



THE IMPACT OF
WORKING-FROM-HOME
ON ENGINEERING
PROFESSIONALS AND
ENGINEERING WORK
– SURVEY SUMMARY



ONTARIO
SOCIETY OF
PROFESSIONAL
ENGINEERS

PROJECT

New Barriers in Engineering and Technology Jobs:
The Uneven Impact of Working-at-Home on Recent Graduates,
Women, and Newcomers

Prepared by :
Prism Economics
and Analysis

Published on :
March 2022

www.ospe.on.ca



“New Barriers in Engineering and Technology Jobs: The Uneven Impact of Working-at-Home on Recent Graduates, Women, and Newcomers” project is funded by the Government of Canada’s Future Skills Centre.

“Nouvelles barrières d’accès aux emplois en ingénierie et en technologie: les répercussions inégales du travail à domicile” est financé par le Centre des Compétences futures du gouvernement du Canada.



Research by



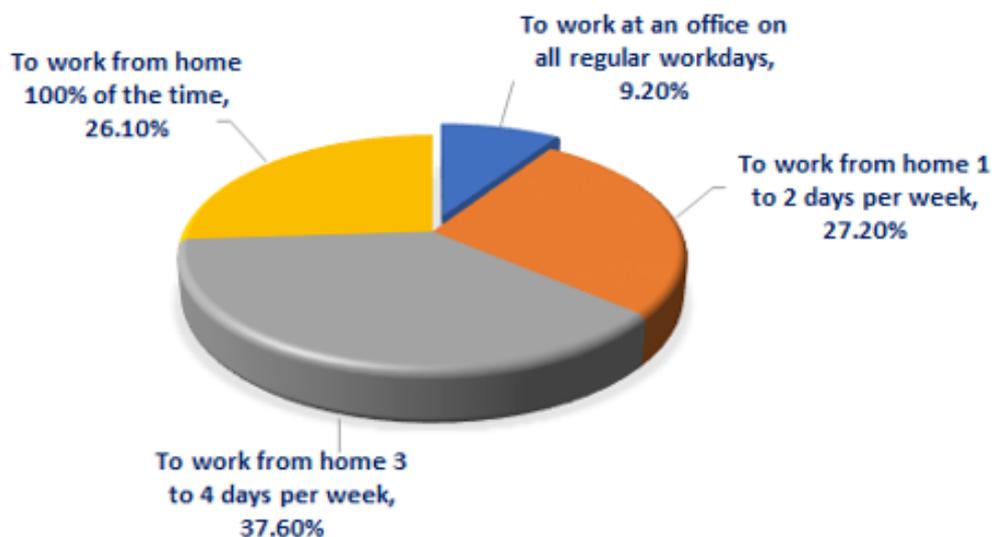
EXECUTIVE SUMMARY

This report summarizes a survey, conducted between October and December 2022, on the impact of working-from-home on engineering professionals and engineering work. The survey was sponsored by the Ontario Society of Professional Engineers (OSPE) through funding from the Future Skills Centre.

There were 1,243 valid responses to the survey. In addition to describing broad trends, the report also focuses on the experience of women, parents (especially mothers), those who immigrated to Canada within the last five years (“newcomers”), and those who are 35 years of age or younger (“early career engineers”).

Prior to COVID-19, 25.8% of respondents worked from home at least part of the time. During the pandemic this proportion rose to 97.0%. The experience of working-from-home has had a significant impact on the preferences of engineering professionals. Regardless of age, gender, or immigration status, two-thirds of engineering professionals want to continue-working-from home three days or more. Only 9.2% of survey participants prefer to return to the office full-time.

WHEN PUBLIC HEALTH AUTHORITIES STATE THAT IT IS SAFE TO RETURN TO WORK IN AN OFFICE ENVIRONMENT, WOULD YOUR PREFERENCE BE:



Around two-thirds of those that want at least a partial work-from-home option also report that whether they remain with their current employer will depend on their employer implementing that hybrid model. The survey results indicate that companies and organizations that opt for a complete return to the office risk a spike in engineering staff turnover.

A large majority (87.6%) of survey participants do not believe that working-from-home has an adverse impact on their productivity. Indeed, a majority (54.0%) report that their productivity increased.

	How would you assess your productivity while working-from-home?								
	Total Sample	Women	Men	Age: < 35	Age: 35-54	Age: 55+	New-comer	Long Term Immigrant	Born in Canada
Decreased	12.4%	12.5%	12.2%	14.8%	11.4%	11.0%	7.3%	9.8%	14.4%
No Change	33.6%	30.2%	35.4%	31.3%	32.0%	38.3%	19.5%	31.0%	35.8%
Increased	54.0%	57.4%	52.5%	53.9%	56.6%	50.6%	73.2%	59.3%	49.9%

The survey supports the view that shifting to at least a partial working-from-home policy holds out the potential to increase the productivity of engineering professionals, if carried out appropriately. However, the magnitude of this productivity gain is unclear. Although supervisors are more likely than not to report a productivity gain, they are somewhat less likely to report this gain than non-supervisors.

A majority of survey respondents do not believe that working-from-home has an adverse impact on the quality of their interaction with managers or co-workers. Most would not miss the reduced opportunity to socialize with co-workers.

	Working-from-home reduces the quality of interaction with my colleagues.	I would miss the reduced opportunity to socialize with my co-workers.	Working-from-home reduces the quality of interactions with my managers.
Disagree	24.0%	27.5%	37.4%
Neutral	39.3%	35.7%	36.6%
Agree	36.7%	36.8%	26.1%

It is notable, however, that between 24.0% and 37.4% of survey participants do not share these positive views about working-from-home. It is also notable that among early career professionals (aged 35 or younger) nearly one in seven report that their productivity decreased. These findings pose a challenge for companies and organizations that implement a work-from-home option. New work organization models will require new human resource management strategies.

A majority of survey respondents work more hours per day when working-from-home. For women who are also mothers, the proportion reporting that they work more hours per day when working-from-home is 75.2%. For mid-career engineers (age 35 to 54), the proportion is 64.5%. It is open to question whether this is sustainable. The apparent trend towards more working hours may also affect salary expectations.

The potential to work remotely will alter the engineering labour market. A large majority of engineering professionals (71.0%) are willing to work for a company or organization in another city which would involve 100% of their work being carried out remotely. It is only a matter of time before companies and organizations that hire engineering professionals, experiment with this option. This has implications for engineering professionals, their employers, and their regulatory bodies.

While a majority (57.1%) would not accept a pay reduction to have at least a partial work-from-home option roughly one engineering professional in six (16.7%) would consider a pay reduction. The proportion increases for women (20.7%) and especially for women who are mothers (24.3%). Additionally, the possibility to recruit workers in other cities to work remotely holds out the potential to do this recruiting in regions where remuneration standards are lower.



INTRODUCTION

This report draws on survey evidence to explore how the widespread adoption of working-from-home affected engineers and engineering work in Ontario. Particular emphasis is put on the experience of women, parents (especially mothers), those who immigrated to Canada within the last five years (“newcomers”), and those who are 35 years of age or younger (“early career engineers”).

The Ontario Society of Professional Engineers (OSPE) distributed a web-based survey to its members between October and December 2022. A total of 1,244 responses were gathered, of which 1,243 were deemed valid. Of the valid responses, 1,202 survey participants reported that they worked from home some or all of the time during the COVID-19 pandemic. The primary focus of this report is on the experience of these 1,202 respondents.

The report focuses on:

- The experience of working-from-home
- The degree of preference for continuing to work-from-home
- The effects of working-from-home on productivity and hours worked
- The impact of working-from-home on engineering teams
- The perceived effects of working-from-home, or wanting to work-from-home, on engineering careers
- The impact of a permanent shift to more working-from-home on the engineering labour market

Figure 1 summarizes the age and gender distribution of the survey sample and compares this distribution to the 2016 Census. It will be seen that women are somewhat over-represented in the survey sample compared to the 2016 Census and that the age distribution of the sample is approximately comparable to the Census.

