain open to experimentation, research, and discovery.

Creative Problem Solving and Idea Generation

As mentioned previously, on site and in office work is important in large part because of the agglomeration effects that come with having employees in one location. Creative and evidence-based problem solving, and creative idea generation all benefit significantly from having employees in one place at one time. This is due to the increased opportunities for, and quality of communication as compared to what can be accomplished virtually while working from home (Haas, 2022).

Conversely, some research suggests that creativity may be enhanced by remote working, as virtual meetings can allow for more time for individual brainstorming, and anonymity in the sharing of ideas (Thompson, 2020). Still other research suggests that the overall impact may be of no statistical significance (Chulvi, Mulet, Felip, & García-García, 2016). However, the literature seems to lean towards the conclusion that fully remote working conditions may inhibit creative problem solving and idea generation as compared to in-person working arrangements.

Research on hybrid working appears to be more mixed on the subject. A growing body of evidence suggests that hybrid working arrangements can allow near or total parity with creativity among team members (Xu, Sarkar, & Rintel, 2023; Chaudhury & Deng, 2022). The general finding appears to be that when individuals are able to choose between in-person and virtual communication and interaction, they are able to allocate their time effectively based on what best serves the goals of their tasks. Sarkar et al. state that "Contrary to the dominant account which associates co-presence with increased creativity, we find that the flexibility of hybrid work, and carefully managed co-present interactions punctuating a regime of focused individual work, is the main catalyst of creativity." (Xu, Sarkar, & Rintel, 2023). It appears that these general findings can, to some extent, carry over to engineering as well. Even in fields such as product engineering where working from home is particularly difficult, there is growing scholarly evidence suggesting that organisations under estimate the efficacy of hybrid working arrangements to deliver equivalent performance when properly managed and supported (Ferguson, et al., 2022).

Similarly to mentorship, employers may face difficulty in maintaining standards for creativity and problem solving in fully remote settings. Those employers that adopt hybrid working arrangements, however, may be able to maintain equivalent levels of creativity and problem solving, provided they allow for the allocation of time and resources to support it.

Stranded Assets and Necessary Investment

The vast majority of assets owned by businesses operating today were purchased at a time when on site working arrangements were assumed to remain the norm forever. Most notable among these assets are vast real estate holdings, often on extremely valuable land located in the cores of major cities. However, these assets can also include office furniture, equipment, and infrastructure.

There is widespread agreement that working from home has led to the devaluation of commercial real estate holdings (Mischke, et al., 2023). As discussed previously, surveys conducted by KPMG suggest that among businesses, large businesses show disproportionate preferences for return to office mandates. This may be partially influenced by the perceived need to make use of otherwise underutilised assets and holdings (Resume.org, 2024).

Additionally, implementing a hybrid or fully remote working arrangement may be particularly costly for engineering companies, for whom the upfront investment of modern technologies can be significant (Lund, Madgavkar, Manyika, & Smit, 2020). Organisations that wish to succeed in a transition to hybrid or fully remote working arrangements may also incur costs relating to the retraining of management. However, organisations are also likely to enjoy a great deal of latitude in passing costs such as high-speed internet and home office furnishings onto employees, thus partially reducing their obligations.

Pros of Working from Home - Employees

Flexibility

By far the single most common benefit of working from home for employees as articulated throughout the literature is the increase in flexibility. Workplace flexibility is said to be: "the ability of workers to make choices that influence when, where, and for how long they engage in work-related tasks" (Hill, et al., 2008).

In a survey conducted by Ipsos, workers in the UK were asked to select up to 3 options from which they benefitted the most when working from home. All four of the top choices, "Better work life balance" (37%), "Saving the cost of commuting" (34%), "Flexibility with my time" (33%), and "Saving the time of commuting" (31%) were related to flexibility (Karian, 2023).

Reclaiming time previously allocated to commuting is particularly important to employees who work from home. Employees are rarely directly compensated for the costs and time associated with commuting. Long commutes are associated with negative physical and mental health outcomes (Han, Peng, & Xu, 2022). Statistics Canada has found that those who work from home sleep longer and dedicate more time to passive and active leisure. They note that these benefits to working from home are commonly the result of repurposing commuting time (Wray, 2024). Taken together, this demonstrates the first major benefit of increased employee flexibility, in that it can directly impact the health and wellbeing of a worker for the better.

The additional flexibility of working from home is also often used to support beneficial behaviours that, while not time intensive, are not possible while at an office. This is of greatest benefit to those with caring responsibilities such as mothers of young children. Working from home can reduce the disruptiveness of dropping off and picking up children – which commonly overlaps with

working hours. It can also ease the burden of domestic activities such as laundry and meal preparation.

Work-Life Balance

Work-life balance exists downstream from work flexibility but is also influenced by other factors and is thus more complicated. This complexity is reflected in the polarisation of survey responses relating to work-life balance, compared to the relative uniformity of questions around other benefits. For example, a survey by ADP found that 46% of respondents believe working from home made it easier to be a working parent, but also that 25% said it made it harder (Richardson & Antonello, 2022).

The blurring of boundaries between an employee's professional and personal lives can be a major contributor to the mixed feelings that surround this topic (Chung H. , 2022). OSPE's previous survey showed that, although more than 30% of respondents felt working from home reduced their feelings of work related stress, more than 10% felt that it made those feelings worse (Prism Economics and Analysis, 2022). These differences in experiences are likely attributable to a wide range of factors, including individual differences in living circumstances and preferences. However, research on the subject has found that one of the major contributors is the implementation of a working from home policy without the usual, but far from universal, schedule flexibility (Laß & Wooden, 2022). Put simply, while working from home and work flexibility are commonly associated, this is not always the case. Such circumstances can exacerbate the weaknesses of working from home and minimise the strengths.

Nonetheless, the net effect appears to be positive, as more than 60% of engineers strongly agreed that working from home helped them achieve better work-life balance (Prism Economics and Analysis, 2022).

Cost Savings

Like employers, employees can enjoy significant cost savings when they are allowed to work from home. Commuting is typically thought of purely in terms of time. However, it also imposes a significant financial cost on many Canadians. A study conducted by CMHC found that, on average, a GTA resident spent more than $500 per month on commuting (Scott & Nanowski, 2018). This is naturally higher for those who are more reliant on travelling by car and have less access to public transit. The present state of affordability in Canadian urban centres such as Toronto makes reducing commuting related costs through relocation and alternative means difficult. Working from home naturally reduces the cost of commuting in direct proportion to the frequency that it is allowed.

Those working in offices often also spend more of their income on incidental expenses. A report released by Owl Labs found that, in addition to commuting costs, those working in office incurred an additional $20 USD per day in pet care expenses, and $16 USD per day on meals (Owl Labs, 2023).

Cost savings made by employees will vary considerably based on a variety of factors. However, estimates generally place them in the range of between $5,000 USD and $10,000 USD per year (Celano, 2022; Howington, 2023).

Cons of Working from Home - Employees

Poorer Interpersonal Relationships

Working from home often has a somewhat negative impact on relationships between coworkers. Polls by Gallup and research by the Harvard Business Review find that those who work from home are more likely to report feelings of loneliness than those working in the office (Gallup, 2024; Montañez, 2024). When asked as part of OSPE's previous working from home survey, 37% of engineers stated that they would miss the opportunity to socialise with their coworkers when working from home (Prism Economics and Analysis, 2022). The same percentage also reported that working from home reduced the quality of their interactions with their colleagues (Prism Economics and Analysis, 2022). In OSPE's current working from home survey, Loneliness was routinely ranked as the most important disadvantage of working from home. Loneliness is increasingly viewed as a major societal health issue, with the impacts of isolation being compared to the smoking of 15 cigarettes per day (Department of Health and Human Services, 2023).

Mentorship

As discussed above, the weakening of communication and interpersonal relationships can reduce the efficacy of mentorship. While employers benefit from mentorship through the development of an increasingly skilled workforce and greater staff loyalty, employees benefit through improved overall career opportunities and higher wages (Byars-Winston & Dahlberg, 2019).

As discussed in the employer mentorship section, fully remote working can reduce the effectiveness of mentorship. However, organisations supportive of hybrid working arrangements may be able to reduce or eliminate these negative impacts. Interestingly, those identified in the literature as being the greatest beneficiaries of mentorship: early career professionals and women, did not differ meaningfully from other groups in OSPE's previous working from home survey. In that survey, respondents under the age of 35 (27%) and women (24%) were closely aligned with the overall average (26%) of respondents wishing to work from home 100% of the time when the pandemic was over (Prism Economics and Analysis, 2022). OSPE's 2025 survey has made similar findings regarding these groups and ratings of the relative importance of mentorship and related aspects of working from home.

Career Progression

Career progression is an issue that has been raised throughout the literature and exists downstream of potential poorer interpersonal relationships and mentorship opportunities. Working from home is often said to result in lower organisational visibility (Clark, 2021). Although research such as that conducted by Nicholas Bloom finds no difference in promotions between those in hybrid and in office working conditions, whether or not an employee's career progression is affected by their choosing to work from home is likely to be highly organisation specific. Organisations with cultures which view working from home negatively will be less likely to promote those who make use of it. A survey conducted by KPMG found that 90% of Canadian CEO's surveyed would reward employees "who make an effort to come into the office with favourable assignments, pay raises, or promotions," ((KPMG, 2024).

Movement between organisations may also be affected. The benefits of communication discussed previously also apply to networking. Poorer networking due to weaker interpersonal relationships and mentorship may make career progression through job changes more difficult.

Despite these potential drawbacks, engineers have previously indicated little concern. In OSPE's previous survey, only 21% of respondents felt that working from home posed a serious risk to their advancement with their employer (Prism Economics and Analysis, 2022). This was even lower among respondents under the age of 35 (17%) and women (17%) the groups who, once again, are thought to benefit the most in terms of career progression from interpersonal relationship building.

Insufficient Working Environment

Successful working from home requires a suitable environment. Research has previously found that 'equity seeking groups' such as women, young people, and recent immigrants are less likely to have access to the environment and infrastructure necessary to work from home (Saba, Cachat-Rosset, Carillo, Klarsfeld, & Marsan, 2021). Employees whose living conditions do not accommodate regular working from home may find their ability to do their jobs compromised by the change. For this reason, consultation prior to a change in working arrangement can be extremely important. In OSPE's 2024 working from home survey, concerns over a respondent's working from home environment were often among the least important.

Women and Working from Home

Both men and women are overwhelmingly likely to report positive impressions towards working from home. However, differences are often found in the intensity of their respective feelings. Women can generally be expected to find greater value in the advantages of working from home, and to view the disadvantages of working from home as less important. This is reflected in OSPE's 2025 survey data, as well as the general literature.

There is ample evidence showing that women achieve superior outcomes across a variety of measures when they are allowed to work from home. Women who work from home have been found to report better work-life balance, stronger job performance, and a narrower motherhood pay gap compared to women who do not (Villamor, Hill, Kossek, & Foley, 2023). Downstream of these benefits are reports of greater life satisfaction and reduced depressive symptoms (Villamore, Hill, Kossek, & Foley, 2023).

Despite this, the ways in which working from home interact with work-life balance, career development, and no doubt other aspects of professional life, especially with regards to women, are complex, and demand deeper analysis.

Work-Life Balance

Flexibility and the work-life balance that it supports is among the most well documented methods by which women in complex and human capital intensive jobs can be kept engaged in their careers (Chung & van der Lippe, 2020). This has recently been demonstrated by the disproportionate attrition of women from companies that have implemented return to office orders. This is especially true of mothers with young children, 38% of whom stated that without workplace flexibility they would have to reduce their work hours or leave their companies, according to a 2023 McKinsey & Company survey (McKinsey & Company, 2023).

Women continue to be responsible for a larger share of domestic and child-rearing responsibilities as compared to men (Statistics Canada, 2022). This is often the cause of work-life conflict, especially for mothers of young children. The ability to work from home with some degree of consistency can support women and mothers in finding a balance between these competing obligations, and further support their long-term professional prospects (Fuller & Hirsh, 2018). However, this experience is not universal. Research conducted throughout the COVID-19 pandemic has also found that many women experience greater work-family conflict while working remotely (Vitória, Ribeiro, & Carvalho, 2022; Song & Gao, 2020; Future Skills Centre, 2021). Subsequent research suggests that this is most commonly the case when women are not afforded the increased schedule control, and thus flexibility, which is associated with, but not a necessary component of working from home (Laß & Wooden, 2022).

There is also the possibility that working from home creates the expectation that women take on an even greater share of domestic obligations, reducing or eliminating the benefits offered by working from home (Ibarra, Gillard, & Chamorro-Premuzic, 2020). It has been previously argued that this phenomenon partially explains why flexible working arrangements often fail to increase the share of women in high level management positions (Chung & van der Lippe, 2020). Put simply, working from home, in and of itself is not a panacea for women with regards to balancing their work and personal lives. Organisations that implement hybrid or full working from home arrangements with the goal of supporting women must engage deeply with the policy and take flexibility into account.

Career Development

Issues of career development and progression loom large in working from home research. This is especially true as they relate to women.

Gender influences how employees make use of working from home. Men tend to use the flexibility of working from home to work more (Arntz, Yahmed, & Berlingieri, 2020). Women, as discussed above, are more likely to dedicate the additional flexibility to managing domestic obligations. At this time, there does not appear to be research studying the implications of this phenomenon directly in great detail. However, in the long term, the likely implication is that the gap in professional achievement between men and women in organisations where working from home is allowed may widen.

Relatedly, one of the most commonly cited concerns of working from home regarding career progression is the prospect of lower organisational visibility (Clark, 2021). Remote working can undercut career advancement in organisations which are not equipped to recognise the performance and needs of those working remotely (Babapour Chafi, Hultberg, & Bozic Yams, 2022). The lack of a physical presence can reduce an employee's ability to advocate on their behalf, access resources, and join informal information sharing networks (Haddon & Lewis, 1994; Mann & Holdsworth, 2003). There are the beginnings of research, conducted during the COVID-19 pandemic which suggest that this is having a larger impact on women, due to the pressures and preferences that make them more likely to choose to work from home some or all of the time (Villamore, Hill, Kossek, & Foley, 2023).

One of the most common means of addressing this is through mentors and other workplace advocates. Women in STEM careers benefit disproportionately from the availability of mentorship. This is especially true with regards to metrics such as retention (Dennehy & Dasgupta, 2017). The relative

rarity of women in engineering, combined with the fact that professional networks are often defined by the sharing of common traits, interests, and experiences, makes these sorts of informal structures more difficult for women to penetrate (Xu & Martin, 2011; Chekwa, 2018).

Subsequent research has begun to bear out this finding. A COVID era research project on the experiences of women in software engineering and mentorship found that:

"Proximity to teammates significantly enhanced mentorship, particularly for female engineers. When working in the same building, female engineers received 40% more peer review comments on their code compared to those on distributed teams. This increase in feedback was due to more follow-up questions and diverse perspectives from colleagues, both male and female.

Conversely, male engineers experienced a smaller, 18% increase in feedback when working in person. This gender disparity highlights that female engineers benefit more from proximity, especially in early career stages where mentorship is crucial." (Emanuel, Harrington, & Pallais, 2023)

Despite this, OSPE's previous survey on the subject found that women (17%) were actually less likely than men (22%) to feel that working from home risked reducing their prospects for advancement (Prism Economics and Analysis, 2022). Similarly, women (24%) were as likely as men (24%) to feel that expressing a desire to work from home would negatively affect their advancement prospects, and were significantly more likely to disagree (43% vs. 35%) (Prism Economics and Analysis, 2022).

Additionally, despite growing research suggesting that working from home at least part of the time does not impose meaningful productivity penalties among engineers, issues of stigma and overall visibility remain.

As discussed previously, research by Nicholas Bloom found that in addition to no detectable reductions in productivity in hybrid working conditions, that rates of promotion and employee evaluations were also unaffected. It is possible, if not likely that this will be highly organisation specific for the foreseeable future. The success of working from home policies is highly contingent on organisational support (Chatterjee, Chaudhuri, & Vrontis, 2022). Organisations with cultures which highly prioritise in-person work, and which undervalue the contributions of those working from home may indirectly marginalise women.

However, historically research has remained mixed on the subject. Bloom's own research found that working from home had no observable impact on the likelihood of promotion. Some pre-COVID research, such as a meta analysis of research on telecommuting and perceptions of career prospects further supported this conclusion, finding no statistically significant effects (Gajendran & Harrison, 2007).

Balancing the stated preferences of women for greater flexibility and more access to working from home, with the potential negative career implications, and the more general benefits will likely be among the most challenging aspects of the development of working from home policy making going forward.

Conclusion

This literature review provides a baseline understanding of the state of working from home as it relates to engineers, and how it has developed in the years since OSPE's initial research into the subject. Some of the key takeaways are as follows:

1) **Working from home has become the new "normal" throughout much of the economy.** In keeping with predictions made in OSPE's previous research project, working from home has evolved beyond its initial status as a temporary solution. While far from universal, and less popular than at its pandemic and legislatively-backed peak, working from home has become an entrenched part of the economy. Statistics Canada estimates that more than 1 in 3 working Canadians work from home at least some of the time, while OSPE's most recent survey finds that 70% of respondents worked from home at least 1 day per week. The literature suggests that although many, and especially larger organisations are seeking to reduce the number of days in which people work from home, and in some cases eliminate the practice entirely, on the whole, adaptation to the practice, spurred on by very real advantages to all parties, and by immense popularity among workers, is ongoing, and working from home in some capacity is here to stay.

2) **Working from home is profoundly popular with workers.** The literature shows that the popularity of working from home is enduring, and goes beyond the pandemic-era circumstances that initiated it. Survey data (including OSPE's own) and scholarly research all point to majorities of workers holding strongly positive feelings towards the practice of working from home. While pandemic era research on working from home was limited to speculation on the sincerity of survey responses, research conducted since then finds that working from home policies can have real and at times significant impacts on recruitment and retention. This is especially true among women in general and mothers in particular. The popularity of working from home means that organisations that do not provide it will likely be expected to provide compelling reasons for their positions, compensate employees in some way to offset its absence, or risk becoming uncompetitive in recruitment and retention.

3) **It is now more likely than not that working from home is compatible with a highly productive and competitive engineering labour force in most cases.** Concerns over worker productivity when working from home were an extremely prevalent feature of COVID-era discourse. Since then, research has repeatedly found that hybrid working arrangements can be enacted without compromising the productivity of at least some varieties of engineer. The research currently skews heavily towards software engineering, where the data is the most easily accessible. However, research on other engineering disciplines is ongoing, and analysis of the underlying structure of productivity in engineering, combined with preliminary research in fields such as design and civil engineering suggest that many of working from home's productivity effects are transferable. Effects on organisational productivity are more nuanced, but also appear compatible with hybrid working arrangements.

4) **There still remain very valid concerns regarding the drawbacks of working from home that warrant close consideration.** The literature shows that working from home can have real, negative consequences for organisations and individuals through its reduction of interpersonal interaction. These drawbacks can manifest as reductions in creative problem solving, mentorship, and career progression. Working from home should not be viewed as a panacea, but as a policy requiring the consideration of different priorities. A universal prescription for working from home policies is inadvisable, and advocacy must be responsive to a wide range of circumstances.

5) **There is likely still a great deal of latent capacity for working from home that has yet to be harnessed.** Similarly to pre-pandemic assumptions about the viability of working from home, it is likely that many industries and organisations are operating from limited frames of reference which do not reflect the capacity for technology and processes to be optimised and to take advantage of the benefits of working from home. This is especially true in the case of hybrid working arrangements, wherein work may be more efficiently allocated so that it is done in the working conditions to which it is best suited.

6) **The relationship between women in engineering and working from home is complex, and will require carefully developed and constantly refined policies to be properly addressed.** While women express strong preferences for working from home, especially as it relates to work-life balance, there is potential for poorly implemented policies to undermine rather than support them. Working from home policies that do not, for example, allow for the associated increases in flexibility can exacerbate work-family conflict, and put greater pressure on women seeking to balance the competing priorities of their engineering careers and personal lives. Relatedly, organisations that encourage women to make use of working from home arrangements must also take care to ensure that in so doing, they are not being marginalised through reduced organisational visibility, less access to mentorship, or other second order impacts to which women in engineering are already disproportionally susceptible.

Overall, this literature review suggests that although working from home research and policy, both in general and as it relates to engineers and women engineers, continues to evolve, it has achieved a degree of stability from which meaningful inferences can be drawn. The capacity for some organisations to successfully allow employees to work from home at least some of the time without meaningfully compromising their competitiveness is no longer speculation, but fact. Women in engineering stand to benefit significantly from this development. With this in mind, OSPE can advocate for the judicious use of context sensitive working from home policies that create benefits for both their membership and employers.

IV

Evidence from a Survey of professional Engineers

In November of 2024 OSPE distributed its second working from home survey to its membership. A round of reminder emails was sent in December of 2024. A total of 1,199 responses were received over the survey period. Of these responses, 1,034 were 'Employed' and therefore deemed valid for the purposes of this analysis.

The survey was designed to build on and enhance the findings of both the prior survey and the wider body of research on working from home conducted since the end of the pandemic. Its specific goals included:

- Determining the prevalence of working from home in engineering both compared to the broader labour force, and to observations made during the COVID-19 pandemic
- Identifying differences in experiences and preferences within and between demographic groups, and especially between men and women
- Understanding the extent to which engineers may be unique compared to the general population in their experiences working from home

A comprehensive review of the collected survey data can be found below, with analysis on the potential meaning and implications of the findings and how they relate to engineers across various demographic categories, with special emphasis placed on observed differences between genders.

Summary

This report summarises the results of a survey conducted between November and December of 2024. The survey was conducted on behalf of the Ontario Society of Professional Engineers (OSPE). There were 1,199 valid responses.

The survey sought to build upon previous research and survey data on the relationship between engineers and working from home policies, with special emphasis on the experiences of women engineers.
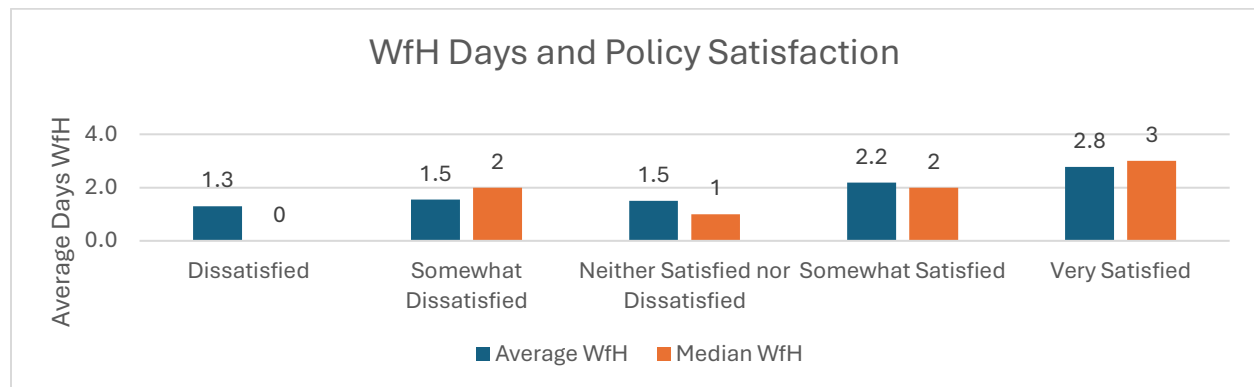
The survey results reveal that although a meaningful majority (70%) of engineers have access to at least some work from home flexibility, a large minority of engineers (30%) do not.

Average Days Worked from Home
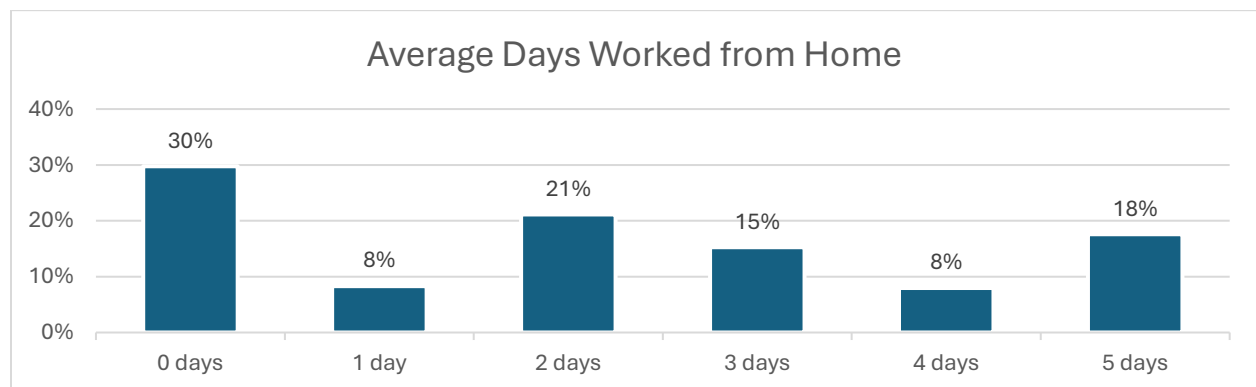
Unexpectedly, the variance in the number of days than an engineer worked from home was far higher within industries and roles than between them. This implies that access to working from home policies may be influenced more heavily by firm-level considerations that initially thought.

The share of those without access to working from home arrangements appears likely to increase in the near future, with 26% of respondents reporting that their employer has announced plans to reduce the number of days for which working from home is allowed.
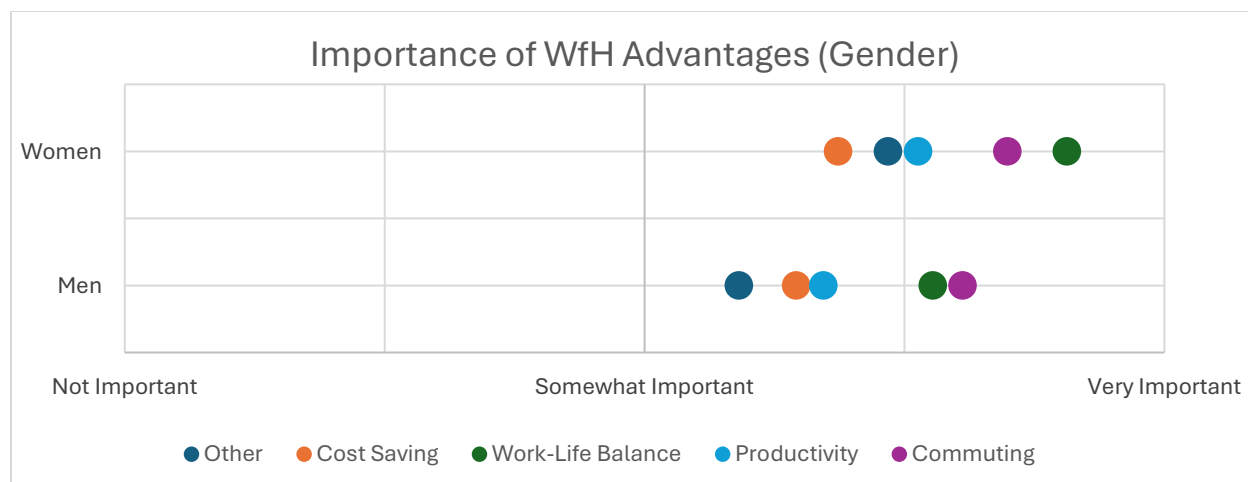
Engineers feel very positively about the ability to work from home. Those who work from home the most report the highest levels of satisfaction with their organisation's policies, while those who work from home the least report the lowest levels of satisfaction.

WfH Days and Policy Satisfaction

Satisfaction Level	Average WfH	Median WfH
Dissatisfied	1.3	0
Somewhat Dissatisfied	1.5	2
Neither Satisfied nor Dissatisfied	1.5	1
Somewhat Satisfied	2.2	2
Very Satisfied	2.8	3

Y-axis: Average Days WfH (0.0, 2.0, 4.0)

There is an overwhelming consensus among engineers across almost all demographic categories that the advantages of working from home are very important, and the disadvantages are much less important, or not important. Differences in the degree of importance that an engineer places on the various advantages and disadvantages of working from home are most closely related to the number of work from home days that an engineer has in a typical week. Whether this is related to exposure, self-sorting, or other factors will require further investigation.

Engineers cohere with the general population in feeling that reductions in time spent commuting and improved work-life balance are the most important advantages of working from home. Loneliness and feelings of isolation are viewed overwhelmingly as being the most important disadvantages of working from home. While the subject of loneliness appears in the working from home literature and discourse, its prominence in the survey data remains striking.

Gender differences, the focus of this research project, are less substantial than expected in the survey data. This is likely at least partially explained by the uniformly positive impressions of respondents regarding working from home. To the extent that they are observed, gender differences follow previous expectations. Women place slightly higher importance on the advantages of working from home, and slightly less importance on the disadvantages than do men.

Importance of WfH Advantages (Gender)

| | Not Important | Somewhat Important | Very Important |

Legend: ● Other ● Cost Saving ● Work-Life Balance ● Productivity ● Commuting

Demographics

Gender

The gender distribution of the valid responses to the survey are shown below. In order of prevalence: 67% of respondents identified as men, 29% as women, 3% preferred not to say, and 1% identified as "Other".
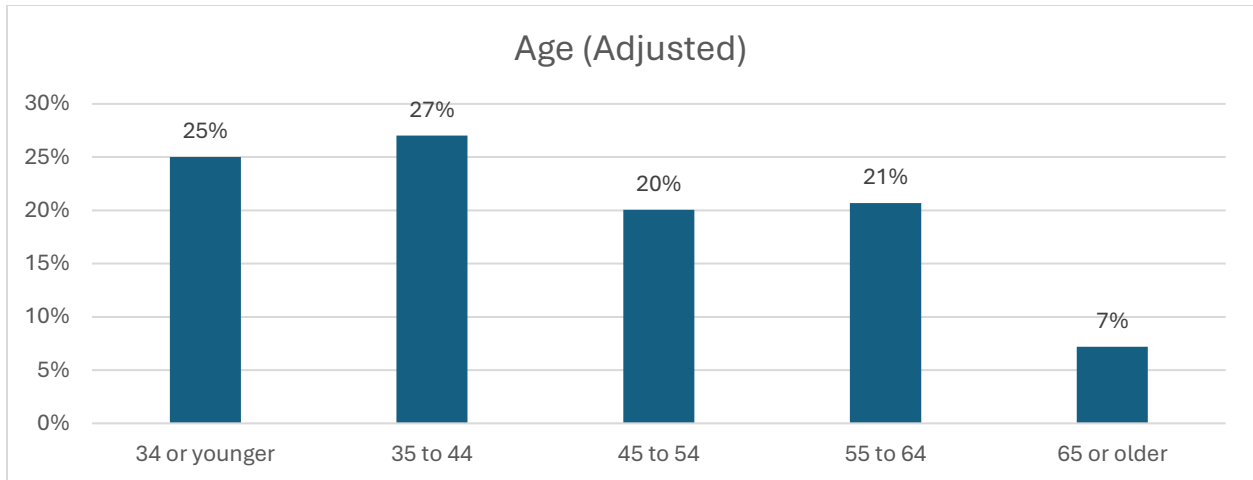
The relatively small sample sizes of those who preferred not to answer and those who identified as "Other" make them infeasible for deeper statistical analysis. For this reason, throughout this report, analysis regarding differences between gender groups will be limited to comparisons between those who identified as men and those who identified as women, as reflected in the "Adjusted Gender %" column.

Gender Response	Raw Gender %	Adjusted Gender %
Man	67%	70%
Woman	29%	30%
Prefer not to say	3%	
Other	1%	

In 2022, Engineers Canada estimated that 15% of their overall membership were women (Engineers Canada, 2023). A 2023 analysis of OSPE's demographics estimated that 22% of Ontarians with engineering degrees, working in engineering, were women as of the 2021 census (Weisling, 2023). Women are therefore significantly overrepresented as a share of the sample in this survey. Given the primary area of focus of this research is the experiences of women, this is beneficial.

Age

An adjusted age distribution of the respondents can be found below.

Appendix 2: Demographics - Age

The relatively small sample sizes of those who reported being "24 or younger" makes them infeasible for deeper statistical analysis. For this reason, throughout this report, analysis regarding differences between age groups will combine the "24 or younger" with "25 to 34" groups to make a "34 or younger" group, as shown above.

Industry

The industry distribution of the respondents is found below.
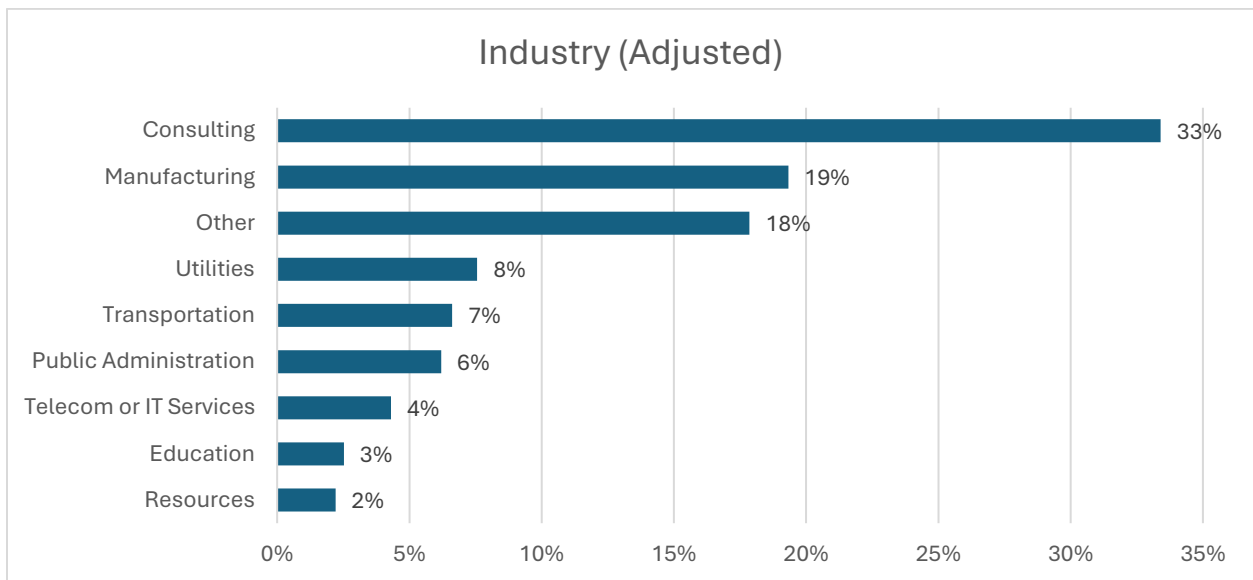
Appendix 3: Demographics - Industry

The relatively small sample sizes of those who reported working in the Wholesale or Retail Trade, Finance or Insurance, Health Care, Social Services, and Real Estate, Property Management industries make them infeasible for deeper statistical analysis. For this reason, throughout this report, analysis regarding differences between industries will combine these groups into "Other" as depicted above.

Roles

The role distribution of the valid respondents to the survey are shown below. Unlike the demographic groups discussed above, respondents were allowed to select as many roles as necessary to accurately describe their duties.
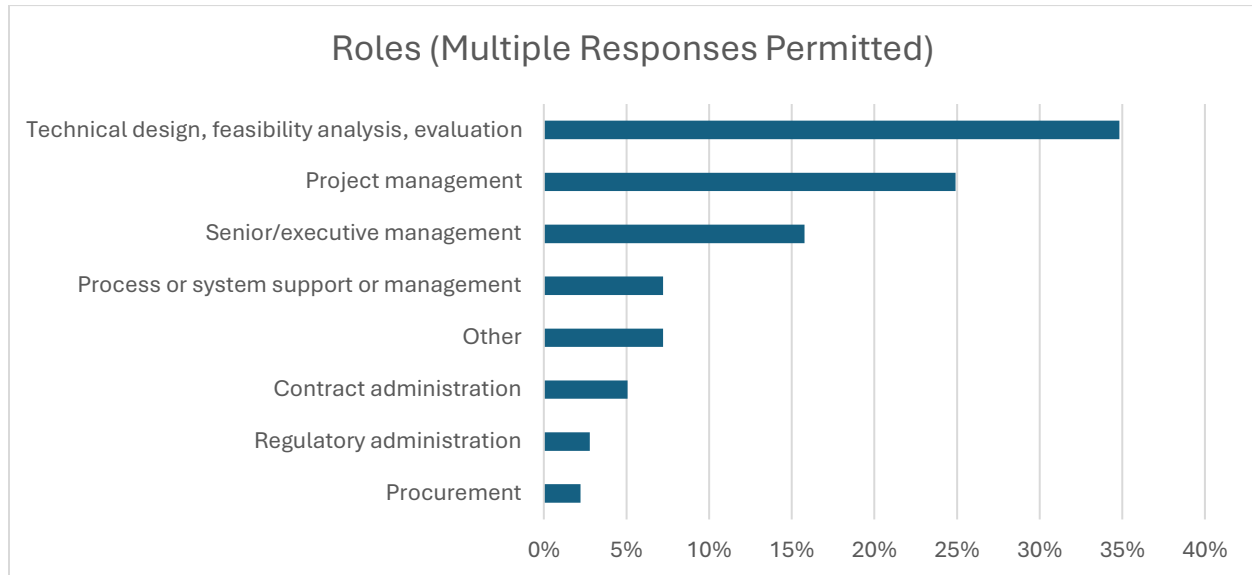

Appendix 4: Demographics - Role

Working from Home

Overview

For the purposes of this study, the most important finding is that the single most common working arrangement was one in which a respondent had 0 work from home days in a typical week. This arrangement described 30% of respondents. Among the remaining 70% of respondents who worked from home at least some of the week, 41% worked a majority of their days from home.

The median number of work from home days per week was 2, and the average was 2.2. The share of respondents based on the average number of days that they report working from home can be found below.
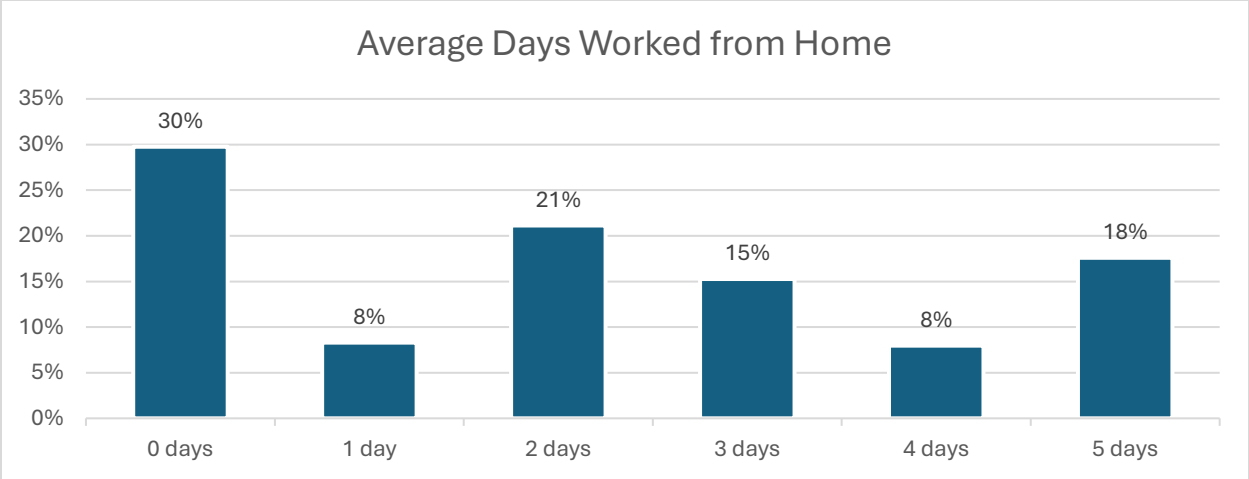
Appendix 5: Average Days Worked from Home

The most common arrangement among those who worked from home was to work 2 days from home. This is typically put forward as the "standard" hybrid working arrangement. It is the working arrangement that features most prominently in the literature and is the arrangement towards which other surveys suggest most organisations are gravitating.

Across industries, there is remarkable consistency in the average number of days worked from home. A given industry's unique characteristics, or particular work requirements are often highlighted as being a major determinant of whether and to what extent working from home is possible. It is commonly argued that some industries are simply unsuited to any amount of working from home. However, this finding suggests that, with possible exceptions such as in Manufacturing and Resources, wherein on-site requirements may be absolute, there is fairly uniform capacity for working from home across industries.
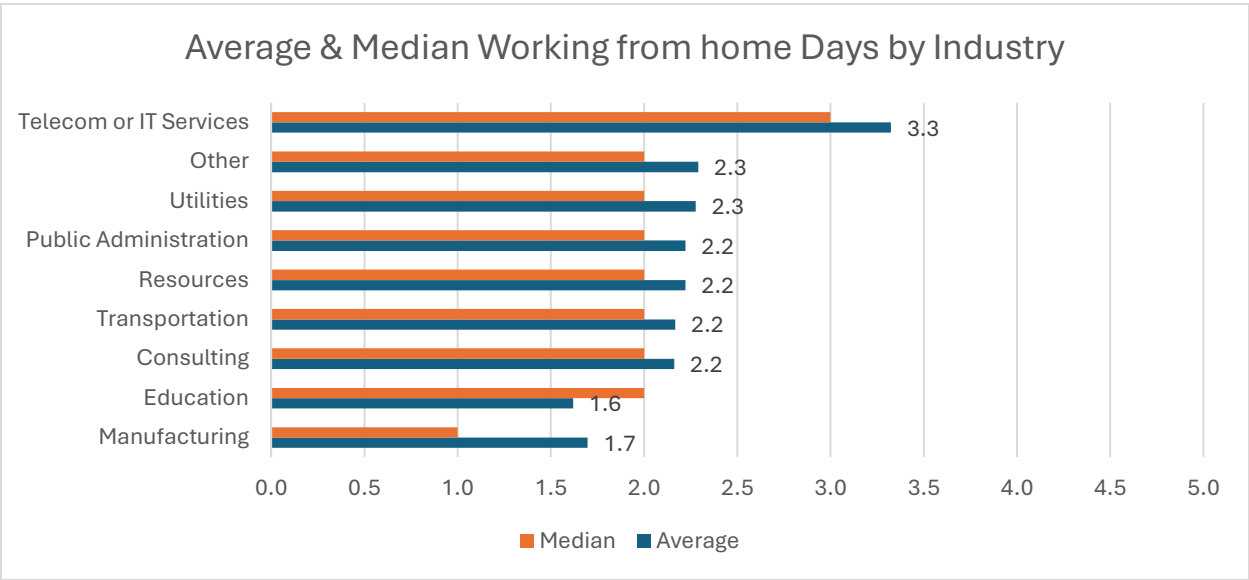
Appendix 6: Average & Median Work from home Days by Industry

A similar pattern can be observed when comparing the typical number of days worked from home across roles. With the exception of Senior/Executive Management, all roles converged around 2 days worked from home per week.
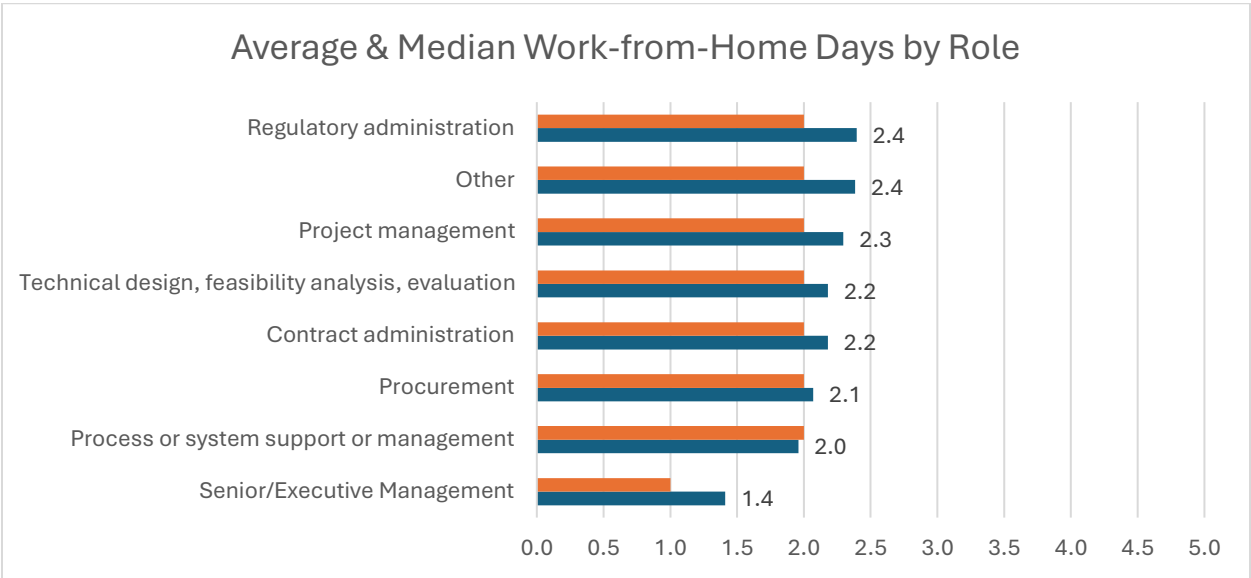
Appendix 7: Average & Median Work from home Days by Role