Figure 1
Survey Sample: Gender, Age and Parental Status of Sample

Survey Variable	Survey Count	Survey Percentage	2016 Census
Gender			
Male	889	72.3%	86.4%
Female	312	25.4%	13.7%
Other	3	0.2%	N/A
Prefer not to answer	25	2.0%	N/A
Age			
Under 25	18	1.5%	4.0%
25 to 34	347	28.1%	22.6%
35 to 44	268	21.7%	22.8%
45 to 54	247	20.0%	26.7%
55 to 64	241	19.5%	17.6%
65+	97	7.9%	6.4%
Prefer not to answer	17	1.4%	N/A

Figure 2 summarizes the immigration status of the survey participants and where and when they learned English.

Figure 2
Survey Sample:
Parent Guardian Status, Immigration Status and English Language Proficiency

Survey Variable	Survey Count	Survey Percentage
Parent/Guardian to a Minor		
Yes	446	36.1%
No	764	61.9%
Prefer not to answer	25	2.0%
Immigration Status		
Born in Canada	774	62.6%
Immigrated 5+ Years Ago	395	32.0%
Immigrated <5 Years Ago ("Newcomers")	44	3.6%
Prefer not to answer	23	1.9%
When English Language Proficiency Acquired		
Learned Growing Up	887	71.7%
Studied	251	20.3%
Learned in School	34	2.8%
Learned as Adult	52	4.2%
Prefer not to answer	14	1.1%

Figure 3 summarizes the educational qualifications of the respondents and whether they obtained their university qualifications in or outside of Canada. The sample over-represents persons with a bachelor’s degree and under-represents persons who obtained their degree outside of Canada.

Figure 3
Survey Sample: Education

Survey Variable	Survey Count	Survey Percentage	2016 Census
Highest Educational Qualification			
Bachelor's Degree in Engineering	814	65.8%	50.1%
Other Bachelor's or Post Graduate Degree	58	4.7%	
Post-Graduate Degree in Engineering	349	28.2%	29.6%
Other Post Graduate Degree			
College Diploma (3 years)	7	0.6%	13.3%
Other College Diploma or Certificate	0	0.00%	7.0%
Other Qualification	8	0.7%	
Prefer not to answer	2	0.2%	N/A
Where did you obtain your highest educational qualification?			
In Canada	1015	82.2%	49.9%
Outside of Canada	217	17.6%	50.1%
Prefer not to answer	3	0.2%	N/A

Parents/guardians of children (age 18 or under) are 36.1% of the sample. Persons born in Canada are overrepresented in the sample: 62.6% vs. 47.0% in the Census. The percentage of newcomers in the survey sample is comparable to their share in the Census.

Figure 4 shows the distribution of the survey sample by industry, primary focus of job, and work organization. As can be seen, consulting is the largest industry in the sample (32.8%), followed by government (14.7%), and manufacturing (16.6%). Government is over-represented in the sample, while manufacturing is under-represented.

Respondents whose primary job focus is “Design” are the largest group in the sample (38.9%), followed by “Planning and Analysis” (20.0%). Work organized on the basis of “Teams” predominates (61.2%), although ‘teams’ is an elastic term which may connote different types of work organization.

Figure 4
Survey Sample:
Industry, Primary Focus of Job, and Type of Work Organization

Survey Variable	Survey Count	Survey Percentage	2016 Census
Industry			
Government	182	14.7%	6.9%
Consulting	407	32.8%	37.4%
Construction	85	6.9%	5.7%
Manufacturing	206	16.6%	26.3%
Resources	24	1.9%	1.5%
Transportation	48	3.9%	2.1%
Communications	45	3.6%	4.0%
Utilities	93	7.5%	4.8%
Other	138	11.1%	11.6%
Prefer not to answer	12	1.0%	N/A
Primary Focus of Job			
Design	482	38.9%	N/A
Planning or analysis	247	20.0%	N/A
Regulatory administration	79	6.4%	N/A
Production or process management	109	8.8%	N/A
Contract management	99	8.0%	N/A
Other	211	17.0%	N/A
Prefer not to answer	11	0.9%	N/A
Type of Work Organization			
Part of a Team	759	61.2%	N/A
On My Own	283	22.8%	N/A
Perform Tasks as Directed	90	7.3%	N/A
Other Type of Work Organization	93	7.5%	N/A
Prefer not to answer	15	1.2%	N/A

Part I of this report focuses on those who worked from home prior to and during the COVID-19 pandemic and their experience of working-from-home.

Part II focuses on the impact of working-from-home on productivity, hours of work, and the quality of engineering work. Part II also reports how survey participants interpret the impact of working-from-home on their professional career prospects.

Part III examines the impact of working-from-home on the engineering labour market, especially participants' preferences in job arrangements and their openness to working remotely in jobs located in another city.

Part IV summarizes the key findings.

PART I:

THE EXPERIENCE OF WORKING-FROM-HOME

Incidence of Working-From-Home

KEY TAKE AWAYS:

- 25.8% of respondents worked from home prior to COVID-19.
- 97.0% of respondents worked from home during COVID-19.
- Early career engineers and newcomers are somewhat less likely to have worked from home “all of the time”.
- Prior to COVID-19, engineering professionals who are also mothers were less likely to have worked from home even part of the week. This pattern was reversed by COVID-19 when women who are mothers were more likely to work from-home “all of the time”.

Prior to COVID-19, 25.8% of respondents reported that they worked from home one day or more. Figure 5 shows that, prior to COVID-19:

- Men were more likely to report working-from-home than women (27.3% vs 20.3%);
- Engineers aged 55 or over were more likely to have worked from home than early career professionals (36.0% vs 17.9%); and
- The experiences of immigrants and newcomers were no different from the survey average.

Error! Reference source not found. 5

Prior to the COVID-19 pandemic, did you work-from-home at least one regular workday per week?

	Total Sample	Women	Men	Age: < 35	Age: 35-54	Age: 55+	New-comer	Long Term Immigrant	Born in Canada
No	74.2%	79.7%	72.7%	82.1%	75.6%	64.0%	75.0%	75.4%	73.7%
Yes	25.8%	20.3%	27.3%	17.9%	24.4%	36.0%	25.0%	24.6%	26.3%

Figure 6 shows that mothers were less likely to have worked from home prior to COVID-19 than the overall survey sample: 19.6% vs 25.8%.

Figure 6

Prior to the COVID-19 pandemic, did you work-from-home at least one regular workday per week?

	Total Sample	Non-Parents/Non-Guardians	Mothers/Female Guardians	Fathers/Male Guardians
No	74.2%	75.1%	80.4%	69.8%
Yes	25.8%	24.9%	19.6%	30.2%

Prior to COVID-19, working-from-home was more common in the Communications, Resources and Construction industries, but less common in Manufacturing, Government, and Utilities. (Figure 7).

Figure 7
During the COVID-19 pandemic, did you work-from-home?

	No	Yes
Total Sample	74.2%	25.8%
Communications	62.2%	37.8%
Construction	69.4%	30.6%
Consulting	71.1%	28.9%
Government	81.1%	18.9%
Manufacturing	79.1%	20.9%
Resources	65.2%	34.8%
Transportation	72.9%	27.1%
Utilities	82.8%	17.2%
Other	70.6%	29.4%

Public health measures taken to contain COVID-19 led to significant changes in the incidence of working-from-home regardless of gender, age group, or industry.

Figure 8 shows that, following the onset of the pandemic, 72.7% of the survey participants worked from home “all of the time” and that a further 24.3% worked from home “some of the time”. There are no significant differences based on gender. It is notable that early career engineers are more likely to work-from-home only “some of the time” (30.1%) compared to engineers aged 55 or over (22.5%). Newcomers are also somewhat more

Figure 8
During the COVID-19 pandemic, did you work-from-home:

	Total Sample	Women	Men	Age: < 35	Age: 35-54	Age: 55+	New-comer	Long Term Immigrant	Born in Canada
None of the time	3.0%	1.9%	3.5%	3.8%	2.1%	3.3%	6.8%	3.5%	2.6%
Some of the time	24.3%	22.5%	25.4%	30.1%	21.8%	22.5%	31.8%	21.3%	25.9%
All of the time	72.7%	75.6%	71.1%	66.0%	76.1%	74.3%	61.4%	75.2%	71.5%

Figure 9 shows that during COVID-19, engineering professionals who are also mothers were more likely to work-from-home “all of the time” (83.3%) than either men who are parents or guardians (73.7%) or respondents who are not parents (70.3%). This was a significant change from the pre-COVID-19 pattern of working-from-home.