As shown in the breakdowns below, there is actually far greater variation in the number of work from home days within industries and roles rather than between them. One potential explanation for this finding is that working from home policy is much more influenced by firm level preferences than by either the nature of the industry or the role in which an engineer is working.
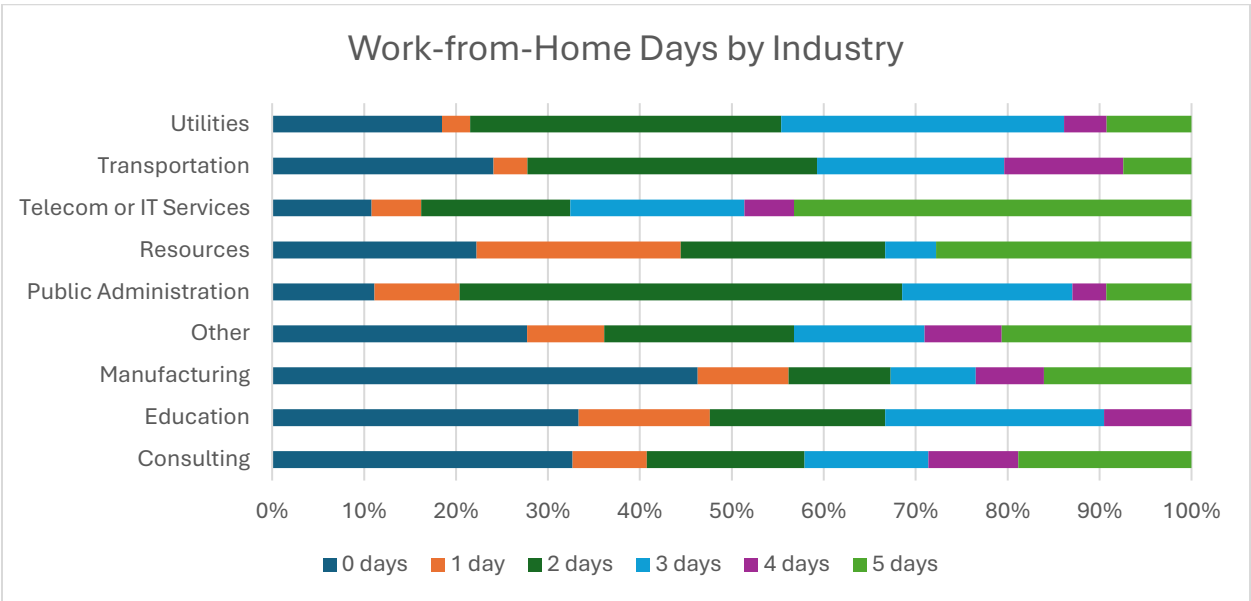
Appendix 8: Work from home Distribution by Industry
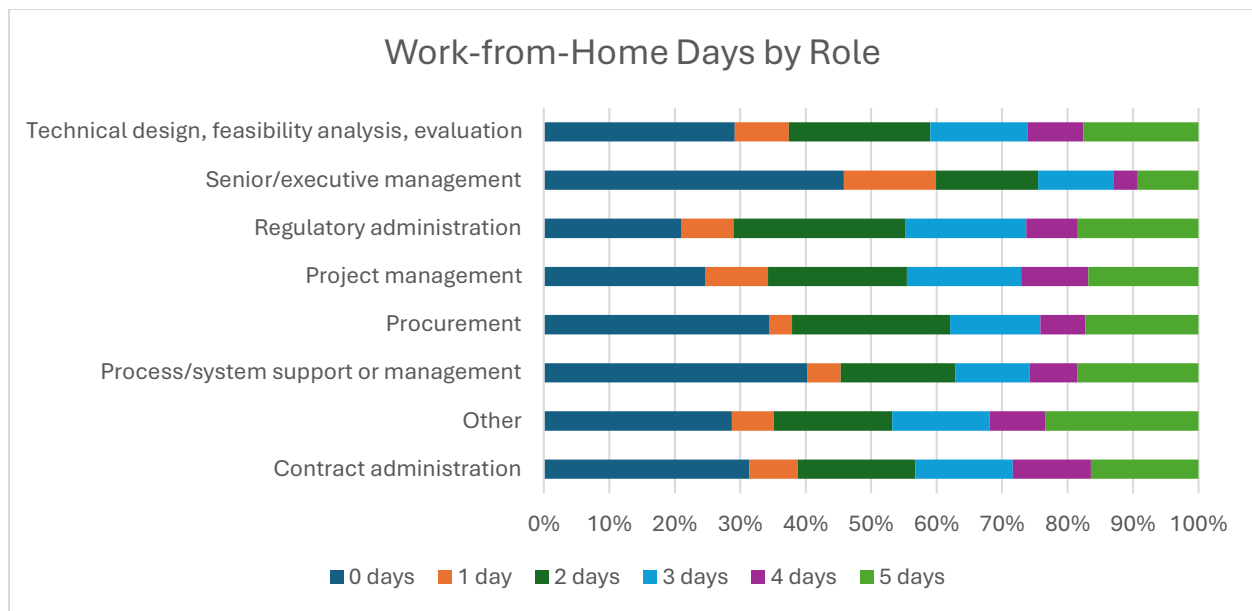
Appendix 9: Work from home Distribution by Role

Working from Home and Satisfaction

The survey results show that the more often someone works from home, the more likely they are to be satisfied with their employer's working from home policy.
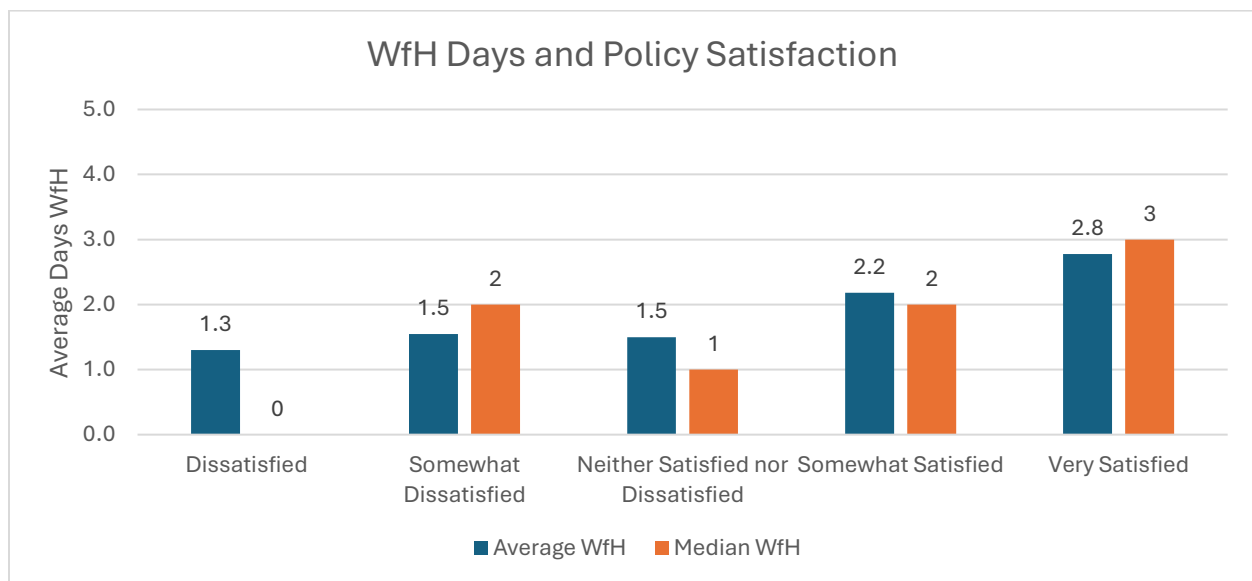
Appendix 10: WfH Days and Policy Satisfaction

Those who reported being dissatisfied with their employer's working from home policy had the lowest average number of days worked from home (1.3), with a median of 0. Those who were very satisfied with their employer's working from home policy worked from home an average of 2.8 days per week, and a median of 3. This is in keeping with existing research, which tends to find that working from home is both highly popular and deeply desired by most employees.

These results are made more complicated by the introduction of demographic factors. The overall trend of satisfaction increasing in tandem with the average number of work from home days remains. However, satisfaction among women is notably lower than among men when the number of work from home days is low. This is then reversed when the number of work from home days is higher.
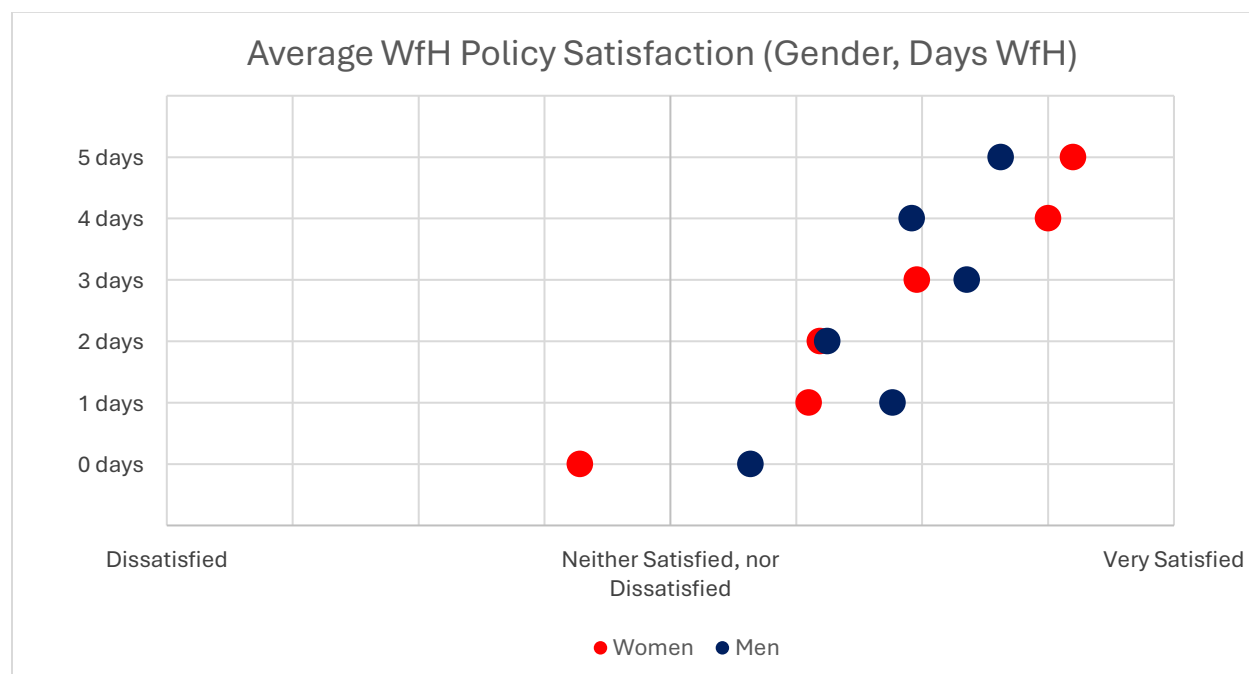
Appendix 11: Average WfH Policy Satisfaction (Gender, Days WfH)

A common theme in working from home research is that while there is widespread agreement among workers on their preferences, differences tend to emerge over the intensity of those preferences.

As can be seen above, both women and men find increasing satisfaction with their organisation's working from home policy as days worked from home increase. However, the satisfaction range of men is half as narrow as that of women.

Women working 0 days from home are also the only group that express anything approaching outright dissatisfaction on average. This is also the single largest gap in preferences observed within the distribution. This aligns closely with previous research, in that it implies that women value at least some form of working from home far more highly than do men. This is also somewhat reflected in the finding that women's satisfaction only exceeds that of men's at the highest rates of working from home, 4 days per week and 5 days per week.

When graphing the levels of satisfaction of those with caring responsibilities, we see a similar pattern. Men with elder care responsibilities and fathers are generally found to be more satisfied than women with elder care responsibilities and mothers respectively when the average number of days worked from home is lower. This tends to reverse when carers work from home 4 or 5 days per week.
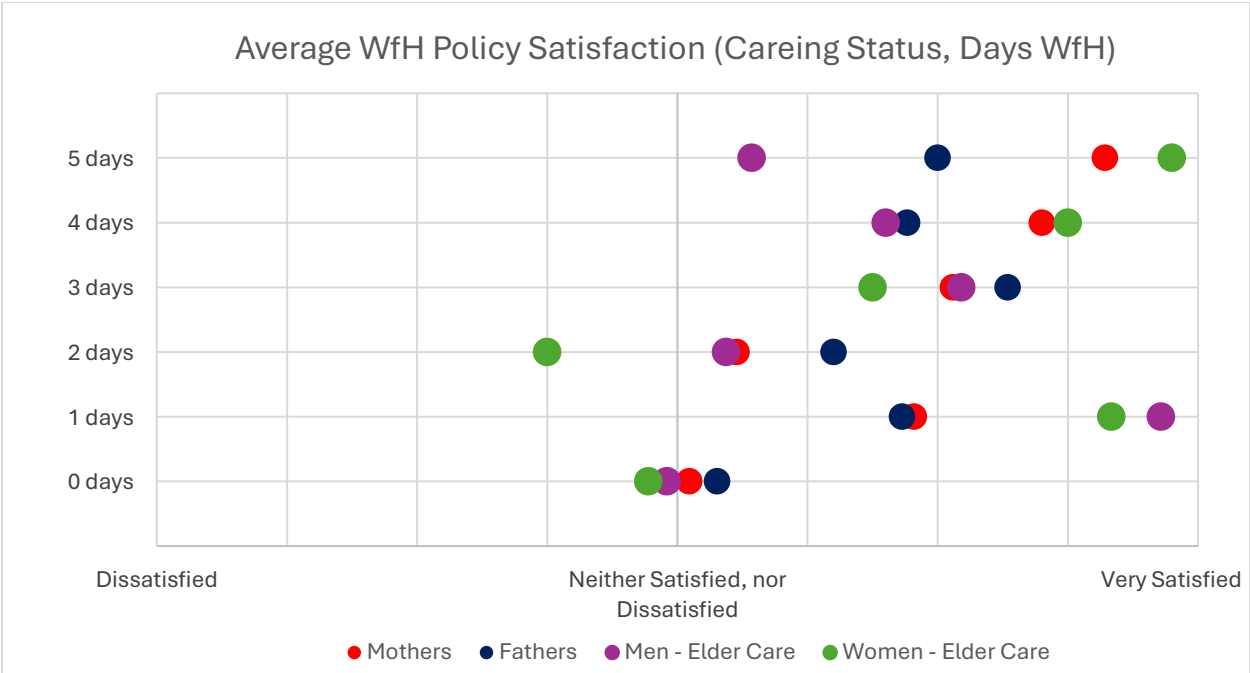
Appendix 12: Average WfH Policy Satisfaction (Caring Status, Days WfH)

When examined in terms of age, the standout finding is that relatively early career engineers – especially those 34 and younger, are by far the most likely to be dissatisfied with a fully in-person working arrangement. This finding is interesting given the stated importance of mentorship and in-person learning for the flourishing of this group, as outlined in the literature review and throughout previous studies.
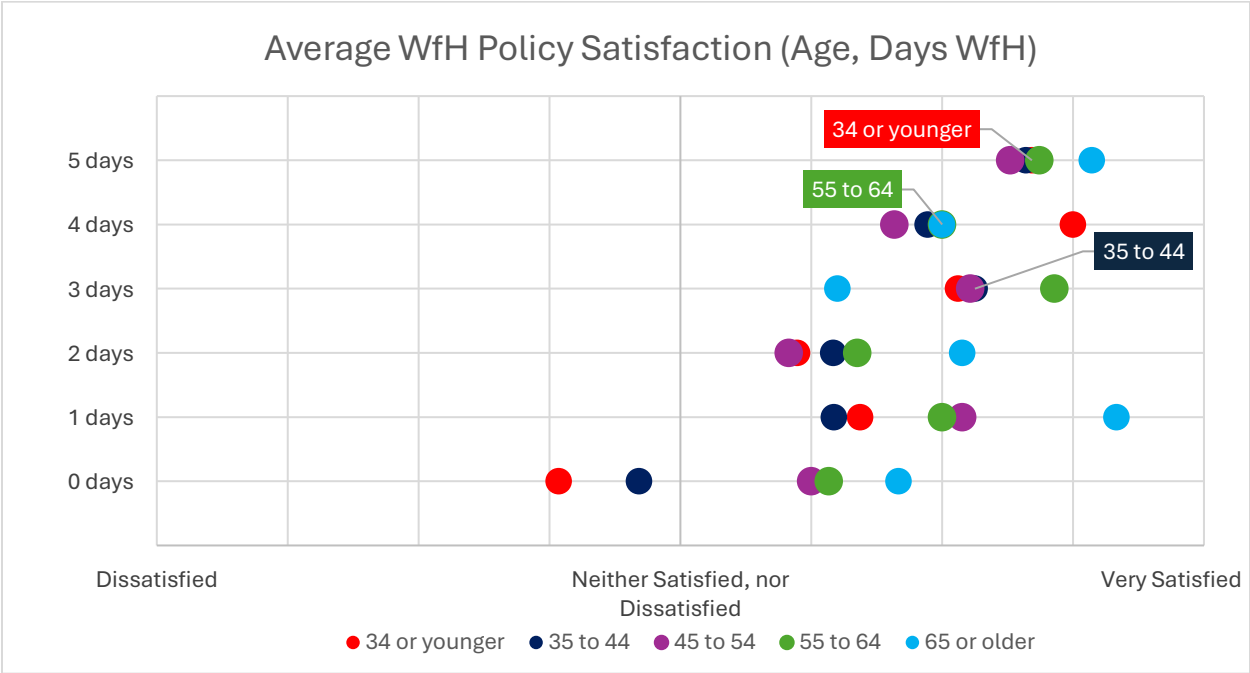
Appendix 13: Average WfH Policy Satisfaction (Age, Days WfH)

However, similar to findings regarding differences between men and women, even a single day of working from home seems to have an enormous impact on young engineers' satisfaction with their organisation's working from home policy. One possible explanation for this is a feeling of resentment in comparing the total absence of a benefit to the presence of it, even if that presence is relatively small.

On an industry level, we observe wide ranges in terms of differences in satisfaction between men and women. The largest observed differences in satisfaction are in the Resources and Education industries. In each case, one gender exists comfortably in the "satisfied" range, while the other crosses over into a more neutral range.
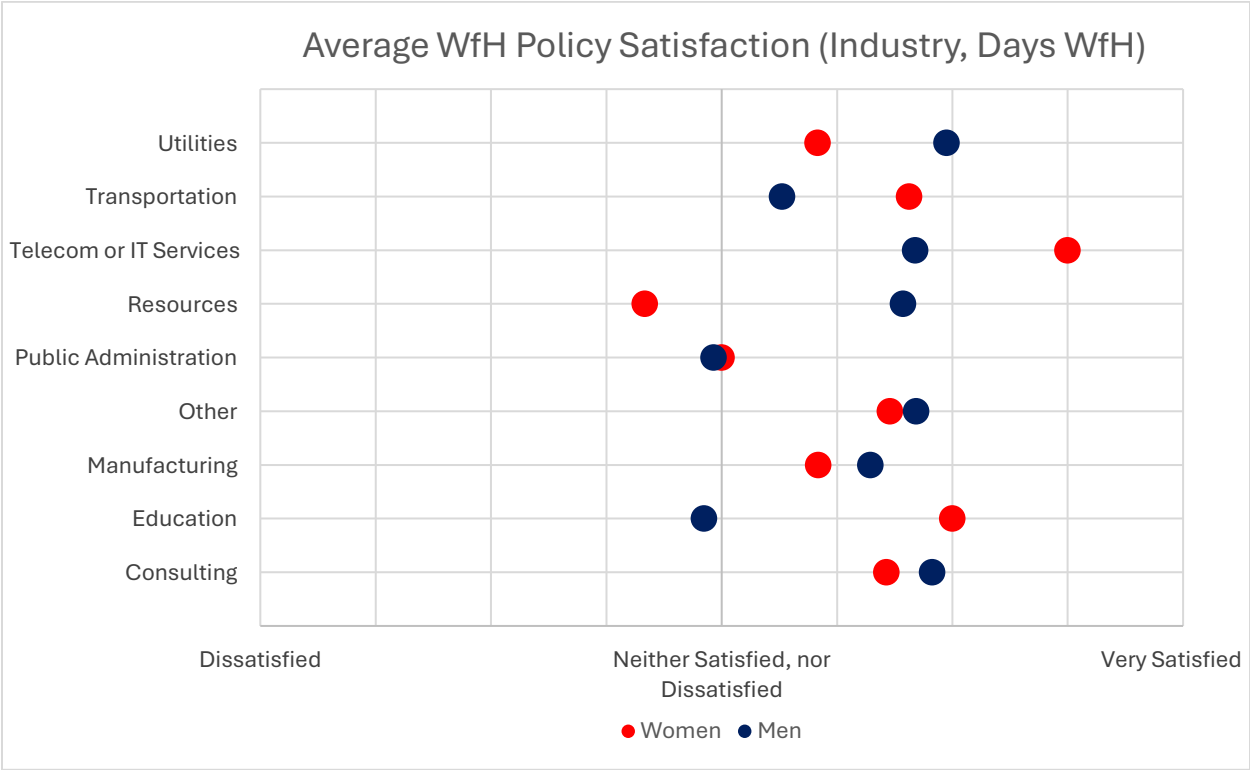
Appendix 14: Average WfH Policy Satisfaction (Industry, Gender, Days WfH)

The average number of days worked from home in the Resources industry does not differ meaningfully from other industries. Additionally, the difference in satisfaction between men and women is far greater than is observed in the Manufacturing industry, where average working from home days are the lowest. Moreover, women in the Resources industry (2.8) report working from home almost 50% more days per week than do their male counterparts (2.0).

The most likely explanation for this divergence is that results are being skewed by extremely small sample sizes when applying both gender and industrial filters, with samples falling to 5 for women in resources and 6 in education.

Average Days Worked from Home by Industry and Gender				
Industry	Men	Women	Difference	Total Average
Consulting	2.09	2.28	0.19	2.15
Education*	1.46	1.67	0.21	1.53
Manufacturing	1.73	1.54	0.19	1.68
Other	2.20	2.69	0.49	2.35
Public Administration	2.46	1.92	0.54	2.21
Resources*	2.00	2.80	0.80	2.22
Telecom or IT Services	3.28	3.50	0.22	3.31
Transportation	2.11	2.29	0.18	2.15
Utilities	2.49	2.18	0.31	2.38

*Sample size likely skewing analysis

If there are unique features to the working from home policies found in these industries causing these enormous differences in satisfaction, they were not reflected in subsequent free-answer responses.

Interestingly, while one might expect job attrition to act as a reasonable, albeit imperfect proxy for working from home policy satisfaction, survey results do not seem to support this assumption. While those who typically worked from home 0 days per week during the pandemic reported having changed employers more than others, the difference is very modest and does not appear to be significant. Despite previous surveys reporting that working from home policy is a key consideration in whether or not an employee remains with their current employer, the survey data implies that other considerations may be of greater importance.
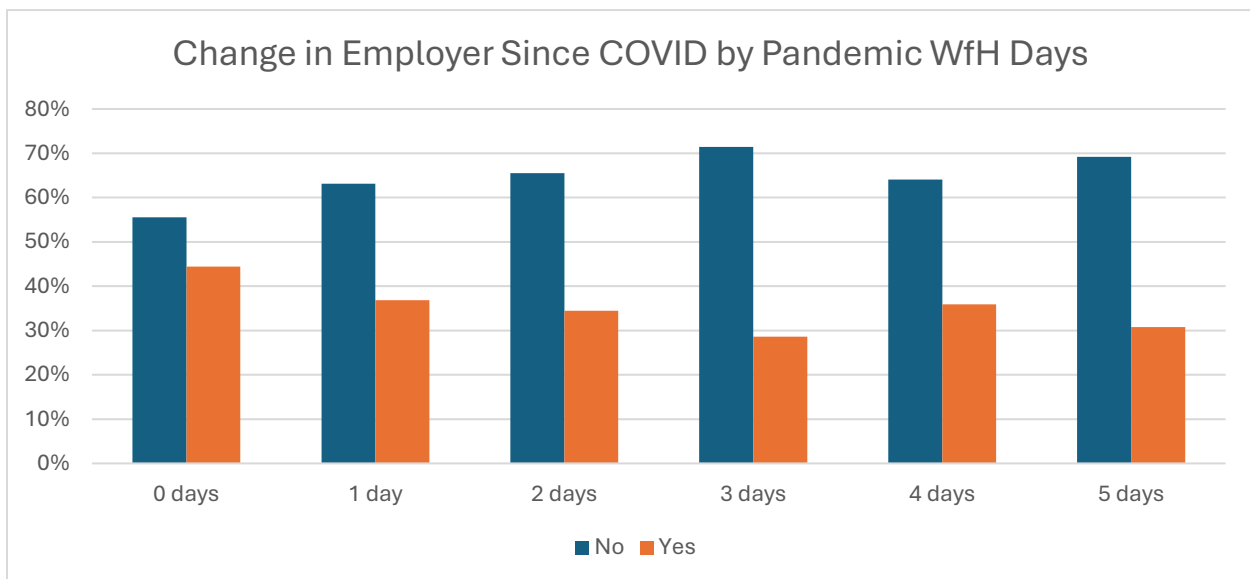
Appendix 15: % Employer Change by Days WfH

Despite this, when asked, 42% of respondents indicated that working from home would be "Essential" in their choosing a job in the future.
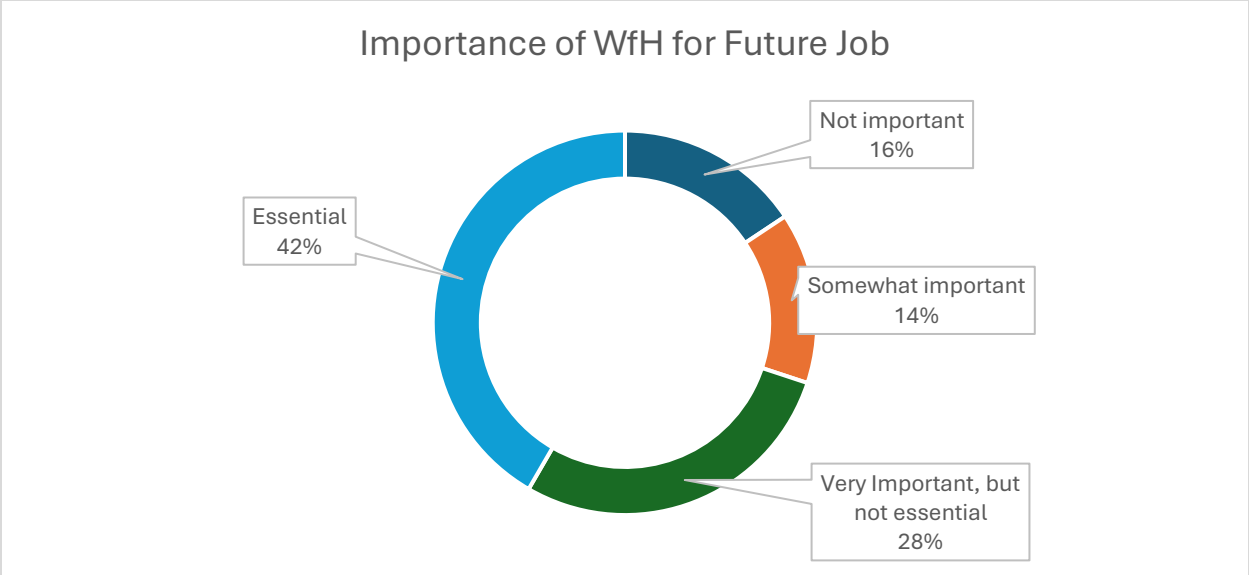
Appendix 16: Importance of WfH for Future Job

As is to be expected, divided by gender, women are substantially more likely to feel that working from home is "Essential" (53%) or "Very Important" (29%) than men (38% and 28% respectively).
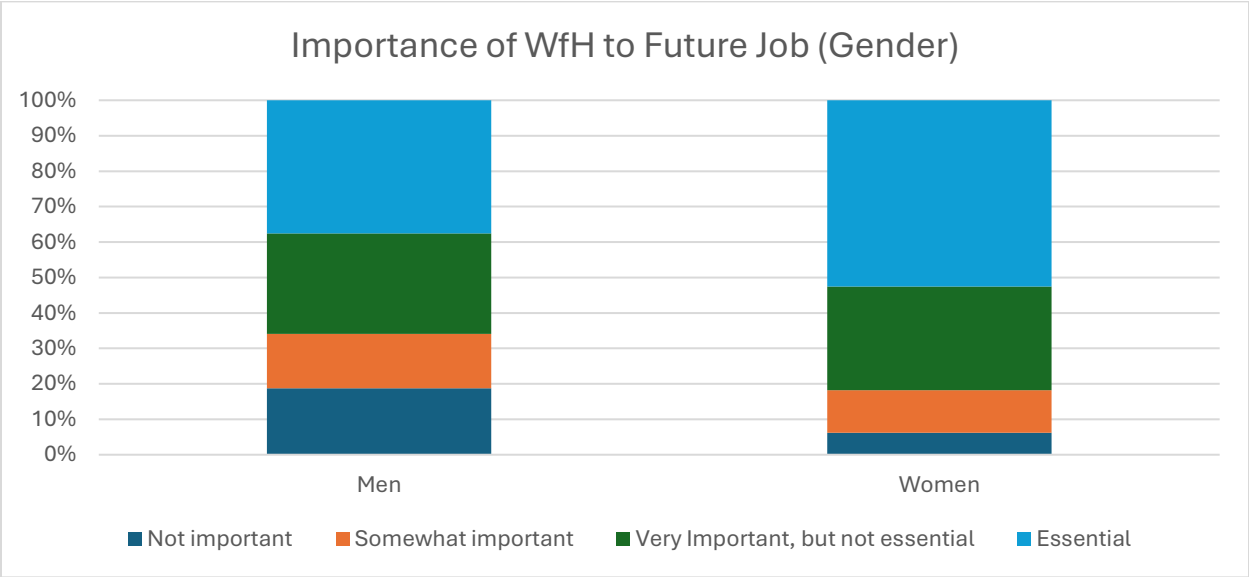
Appendix 17: Importance of WfH to Future Job (Gender)

Advantages and Disadvantages

Advantages

Throughout the survey, respondents were given the chance to rank their personal feelings on the importance of various advantages of working from home identified throughout the research process. These advantages included:

- Reduced commuting (Commuting)
- Increased ability to concentrate / fewer interruptions / improved productivity (Productivity)
- Better balance of family and work responsibilities (Work-Life Balance)
- Cost Saving
- Other

In this section, rankings of importance have been assigned numeric values, the average of which has then been used to represent general feelings of importance than a group has assigned to a particular advantage of working from home.

Across demographic groups, there is a consistent hierarchy of importance among the advantages listed. While not universal, this hierarchy applies across most groups, and is as follows:

1) Work-Life Balance and Commuting
2) Productivity and Cost Saving
3) Other

Gender

Although men and women broadly agree on the benefits of working from home, the data indicate that women feel more strongly about these benefits than do men. On average, women ranked every advantage of working from home as being more important than did men.
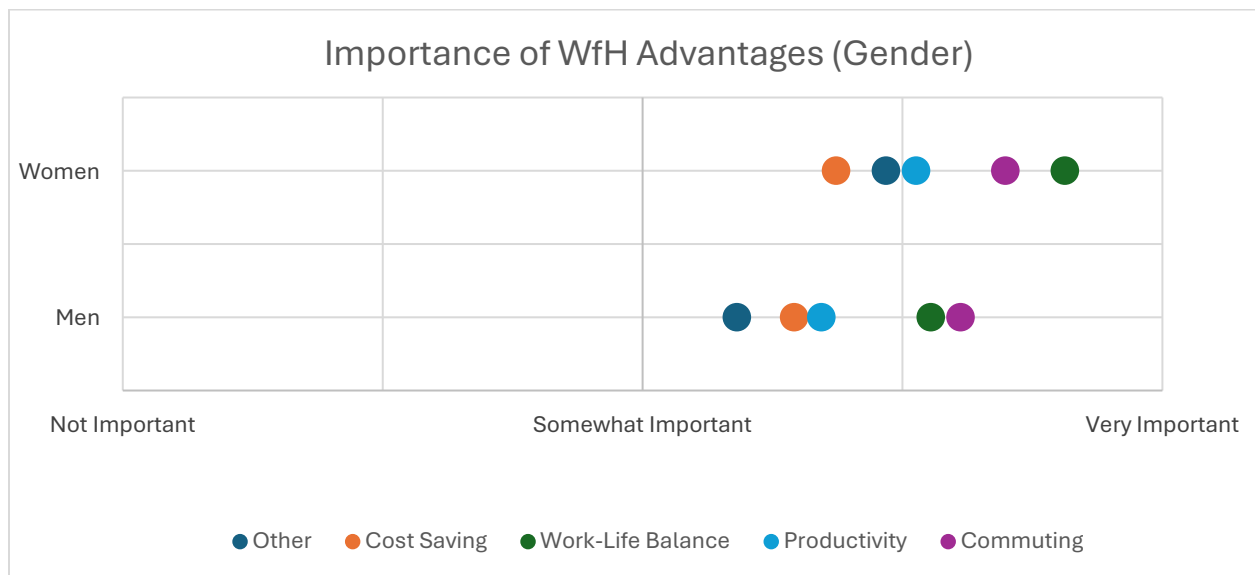
Appendix 18: Importance of WfH Advantages (Gender)

This finding is in keeping with the findings of previous research, which tends to show that working from home is widely popular, and that differences between men and women are found primarily in the intensity of their preferences.

In keeping with this trend, there are only minor variations in the overall rankings of the importance of advantages between genders. Specifically, women view Work-Life Balance as being a more important advantage than Commuting, while the opposite is true of men. This finding is to be expected, as research has tended to find that work-life balance is the single most important benefit of working from home among women.

Age

Across age groups, differences in the ranked importance of the advantages of working from home are generally minor. Commuting and Work-Life Balance remain the most important benefits. Work-Life Balance peaks in importance in the 35 to 44 age range, then steadily decreases in both absolute and relative terms as respondent age increases. This is most likely explained by the decrease in caring responsibilities and other major demands on personal time that tends to occur naturally as people age.
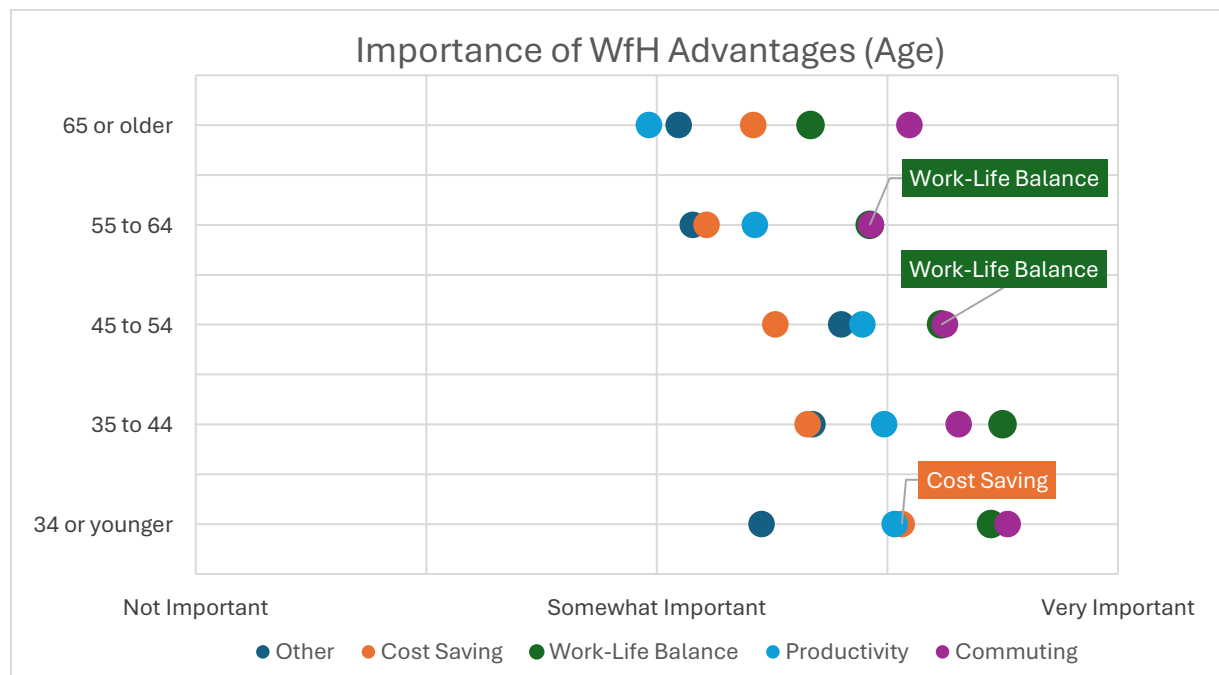
Appendix 19: Importance of WfH Advantages (Age)

Similarly, a tapering off of the importance of Productivity can be observed as respondent age increases. This may be due to age correlating with more senior and managerial roles in which the benefits of working from home are less likely to manifest.

Caring Status

Across caring status groups, we see that mothers and women with elder care responsibilities place greater importance on Work-Life Balance than do either of their respective male counterparts or

those without caring responsibilities. This continues the previously observed trend of women viewing the benefits of working from home as more important than men.
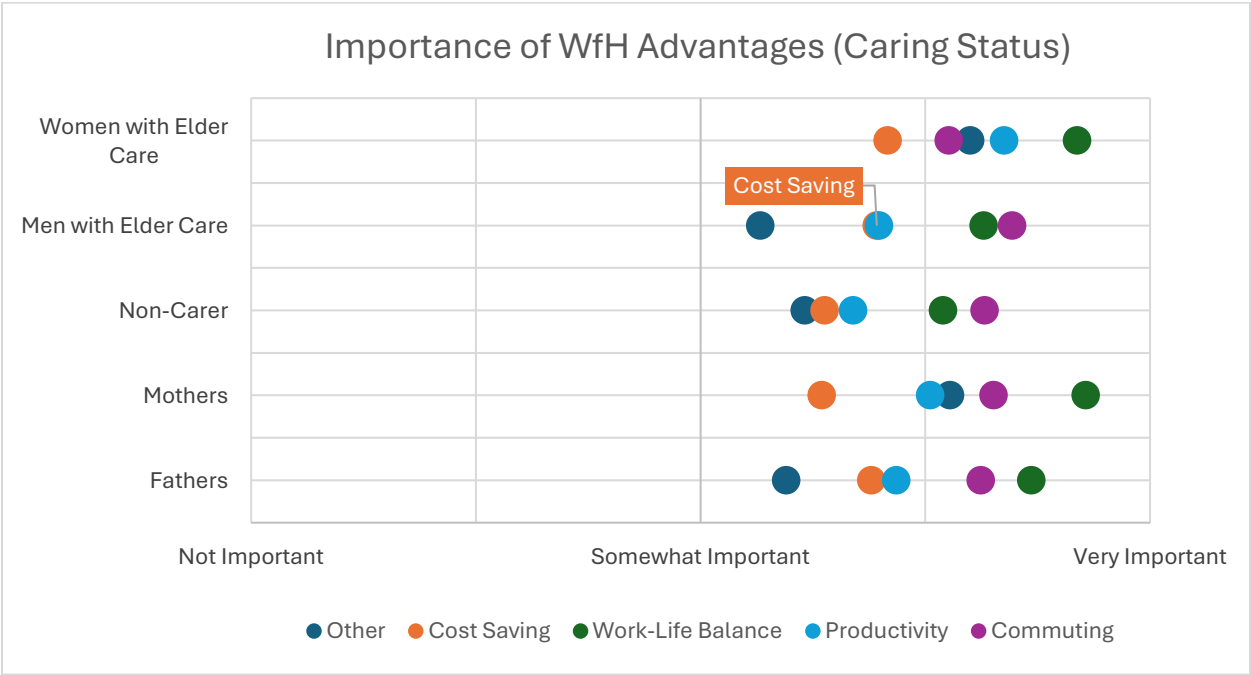
Appendix 20: Importance of WfH Advantages (Caring Status)

Gender differences aside, there are very few meaningful observations to be made regarding the differences between caring status groups. This in itself can be interpreted as a somewhat significant finding, given that the existing literature consistently suggests that those with caring responsibilities in general, and women with such responsibilities in particular can be expected to place a higher premium on such benefits than others. With that being said, as has been alluded to previously, it is possible that differences may be being masked by the overall popularity of working from home.

Industry

There is only very mild variation across industries in terms of the importance of the various advantages of working from home, with the possible exception of those working in the Resources industry. This finding is interesting given that, as mentioned in the Demographics section, industry is often held as being one of the major determinants of the viability and efficacy of working from home. Future industry focused research may seek to explore this question more deeply by specifying whether an advantage or disadvantage of working from home is considered in relation to a respondent's particular industry or working circumstances, rather than this survey's more general approach.

Importance of WfH Advantages (Industry)
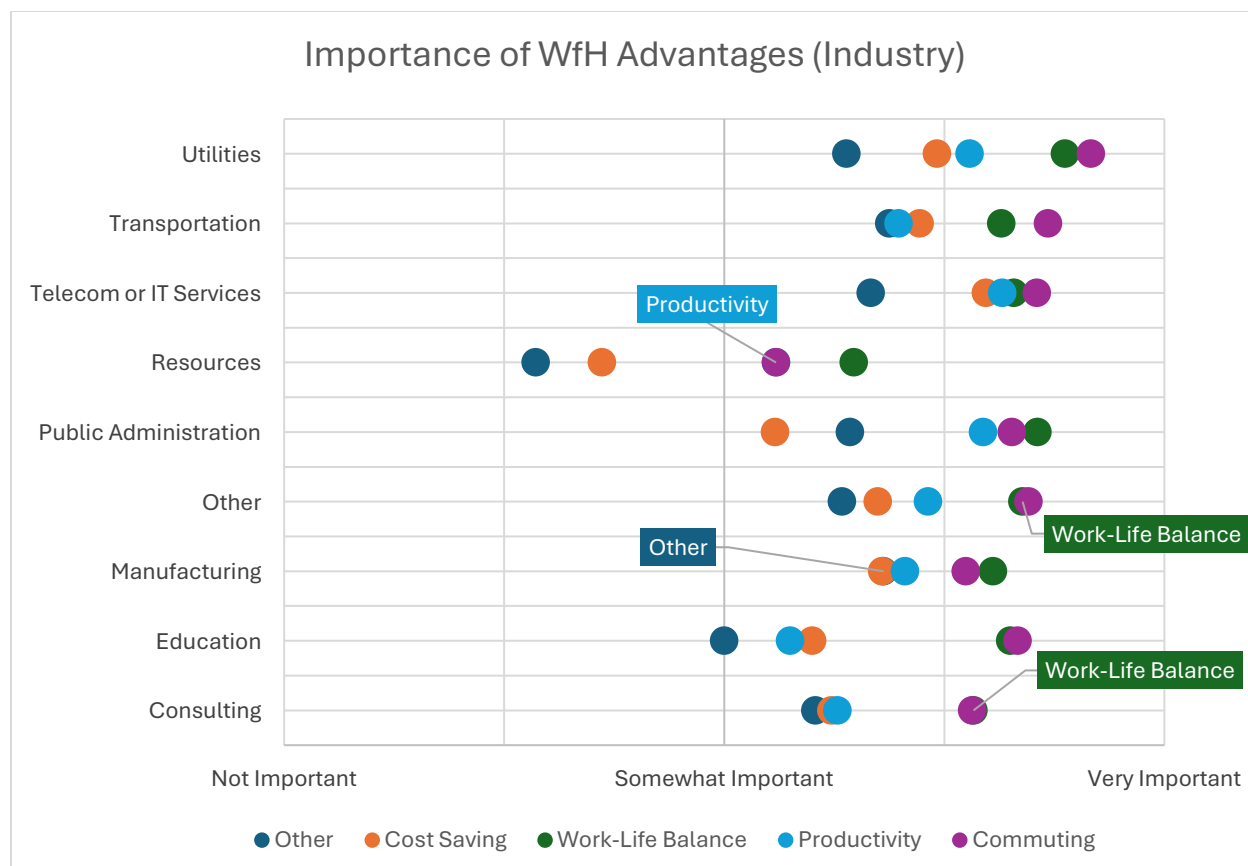
Appendix 21: Importance of WfH Advantages (Industry)

Although those working in the Resources industry appear to be major outliers in their rankings of importance, this may be explained by their comparatively small sample size. This style of major divergence among Resources industry respondents is repeated in the Disadvantages section. If the small sample size is not the reason for the distinctly different values expressed in the survey, additional explanations were not found in the free answer sections.

With the exception of the Resources industry, there is once again universal agreement that the two largest advantages of working from home are reduced commuting and better work life balance. Most industries give a very slight advantage to reduced commuting, though this is reversed in Manufacturing and Other. Regardless, they are generally ranked closely enough that it is difficult to draw any real inferences based on these differences.

Days Worked from Home

The number of days that a respondent works from home is the demographic factor associated with the largest variation in rankings of importance. The survey data reveals that the more work from home days that a respondent has in a typical work week, the more likely they are to feel that the advantages of working from home are important.
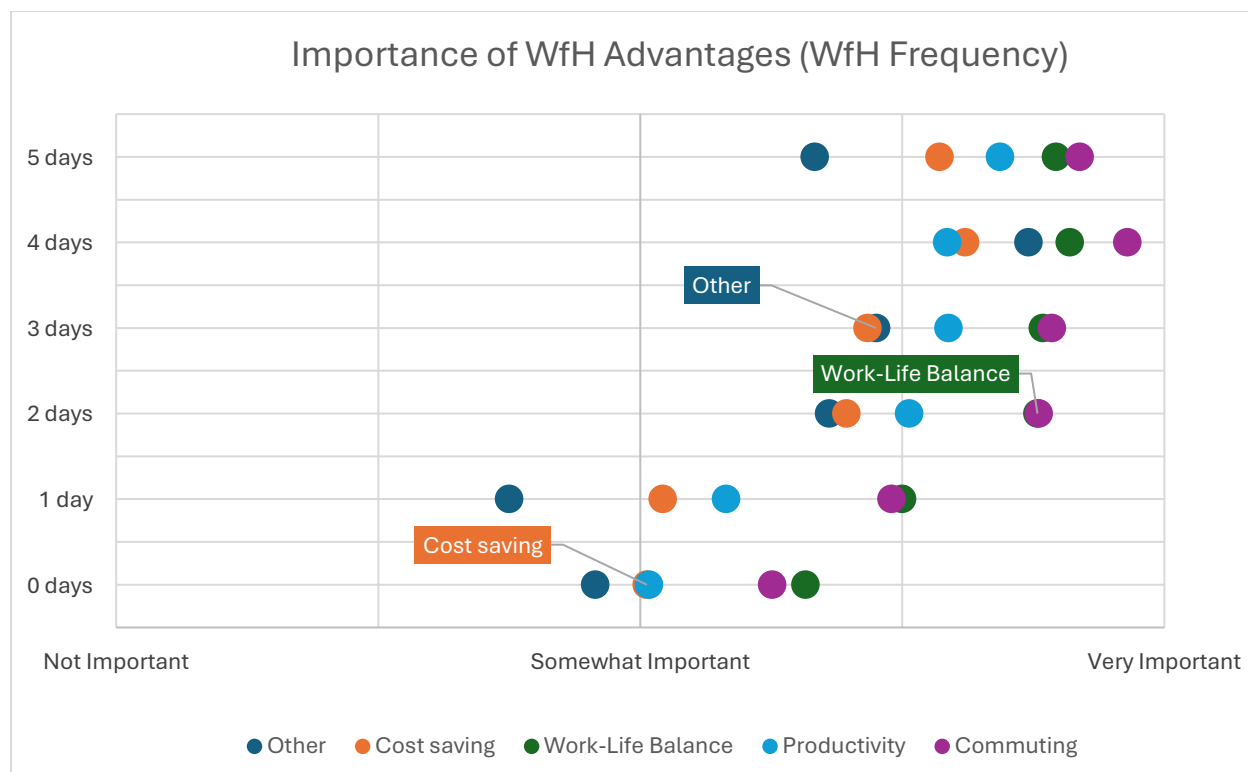
Appendix 22: Importance of WfH Advantages (WfH Frequency)

Overall, the lowest average ratings came from people who reported 0 or 1 work from home day per week. For those with 2 or more work from home days, the ratings tend to group together, similarly to the patterns seen with other demographic markers discussed earlier.

The nature of this survey makes determining the directionality of these results impossible. Whether working from home less often causes people to value the advantages less, or that people who value the advantages of working from home less are those who choose to work from home the least cannot be known with the current data.

"Other" Advantages

Respondents had the opportunity to give additional context to their ratings of "Other" through a free response section. Analysis reveals that the three most common themes among the responses were:

- Flexibility/Work-Life Balance
- Time and cost savings
- Mental and physical health benefits

These themes were identical across gender lines, differing only in terms of the frequency with which they appeared. A comparison of the relative frequency of these themes can be found below.