Figure 9
During the COVID-19 pandemic, did you work-from-home:

	Total Sample	Non-Parents/Non-Guardians	Mothers/Female Guardians	Fathers/Male Guardians
None of the	3.0%	3.3%	2.8%	2.4%
Some of the	24.3%	26.5%	13.9%	23.9%
All of the time	72.7%	70.3%	83.3%	73.7%

The incidence of working-from-home “all of the time” was somewhat different across industries (Figure 10). While all industries reported a high incidence of working-from-home, Construction, Manufacturing, and Resources appear to be more likely to operate under a hybrid model with many engineering professionals working-from-home only “some of the time”. By contrast, Communications, Government, and Consulting are more likely to have shifted to working-from-home “all of the time”.

Figure 10
During the COVID-19 pandemic, did you work-from-home?

	“None of the time”	“Some of the time”	“All of the time”
Total Sample	3.0%	24.3%	72.7%
Communications	4.4%	11.1%	84.4%
Construction	4.7%	43.5%	51.8%
Consulting	1.5%	17.7%	80.8%
Government	1.1%	16.5%	82.4%
Manufacturing	5.4%	41.0%	53.7%
Resources	4.2%	29.2%	66.7%
Transportation	2.1%	22.9%	75.0%
Utilities	1.1%	28.0%	71.0%
Other	5.8%	19.6%	74.6%

The incidence of working-from-home will evolve further as public health restrictions and advisories are lifted. The next section reports how engineering professionals feel about future working-from-home options.

Views on Working-from-home

KEY TAKE AWAYS:

- 63.6% of engineers prefer to work the majority of their days from home after COVID-19 restrictions are lifted.
- Newcomers are most likely to prefer working all days from home (31.7%).
- Only 9.2% of engineering professionals want to return to the office full-time.
- Non-parents are somewhat more likely than parents to prefer working-from-home full-time.

Respondents have a strongly positive view of working-from-home (Figure 11). When COVID-19 restrictions are lifted, almost two-thirds (63.2%) would prefer to work-from-home a majority of days. Only 9.2% would prefer to work at their office on all regular workdays. There are no significant differences in preferences based on gender, age, or immigration status, although newcomers appear to prefer working at an office on all regular workdays the least (4.9%). Respondents who are age 55 or over prefer this option the most (10.9%), although those preferring a full return to the office are a small minority even within this age group.

Figure 11
When public health authorities state that it is safe to return to work in an office environment, would your preference be:

	Total Sample	Women	Men	Age: < 35	Age: 35-54	Age: 55+	New-comer	Long Term Immigrant	Born in Canada
To work at an office on all regular workdays	9.2%	8.3%	9.9%	6.9%	10.0%	10.9%	4.9%	7.4%	10.7%
To work-from-home 1 to 2 days per week	27.2%	29.4%	26.2%	30.6%	25.1%	26.8%	19.5%	23.6%	29.6%
To work-from-home 3 to 4 days per week	37.6%	38.3%	37.6%	35.7%	41.4%	33.3%	43.9%	41.4%	35.6%
To work-from-home 100% of the time	26.1%	24.1%	26.4%	26.9%	23.5%	29.0%	31.7%	27.6%	24.2%

Parents/guardians do not differ significantly in their preference for working-from-home compared to non-parents/non-guardians (Figure 12).

Figure 12
When public health authorities state that it is safe to return to work in an office environment, would your preference be:

	Total Sample	Non-Parents/Non-Guardians	Mothers/Female Guardians	Fathers/Male Guardians
To work at an office on all regular workdays	9.2%	9.3%	9.6%	9.6%
To work-from-home 1 to 2 days per week	27.2%	28.3%	26.9%	24.8%
To work-from-home 3 to 4 days per week	37.6%	35.2%	41.4%	41.5%
To work-from-home 100% of the time	26.1%	27.2%	22.1%	24.2%

Figure 13 shows that 44.9% of respondents report that working-from-home reduces their work-related stress. Newcomers are the demographic group most likely to agree with this assertion (67.5%).

Figure 13
Working-from-home, at least part of the week, will reduce my experience of work-related stress:

	Total Sample	Women	Men	Age: < 35	Age: 35-54	Age: 55+	New-comer	Long Term Immigrant	Born in Canada
Disagree	22.7%	19.9%	23.8%	16.3%	24.5%	27.8%	5.0%	21.6%	24.4%
Neutral	32.4%	30.3%	33.4%	33.4%	28.6%	37.8%	27.5%	27.7%	35.0%
Agree	44.9%	49.8%	42.8%	50.3%	46.9%	34.5%	67.5%	50.7%	40.6%

Figure 14 shows that mothers are more inclined to agree that working-from-home reduces work-related stress.

Figure 14
Working-from-home, at least part of the week, will reduce my experience of work-related stress:

	Total Sample	Non-Parents/Non-Guardians	Mothers/Female Guardians	Fathers/Male Guardians
Disagree	22.7%	22.4%	21.4%	24.8%
Neutral	32.4%	33.7%	28.2%	31.7%
Agree	44.9%	44.0%	50.5%	43.5%

Hours Worked

KEY TAKE AWAYS:

- When working-from-home:
 - 56.8% of respondents report working more hours
 - 75.2% of mothers report working more hours
 - 64.5% of respondents in the age range 35 to 54 report working more hours
 - only 7.3% of respondents report working fewer hours
- Respondents working in Utilities are somewhat more likely to work more hours (62.6%) while respondents working in Resources are somewhat less likely (47.8%).
- Engineers whose primary job focus is Contract Management are among the most likely to report working more hours (66.0%).

Figure 14 shows that mothers are more inclined to agree that working-from-home reduces work-related stress.

Figure 19
In terms of hours worked, when you are/were working-from-home, as compared to a typical workday in an office, did you tend, on average, to work:

	Total Sample	Women	Men	Age: < 35	Age: 35-54	Age: 55+	New-comer	Long Term Immigrant	Born in Canada
Fewer Hours	7.3%	4.9%	8.1%	8.6%	5.6%	7.7%	9.8%	4.8%	8.4%
Same Hours	36.1%	34.1%	36.7%	41.6%	29.9%	40.6%	19.5%	31.5%	39.6%
More Hours	56.7%	61.0%	55.2%	49.9%	64.5%	51.7%	70.7%	63.8%	52.0%

It is notable that, when working-from-home:

- Only 7.3% of respondents report working fewer hours
- Close to two-thirds (65.5%) of respondents in the age group 35 to 54 report working more hours
- 63.8% of immigrants report working more hours; for respondent who were born in Canada, the comparable proportion is 52.0%

Figure 20 shows that three-quarters (75.2%) of women who are mothers work more hours while working-from-home. The comparable proportion for men who are fathers is 59.4%.

Figure 20
When you are/were working-from-home, as compared to a typical workday in an office, did you tend, on average, to work:

	Total Sample	Non-Parents/Non-Guardians	Mothers/Female Guardians	Fathers/Male Guardians
Fewer Hours	7.3%	7.5%	2.9%	8.1%
Same Hours	36.1%	39.2%	21.9%	32.5%
More Hours	56.7%	53.3%	75.2%	59.4%

The pattern of working more hours while working-from-home is comparable across industries, although somewhat higher in Utilities and somewhat lower in Resources. (Figure 21).

Figure 21
When you are/were working-from-home, as compared to a typical workday in an office, did you tend, on average, to work:

	Fewer Hours	Same Hours	More Hours
Total Sample	7.3%	36.1%	56.7%
Communications	16.3%	27.9%	55.8%
Construction	6.2%	35.8%	58.0%
Consulting	6.8%	36.3%	56.9%
Government	7.2%	33.3%	59.4%
Manufacturing	5.7%	43.0%	51.3%
Resources	13.0%	39.1%	47.8%
Transportation	8.5%	40.4%	51.1%
Utilities	3.3%	34.1%	62.6%
Other	10.0%	30.8%	59.2%

Figure 22 shows that almost two-thirds (66.0%) of respondents whose primary job focus is Contract Management work more hours when working-from-home.