Men	Women
Flexibility/Work-Life Balance	Mental/Physical Health
Time and Cost Savings	Flexibility/Work-Life Balance

Mental and Physical Health	Time and Cost Savings

Disadvantages

Throughout the survey, respondents were given the chance to rank their personal feelings on the importance of various disadvantages of working from home identified throughout the research process. These disadvantages included:

- Reduced interaction with colleagues / loneliness (Loneliness)
- Reduced personal productivity (Personal Productivity)
- Reduced team productivity / creativity / problem-solving (Team Productivity)
- Reduced mentorship opportunities (Mentorship)
- Reduced promotion opportunities (Promotion)
- Inadequate work from home environment / cost (Environment)
- Blurred personal & professional boundaries / longer hours / burnout (Work-Life Balance)
- Other

In this section, rankings of importance have been assigned numeric values, the average of which has then been used to represent general feelings of importance than a group has assigned to a particular disadvantage of working from home.

Across demographic groups, a consistent hierarchy of disadvantages can be observed. While not universal, these groupings describe a typical distribution of disadvantages across most demographics, and are as follows:

1) Loneliness, Mentorship, and Team Productivity
2) Work-Life Balance, Promotion, and Personal Productivity
3) Other and Environment

Due to the large number of disadvantage options provided, for the purposes of visual clarity, graphs throughout this section will occasionally limit the visibility of data points. Tables showing the full values of each graph and the relative importance placed on all of the disadvantages can be found in the Appendix.

Gender

Men and women were strongly aligned in their perceptions of the importance of the disadvantages of working from home. The average importance ratings of the disadvantages of working from home appear in identical order, and differ only very mildly in their overall average importance. Both men and women view the disadvantages of working from home as being no more than "Somewhat Important", and most as hewing towards being "Not Important".

Importance of WfH Diasadvantages (Gender)
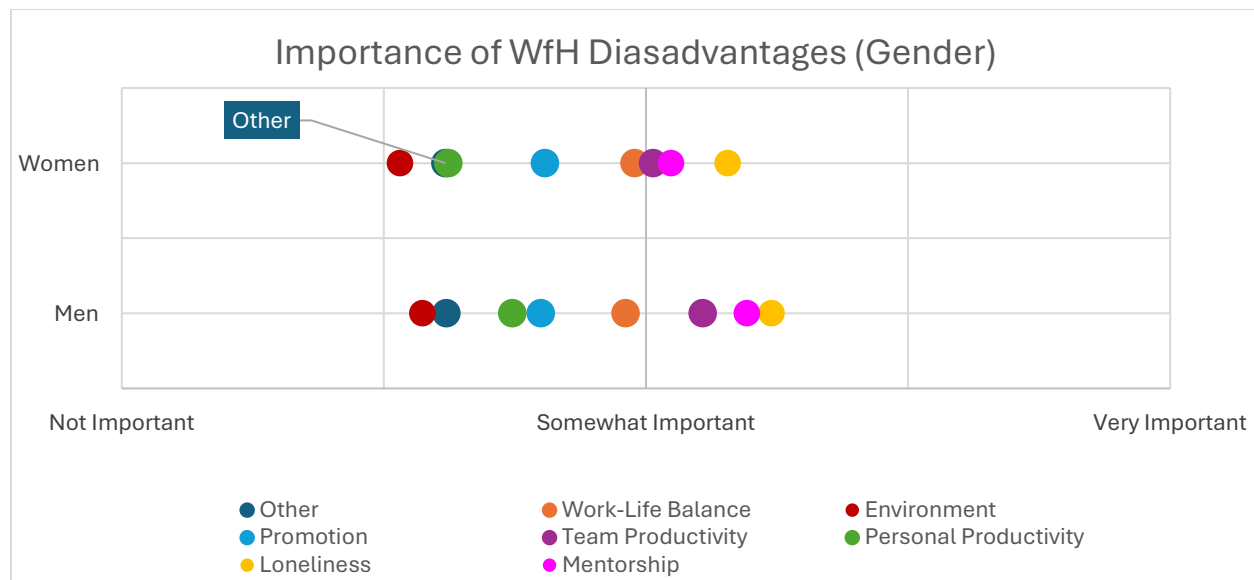
Appendix 23: Importance of WfH Disadvantages (Gender)

Loneliness is the disadvantage that is most likely to be ranked as important among both men and women. This establishes a pattern that will persist throughout the analysis.

It should be noted that for women, no disadvantage was ranked as being as important as the lowest ranked advantage in the previous section, "Cost Saving". For men, only "Loneliness" and "Mentorship" were ranked as being more important than their lowest ranked advantage, "Other".

Age

Across age groups, the general patterns of the importance of disadvantages hold. The "Core" disadvantages of Loneliness, Mentorship, and Team Productivity appear in the same order across all age groups, and are identified as being both the most important disadvantages among the options presented, and meaningfully more important than the average.
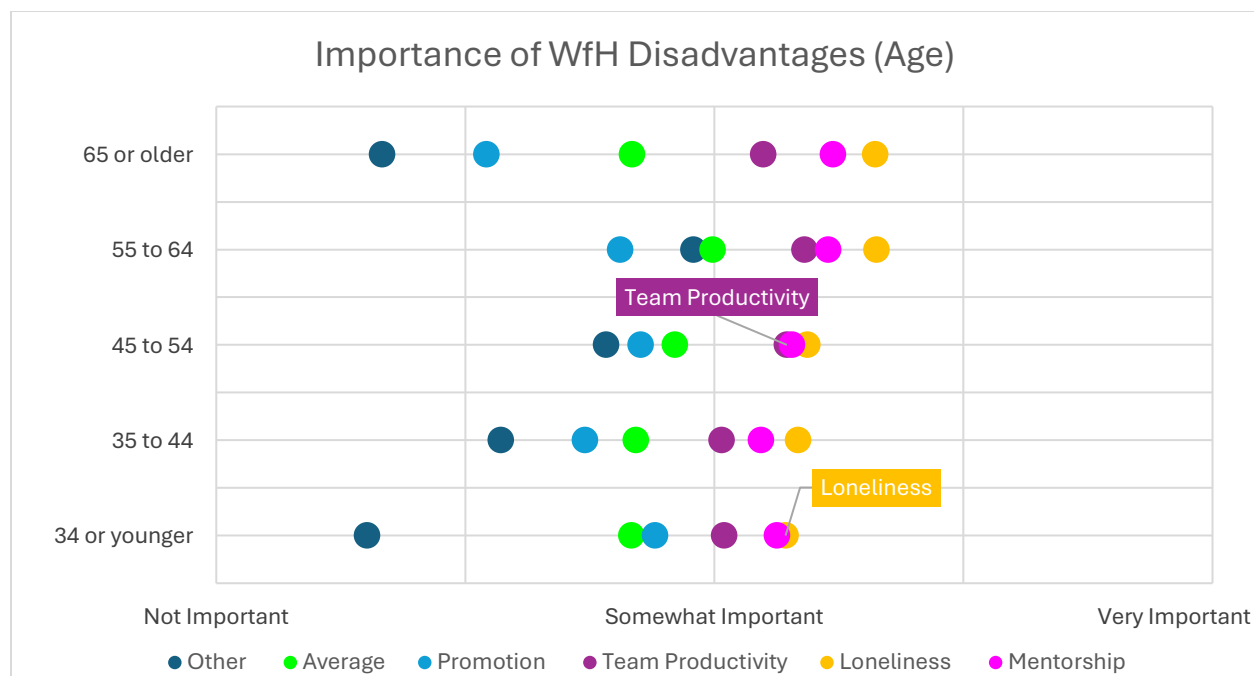
Appendix 24: Importance of WfH Disadvantages (Age)

Once again, there is a general consensus among the age groups, as reflected in the stability of the Average importance rating. The most notable exception to this consensus is in respondent's rating of "Other", which climbs in importance as respondent's age, peaking between the ages of 55 and 64, and then collapsing among those 65 and older. It is not clear at this time why this behaviour is observed in the "Other" disadvantage.

Interestingly, disadvantages such as the impact of working from home on Mentorship and Promotion are of the least concern to younger respondents, despite research and conventional wisdom suggesting that they are the group most likely to suffer adverse effects in these areas as a result of working from home.

Caring Status

Women with caring responsibilities show somewhat different priorities and rankings of importance than do their male counterparts. Mothers and especially women with elder care responsibilities rank Loneliness, in relative terms, as significantly less important than do their male counterparts. In absolute terms, women with elder care responsibilities are one of the very few demographic groups to rank Loneliness as less than "Somewhat Important".
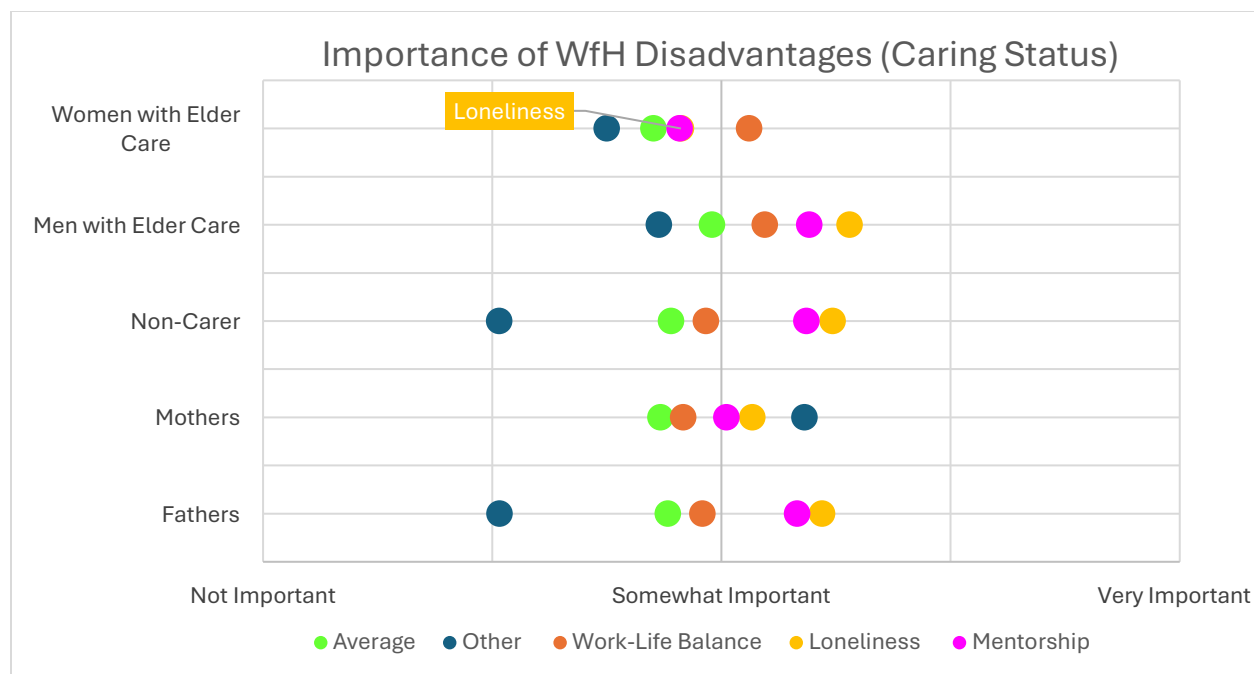
Appendix 25: Importance of WfH Disadvantages (Caring Status)

The importance of "Other" also takes on unique significance among mothers. While it is not clear at this time why "Other" is ranked so highly among mothers compared to any other demographic group, one likely possibility is that it is being driven by child-care related issues, though this does not feature prominently in the free response portion of the survey.

Industries

Loneliness remains the most important disadvantage of working from home across all industries except for Transportation, in which an abnormally high degree of importance is assigned to "Other". The Resources industry continues to show a uniquely wide range of ratings compared to other industries for reasons that are not clear at present.
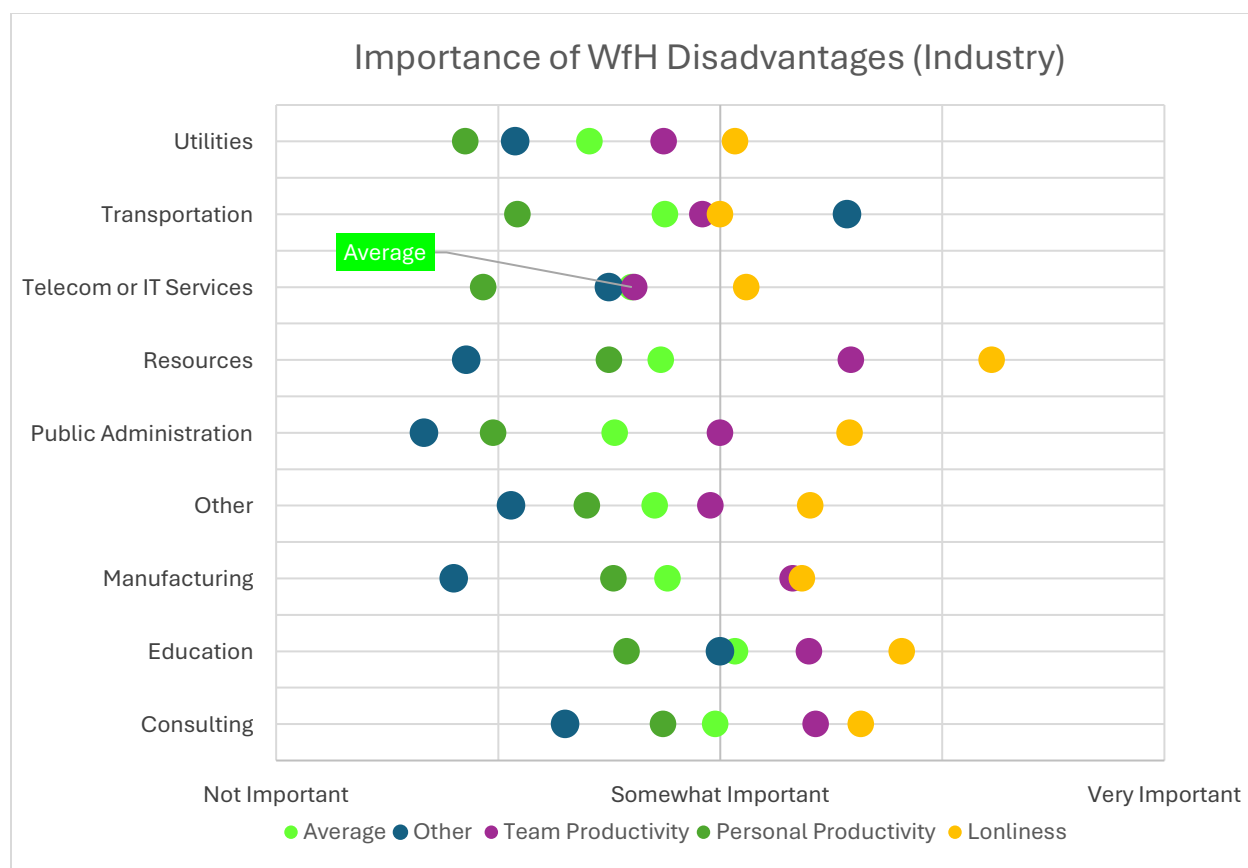
Appendix 26: Importance of WfH Disadvantages (Industry)

Aside from these anomalous cases, only modest differences can be observed across industries, indicating a general consensus or high degree of similarity in the working from home experiences of respondents. This is once again a somewhat unexpected finding given the emphasis on industry differences that is often found throughout the literature and research.

Days Worked from Home

Those who report having 0 or 1 work from home day per week place greater importance on the disadvantages of working from home than any other demographic group by a significant margin. As in the Advantages section, the average number of work from home days that a respondent reports having in a typical week is predictive of the largest differences in importance rankings observed across demographic groups.
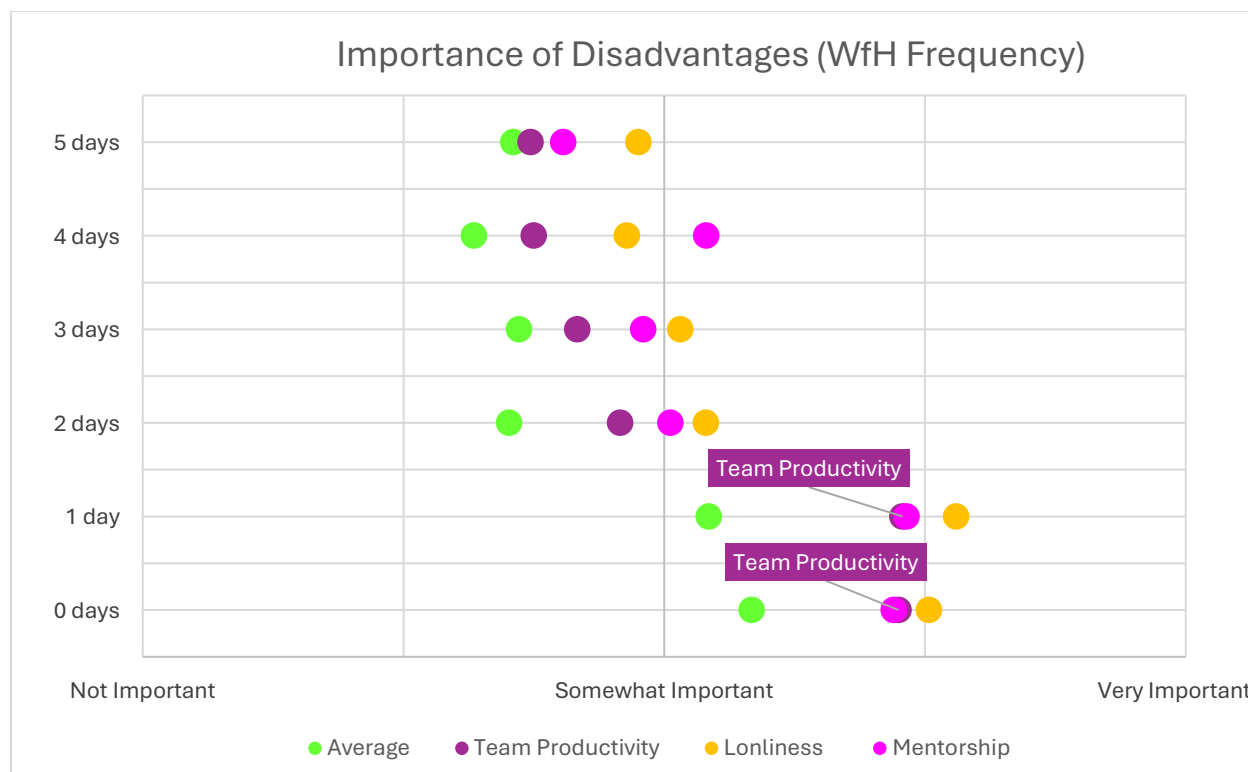
Appendix 27: Importance of WfH Disadvantages (WfH Frequency)

With the possible exception of those working in the Resources industry, those working 0 or 1 day from home are the only instance in which a demographic group view disadvantages of working from home as being of similar importance to advantages within other groups. Uniquely, this is the case for three disadvantages (Loneliness, Team Productivity, and Mentorship). This stands in stark contrast to those working 2 or more days from home per week, who demonstrate rankings of importance which are largely in line with those of all other demographic groups.

Once again, two potential interpretations arise. The first is that the disadvantages of working from home become less important as exposure to the practice increases. The inverse, that a lack of exposure to working from home is associated with greater skepticism may also be associated with this interpretation. Alternatively, it is possible that those who are most concerned about the drawbacks of working from home choose to work for organisations or roles in which they work from home as little as possible.

"Other" Disadvantages

Mothers and those aged 55 to 64 differed significantly from other groups in their rankings of "Other" disadvantages. The free response section did not offer clear insights for these and other groups to draw conclusions on why their perspective differs so much from their cohort.

The three most common themes expressed in the "Other" free answer section were as follows:

- Lack of in-person interaction
- Impacts on productivity and accountability
- Work-Life balance issues

Analysis

Working from Home and Gender

At a high level, the survey data supports existing research on the relationship between gender and working from home. Women reported their highest levels of satisfaction, and higher levels than men in any condition, with their organisation's working from home policy when they worked from home an average of 4 or 5 days per week. Conversely, women reported their lowest levels of satisfaction, and lower than men in any other condition, when they worked from home 0 days per week.

The survey data also shows that women generally view the advantages of working from home as more important and the disadvantages as less important than do men. In the case of the former, this difference may be significant, but not substantial, in the case of the latter, the differences do not appear to be significant. In the case of advantages, women, on average, ranked every advantage as being more important than did men.

These observations carry over to caring status, in which mothers and women with elder care obligations once again rank the advantages of working from home as being more important and the disadvantages less important than their male counterparts. Once again, these differences are modest, and in the case of disadvantages may not be significant.

As has been discussed previously, the high value placed on working from home by a large majority of respondents may be masking the true scope of gender differences. However, the survey data supports the idea that, at a minimum, women in engineering value working from home more highly than men.

Access to Working from Home

A substantial minority of engineers (30%) report having no regular access to working from home. Among those who do work from home at least some of a typical week, the most common arrangement is 2 days per week. 2 days per week also roughly aligns with the average and median number of days per week that engineers across almost all industries and roles work from home.

The survey data complicates previously established and popular narratives about the limitations of working from home within and between industries and roles. Research has tended to place a great deal of emphasis on the extent to which different industries and roles are or are not well-suited to working from home. The survey data shows that the number of days that an engineer works from home actually varies more within industries and roles than between them. Outside of industries such as Resources and Manufacturing, where reluctance to introduce working from home policies is more likely to stem from physical constraints or the need to retain intimate control over ongoing processes, there appears to be far greater capacity to adopt at least some working from home practices than previously assumed.

Further research is necessary to understand the drivers of variance in working from home policies within industries, roles, and other economic groups. The literature has touched on the idea that there exists greater latent capacity for working from home in engineering fields such as design, but wider ranging research remains elusive. One likely explanation is that working from home policy is

much more driven at the level of individual firms rather than the industries in which they work or the roles which they employ.

As it stands, the current methodology does not allow, for example, to make inferences regarding the role of organisational culture in determining working from home access as compared to true impracticality. Finer grained analysis may be necessary for future research to understand the primary determinants of working from home policy.

Homogeneity of Advantages

Combined with the previous OSPE survey and existing research, this survey suggests that absent major new developments, it can be presumed that the feelings of engineers regarding working from home fall broadly in line with those of the general population. Engineers feel strongly regarding the advantages of working from home, and significantly more strongly than they do the disadvantages with limited exceptions.

In particular, as with surveys of other employees, engineers place the highest premiums on reductions on improved work-life balance and reductions in time spent commuting. This is true across nearly all demographic groups. Women, on average, are slightly more likely to view work-life balance as being an important advantage as compared to men. However, there is near identical alignment between the genders on the relative importance of the advantages of working from home overall.

Across industries and age groups, the survey reveals somewhat higher variation in rankings of importance. However, the broader trend of engineers voicing positive impressions of working from home remains true.

This speaks to a recurring issue in working from home surveys. The overwhelmingly positive impression that respondents have regarding working from home complicates the ability to determine meaningful differences between demographic groups – most notably genders – in the relative value that they place on any given advantage. On average, almost no demographic groups ranked an advantage of working from home as being anything approaching "Not Important".

Disadvantages and the Importance of Loneliness

Loneliness is increasingly viewed as an issue of major social concern. While the topic of loneliness has been broached throughout the working from home research, it is often in passing. Similarly, across the interviews conducted, while respondents would often discuss issues that may be tangentially related to loneliness, it was rarely if ever addressed directly. This survey data reveals that loneliness is viewed overwhelmingly as an issue of importance among engineers – especially compared to its prominence in popular discourse.