Figure 22
When you are/were working-from-home, as compared to a typical workday in an office, did you tend, on average, to:

	Total Sample	Contract management	Design	Planning or analysis	Production or process management	Regulatory administration	Other
Fewer Hours	7.3%	7.2%	6.5%	5.8%	10.9%	9.2%	8.3%
Same Hours	36.1%	26.8%	36.0%	40.3%	37.6%	31.6%	36.8%
More Hours	56.7%	66.0%	57.5%	53.9%	51.5%	59.2%	54.9%

Engagement with Others

KEY TAKE AWAYS:

- 36.7% report that working-from-home negatively impacts interactions with colleagues while 24.0% report that it does not
- 36.8% of respondents report that they miss socializing with colleagues while working-from-home, while 27.5% do not
- 26.1% of respondents report that working-from-home worsens interactions with managers, while 37.4% report that it does not

Figure 23 shows that there is no consensus on how working-from-home affects interactions with colleagues, although more respondents believe that working-from-home reduces the quality of interaction (36.7%) than believe that it does not (24.0%).

Figure 23
Working-from-home reduces the quality of interaction with my colleagues:

	Total Sample	Women	Men	Age: < 35	Age: 35-54	Age: 55+	New-comer	Long Term Immigrant	Born in Canada
Disagree	24.0%	25.7%	23.6%	26.9%	23.8%	21.9%	31.7%	31.5%	18.9%
Neutral	39.3%	40.5%	38.9%	40.4%	41.3%	34.6%	36.6%	36.1%	41.2%
Agree	36.7%	33.9%	37.5%	32.7%	34.9%	43.5%	31.7%	32.4%	39.9%

Respondents who are aged 55 or over are the most likely to believe that working-from-home reduces the quality of interaction with colleagues (43.5%). Respondents under the age of 35 are the least likely (32.7%).

Figure 24 shows that more than a third of respondents report a reduction in the quality of interaction with colleagues regardless of whether they work on project teams, on their own, or perform tasks as assigned. More than half (54.4%) of respondents in “Other” type of work organization report a reduced quality of interaction.

Figure 24
Working-from-home reduces the quality of interaction with my colleagues:

	Total Sample	“Mainly part of a project team”	“Mainly on my own”	“Perform tasks as assigned”	“Other type of work organization”
Disagree	24.0%	25.2%	23.1%	25.0%	13.3%
Neutral	39.3%	39.2%	42.8%	36.3%	32.2%
Agree	36.7%	35.6%	34.2%	38.8%	54.4%

Figure 25 shows that there is no consensus on whether respondents would miss the opportunity to socialize with co-workers.

Figure 25
I would miss the reduced opportunity to socialize with my co-workers:

	Total Sample	Women	Men	Age: < 35	Age: 35-54	Age: 55+	New-comer	Long Term Immigrant	Born in Canada
Disagree	27.5%	28.9%	26.5%	31.6%	28.1%	20.7%	29.3%	28.7%	26.0%
Neutral	35.7%	35.9%	36.3%	34.2%	38.5%	33.9%	34.2%	35.2%	35.9%
Agree	36.8%	35.2%	37.2%	34.2%	33.4%	45.5%	36.6%	36.0%	38.2%

As can be seen from Figure 25:

- Overall, 36.8% of respondents would miss the opportunity to socialize with co-workers, while 27.5% would not
- Respondents who are aged 55 or over are most likely to miss the opportunity to socialize with co-workers (45.5%)

Figure 26 shows that work organization has an impact on whether respondents would miss the opportunity to socialize with colleagues. More than half (52.3%) of respondents who work in "Other" types of organizational models would miss the opportunity to socialize with co-workers.

Figure 26
I would miss the reduced opportunity to socialize with my co-workers:

	Total Sample	"Mainly part of a project team"	"Mainly on my own"	"Perform tasks as assigned"	"Other type of work organization"
Disagree	27.5%	29.3%	25.5%	28.8%	17.1%
Neutral	35.7%	34.6%	37.6%	42.5%	30.7%
Agree	36.8%	36.1%	36.9%	28.8%	52.3%

There is no consensus among respondents on whether working-from-home reduces the quality of interaction with managers (Figure 27). Approximately a quarter (26.1%) of respondents agree that working-from-home reduces the quality of their interaction with managers while 37.4% believe that working-from-home does not have this result. There are no material differences across gender or age group. Long-term immigrants appear to be somewhat less concerned that working-from-home reduces the quality of their interaction with managers (46.3%).

Figure 27
Working-from-home reduces the quality of interactions with my managers:

	Total Sample	Women	Men	Age: < 35	Age: 35-54	Age: 55+	New-comer	Long Term Immigrant	Born in Canada
Disagree	37.4%	40.1%	36.2%	37.4%	37.1%	37.2%	40.0%	46.3%	31.8%
Neutral	36.6%	38.7%	36.2%	37.6%	37.6%	34.5%	37.5%	29.9%	39.8%
Agree	26.1%	21.2%	27.7%	25.0%	25.3%	28.3%	22.5%	23.8%	28.4%

Figure 28 shows that respondents who work mainly on their own are the least concerned about working-from-home reducing the quality of interaction with their managers (22.4%) while those working in “Other” types of organizational models are the most concerned (36.1%).

Figure 28
Working-from-home reduces the quality of interactions with my managers:

	Total Sample	“Mainly part of a project team”	“Mainly on my own”	“Perform tasks as assigned”	“Other type of work organization”
Disagree	37.4%	37.3%	35.8%	40.7%	37.2%
Neutral	36.6%	36.0%	41.7%	34.6%	26.7%
Agree	26.1%	26.7%	22.4%	24.7%	36.1%

PART II:**PERCEIVED IMPACT OF WORKING-FROM-HOME
ON ENGINEERING PRODUCTIVITY AND CAREERS****Incidence of Working-From-Home****KEY TAKE AWAYS:**

- 54.0% of respondents report an increase in productivity when working-from-home; only 12.4% report a reduction in productivity.
- Supervisors are almost 13% less likely to report an increase in the productivity of the staff that report to them compared to the self reported increase in productivity of respondents who are not supervisors.
- There is no material difference in how men and women perceive changes in their productivity. Nor is there any material difference across age groups.
- Respondents who work in Transportation are the least likely to report an increase in productivity (39.1%); respondents working in Manufacturing are the most likely (60.0%).

Figure 29 shows that 54.0% of all respondents report an increase in their productivity while working-from-home. However, there is a notable difference between how non-supervisory respondents view their productivity and how supervisors view the productivity of their subordinates. As can be seen in Figure 29, 49.5% of non-supervisory respondents report an increase in their productivity while working-from-home. However, only 36.7% of supervisors report that their subordinate's productivity increased. There is also a difference in how supervisors and non-supervisors view their own productivity. As noted, 49.5% of non-supervisors report an increase in their own productivity. By contrast, 57.3% of supervisors report an increase in their productivity.

Figure 29
How would you assess your productivity while working-from-home¹?

	Total Sample	Non-Supervisors Personal Ratings n=394	Supervisor Ratings of Subordinates n=513	Supervisor Ratings of Own Productivity n=510
Decreased	12.4%	12.2%	19.5%	14.1%
No Change	33.6%	38.3%	43.8%	28.6%
Increased	54.0%	49.5%	36.7%	57.3%

¹ In this table “non-supervisors” is a sub-set of persons who report working-from-home during COVID-19. Supervisors is a sub-set of the total sample, which includes supervisors who did not work-from-home during COVID-19.

Figure 30 shows that newcomers are markedly more likely (73.2%) to report higher productivity. There are no significant differences between how men and women perceive their productivity. Nor are there any significant differences across age groups.

Figure 30
How would you assess your productivity while working-from-home?

	Total Sample	Women	Men	Age: < 35	Age: 35-54	Age: 55+	New-comer	Long Term Immigrant	Born in Canada
Decreased	12.4%	12.5%	12.2%	14.8%	11.4%	11.0%	7.3%	9.8%	14.4%
No Change	33.6%	30.2%	35.4%	31.3%	32.0%	38.3%	19.5%	31.0%	35.8%
Increased	54.0%	57.4%	52.5%	53.9%	56.6%	50.6%	73.2%	59.3%	49.9%

Figure 30 shows that newcomers are markedly more likely (73.2%) to report higher productivity. There are no significant differences between how men and women perceive their productivity. Nor are there any significant differences across age groups.

Figure 31
How would you assess your productivity while working-from-home?