The overall impression created by the survey data is that the concerns regarding the disadvantages of working from home are disproportionately driven by those who are least likely to engage in the practice. Across almost all demographic groups, disadvantages were at most, considered "Somewhat important", but tended to skew towards "Not important". Again, the one major outlier in this trend was loneliness – the only disadvantage which was regularly ranked as "Important" at rates resembling those of some, albeit lower-level advantages. Given the growing body of research

on the negative mental and physical health effects of loneliness and isolation, organisations and future research may need to consider placing a greater degree of focus on the subject going forward.

Reduced mentorship was often the second most prevalent disadvantage of working from home. Concerns regarding mentorship are somewhat supported by the existing research and literature. The results of the interviews also suggest that it is an issue taken very seriously by engineering employers. Although it is ranked as important relative to other disadvantages throughout the survey, compared to rankings of the advantages of working from home it remains relatively obscure. It is also viewed as marginally less important on average by younger engineers than older ones. Employers may therefore find it difficult to balance their preferences for the mentorship of young and early career engineers, typically through in-office presence, against the comparative disinterest of this same group.

Concerns over team productivity also featured prominently throughout the interview process. By comparison, this disadvantage was of only moderate concern among survey respondents. This likely reflects the different targets of research. While the interviews emphasised the experience of employers and organisations, the surveys focused on the experiences of employees. Together, it is therefore suggested that employers and employees differ at least somewhat, and possibly substantially in their respective concerns over team productivity when working from home.

Conclusion

This survey was successful in its goal of expanding on the findings of previous working from home survey data, and increasing the generalisability of other survey data and research to engineers. It also offers a strong basis on which OSPE can base its future advocacy efforts.

Some of the most important takeaways from the survey data are as follows:

1) **Women engineers find greater value in working from home than do men, often by a substantial margin.** Women surveyed reported being much less satisfied than men when they did not have access to a regular working from home arrangement, and reported much higher levels of satisfaction when working from home 4 or 5 days per week. On average, women also ranked every advantage of working from home as being more important than did men, and ranked the disadvantages of working from home as generally being less important. This was also true of women with caring responsibilities as compared to men with caring responsibilities. Women were also more likely to report that working from home would be an essential component of a future job. Overall, these results indicate that women in engineering do not differ substantially in their preferences from women in the general labour force with regards to their feelings on working from home. Organisations that wish to hire or retain women engineers will need to engage with these feelings to remain a competitive destination for their talents.

2) **The preferences of young engineers are at odds with many employers, which may be a source of conflict.** Young engineers report strong overall preferences for working from home. Compared to other age groups, they are much more likely to report dissatisfaction with the absence of a working from home arrangement. Additionally, young engineers, on average, do not view disadvantages such as reduced mentorship, reduced prospects of promotion, or reduced productivity as being important. They also view these disadvantages as being less

important than do their older peers, despite being the group most likely to be affected. These findings are important because interviews and surveys of engineering employers have shown that they are extremely concerned with the impact of working from home on young engineers, especially as it relates to mentorship. How employers and young engineers navigate this divergence in preferences remains to be seen.

3) **Organisational demographics are relatively weak predictors of working from home preferences.** Much of the research on working from home focuses on the extent to which the industry or role in which an engineer is employed dictates whether and to what extent working from home is a viable option. The survey data complicates this lens of analysis by showing that, on average, the number of days worked from home by engineers is fairly consistent between industries and roles. The survey data further shows that there is actually far greater variance within these groups rather than between them. This implies that access to working from home is being driven by other factors, likely at the organisational level. Moreover, it suggests that outside of firms in which there is an indisputable need for engineers to be constantly on-site, as may be the case in some manufacturing and natural resource projects, there is likely substantial latent capacity for the adoption of working from home policies among engineering firms.

4) **Regular access to working from home is the strongest predictor of an engineer's perceptions of its advantages and disadvantages.** The largest differences in the average reported importance of the various advantages and disadvantages of working from home are found when comparing those who do not work from home to those who do. Those who work from home 0 or 1 day per week place substantially less importance on the advantages, and substantially more importance on the disadvantages than groups within any other demographic. Whether this is driven by self sorting behaviours, a lack of familiarity, or some other cause cannot be known at this time.

5) **Loneliness is an issue of major concern and should be made highly salient in discussions of working from home.** Loneliness can be a cause of significant physical and mental health risks. Across almost all demographic groups, loneliness was consistently cited as being the most important disadvantage of working from home. More importantly, unlike Mentorship and Team Productivity which often appeared second and third respectively, loneliness is not an issue which organisations have a direct economic incentive or means by which to address. The long term impacts of loneliness on engineers and the extent to which it may be exacerbated by working from home are not known, and exist well beyond the scope of labour and economic analysis, but should be taken extremely seriously.

Overall, the results of this survey should equip OSPE with the information necessary to ensure that its future advocacy efforts accurately reflect the priorities of its members. Combined with previous survey data, it suggests that a consensus on the popularity of working from home, and the particular aspects that make working from home desirable are consistent and reasonably well understood. Future research should seek to be more narrowly focused on the specific aspects of working from home for which understanding remains somewhat limited.

V

Evidence from a Survey of Engineering Employers

In addition to the aforementioned interviews, OSPE also commissioned an employer survey through market research firm Ipsos to add additional breadth to the findings. The survey was distributed to high-level decision makers across 100 Canadian engineering or engineering-affiliated organisations.

Demographics

Based on Statistics Canada's definitions of small, medium, and large businesses, a breakdown of the size of the organisations surveyed can be found below.
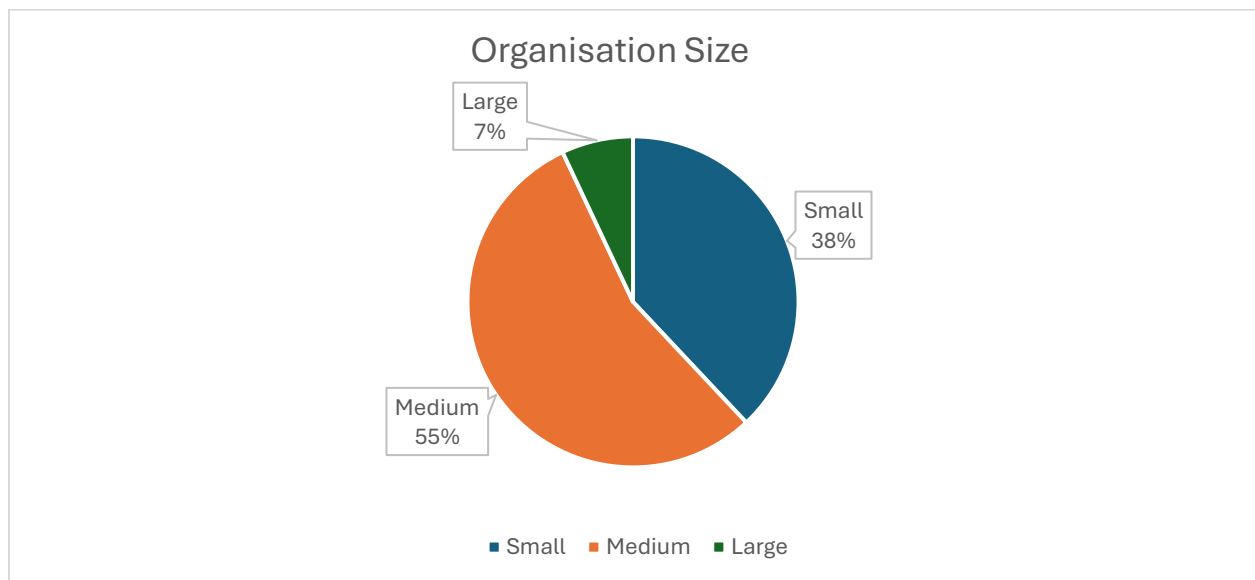
The small number of respondents representing large businesses mean that findings regarding this group may be easily skewed, and therefore less reliable.

Respondents were also asked to describe the type of organisation for which they worked. Among respondents, Manufacturers were substantially overrepresented at 86% of those surveyed.

Organisation Type

Category	Value
Utilities	1%
Technology	2%
Resource Industries	2%
Manufacturers	86%
Engineering Consultancies	9%
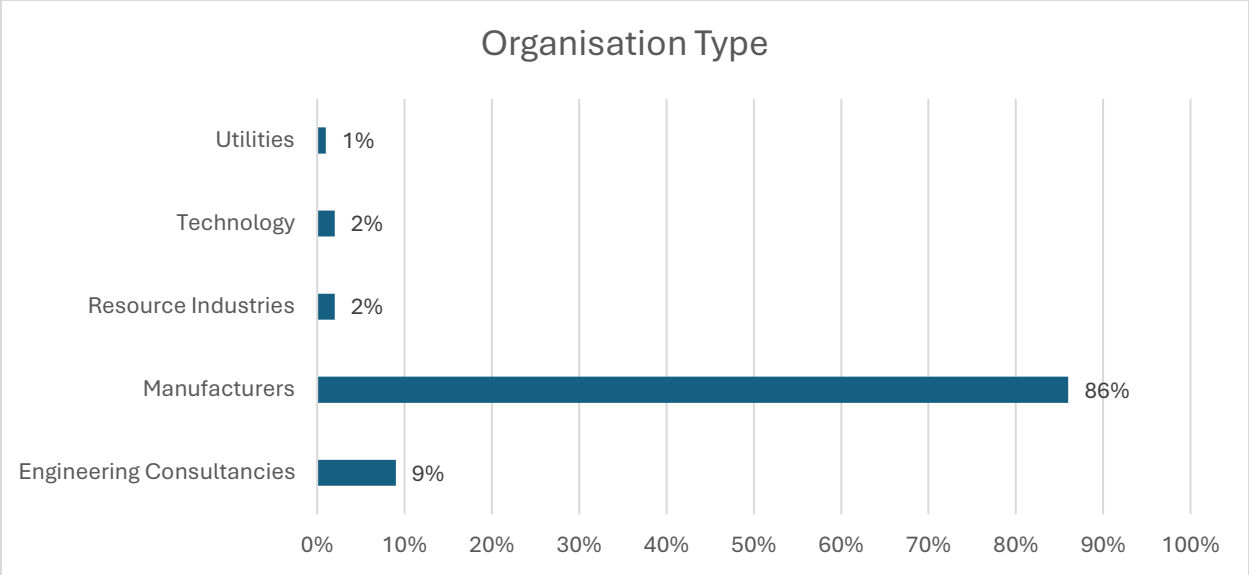
The enormous overrepresentation of manufacturers directly impacts the generalisability of the survey data, as does the small sample size of the remaining organisations. For the purposes of analysis, organisations in the Resource Industries, Technology, and Utilities groups will be consolidated into the group "Other". However, even when combined, this group's small sample size makes the biasing of results extremely likely. This is also the case for the Engineering Consultancies group. The potential impacts of these industry groupings should remain front of mind for readers throughout the survey data analysis.

Prior to the COVID-19 pandemic, 30% of respondent organisations reported allowing at least some of their engineers or technical staff to work from home on some occasions. This extremely broad definition likely explains the high prevalence of working from home among respondents as compared to OSPE's previous surveys or the findings of the literature review.

Pre-COVID WfH Availability

No	70%
Yes	30%
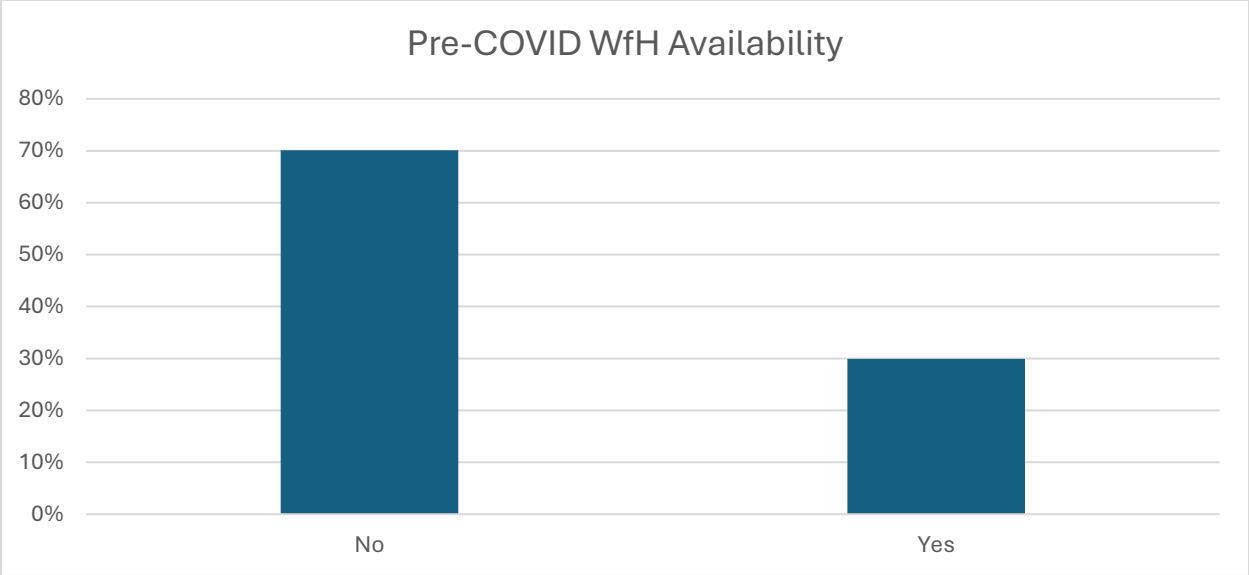
During the COVID-19 pandemic, 36% of respondents report that working from home was not at all available to their engineering or technology staff. This differs substantially from the experiences of those interviewed for this report, and OSPE's previous and current working from home surveys. This result is most likely explainable by the overrepresentation of manufacturing organisations in the sample.

Availability of WfH to Engineering/Technology Staff During COVID
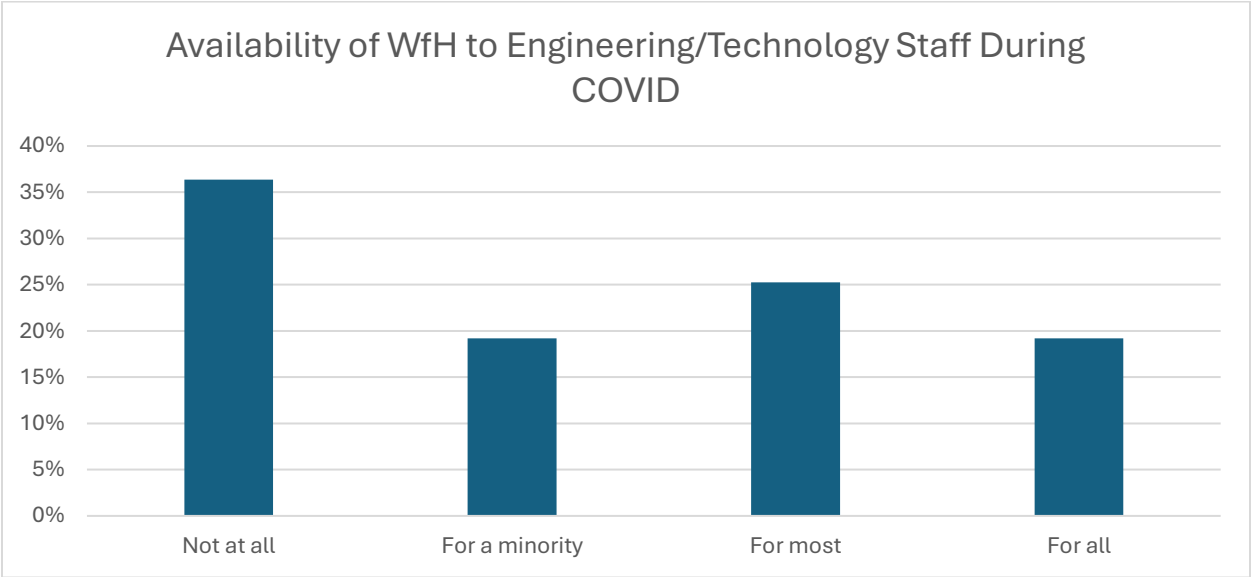
Among respondent organisations, the most common working from home arrangement was one in which working from home was not permitted. At 41%, this arrangement was a larger share of respondents than all partial or full working from home arrangements combined. This differs substantially from the experiences of those interviewed for this report, and OSPE's previous and current working from home survey. This result is most likely explainable by the overrepresentation of manufacturing organisations in the sample.

Organisation Current WfH Policy
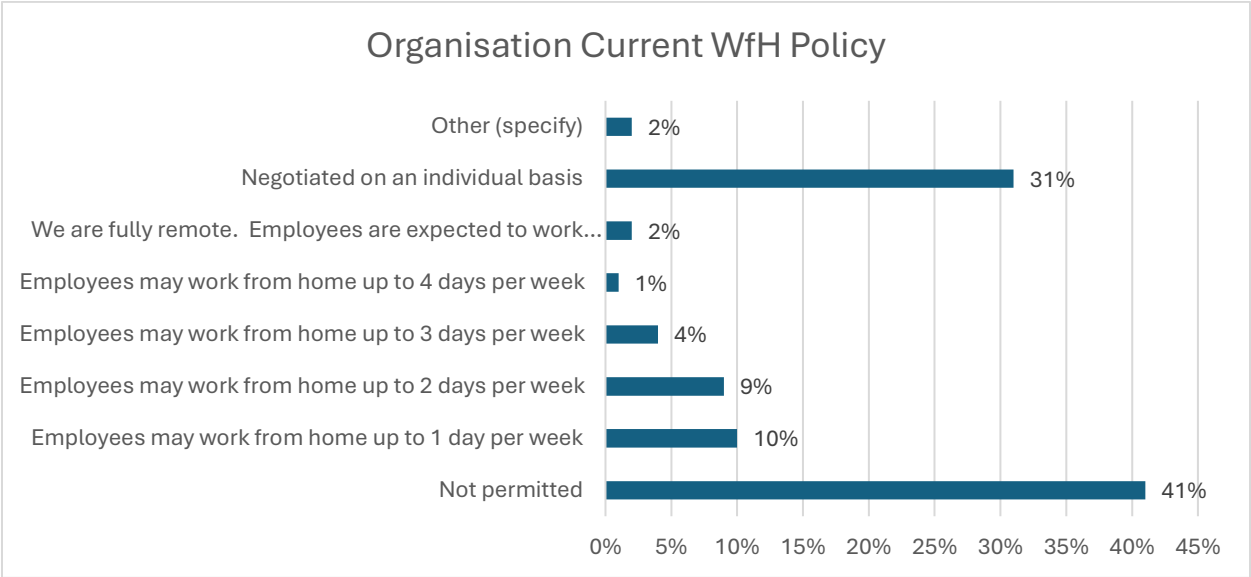
The second most common policy was to have access to working from home negotiated on an individual basis. This likely represents a similar mentality to what was expressed throughout the interviews, that even among organisations in which working from home was generally not allowed or discouraged, exceptions would be made for highly in-demand roles, or for individuals deemed valuable enough for an exception to be made.

Human Resource Functions

Respondents were given the chance to describe the impact of working from home on their engineers and technology staff with regards to four key human resource functions within their respective organisations. These functions included:

- Managing engineering or technology staff (Management)
- Training engineering or technology staff (Training)
- Mentoring engineering or technology staff (Mentorship)
- Fostering corporate culture among engineering and technology staff (Culture)

Regardless of organisational size, respondents reported that working from home had, on average, made all four human resource functions more difficult. In keeping with themes that emerged throughout the interview process, mentorship was the function most often ranked as being made more difficult across small and medium-sized organisations. Large organisations also reported that mentorship was made more difficult at a rate in line with those of their small and medium-sized peers, but were unique in the frequency with which they reported difficulty in fostering a corporate culture when working from home.

These findings remained largely unchanged when organisations were instead broken down by type. All types of organisations surveyed reported that working from home made their human resource functions more difficult.

WfH Impact on Engineers and Technicians (HR Functions)

Legend: ● Culture ● Mentorship ● Training ● Management

X-axis: More Difficult — No Difference — Less Difficult

Y-axis: Other, Manufacturers, Engineering Consultancies

Among those in the consolidated type "Other", Culture stands out as being substantially more likely to be made more difficult by working from home. For Manufacturers and especially Engineering Consultancies, Mentorship remains the standout function, once again in keeping with the themes which emerged throughout the interviews.

Business Functions

Respondents were also given the chance to describe the impact of working from home on their engineers and technology staff with regards to four key business functions within their respective organisations. These functions included:

- The productivity of your engineering and technology staff (Productivity)
- The functioning of engineering or design teams (Team Functionality)
- The ability of your engineering or technology staff working with suppliers (Working with Suppliers)
- The ability of your engineering or technology staff working with customers or clients (Working with Customers/Clients)

Compared to human resource functions, the impacts of working from home on business functions is much more mixed. Small and medium businesses, on average, reported that there was no significant effect of working from home on the listed business functions, but skewed towards worsening them. Large businesses were similarly neutral, except in the case of productivity, for which there were substantially more likely to report an increase.

WfH Impact on Engineers and Technicians (Business Functions)
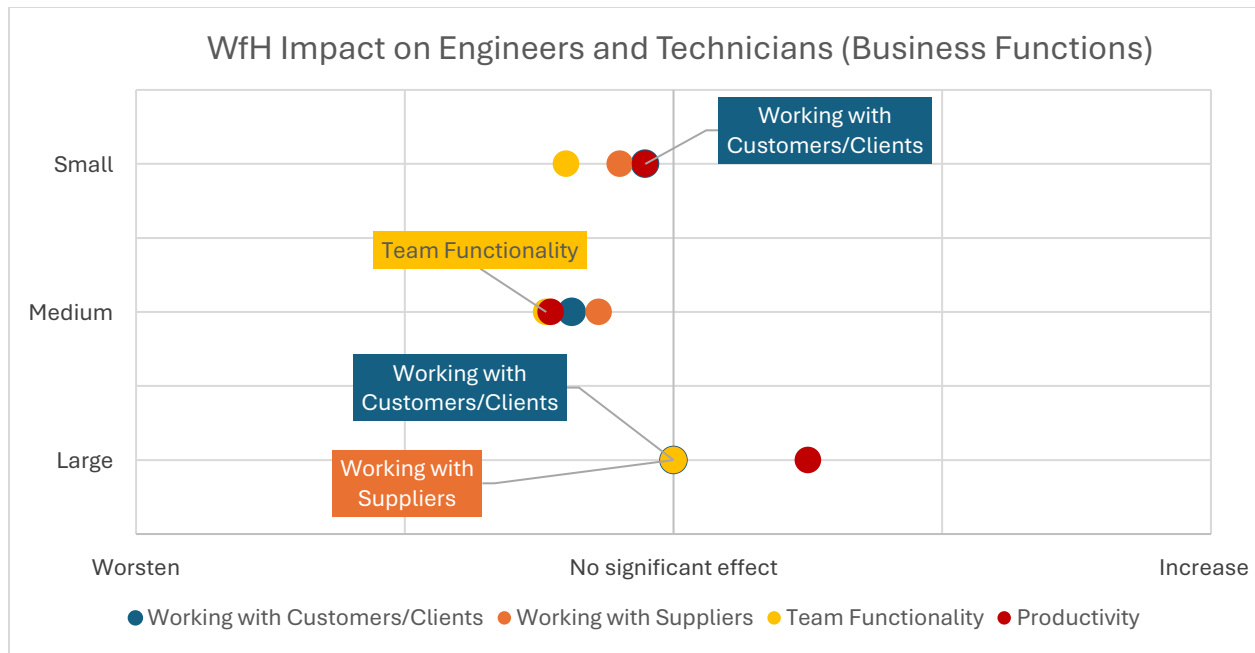
A somewhat similar finding occurs when responses are divided by organisation type. All three types of businesses, on average, report no significant effect, but again, with a negative skew. Productivity among those in the "Other" grouping proves to be the exception, with respondents being extremely likely on average to report an increase when working from home.