	Total Sample	Non-Parents/Non-Guardians	Mothers/Female Guardians	Fathers/Male Guardians
Decreased	12.4%	12.6%	12.4%	12.5%
No Change	33.6%	34.9%	27.6%	33.1%
Increased	54.0%	52.5%	60.0%	54.4%

Perceptions of productivity change vary only modestly by industry (Figure 32). Respondents who work in Transportation are the least likely to report an increase in productivity (39.1%) while respondents working in Manufacturing are the most likely (60.0%).

Figure 32
How would you assess your productivity while working-from-home?

	Decreased	No Change	Increased
Total Sample	12.4%	33.6%	54.0%
Communications	16.3%	27.9%	55.8%
Construction	7.0%	37.2%	55.8%
Consulting	8.6%	35.8%	55.6%
Government	15.3%	35.3%	49.4%
Manufacturing	12.2%	27.8%	60.0%
Resources	10.8%	36.1%	53.1%
Transportation	13.0%	47.8%	39.1%
Utilities	14.9%	36.2%	48.9%
Other	6.5%	33.7%	59.8%

Figure 33 shows that respondents whose primary job focus is contract management are the most likely to report an increase in productivity (62.9%) whereas respondents working primarily in design are the least likely (48.8%). Respondents in production or process management are the most likely to report a decrease in productivity (16.8%).

Figure 33
How would you assess your productivity while working-from-home?

	Total Sample	Contract management	Design	Planning or analysis	Production or process management	Regulatory administration	Other
Decreased	12.4%	7.2%	12.9%	10.3%	16.8%	11.8%	14.7%
No Change	33.6%	29.9%	38.3%	32.6%	27.7%	26.3%	31.4%
Increased	54.0%	62.9%	48.8%	57.0%	55.5%	61.8%	53.9%

Figure 34 shows that respondents who describe their work organization model as “Other” are the most likely to report a decrease in productivity (20.0%). It will be recalled that these respondents are also the most likely to report that working-from-home reduces the quality of their interaction with managers (Figure 28).

Figure 34
How would you assess your productivity while working-from-home?

	Total Sample	“Mainly part of a project team”	“Mainly on my own”	“Perform tasks as assigned”	“Other type of work organization”
Decreased	12.4%	12.2%	11.8%	11.1%	20.0%
No Change	33.6%	33.1%	34.9%	40.7%	27.8%
Increased	54.0%	54.7%	53.3%	48.2%	52.2%

Productivity Change and Hours Worked

KEY TAKE AWAYS:

- Only 18.7% of respondents report an increase in productivity without also reporting working more hours.
- Of those who report an increase in productivity, almost two-thirds (65.2%) also report working more hours. Mid-career engineers (aged 35 to 54) are the most likely to report both an increase in productivity and working more hours per day (70.6%).
- To some degree, the perception of an increase productivity may reflect an increase in working time, rather than an increase in output per hour.

Figure 35 shows that of the 53.8% of respondents that report an increase in productivity, 35.2% also report working more hours. This means that approximately two-thirds of those who report an increase in productivity are also reporting that they work more hours when working-from-home. This finding suggests that, in many cases, the source of the increased productivity may actually be an increase in hours worked rather than a change in output per hour.

Figure 35
Change in Productivity vs. Hours Worked (All Respondents that Worked from Home)

	Decreased Productivity	Same Productivity	Increased Productivity	Total
Fewer Hours	3.9%	1.8%	2.0%	7.7%
Same Hours	3.9%	15.5%	16.6%	36.0%
More Hours	5.3%	15.9%	35.2%	56.4%
Total*	13.1%	33.2%	53.8%	100.1%

*Total exceeds 100.0% owing to rounding.

There are notable differences between supervisors and non-supervisors in the correlation of hours worked and productivity changes (Figure 36). Almost three quarters (73.8%) of supervisors who report an increase in productivity also report working more hours per day. This compares to 56.9% of non-supervisors.

Figure 36
Change in Productivity vs. Hours Worked (Non-supervisors vs. Supervisors)

	Non-Supervisors			Supervisors		
	Decreased Productivity	Same Productivity	Increased Productivity	Decreased Productivity	Same Productivity	Increased Productivity
Fewer Hours	29.2%	6.7%	4.6%	33.3%	4.1%	3.1%
Same Hours	37.5%	53.3%	38.5%	25.0%	37.0%	23.1%
More Hours	33.3%	40.0%	56.9%	41.7%	58.9%	73.8%

Figure 37 shows that there is no significant difference between men and women in the correlation between hours worked and productivity.

Figure 37
Change in Productivity vs. Hours Worked (Women vs. Men)

	Women			Men		
	Decreased Productivity	Same Productivity	Increased Productivity	Decreased Productivity	Same Productivity	Increased Productivity
Fewer Hours	18.4%	5.4%	1.7%	31.7%	5.3%	4.5%
Same Hours	26.3%	43.5%	30.9%	29.8%	47.2%	31.2%
More Hours	55.3%	51.1%	67.4%	38.5%	47.5%	64.4%

Mid-career engineers (aged 35 to 54) are the most likely to report both an increase in productivity and an increase in hours worked per day (70.6%)

Figure 38
Change in Productivity vs. Hours Worked (Age Groups)

	Age: 35-54		
	Decreased Productivity	Same Productivity	Increased Productivity
Fewer Hours	24.6%	4.4%	2.5%
Same Hours	29.8%	35.0%	27.0%
More Hours	45.6%	60.6%	70.6%

Figure 39
Change in Productivity vs. Hours Worked (Age Groups)

	Age: < 35			Age: 55+		
	Decreased Productivity	Same Productivity	Increased Productivity	Decreased Productivity	Same Productivity	Increased Productivity
Fewer Hours	28.9%	6.4%	4.2%	33.3%	4.0%	4.9%
Same Hours	30.8%	56.4%	36.0%	27.8%	54.0%	32.9%
More Hours	40.4%	37.3%	59.8%	38.9%	41.9%	62.2%

Figures 40 and 41 show that there is no significant difference across immigration status among those that report an increase in productivity and an increase in the number of hours worked. Newcomers are more likely to work more hours regardless of changes in productivity compared to other groups.

Figure 40
Change in Productivity vs. Hours Worked (Immigration Status)

	Newcomers			Long Term Immigrants		
	Decreased Productivity	Same Productivity	Increased Productivity	Decreased Productivity	Same Productivity	Increased Productivity
Fewer Hours	33.3%	12.5%	6.7%	24.3%	4.3%	1.8%
Same Hours	0.0%	12.5%	23.3%	16.2%	41.4%	28.4%
More Hours	66.7%	75.0%	70.0%	59.5%	54.3%	69.8%

Figure 41
Change in Productivity vs. Hours Worked (Immigration Status)

	Born in Canada		
	Decreased Productivity	Same Productivity	Increased Productivity
Fewer Hours	29.6%	5.2%	4.6%
Same Hours	33.3%	49.8%	34.2%
More Hours	37.0%	45.0%	61.2%

Perceived Impact of Working-from-home on Career Prospects

KEY TAKE AWAYS:

- 20.5% of respondents believe that working-from-home will reduce their prospects for advancement with their employer; 41.3% of respondents disagree.
- Women are somewhat more likely to believe that working-from-home will have no negative effect on their advancement prospects (49.0% vs 41.3%)
- Respondents working in Resources are more likely than other respondents to fear that working-from-home will harm their advancement prospects (36.4%) as are respondents whose primary job focus is production or process management.

Figure 42 shows that approximately a fifth (20.5%) of survey respondents believe that working-from-home will reduce their prospects for advancement with their current employer, while twice as many (41.3%) believe that working-from-home will have no impact on their advancement prospects. Women are more likely to believe that working-from-home will have no effect on their advancement than men (49.0% vs 38.4%). Respondents who are aged 55 or older are somewhat more likely to believe that working-from-home will harm their advancement prospects than are early career professionals (24.5% vs 16.8%).

Figure 42
There is a serious risk that working-from-home will reduce my prospects for advancement with my employer:

	Total Sample	Women	Men	Age: < 35	Age: 35-54	Age: 55+	New-comer	Long Term Immigrant	Born in Canada
Disagree	41.3%	49.0%	38.4%	45.5%	39.1%	39.9%	45.5%	48.1%	37.2%
Neutral	38.2%	33.7%	40.1%	37.7%	40.0%	35.7%	36.4%	32.3%	41.4%
Agree	20.5%	17.3%	21.6%	16.8%	20.9%	24.5%	18.2%	19.6%	21.4%

Figure 43 shows that 36.4% of respondents working in Resources believe that working-from-home will reduce their advancement prospects. In all other industries, the proportion believing that working-from-home negatively affects their advancement prospects ranges from 17.4% to 25.6%.

Figure 43
There is a serious risk that working-from-home will reduce my prospects for advancement with my employer:

	Disagree	Neutral	Agree
Total Sample	41.3%	38.2%	20.5%
Communications	27.9%	46.5%	25.6%
Construction	46.2%	30.8%	23.1%
Consulting	41.8%	37.9%	20.4%
Government	48.5%	33.7%	17.8%
Manufacturing	32.6%	42.6%	24.7%
Resources	27.3%	36.4%	36.4%
Transportation	39.1%	43.5%	17.4%
Utilities	45.1%	39.6%	15.4%
Other	44.8%	38.4%	16.8%

Figure 44 shows that respondents whose primary job focus is planning or analysis are the least likely to believe that working-from-home will adversely affect their advancement prospects (15.3%) while respondents whose primary jobs focus is production or process management are the most likely to have this concern (27.9%).

Figure 44
There is a serious risk that working-from-home will reduce my prospects for advancement with my employer:

	Total Sample	Contract management	Design	Planning or analysis	Production or process management	Regulatory administration	Other
Disagree	41.3%	44.7%	40.4%	41.1%	32.7%	44.4%	45.3%
Neutral	38.2%	31.9%	37.8%	43.6%	39.4%	31.9%	36.8%
Agree	20.5%	23.4%	21.8%	15.3%	27.9%	23.6%	17.9%

There is no significant difference between supervisors, non-supervisors, and the general sample over how they believe working-from-home will affect their prospects for advancement (Figure 45).

Figure 45
There is a serious risk that working-from-home will reduce my prospects for advancement with my employer:

	Total Sample	Non-Supervisors	Supervisors
Disagree	41.3%	42.2%	40.9%
Neutral	38.2%	37.6%	37.1%
Agree	20.5%	20.2%	22.0%

The survey distinguished between actually working-from-home and wanting to work-from-home on advancement prospects. This is a potentially important distinction. As COVID-19 restrictions are lifted, employers will introduce return-to-work policies. It is, therefore, important to understand whether engineering professionals believe that expressing a desire to work-from-home will affect their advancement prospects.

Figure 46 shows that there are no significant differences within or between demographic groups regarding how wanting to work-from-home is expected to affect their prospects for advancement. Around a quarter of survey respondents believe that wanting to work-from-home will adversely affect their prospects for advancement while a substantially greater proportion of respondents, regardless of age, gender, or immigration status, do not believe that expressing a preference for working-from-home will affect advancement prospects.

Figure 46
There is a serious risk that wanting to work-from-home will reduce my prospects for advancement with my employer:

	Total Sample	Women	Men	Age: < 35	Age: 35-54	Age: 55+	New-comer	Long Term Immigrant	Born in Canada
Disagree	37.0%	42.9%	34.9%	38.2%	38.7%	34.3%	46.5%	40.9%	34.0%
Neutral	39.0%	33.6%	40.8%	39.9%	38.1%	38.5%	30.2%	34.5%	42.5%
Agree	24.0%	23.6%	24.3%	21.9%	23.3%	27.3%	23.3%	24.6%	23.5%

As shown in Figure 47, 50% of respondents in Resources report that wanting to work-from-home will reduce their prospects for advancement.

Figure 47
There is a serious risk that wanting to work-from-home will reduce my prospects for advancement with my employer:

	Disagree	Neutral	Agree
Total Sample	37.0%	39.0%	24.0%
Communications	31.8%	40.9%	27.3%
Construction	39.7%	30.8%	29.5%
Consulting	39.7%	37.6%	22.8%
Government	45.9%	37.1%	17.1%
Manufacturing	26.2%	42.9%	30.9%
Resources	22.7%	27.3%	50.0%
Transportation	31.9%	48.9%	19.2%
Utilities	32.6%	43.8%	23.6%
Other	40.2%	40.2%	19.7%

Respondents whose primary job focus is production or process management are also more likely to be concerned about the impact of wanting to work-from-home on advancement prospects (Figure 48).

Figure 48
There is a serious risk that wanting to work-from-home will reduce my prospects for advancement with my employer:

	Total Sample	Contract management	Design	Planning or analysis	Production or process management	Regulatory administration	Other
Disagree	37.0%	41.5%	34.9%	41.5%	28.9%	44.4%	34.2%
Neutral	39.0%	30.9%	39.8%	38.6%	39.4%	27.8%	45.8%
Agree	24.0%	27.7%	24.9%	19.1%	32.7%	29.2%	20.0%

There is no significant difference between supervisors, non supervisors, and the overall sample in how they believe wanting to work-from-home will affect their prospects for advancement.

Impact of Working-from-home on the Quality of Engineering Teamwork

KEY TAKE AWAYS:

- 18.0% of respondents believe that working-from-home will reduce the build-up of trust among co-workers, while 43.3% disagree with this view.
- 22.0% of respondents believe that working-from-home makes it more difficult to deal with problems that arise suddenly, while 45.5% do not agree with this.

Figure 49 shows that while around a fifth (18.0%) of survey respondents believe that working-from-home reduces the build-up of trust with co-workers, more than twice as many respondents (43.3%) do not share this view.

Figure 49
Working-from-home reduces the build-up of trust with co-workers:

	Total Sample	Women	Men	Age: < 35	Age: 35-54	Age: 55+	New-comer	Long Term Immigrant	Born in Canada
Disagree	43.3%	44.9%	43.2%	49.1%	42.1%	39.4%	57.5%	50.5%	38.6%
Neutral	38.6%	40.5%	38.2%	36.5%	38.8%	40.7%	22.5%	33.8%	42.0%
Agree	18.0%	14.6%	18.7%	14.4%	19.1%	20.0%	20.0%	15.7%	19.4%

Figure 50 shows concern about working-from-home reducing the build-up of trust is somewhat greater among respondents whose work organization model is categorized as “Other”.

Figure 50
Working-from-home reduces the build-up of trust with co-workers:

	Total Sample	“Mainly part of a project team”	“Mainly on my own”	“Perform tasks as assigned”	“Other type of work organization”
Disagree	43.3%	44.2%	41.3%	55.0%	32.6%
Neutral	38.6%	37.9%	40.9%	33.8%	40.5%
Agree	18.0%	17.9%	17.8%	11.3%	27.0%

As shown in Figure 51, 22.0% agree with the statement that working-from-home makes it more difficult to deal with problems that arise suddenly, while 45.5% disagree with the statement. There are no significant differences across or between demographic groups on this question.

Figure 51
Working-from-home makes it more difficult to deal with problems that arise suddenly:

	Total Sample	Women	Men	Age: < 35	Age: 35-54	Age: 55+	New-comer	Long Term Immigrant	Born in Canada
Disagree	45.5%	46.2%	45.6%	49.1%	44.5%	44.0%	45.0%	46.6%	44.5%
Neutral	32.5%	35.0%	31.4%	33.6%	33.3%	29.4%	37.5%	28.6%	34.1%
Agree	22.0%	18.8%	23.0%	17.2%	22.2%	26.6%	17.5%	24.8%	21.5%

Figure 52 shows that there are also no significant differences across types of work organization

Figure 52
Working-from-home makes it more difficult to deal with problems that arise suddenly:

	Total Sample	“Mainly part of a project team”	“Mainly on my own”	“Perform tasks as assigned”	“Other type of work organization”
Disagree	45.5%	46.0%	45.9%	44.4%	40.5%
Neutral	32.5%	30.6%	35.1%	42.0%	31.5%
Agree	22.0%	23.4%	19.0%	13.6%	28.1%

PART III:

IMPACT OF WORKING-FROM-HOME ON THE ENGINEERING LABOUR MARKET

Impact of Working-from-home on Current and Future Employment

KEY TAKE AWAYS:

- 44.6% of respondents agree that whether they remain in their current job will depend on whether their employer allows at least a partial work-from-home option.
- Almost two-thirds (65.9%) regard a work-from-home option as an important consideration in a future job.
- 71.0% of respondents are willing to work for a company in another city if that entails 100% of the work being done remotely.
- Roughly one engineering professional in six (16.7%) would accept a lower salary to have a partial work-from-home option. For women, the proportion is 20.7%. For mothers, 24.3%.