WfH Impact on Engineers and Technicians (Business Functions)
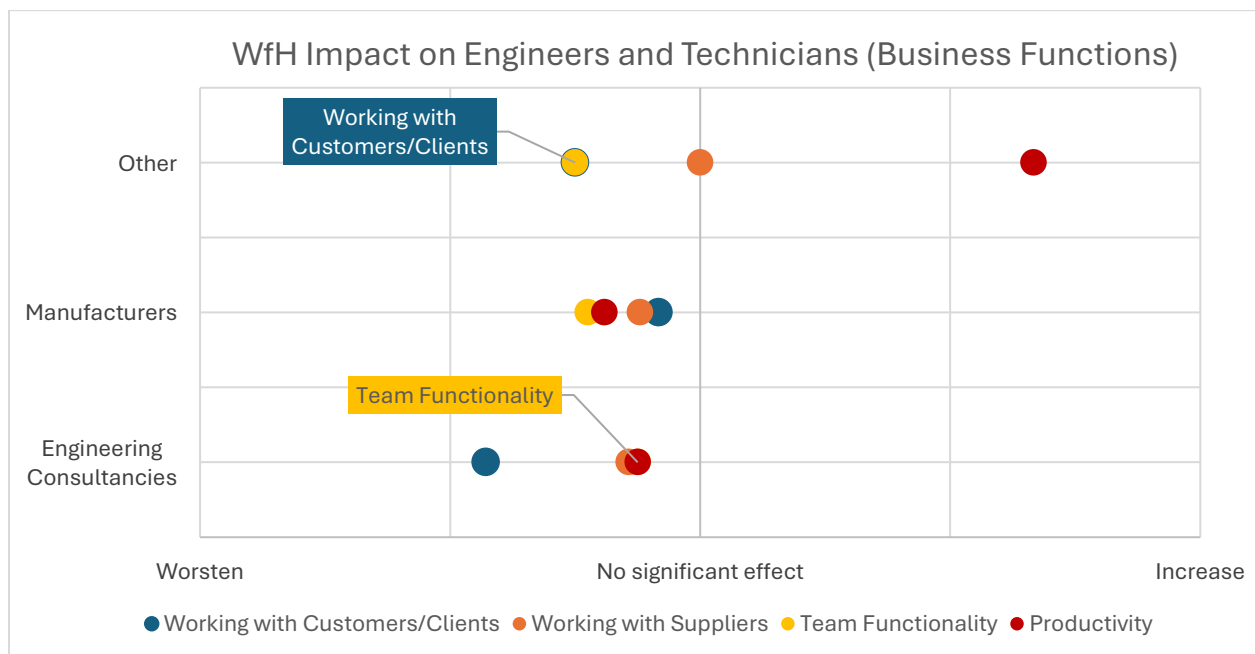
Otherwise, one additional major outlier is the substantially more negative experience of Engineering Consultancies in working with customers and clients as compared to other groups.

Analysis

The nature of the survey sample makes drawing meaningful conclusions about engineering employers in general difficult. With regards to engineering employers in manufacturing, the survey reveals broad skepticism of, and difficulty with working from home. These findings extended to those in engineering consultancies and other industries, although the small sample sizes make these findings problematic.

Across organisation sizes and types, the consensus was that working from home has, on average, made core human resource functions more difficult, and has worsened core business functions. As in the interviews, mentorship was of particular concern.

An exception to these generally negative findings comes in the form of productivity ratings among those in the "Other" and large organisation groups. However, these groups are the smallest of their respective categories, and are thus prone to error.

Overall, compared to the interviews and literature review, the employer survey paints a substantially less positive picture of working from home at the employer level. Manufacturing is one of the industries for which working from home is considered to be the most fraught. At a minimum, this survey data supports the idea that, on the employer side, manufacturers are facing difficulties with adapting to this new working environment. Whether this extends to other industries cannot be determined with the available data, however it appears that serious investigation may be necessary.

Conclusion

This survey reveals that engineering employers, especially those in manufacturing, are finding it difficult to integrate working from home into their general operations. Employers report that neutral to somewhat negative outcomes regarding the impact of working from home on core business functions. Employers also report strongly negative outcomes regarding working from home and how it affects their ability to perform key human resource functions.

This survey data diverges from what was expressed in the employee survey and the employer interviews, it is likely that implementing working from home in manufacturing related industries is somewhat more difficult than in other industries.

Due to the significant overrepresentation of manufacturers and the small sample sizes in other categories, these findings should not be taken as universally applicable across the engineering sector. However, they do point to the need for a more nuanced understanding of how different organisational contexts affect the viability and impact of working from home policies.

VI
Evidence from Interviews with Employers

Summary

On OSPE's behalf, Prism conducted interviews with representatives of 15 different organisations including engineering firms, major direct employers of engineers, or provided support to such employers. The goal of these interviews was to gauge the experiences of engineering employers with regards to working from home policy.

The interviews revealed that working from home has become an increasingly, though not universally accepted part of the human resource landscape of engineering employers. Since the COVID-19 pandemic, 80% of employers interviewed have adopted at least a hybrid working from home policy framework.

Among those that have adopted a hybrid or fully remote arrangement, ongoing policy development indicates that the change is likely to be durable, though the number of work from home days may be subject to change.

Although general working from home policies were common, none of the organisations interviewed had working from home policies specifically tailored to the unique challenges faced by women in engineering.

This was in contrast to the proliferation of working from home policies designed to support young and early career engineers. Virtually all of the interviewees raised concerns about the impact of working from home on young and early career engineers.

Organisations that adopted more flexible working arrangements following the COVID-19 pandemic emphasised familiar benefits such as: reduced commuting, cost savings, and improved personal productivity. However, as mentioned previously, concerns were raised over the impacts of working from home on young and early career engineers.

 Those who voiced a strong preference for in-office attendance, or who pursued a full return to the office cited superior collaboration as a primary benefit. The adverse effects of working from home on junior engineers in terms of mentorship and informal learning also featured especially prominently in this group. However, they also acknowledged that a return to the office was often associated with increased attrition, especially among women. This is in keeping with findings in the literature review and OSPE's employee survey.

The interviews were also supplemented with an employer survey. The survey sample was heavily skewed towards manufacturing organisations. The survey suggested that employers were having substantial difficulties in balancing core human resource and business functions with working from home. The degree of negativity observed in the employer survey was well beyond what was described by most interviewees and the findings of the employee survey. This is likely due to the biasing of the sample towards the particular experiences of the manufacturing industry.

Employer Interviews

Prism began reaching out to major engineering employers on OSPE's behalf in November of 2024 with the goal of scheduling a series of one-on-one interviews. These interviews were to be conducted with the goal of developing a more nuanced understanding of the experiences, policies, and reasonings of engineering employers with regards to working from home than could be accomplished through a literature review and survey alone.

A total of 15 interviews with representatives of these organisations were conducted. A breakdown of both the size and public or private status of the organisations on whose behalf interviewees spoke can be found below.
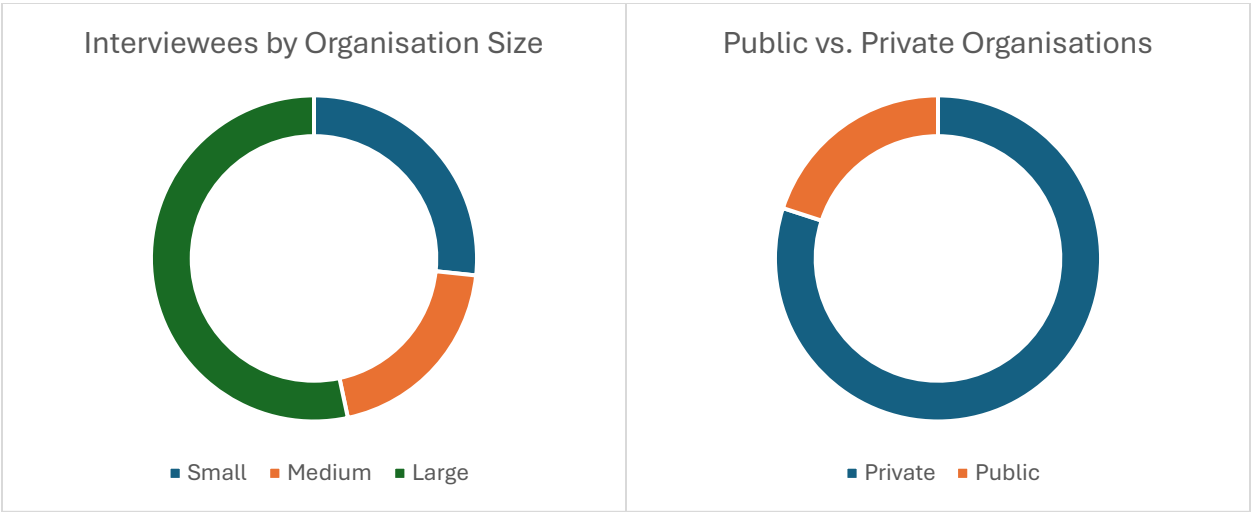
Most interviewees represented organisations with operations that spanned a wide variety of industries and specialisations. For the purposes of this report, interviewee organisations have been grouped into loosely defined classifications. Many organisations have been added to multiple classifications to better reflect the variety of their interests. A breakdown of these classifications can be found below.
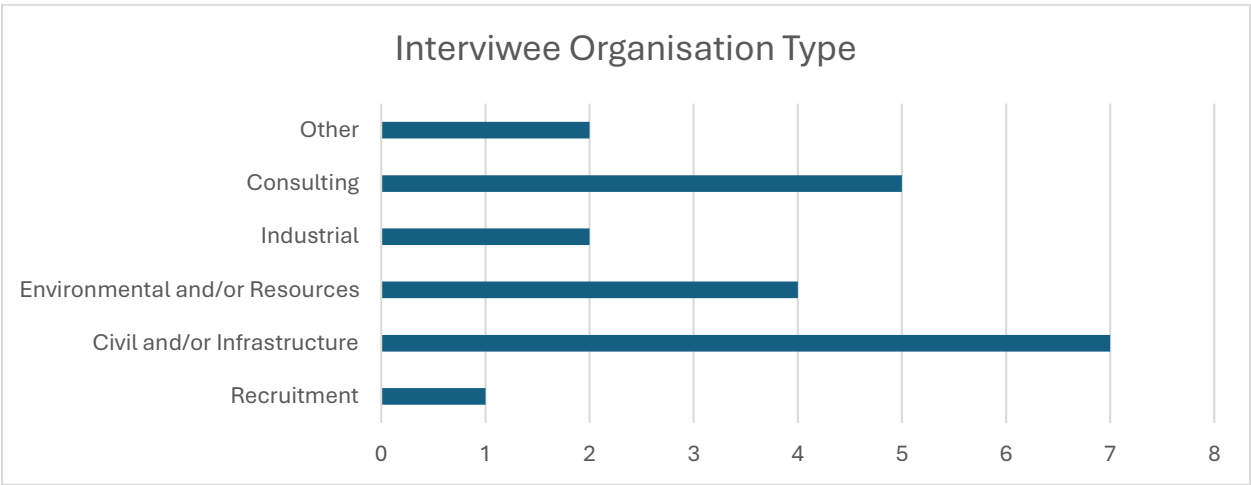
Interviewees and their respective organisations were granted full and total anonymity as part of the interview process so that they could speak candidly and without fear that their responses would adversely affect their careers or employers. No personally or organisationally identifying information will appear in this or any other published report.

Quotes which were especially effective at summarising a major theme of the research will appear throughout the report. These quotes have undergone minimal editing for the sake of clarity or to preserve the anonymity of the speaker.

Working from Home Policies and Arrangements

All respondents reduced or eliminated in-office work for the duration of the COVID-19 pandemic and lockdowns. Following the end of the pandemic and lockdowns, only 2 of the 15 interviewee organisations returned to a full in-office working arrangement. 3 interviewees retained a fully remote working arrangement following the end of the pandemic, and a further 9 chose to enact a hybrid model. In total, 80% of those interviewed adopted some form of working from home arrangement. One interviewee represented a firm specialising in the recruitment of engineers rather than a firm which actively employed them. This organisation's working from home policies were therefore not applicable and have been labelled as such.

Working from Home Arrangement	Interviewees
Fully Remote / Total Flexibility	3
Hybrid	9
Full Return to Office	2
Not Applicable	1

Variations of a hybrid model in which employees work part of their week from home and part in-office or on-site were by far the most common working from home arrangement among those interviewed. Though interviewees provided examples of a wide variety of models, as will be discussed below, the effective norm was a policy allowing for an average of 2 – 3 days working from home per week.

It should be noted that the classifications of working from home arrangements found above are extremely fluid. For example, interviewees representing some of the smallest organisations, described policies in which employees were simultaneously allowed full discretion in their work location, but were also strongly encouraged to appear in-office as often as possible. Some larger organisations described strict in-person attendance requirements, but also allowed for employees to apply for a working from home exemption through a formal process. Membership to a given group is therefore based on the number of days that a typical engineering employee in a typical week can expect to work from home or in their office.

Policy Designs

All interviewees indicated that prior to the COVID-19 pandemic, working from home was either rare or non-existent within their organisations. The near universal pre-COVID policy was an informal, case-by-case arrangement in which an employee would be allowed to work from home in response to

a very limited number of personal circumstances, the most common example of which was a doctor's appointment. For the remaining interviewees, working from home was not an option.

Post-COVID, interviewees described a wide range of working from home policy designs. There was little indication that a consensus had been reached regarding the "best" model by which to organise a working from home arrangement.

An organisation's size was not clearly correlated with the number of days an employee would work from home in a typical week. Consulting organisations tended to offer greater flexibility than those in other industries. Two of the three organisations that offered full employee discretion were involved in consulting. Otherwise, the prevalence of hybrid working arrangements within the sample makes drawing connections between industry and working arrangement difficult.

Whether an organisation was private or public was strongly correlated with their working from home arrangement. All public organisations interviewed were currently operating under a hybrid working arrangement.

How a working from home policy was managed was strongly correlated with the size of the organisation. Small and small-medium organisations generally described trust-based, ad-hoc means of managing their working from home arrangements. Larger organisations tended to describe using or working towards developing more formal working from home policy management systems.

Broadly, the most common working from home model was a hybrid arrangement in which employees worked from home the equivalent of 2 – 3 days per week. However, there were significant differences both in how policy decisions were made, and how work from home days were allocated.

Most commonly, responsibility for setting the specifics of a working from home policy rested at the executive level. However, this method was used by less than half of interviewees. Other interviewees worked for organisations where working from home policy decisions were made at the departmental or team levels, with negotiations taking place between these groups when wider in-person collaboration was necessary. Still others allowed for more or total employee discretion regarding how often they did or did not work from home. Some organisations with high levels of employee discretion described efforts to make coming into the office an attractive prospect on its own merits, without the need for policy to compel employees to return. Public organisations differed in that their working from home policies tended to take into account a wider range of stakeholders. Among those interviewed, guidance or directives from the government body under which they worked was often the starting point for the development of a working from home policy.

Organisations in which teams or departments set working from home policy, understandably, tended to be larger. Top-down Executive policy setting was present among large and small businesses.

An organisation's industry did not appear to strongly corelate with how working from home policy was to be set, beyond the absence of team based policy setting, likely due to having fewer employees on average.

Interviewees also offered many different methods by which to measure the number of days worked from home. Roughly half of interviewees worked for an organisation in which working from home was quantified as a specific number of days per week. However, others based their in-office

requirements on alternative metrics such as the percentage of hours worked per month, or as a share of billable hours. The method by which an employer measured an employee's work from home days did not appear to be linked to an organisation's size or industry.

Returning to the Office

Among those organisations that enacted a full or partial return to the office, the reasoning was fairly consistent. Most reported either believing or observing that in the long term, working from home was associated with lower organisational productivity, creative problem solving, communication, and other similarly important contributors to engineering success. Many also cited difficulty with

"We definitely noticed a little bit less mentorship happening once we did the switch to online. A little bit less engagement."

maintaining an overarching office culture as being a concern. This was often framed as being part of a broader trend of 'siloing' or departmental segregation. Finally, issues relating to young and early career engineers were brought up repeatedly, and are discussed in greater detail in a dedicated section.

Interviewees representing organisations with a focus on civil, environmental, and industrial engineering tended to speak more strongly on the importance of having employees return to the office.

It should be noted that most interviewees drew distinctions between organisational productivity and individual productivity. Most noted that their employees adapted both well and quickly to remote working with the onset of the pandemic. There was a general consensus that existing employees continued to produce work at similar levels of quality while working from home compared to when they were working in the office (sometimes after brief periods of adjustment), with only few exceptions.

However, responses were more mixed with regards to new hires. Several interviewees felt that it was more difficult to integrate new hires – including otherwise experienced engineers, when doing so remotely. The need for a sense of trust as a pre-condition of working from home following the pandemic was raised by several organisations, but was especially prevalent among smaller ones. There was a sense among some that working from home would be used as an opportunity to shirk their responsibilities, and thus that outside of those with whom a strong relationship of trust had been established, it was inappropriate. This therefore justified a partial or total return to the office where such a relationship could be built and maintained.

The extent to which less or no access to working from home adversely affected the recruitment experience of interviewees was extremely mixed. For some the subject was raised repeatedly throughout the recruitment process, while others found that an emphasis on in-office work was seen as desirable among those who were prioritising in-person work experience. Still others preferred that those who wanted to work from home were less likely to apply, citing a belief that they would make for a poor cultural fit in their organisation. A recruiter specialising in engineers noted that among his clients there was a strong and growing bias against the hiring of fully remote workers.

Remaining Remote

Although most interviewees reduced the number of days that they worked from home compared to during COVID, some embraced fully remote working arrangements. The reasons given for remaining remote were in line with those discussed throughout the literature review. Specifically, an

expanded labour pool, greater work-life balance, cost savings on real estate, and no observed reductions in overall productivity. The small number of interviewees that opted for such an arrangement makes it impossible to draw inferences based on industry or organisational size.

In addition to an explicit fully remote working arrangement in which the physical offices of the organisation were sold or made otherwise inaccessible, there were also those that enacted policies of total employee discretion. In practice, this often amounted to a primarily working from home arrangement. Some continued to maintain a smaller overall office footprint but did so with the expectation that it would not consistently be fully used.

"We're trying to propagate the culture by mixing and matching people who wouldn't normally meet. I think that is a benefit of remote working, because before they would have had to be people in the same office or a similar area. So now we can mix people from different places and really try to figure out a way to make the firm feel more connected."

Even among those organisations that implemented a policy of full working from home, significant concerns were raised over the potential impact of such policies on young or early career engineers. One organisation went so far as to effectively end the hiring of early career engineers, believing that they would not be, on average, economically viable hires in a fully remote working environment.

Organisations which employed both engineers in fields which required an in-office or on-site presence and engineers who could work from home occasionally raised concerns over perceptions of equity or fairness between departments, but this was rare.

On the subject of recruitment, those organisations which placed greater emphasis on working from home tended to report a positive impact on the sourcing of new talent. Even those who required occasional in-office presence tended to note that their policies substantially expanded the geographic area from which they could recruit.

Organisations with hybrid working arrangements that emphasised in-office presence, and those with full in-person mandates often reported that, if a position were sufficiently difficult to fill, or if an employee were especially important, an exception would be made to allow for working from home if it made recruitment or retention possible.

Impacts on Women

Among those interviewed, none had developed working from home policies or programs which were specifically targeted or designed for women.

Many interviewees noted that their overarching working from home policies allowed for additional flexibility which could in turn be used to better accommodate women. The most common example given was that working from home could be used to smooth the gradual reintegration of women into their roles following maternity leave. There was also a general willingness to allow working from home to be used in support of childcare responsibilities. However, these were described as addenda to pre-existing policy guidelines, rather than ones proactively designed to address women's unique and complicated relationship with working from home.

This should not be understood as an organisation being unsupportive of women. Many interviewees, particularly those representing larger organisations made repeated reference to initiatives within their organisations that existed to support women and women engineers. However, compared to the explicit policy focus placed on young and early career engineers discussed in the next section, woman focused working from home policy did not yet appear to have become a priority.

"Some of what we've done on things like hybrid work can feel surface level. We talk a bunch about how things like childcare more commonly fall to the mother, but we don't really have policies that acknowledge that, despite trying to say that we want to be an employer of choice for women."

More broadly, most interviewees acknowledged the complicated relationship between working from home policy and women. Among organisations that had enacted a partial or full return to office, it was common to report increased employee attrition, especially among women – although this was generally said to be relatively modest overall. This is in keeping with previous research showing that attrition rates are higher among women when returns to office are enacted.

Impacts on Young and Early Career Engineers

Compared to women, working from home policy development focused on young and early career engineers was significantly more advanced. Every interviewee directly or indirectly raised the impact of working from home on young engineers as being among their largest concerns, and a major consideration in the development of their respective working from home policies.

Their concerns were in line with those raised throughout the literature and previous surveys. Concerns regarding mentorship, socialisation, and supervision were front of mind across all interviewees. When discussing their decision to remain fully remote following the end of the pandemic, one interviewee explained that they had effectively ended the hiring of junior

"I found younger people wanted to work from home more, but I just don't think they learn as well that way. The only people working from home would make sense for are the senior people who don't need any help, but they should be collaborating and teaching, and you can't teach well from home."

level engineers. This was done based on the belief that a fully remote company could not make the necessary time and oversight investments to support engineers still early in their careers.

In response to these issues, interviewees across industries and organisation sizes had developed targeted programs and policies meant to directly support young and early career engineers in hybrid and fully remote working arrangements. The most common policy was to set a minimum number of in-office days for junior engineers. This was often paired with an obligation on the part of senior staff to also be on-site and available for some or all of these days.

Some larger organisations with more formal policy frameworks also reported rethinking or restructuring their mentorship programs to better support these engineers and encourage collaboration across levels of experience and age groups.

Analysis

Broadly, the interviews show that working from home is increasingly accepted by engineering employers. Employers seeking a full in-office working arrangement represented only 2 of 15 interviewees. Although fully remote working is similarly unpopular, the continuing development of hybrid working arrangements implies an overall shift towards working from home.

As is to be expected, working from home policy making has moved beyond the purely functional, and is now directed toward optimisation for human resource outcomes. Working from home policy development is overwhelmingly focused on early career engineers, around whom a consensus appears to have formed regarding the potential adverse effects of working from home.

Woman-centred policy development has, by comparison, lagged considerably. While firms are proactive in developing policies to address the needs of young engineers, woman-oriented policies are most often informal or incidental.

An organisation's size and industry, for the most part, does not appear to have a high degree of influence on working from home policy outside of logistical matters related to an organisation's scale. This is somewhat in keeping with the employee survey, which found that an organisation's industry and/or an engineer's role were much less likely to be defining traits in setting working from home policy than anticipated. As was to be expected, the difference between private and public organisations is much more pronounced, with public organisations being made accountable to a wider set of stakeholders, and operating under a fundamentally different economic and employment paradigm.

Conclusion

The employer interviews and employer survey have added a great deal of nuance to OSPE's understanding of working from home in engineering. Some key takeaways include:

1) **Woman focused working from home policy development remains in its infancy.** No interviewees had developed formal working from home policies focused on and tailored towards the unique challenges faced by women in engineering. This is of significant concern, given the scholarly research exploring the differential impacts of working from home on women, and the underrepresentation of women in engineering. Employers wishing to hire and retain women engineers may need to invest resources into fleshing out policies which better reflect their priorities. This is supported by confirmation among those interviewed that women were somewhat more likely to leave following partial and full return to office orders, as was alluded to in the literature review and the survey data.

2) **Employers are extremely concerned about the impacts of working from home on early career engineers.** This was universally true among interviewees, and was strongly the case among survey respondents. The extent to which employers express concerns regarding mentorship is somewhat in contrast to the results of the employee survey, which showed a comparative lack of concern among young engineers. The interviews also give insight into some of the emergent

strategies on how best to deal with these issues. The decision by one interviewee to effectively end the hiring of junior staff raises serious concerns over the potential fallout of working from home policy development. This is a dimension of working from home policy which demands close scrutiny.

3) **Evidence on the extent to which employers are supportive of working from home is mixed to slightly positive.** Most interviewees expressed views on working from home which could be described as cautiously supportive. While some remained deeply skeptical or outright hostile, the vast majority of interviewees were open to hybrid working arrangements, and had already or were in the process of developing policies to support them. Conversely, the employer survey shows that, at a minimum, employers in the manufacturing sector are facing at least moderate difficulty in balancing working from home with their day-to-day operations. Whether these difficulties extend to other industries, or reflect the unique challenges faced by the manufacturing industry remains to be seen.

4) **Working from home policy development is ongoing, and a consensus on best practices has not yet emerged.** Interviewees described a wide variety of decision-making processes and methods of measurement surrounding working from home policy development. Whether policy is best developed using a top-down or bottom-up approach, whether discretion should be with the employee, team, or department, and whether working from home time should be measured in terms of days, billable hours, or in terms of organisational priorities such as mentorship varied considerably between organisations and across industries, sizes, and between the public and private sectors. This reflects the novelty of working from home as a policy area, even several years after the end of the COVID-19 pandemic. Whether best-practices emerge based on organisation size, industry, sector, or remain a firm-by-firm consideration will be a matter for future analysis.

When combined with findings gleaned through surveys and a review of the scholarly sources, this engagement with employers sheds light on the underlying tensions which exist between employees and employers in engineering with regards to working from home. These tensions are especially pronounced along the lines of gender and age. Throughout its advocacy efforts, OSPE will need to balance the growing, but far from total acceptance of working from home among employers with the often divergent preferences of engineering employees.

VII
Implications for Finding the Right Balance

The evidence summarized in the previous chapters points to six conclusions.

1. *There is no "one size fits all" solution to finding the right balance between increased flexibility for employees and the needs of organisations to realize the productivity gains that come from in-person communication and collaboration. However, for most organisations, a hybrid model in which employees have the option to work two scheduled days from home should be given serious consideration, provided the organisation concurrently takes proactive steps to formalize mentoring and foster communications and collaboration during the scheduled in-office workdays.*

   While technical factors will often limit the potential for a work from home option, it is notable that there is more variance in the availability of work from home options *within* industries than across industries. This implies that human resource management philosophies are at least as important, if not more important, than narrow, technical considerations. Organisations that reject a work from home option on the grounds that "it is not practical" will often be contradicted by similar organisations that implement such options. Organisations that choose not to implement a work from home option risk being seen as a less desirable place to work with all the consequences that this may imply for employee morale, turnover, and the quality of new hires.

   It must also be acknowledged, however, that the research identifies costs to an organisation introducing a work from home option. These costs are relatively modest when the work from home option is limited to two *scheduled* days per week. Moreover, these costs appear to be more than offset, in most cases, by the clear benefits to employees, morale, and individual productivity.

   The cost to organisational productivity increases, however, when the work from home option allows for full discretion over choosing days to work from home and when the option exceeds two days per week. The evidence on a third work from home day is ambiguous, but clearer for four and five days. Organisations may be able to implement compensating strategies to offset these costs, but this is more challenging when flexibility exceeds two scheduled days.

   For all of these reasons, a hybrid model deserves the most serious consideration for most organisations.

2. *Any degree of working from home flexibility reduces the opportunities for informal mentorship of junior employees. This is a significant disadvantage which needs to be countered with formalized mentorship programs.*

   A report by the U.S.-based National Academies of Sciences, Engineering, and Medicine stressed the importance of mentorship for early and mid-career professionals. There are also research findings that show that mentorship is an important factor in women remaining in an engineering career. In most organisations, mentorship is informal. The frequency of interactions between a junior employee and a senior employee is necessarily reduced when a work from home option is introduced. While there may be opportunities for interaction using technology, the frequency and quality of these interactions is not likely to be comparable to in-person interactions.

Many employers report that the loss of mentorship opportunities is one of the most important drawbacks to a working from home option. It is important, therefore, that organisations that introduce a working from home option take two steps. First, the work from home days should be scheduled so that there is a significant overlap of in-office days for junior and senior engineers. Second, mentorship needs to be formalized such that a junior employee has regularly scheduled mentoring conversations with designated senior employees. It is notable that a study undertaken by IPSOS for TD Canada Trust found that formal mentorship programs are more common in companies that have adopted a hybrid approach to working from home.

3. *Organisations that eliminate a work from home option should expect an increase in employee dissatisfaction, higher rates of turnover and greater challenges in recruiting new staff in comparison with competing organisations that offer flexibility options.*

The evidence is unambiguous: the overwhelming majority of employees place significant value on increased flexibility. This is true irrespective of age and gender. In the post-COVID era, this flexibility is now a recognized and important factor in job satisfaction. Organisations that fully roll back flexibility from the COVID period will see a decline in employee satisfaction. The dissatisfaction will be accentuated when these employees compare their situation to others who continue to enjoy a degree of flexibility. The evidence is also clear that this increased dissatisfaction leads to higher turnover with the costs to an organisation that this implies. For engineering and technology staff, the cost of turnover increases with the experience and specialized skills of the departing staff. Estimates of the cost to organisations of replacing engineering and technology employees typically exceed one third of annual salary and are often significantly higher.

Survey evidence is also unambiguous in showing that employees attach significant importance to the availability of a work from home option when considering future employment. Organisations that do not offer any flexibility options will find that some job-seekers decline to apply for the organisation's posted opportunities or opt for other employers when weighing competing job offers. The severity of this cost to organisations and its potential pressure on remuneration, of course, will vary over the economic cycle.

4. *The impact of eliminating a work from home option will be particularly evident in reduced retention of and greater difficulty in recruiting women professionals. Organisations that eliminate a work from home option are therefore at risk of having fewer women in their workforce and less diversity.*

While greater flexibility is valued by all employees, regardless of age or gender, the survey evidence unambiguously shows that women value a work from home option to a greater degree than men. A greater proportion of women than men indicated that they would seek alternative employment if their employer eliminated a work from home option. When considering future employment opportunities, 82% of women, compared to 66% of men, described a working from home option as either "essential" or "very important, but not essential". It is not difficult to conclude that organisations that do not offer a work from home option will likely experience higher quit rates on

the part of women and greater difficulty in hiring women. Any progress that has been made in advancing the role of women in an organisation is likely to be put at risk if a work-from-home option is eliminated.

5. *Organisations that eliminate a work from home option potentially forego increases in individual employee productivity that competing organisations with a work from home option will enjoy.*

Surveys consistently find that respondents report increased personal productivity when they work from home. They attribute this to fewer interruptions and reduced commuting time. OSPE's 2022 member survey indicated that respondents used approximately half of their reduced commuting time to their employer's benefit. The same survey found that 54% of respondents reported increased personal productivity, while 34% reported no change. In that same survey, 37% of engineering supervisors reported increased productivity among those they supervised, and a further 44% reported no change – a lower, but still significant indicator of the impact of working from home on individual productivity.

The research literature identifies five factors that are the principal contributors to engineering productivity, four of which are relevant to this discussion: job satisfaction, hours worked, communications and collaboration, and efficiency. The survey evidence indicates clearly that a work from home option increases job satisfaction. There is also, as noted, evidence that professional employees allocate a portion of their avoided commuting time to their work, thereby increasing hours worked. Finally, surveys confirm that professional employees are interrupted less frequently when working from home, thereby increasing their ability to concentrate. This is an increase in efficiency. Communication and collaboration can, however, be diminished. On balance three of the four factors that contribute to engineering productivity are enhanced. Potential reductions in communication and collaboration frequency are partially offset by software solutions, but, in any event, are not a significant cost when engineers work from home only two days per week. It should also be borne in mind that, while communication and collaboration are important, a large amount of engineering work is carried out autonomously.

Overall, therefore, the balance of evidence indicates that a work from home option increases individual productivity of professional engineers. Organisations that do not allow a work from home option implicitly forego this potential source of increased engineering productivity.

6. *Organisations that opt for complete flexibility, allowing employees to work from home as many days as they wish, risk a loss of organisational productivity owing to reduced communication and collaboration.*

Survey evidence confirms that the frequency, and sometimes the quality, of interaction with colleagues and team members can be diminished when that communication is mediated by technology. This technology, while valuable, is not a perfect substitute for in-person communication. Research findings indicate that the cost of reduced communications and collaboration is modest when employees work from home one or two days per week but becomes more significant when the number of at-home days increases to four or five. The evidence is ambiguous for three days. There are undoubtedly some functions in an organisation that do not

require significant communications or collaboration. For these types of functions, connectivity technology may be sufficient. There may be no cost to full flexibility. However, it is unlikely that these conditions apply to most professional functions. There will also be a loss of mentorship opportunities which are discussed above. As a practical matter, therefore, there is a limit to the flexibility that an organisation can offer. For this reason, the hybrid model is an alternative to both the "no flexibility" and the "full flexibility" models and will likely be optimal in many cases.

■

Appendix

Demographics – Appendix

Appendix 1: Demographics - Gender

Gender Response	Raw Gender %	Adjusted Gender %
Man	67%	70%
Woman	29%	30%
Prefer not to say	3%	
Other	1%	

Appendix 2: Demographics - Age

Age Group	Raw Age %	Adjusted Age %
24 or Younger	2%	
25 to 34	23%	
34 or Younger		25%
35 to 44	27%	27%
45 to 54	20%	20%
55 to 64	21%	21%
65 or older	7%	7%

Appendix 3: Demographics - Industry

Industry	Raw Industry %	Adjusted Industry %
Consulting	33%	33%
Manufacturing	19%	19%
Other	15%	18%
Utilities	8%	8%
Transportation	7%	7%
Public Administration	6%	6%
Telecom or IT Services	4%	4%
Education	3%	3%
Resources	2%	2%
Real Estate, Property Management	2%	
Health Care, Social Services	1%	
Finance or Insurance	1%	
Wholesale or Retail Trade	0%	

Role	Percentage of Respondents (Multiple Responses Permitted)
Technical design, feasibility analysis, evaluation	35%
Project management	25%
Senior/Executive Management	16%
Process or system support or management	7%
Other	7%
Contract administration	5%
Regulatory administration	3%
Procurement	2%

Working from home – Appendix

Overview - Appendix

Appendix 5: Average Days Worked from Home

Work from home Days per Week	Respondent %
0 days	30%
1 day	8%
2 days	21%
3 days	15%
4 days	8%
5 days	18%

Appendix 6: Average & Median Work from home Days by Industry

Industry	Median WfH	Average WfH
Consulting	2	2.2
Education	2	1.6
Manufacturing	1	1.7
Other	2	2.3
Public Administration	2	2.2
Resources	2	2.2
Telecom or IT Services	3	3.3
Transportation	2	2.2
Utilities	2	2.3

Appendix 7: Average & Median Work from home Days by Role

Role	Median WfH	Average WfH
Technical design, feasibility analysis, evaluation	2	2.2
Contract administration	2	2.4
Project management	2	2.0
Other	2	2.1
Senior/executive management	2	2.3
Process or system support or management	2	2.4
Procurement	1	1.4
Regulatory administration	2	2.2

Appendix 8: Work from home Distribution by Industry

Industry	0 days	1 day	2 days	3 days	4 days	5 days
Consulting	32.7%	8.1%	17.2%	13.5%	9.8%	18.9%
Education	33.3%	14.3%	19.0%	23.8%	9.5%	0.0%
Manufacturing	46.3%	9.9%	11.1%	9.3%	7.4%	16.0%
Other	27.7%	8.4%	20.6%	14.2%	8.4%	20.6%
Public Administration	11.1%	9.3%	48.1%	18.5%	3.7%	9.3%
Resources	22.2%	22.2%	22.2%	5.6%	0.0%	27.8%
Telecom or IT Services	10.8%	5.4%	16.2%	18.9%	5.4%	43.2%
Transportation	24.1%	3.7%	31.5%	20.4%	13.0%	7.4%
Utilities	18.5%	3.1%	33.8%	30.8%	4.6%	9.2%

Appendix 9: Work from home Distribution by Role

Role	0 days	1 day	2 days	3 days	4 days	5 days
Contract administration	31.3%	7.5%	17.9%	14.9%	11.9%	16.4%
Other	28.7%	6.4%	18.1%	14.9%	8.5%	23.4%
Process/system support or management	40.2%	5.2%	17.5%	11.3%	7.2%	18.6%
Procurement	34.5%	3.4%	24.1%	13.8%	6.9%	17.2%
Project management	24.6%	9.7%	21.2%	17.4%	10.3%	16.8%
Regulatory administration	21.1%	7.9%	26.3%	18.4%	7.9%	18.4%
Senior/executive management	45.8%	14.1%	15.6%	11.5%	3.6%	9.4%
Technical design, feasibility analysis, evaluation	29.2%	8.2%	21.6%	14.9%	8.5%	17.6%

Working from home and Satisfaction - Appendix

Appendix 10: WfH Days and Policy Satisfaction

Satisfaction with employer WfH?	Average WfH	Median WfH
Dissatisfied	1.3	0
Very Satisfied	2.8	3
Somewhat Satisfied	2.2	2
Somewhat Dissatisfied	1.5	2
Neither Satisfied nor Dissatisfied	1.5	1

Appendix 11: Average WfH Policy Satisfaction (Gender, Days WfH)

Days WfH	Men - Satisfaction	Women - Satisfaction
0 days	0.3	-0.4
1 day	0.9	0.6
2 days	0.6	0.6
3 days	1.2	1.0
4 days	1.0	1.5
5 days	1.3	1.6

*Note: -2 = "Dissatisfied", 2 = "Very Satisfied"

Appendix 12: Average WfH Policy Satisfaction (Caring Status, Days WfH)

Days WfH	Fathers – Satisfaction	Mothers – Satisfaction	Men – Elder Care – Satisfaction	Women – Elder Care - Satisfaction
0 days	0.2	0.0	0.0	-0.1
1 day	0.9	0.9	1.9	1.7
2 days	0.6	0.2	0.2	-0.5
3 days	1.3	1.1	1.1	0.8
4 days	0.9	1.4	0.8	1.5
5 days	1.0	1.6	0.3	1.9

*Note: -2 = "Dissatisfied", 2 = "Very Satisfied"

Appendix 13: Average WfH Policy Satisfaction (Age, Days WfH)

Days WfH	34 or younger - Satisfaction	35 to 44 - Satisfaction	45 to 54 - Satisfaction	55 to 64 - Satisfaction	65 or older - Satisfaction
0 days	-0.5	-0.2	0.5	0.6	0.8
1 day	0.7	0.6	1.1	1.0	1.7
2 days	0.4	0.6	0.4	0.7	1.1
3 days	1.1	1.1	1.1	1.4	0.6
4 days	1.5	0.9	0.8	1.0	1.0
5 days	1.3	1.3	1.3	1.4	1.6

Appendix 14: Average WfH Policy Satisfaction (Industry, Gender, Days WfH)

Industry	Men - Satisfaction	Women - Satisfaction
Consulting	0.9	0.7
Education	-0.1	1.0
Manufacturing	0.6	0.4
Other	0.8	0.7
Public Administration	0.0	0.0
Resources	0.8	-0.3
Telecom or IT Services	0.8	1.5
Transportation	0.3	0.8
Utilities	1.0	0.4

*Note: -2 = "Dissatisfied", 2 = "Very Satisfied"

Appendix 15: % Employer Change by Days WfH

Days WfH	No - Employer Change	Yes - Employer Change
0 days	56%	44%
1 day	63%	37%
2 days	66%	34%
3 days	71%	29%
4 days	64%	36%
5 days	69%	31%

Appendix 16: Importance of WfH for Future Job

Importance of WfH for Future Job	Respondent %
Not important	16%
Somewhat important	14%
Very Important, but not essential	28%
Essential	42%

Appendix 17: Importance of WfH to Future Job (Gender)

Importance of WfH for Future Job	Men	Women
Not important	19%	6%
Somewhat important	15%	12%

Very Important, but not essential	28%	29%
Essential	38%	53%

Advantages and Disadvantages – Appendix

Advantages – Appendix

Appendix 18: Importance of WfH Advantages (Gender)

Gender	Commuting	Productivity	Work-Life Balance	Cost Saving	Other
Men	0.6	0.3	0.6	0.3	0.2
Women	0.7	0.5	0.8	0.4	0.5

*Note: -1 = "Not Important", 1 = "Very Important"

Appendix 19: Importance of WfH Advantages (Age)

Age	Commuting	Productivity	Work-Life Balance	Cost Saving	Other
34 or younger	0.8	0.5	0.7	0.5	0.2
35 to 44	0.7	0.5	0.8	0.3	0.3
45 to 54	0.6	0.4	0.6	0.3	0.4
55 to 64	0.5	0.2	0.5	0.1	0.1
65 or older	0.5	0.0	0.3	0.2	0.0

*Note: -1 = "Not Important", 1 = "Very Important"

Appendix 20: Importance of WfH Advantages (Caring Status)

Caring Status	Commuting	Productivity	Work-Life Balance	Cost Saving	Other
Fathers	0.6	0.4	0.7	0.4	0.2
Mothers	0.7	0.5	0.9	0.3	0.6
Non-Carer	0.6	0.3	0.5	0.3	0.2
Men with Elder Care	0.7	0.4	0.6	0.4	0.1
Women with Elder Care	0.6	0.7	0.8	0.4	0.6

*Note: -1 = "Not Important", 1 = "Very Important"

Appendix 21: Importance of WfH Advantages (Industry)

Industry	Commuting	Productivity	Work-Life Balance	Cost Saving	Other
Consulting	0.6	0.3	0.6	0.2	0.2
Education	0.7	0.2	0.7	0.2	0.0
Manufacturing	0.5	0.4	0.6	0.4	0.4
Other	0.7	0.5	0.7	0.3	0.3
Public Administration	0.7	0.6	0.7	0.1	0.3

Resources	0.1	0.1	0.3	-0.3	-0.4
Telecom or IT Services	0.7	0.6	0.7	0.6	0.3
Transportation	0.7	0.4	0.6	0.4	0.4
Utilities	0.8	0.6	0.8	0.5	0.3

*Note: -1 = "Not Important", 1 = "Very Important"

Appendix 22: Importance of WfH Advantages (WfH Frequency)

Days WfH	Commuting	Productivity	Work-Life Balance	Cost saving	Other
0 days	0.3	0.0	0.3	0.0	-0.1
1 day	0.5	0.2	0.5	0.0	-0.3
2 days	0.8	0.5	0.8	0.4	0.4
3 days	0.8	0.6	0.8	0.4	0.5
4 days	0.9	0.6	0.8	0.6	0.7
5 days	0.8	0.7	0.8	0.6	0.3

*Note: -1 = "Not Important", 1 = "Very Important"

Disadvantages – Appendix

Appendix 23: Importance of WfH Disadvantages (Gender)

Gender	Loneliness	Personal Productivity	Team Productivity	Mentorship	Promotion	Environment	Work-Life Balance	Other
Men	0.2	-0.3	0.1	0.2	-0.2	-0.4	0.0	-0.4
Women	0.2	-0.4	0.0	0.0	-0.2	-0.5	0.0	-0.4

*Note: -1 = "Not Important", 1 = "Very Important"

Appendix 24: Importance of WfH Disadvantages (Age)

Age	Loneliness	Personal Productivity	Team Productivity	Mentorship	Promotion	Environment	Work-Life Balance	Other	Loneliness
34 or younger	-0.2	0.1	-0.4	0.0	0.1	-0.1	-0.4	0.0	-0.7
35 to 44	-0.2	0.2	-0.3	0.0	0.1	-0.3	-0.5	-0.1	-0.4
45 to 54	-0.1	0.2	-0.2	0.1	0.2	-0.1	-0.4	-0.1	-0.2
55 to 64	0.0	0.3	-0.2	0.2	0.2	-0.2	-0.4	0.1	0.0

| 65 or older | -0.2 | 0.3 | -0.2 | 0.1 | 0.2 | -0.5 | -0.5 | -0.2 | -0.7 |

*Note: -1 = "Not Important", 1 = "Very Important"

Appendix 25: Importance of WfH Disadvantages (Caring Status)

Caring Status	Average	Loneliness	Personal Productivity	Team Productivity	Mentorship	Promotion	Environment	Work-Life Balance	Other
Fathers	-0.1	0.2	-0.3	0.1	0.2	-0.2	-0.4	0.0	-0.5
Mothers	-0.1	0.1	-0.5	-0.1	0.0	-0.2	-0.5	-0.1	0.2
Non-Carer	-0.1	0.2	-0.3	0.1	0.2	-0.2	-0.4	0.0	-0.5
Men with Elder Care	0.0	0.3	-0.3	0.2	0.2	-0.1	-0.4	0.1	-0.1
Women with Elder Care	-0.1	-0.1	-0.4	-0.1	-0.1	0.0	-0.3	0.1	-0.3

*Note: -1 = "Not Important", 1 = "Very Important"

Appendix 26: Importance of WfH Disadvantages (Industry)

Industry	Average	Loneliness	Personal Productivity	Team Productivity	Mentorship	Promotion	Environment	Work-Life Balance	Other
Consulting	0.0	0.3	-0.1	0.2	0.3	-0.1	-0.4	0.1	-0.3
Education	0.0	0.4	-0.2	0.2	0.2	-0.2	-0.2	0.0	0.0
Manufacturing	-0.1	0.2	-0.2	0.2	0.1	-0.1	-0.4	-0.1	-0.6
Other	-0.1	0.2	-0.3	0.0	0.1	-0.2	-0.4	0.0	-0.5
Public Administration	-0.2	0.3	-0.5	0.0	0.0	-0.4	-0.5	-0.1	-0.7
Resources	-0.1	0.6	-0.3	0.3	-0.1	-0.2	-0.8	-0.1	-0.6
Telecom or IT Services	-0.2	0.1	-0.5	-0.2	0.0	-0.2	-0.6	0.1	-0.3
Transportation	-0.1	0.0	-0.5	0.0	0.1	-0.3	-0.5	-0.1	0.3
Utilities	-0.3	0.0	-0.6	-0.1	0.1	-0.4	-0.6	-0.3	-0.5

*Note: -1 = "Not Important", 1 = "Very Important"

Appendix 27: Importance of WfH Disadvantages (WfH Frequency)

Days WfH	Average	Loneliness	Personal Productivity	Team Productivity	Mentorship	Promotion	Environment	Work-Life Balance	Other
0 days	0.2	0.5	0.1	0.4	0.4	0.0	-0.2	0.2	-0.1
1 day	0.1	0.6	0.0	0.5	0.5	-0.1	-0.3	0.0	-0.4
2 days	-0.3	0.1	-0.5	-0.1	0.0	-0.3	-0.6	-0.1	-0.9
3 days	-0.3	0.0	-0.6	-0.2	0.0	-0.4	-0.6	-0.1	-0.4
4 days	-0.4	-0.1	-0.5	-0.3	0.1	-0.3	-0.7	-0.3	-0.9
5 days	-0.3	0.0	-0.6	-0.3	-0.2	-0.4	-0.5	-0.1	-0.3

*Note: -1 = "Not Important", 1 = "Very Important"

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