Figure 53 shows that 44.6% of respondents agree with the statement that whether they remain in their current job will depend on their employer allowing at least a partial work-from-home option. There are no significant differences based on gender or age group. For newcomers and long-term immigrants, the work-from-home option is more important.

Figure 53
Whether I remain in my current job will depend on my employer allowing at least a partial work-from-home option:

	Total Sample	Women	Men	Age: < 35	Age: 35-54	Age: 55+	New-comer	Long Term Immigrant	Born in Canada
Disagree	33.1%	29.2%	34.5%	26.4%	33.1%	41.5%	12.2%	26.0%	38.3%
Neutral	22.3%	25.0%	21.5%	27.3%	21.1%	18.1%	31.7%	20.9%	22.5%
Agree	44.6%	45.8%	44.0%	46.3%	45.8%	40.4%	56.1%	53.1%	39.2%

Figure 54 shows that the availability of a work-from-home option is even more important when respondents are considering a future job. While 44.6% consider a work-from-home option important when deciding whether to remain at their current job, 65.9% regard such an option as important when considering a future job.

Figure 54
In choosing a future job, an important consideration will be whether the employer allows at least a partial work-from-home option:

	Total Sample	Women	Men	Age: < 35	Age: 35-54	Age: 55+	New-comer	Long Term Immigrant	Born in Canada
Disagree	12.7%	8.3%	14.2%	9.6%	11.6%	18.8%	7.0%	10.6%	14.3%
Neutral	21.4%	20.6%	21.5%	20.7%	21.0%	22.3%	20.9%	18.2%	22.7%
Agree	65.9%	71.1%	64.3%	69.7%	67.5%	58.9%	72.1%	71.3%	63.0%

Figure 55 shows that 71.0% of respondents are willing to work for a company in another city if the work is done 100% remotely, while only 14.6% are unwilling. Men are somewhat more open to this option than women and early career professionals are somewhat more open than mid-career professionals, although there are still large majorities in all groups who would be willing to work 100% remotely.

Figure 55
I would consider working for an employer in another city if that employer allowed me to work-from-home 100% of the time:

	Total Sample	Women	Men	Age: < 35	Age: 35-54	Age: 55+	New-comer	Long Term Immigrant	Born in Canada
Disagree	14.6%	16.6%	13.6%	9.1%	15.4%	20.4%	2.3%	15.6%	15.0%
Neutral	14.4%	16.9%	13.6%	15.5%	16.3%	9.8%	15.9%	7.8%	17.9%
Agree	71.0%	66.6%	72.9%	75.4%	68.4%	69.8%	81.8%	76.7%	67.1%

Only 16.7% of respondents would accept a lower salary to have a partial work-from-home option (Figure 56).

Figure 56
I would accept a somewhat lower salary to have at least a partial work-from-home option:

	Total Sample	Women	Men	Age: < 35	Age: 35-54	Age: 55+	New-comer	Long Term Immigrant	Born in Canada
Disagree	57.1%	56.7%	56.9%	55.3%	58.2%	57.5%	41.9%	54.4%	59.2%
Neutral	26.2%	22.6%	28.0%	31.7%	24.1%	23.3%	39.5%	24.2%	26.4%
Agree	16.7%	20.7%	15.2%	13.1%	17.7%	19.3%	18.6%	21.5%	14.5%

Women, especially mothers, and respondents aged 55 or older are somewhat more willing to accept a lower salary for a work-from-home option. (Figure 56 and Figure 57).

Figure 56
I would accept a somewhat lower salary to have at least a partial work-from-home option:

	Total Sample	Women	Men	Age: < 35	Age: 35-54	Age: 55+	New-comer	Long Term Immigrant	Born in Canada
Disagree	57.1%	56.7%	56.9%	55.3%	58.2%	57.5%	41.9%	54.4%	59.2%
Neutral	26.2%	22.6%	28.0%	31.7%	24.1%	23.3%	39.5%	24.2%	26.4%
Agree	16.7%	20.7%	15.2%	13.1%	17.7%	19.3%	18.6%	21.5%	14.5%

Respondents who Differed from the Majority in their Experience of Working-from-home

KEY TAKE AWAYS:

- 12.4% of respondents report that they are less productive when working-from-home. The proportion is similar across gender and age group.
- 82.3% of the respondents who report decreased productivity would prefer to work a majority of their days in an office, compared to 36.4% of the total sample.
- Those who report that they are less productive also report much more negative perceptions of the social and professional effects of working-from-home.
 - 61.6% do not believe that working-from-home will reduce their work-related stress
 - 81.8% believe that working-from-home will reduce the quality of interaction with colleagues
 - 51.0% believe that working-from-home reduces the build-up of trust
 - 69.8% miss the opportunity to socialize with co-workers

Figure 58 shows that 12.4% of respondents report a decrease in productivity while working-from-home. Early career professionals are somewhat more likely to report decreased productivity, while newcomers and long-term immigrants are less likely. This finding underscores the need for companies and organizations that adopt working-from-home options to implement practices and procedures that ensure that the change in working arrangements does not impede regular communication between early career professionals and their more senior and experienced co-workers.

Figure 58
How would you assess your productivity while working-from-home?

	Total Sample	Women	Men	Age: < 35	Age: 35-54	Age: 55+	New-comer	Long Term Immigrant	Born in Canada
Decreased	12.4%	12.5%	12.2%	14.8%	11.4%	11.0%	7.3%	9.8%	14.4%
No Change	33.6%	30.2%	35.4%	31.3%	32.0%	38.3%	19.5%	31.0%	35.8%
Increased	54.0%	57.4%	52.5%	53.9%	56.6%	50.6%	73.2%	59.3%	49.9%

There is no reported difference between parents and non-parents, including mothers (Figure 59). This is an important finding as anecdotal commentary sometimes suggested that parents were more likely to be distracted while working-from-home. The survey evidence does not support this.

Figure 59
How would you assess your productivity while working-from-home?

	Total Sample	Non-Parents/Non-Guardians	Mothers/Female Guardians	Fathers/Male Guardians
Decreased	12.4%	12.6%	12.4%	12.5%
No Change	33.6%	34.9%	27.6%	33.1%
Increased	54.0%	52.5%	60.0%	54.4%

Figure 60 shows that the proportion of respondents reporting decreased productivity is somewhat different across industries. Respondents who work in Construction or Consulting are less likely to report a decrease in productivity while those working in Communications and Government are marginally more likely to report a decrease in productivity.

Figure 60
How would you assess your productivity while working-from-home?

	Decreased	No Change	Increased
Total Sample	12.4%	33.6%	54.0%
Communications	16.3%	27.9%	55.8%
Construction	7.0%	37.2%	55.8%
Consulting	8.6%	35.8%	55.6%
Government	15.3%	35.3%	49.4%
Manufacturing	12.2%	27.8%	60.0%
Resources	10.8%	36.1%	53.1%
Transportation	13.0%	47.8%	39.1%
Utilities	14.9%	36.2%	48.9%
Other	6.5%	33.7%	59.8%

Survey respondents whose job focus is primarily contract management are the least likely to report a decrease in productivity while those whose job focus is production or process management are more likely report a decrease in productivity (Figure 61).

Figure 61
How would you assess your productivity while working-from-home?

	Total Sample	Contract management	Design	Planning or analysis	Production or process management	Regulatory administration	Other
Decreased	12.4%	7.2%	12.9%	10.3%	16.8%	11.8%	14.7%
No Change	33.6%	29.9%	38.3%	32.6%	27.7%	26.3%	31.4%
Increased	54.0%	62.9%	48.8%	57.0%	55.5%	61.8%	53.9%

Figure 62 shows that 40.8% of those who report a decrease in productivity while working-from-home also report wanting to work in an office on all regular workdays. Their preference for working 100% from the office is more than 4 times that of the total sample (9.2%).

Figure 62
When public health authorities state that it is safe to return to work in an office environment, would your preference be:

	Total Sample	Productivity Decreased	No change in productivity	Productivity increased
To work at an office on all regular workdays	9.2%	40.8%	7.8%	3.0%
To work-from-home 1 to 2 days per week	27.2%	41.5%	32.6%	20.4%
To work-from-home 3 to 4 days per week	37.6%	11.6%	39.6%	42.3%
To work-from-home 100% of the time	26.1%	6.1%	20.1%	34.4%

Figure 63 shows that 61.6% of respondents that report a decrease in productivity while working-from-home also disagree that working-from-home will reduce their feelings of work-related stress. They do so at a rate almost three times greater than the total sample (22.7%).

Figure 63
Working-from-home, at least part of the week, will reduce my experience of work-related stress:

	Total Sample	Productivity Decreased	No change in productivity	Productivity increased
Disagree	22.7%	61.6%	24.9%	12.1%
Neutral	32.4%	25.3%	38.6%	30.3%
Agree	44.9%	13.0%	36.5%	57.7%

Figure 64 shows that those who report a decrease in productivity are more than twice as likely that the total sample to voice concern over how working-from-home will affect the quality of their interactions with colleagues. Figure 65 further shows that they are also more than twice as likely to believe that working-from-home will negatively affect the build-up of trust with co-workers.

Figure 64
Working-from-home reduces the quality of interaction with my colleagues:

	Total Sample	Productivity Decreased	No change in productivity	Productivity increased
Disagree	24.11%	4.1%	13.8%	35.0%
Neutral	39.34%	14.2%	43.2%	42.8%
Agree	36.55%	81.8%	43.0%	22.2%

Figure 65
Working-from-home reduces the build-up of trust with co-workers:

	Total Sample	Productivity Decreased	No change in productivity	Productivity increased
Disagree	43.3%	12.2%	38.7%	53.5%
Neutral	38.6%	36.7%	42.8%	36.5%
Agree	18.0%	51.0%	18.6%	10.1%

Figure 66 also shows that they are almost twice as likely to miss socializing with co-workers as the total sample.

Figure 66
I would miss the opportunity to socialise with my co-workers:

	Total Sample	Productivity Decreased	No change in productivity	Productivity increased
Disagree	27.5%	4.7%	22.4%	34.6%
Neutral	35.7%	24.2%	32.6%	38.8%
Agree	36.8%	69.8%	41.8%	24.4%

Conclusions

KEY TAKE AWAYS:

- Companies and organizations that opt for a complete return to the office would appear to be taking on a significant staff turnover risk.
- Companies and organizations that implement a partial work-from-home option will need to develop strategies to address the downside risks of remote work on the functioning of engineering teams.
- It is open to question whether the apparent trend of working more hours per day when working-from-home is sustainable.
- Shifting to at least partial working-from-home holds out the potential to increase the productivity of engineering professionals, if carried out appropriately.
- Around a quarter (24%) of engineering professionals fear negative repercussions for their careers if they work-from-home or express a desire to work-from-home. Companies and organizations will need to address this concern.
- Hiring workers in other cities to work remotely will change the engineering labour market from being essentially regional to national, North American, or global. This has implications for both engineers and regulatory bodies.
- Working-from-home may negatively affect remuneration trends in engineering

Prior to COVID-19, the survey indicates that around a quarter (25.8%) of engineering professionals worked from home some of the time. COVID-19 radically altered this picture. The survey suggests that an overwhelming majority (97.0%) of engineering professionals worked from home at least part of the week while COVID-19-related public health restrictions were in place. The extended experience of working-from-home has changed preferences and expectations. These changes will have significant long-term effects on:

- Human resources management
- The way that engineering work is undertaken
- How engineering teams function
- The skills needed by engineering managers
- The functioning of the engineering labour market

Some of these changes may have a greater impact on early career engineers, women, and newcomers.

The survey results support the following broad conclusions:

Some of these changes may have a greater impact on early career engineers, women, and newcomers.

The survey results support the following broad conclusions:

1. Engineering managers will need to take into account the likelihood that close to two-thirds of the engineering professionals whom they employ now say that they would prefer to work the majority of their days from home when COVID-19 restrictions are lifted. This poses a major challenge to companies and organizations that are planning a complete return to the office in the near future. The survey results suggest that there will be considerable dissatisfaction and morale challenges in companies and organizations that adopt that strategy. Only 9.2% of engineering professionals indicated that they want to return full-time to the office. Of those engineering professionals that would prefer at least a partial work-from-home option, around two-thirds also indicate that whether they remain in their current job will depend on their employer implementing that option. Companies and organizations that opt for a complete return to the office would appear to be taking on a significant staff turnover risk. Moreover, they would be doing so when other indicators suggest increased hiring challenges for employers, especially for employers that do not offer a partial work-from-home option.

2. Companies and organizations that plan to implement a partial work-from-home option will need to develop strategies to address the potential downside risks of remote work on the functioning of engineering teams. It is true that 37.4% of engineering professionals believe that working-from-home does not reduce the quality of their interaction with managers. However, more than a quarter (26.1%) believe that, based on their experience, working-from-home does reduce the quality of interaction with managers. This is a significant proportion of survey respondents. The implication is that companies and organizations will need to better prepare and train their engineering managers to supervise subordinates who are working-from-home at least part of the week. Similarly, although 36.7% of engineering professionals do not believe that working-from-home reduces the quality of interaction with colleagues, fully 24.0% hold the opposite view. Again, this is a significant proportion. It implies that if the quality of engineering teams is to be sustained, the members of those teams may need training on interacting with colleagues when working remotely and clearly stated expectations about the frequency and depth of those interactions.

3. Based on the survey results, there is strong reason to believe that a majority (56.8%) of engineering professionals worked more hours per day when working-from-home. For women who are also mothers, the proportion reporting that they worked more hours per day when working-from-home was 75.2%. For mid-career engineers (aged 35 to 54), the proportion was 64.5%. It is open to question whether this is sustainable. The apparent trend towards more working hours may also affect salary expectations.

4. The shift to working-from-home for at least part of the week may have a favourable impact on productivity, although the magnitude of this impact and its cause are unclear. While supervisors and non-supervisory engineering professionals have a different perception of the productivity gains from working-from-home, both appear to agree that this is a net productivity gain. It is not clear whether this is attributable to an actual improvement in output per hour or to an increase in effort reflected in more hours of work. Although there is room for interpretation, the survey data appear to support the view that shifting to at least partial working-from-home holds out the potential to increase the productivity of engineering professionals, if carried out appropriately.

5. Based on the survey evidence, most women, early career professionals, and newcomers believe that their engineering careers will not be disadvantaged by either working-from-home or indicating a preference to work-from-home. There is, however, a significant minority (around 24%) that do fear negative repercussions for their engineering careers. Companies and organizations that employ engineering professionals will need to address this concern.

6. The potential to work remotely may alter the engineering labour market. A large majority of engineering professionals (71.0%) are willing to work for a company or organization in another city which would involve 100% of their work being carried out remotely. It is only a matter of time before companies and organizations that hire engineering professionals, experiment with this option. To the degree that hiring workers in other cities to work remotely becomes an accepted practice, the nature of the engineering labour market will change from being essentially regional to national, North American, or global. This has implications for both engineers and regulatory bodies.

7. Working-from-home may negatively affect remuneration trends in engineering. While a majority (57.1%) would not accept a pay reduction to have at least a partial work-from-home option roughly one engineering professional in six (16.7%) would consider a pay reduction. The proportion increases for women (20.7%) and especially for women who are mothers (24.3%). Additionally, the possibility to recruit workers in other cities to work remotely holds out the potential to do this recruiting in regions where remuneration standards are lower.

It is too early to draw definitive conclusions on the effects of working-from-home on engineering professionals, engineering work, and the engineering labour market. However, the implications of the survey results presented in this report are that the emergence of working-from-home as a normal practice is likely to have important long-term implications for both engineering professionals and the companies and organizations that employ them.





THE IMPACT OF
WORKING-FROM-HOME
ON ENGINEERING
PROFESSIONALS AND
ENGINEERING WORK
- SURVEY SUMMARY



ONTARIO
SOCIETY OF
PROFESSIONAL
ENGINEERS

CONTACT US

Ontario Society of Professional Engineers
4950 Yonge Street, Suite 502
Toronto, Ontario M2N 6K1
1-866-763-1654

www.ospe.on.ca

