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Reconsidering Discretionary Travel

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Reconsidering Discretionary Travel

Abstract

Constraining high emissions discretionary travel is an essential part of climate change mitigation. This working paper contends that the time has come for governments to require businesses and private citizens to reduce discretionary travel and minimize emissions where travel cannot be avoided. In the near-term, technology alone cannot solve the problem when alternative energy projects often rely on resource extraction projects that have their own ecological and public health costs, particularly for disadvantaged mining communities. To limit emissions resulting from discretionary travel, we must apply the lessons we have learned from pandemic mitigation practices about how to work and meet for business purposes remotely. Here, I begin by surveying the scientific evidence about the damage caused by travel related greenhouse gas emissions (GHG). Second, I examine the lessons that we can apply from pandemic mitigation practices towards combating transport emissions. In the process, I draw distinctions between discretionary and necessary travel that serves human rights interests that should be exempt from quotas and rations. Third, I cover the challenges of reducing ground transport emissions in countries with low population densities like Canada that are dependent on automobile transportation. Fourth, I highlight the contribution of wealthy knowledge workers to overall travel emissions and proposals for reducing the environmental impact of their activities with remote work and flight rationing. I conclude by considering the implications of maintaining features of a remote work-based economy to meet the exigencies of the climate emergency.

Keywords: transportation, emissions, aviation, rationing, telework, social justice

Introduction

The modern carbon dioxide record began in 1958 when the average atmospheric carbon dioxide (CO₂) reading was 315 parts per million. The pace of the rise in atmospheric carbon dioxide has steadily increased, with atmospheric CO₂ levels hitting a new record every year. In May 2023, carbon dioxide levels rose to 424 parts per million, a level that has not been seen for 3 million years. The last time that the global average CO₂ level was as high as it is now, sea levels were at least 4.9 metres (16 feet) higher than at the beginning of the twentieth century, and they are rising at an increasing rate each year (Lindsey 2024). This raises the spectre that significant portions of low-lying countries like Kiribati and Bangladesh soon will be underwater, resulting in a loss of arable land and the displacement of millions as climate refugees (Lieberman and Gordon 2021, 194).

The movement of climate refugees to places of refuge is not discretionary travel, but rather forced mobility. Here, my focus is on discretionary travel. I define this form of travel as non-essential commutes to offices for work that can be done remotely, and business travel that can be moved to online conferencing platforms. Building on Sullivan (2022), I distinguish discretionary travel from necessary travel that serves basic human needs and safeguards human rights, such as refugees, asylum seekers, and climate change migrants fleeing for their lives from the threat of death, violence or natural disasters (Sullivan 2022, 8). In short, the continuous escalation of carbon dioxide levels and other human-generated greenhouse gases (GHG) has created new urgency in our need to cut emissions immediately. The coronavirus pandemic – and its accompanying once in a century declines in travel-related emissions may be abating, but the climate change crisis remains with us, with one difference. The pandemic taught us that rapid emissions-reducing changes in how business is conducted are feasible, even if these changes are controversial (Kerns and Moore 2021, xxi). Businesses and universities now have substantial experience successfully reducing their carbon emissions and climate impact by foregoing discretionary travel and allowing many of their employees to work remotely whenever possible. Institutions that advertise their commitment to social and ecological responsibility have an added moral imperative to live up to their principles. If humanity returns to the pre-pandemic status quo, and in particular, if wealthy elites who are responsible for the vast majority of flights, commutes, and other carbon intensive activities do not alter their mobility choices, emissions will continue to rise unabated.

Hence, the continuous escalation of carbon dioxide levels and other human-generated greenhouse gases (GHG) has created new urgency in our need to cut emissions immediately. The coronavirus pandemic – and its accompanying once in a century declines in travel-related emissions may be abating, but the climate change crisis remains with us, with one difference. The pandemic taught us that rapid emissions-reducing changes in how business is conducted are feasible, even if these changes are controversial (Kerns and Moore 2021, xxi). Businesses and universities now have substantial experience successfully reducing their carbon emissions and climate impact by foregoing discretionary travel and allowing many of their employees to work remotely whenever possible. Institutions that advertise their social and ecological responsibility have an added moral imperative to live up to their principles. If humanity returns

to the pre-pandemic status quo, and in particular, if wealthy elites who are responsible for the vast majority of flights, commutes, and other carbon intensive activities do not alter their mobility choices, emissions will continue to rise unabated.

The pandemic forced the business and academic travel industry to adapt in ways that decreased the climate impact of their activities by scheduling virtual conferences without the need to fly to distant venues. The speed with which governments and private institutions responded to the pandemic has convinced some environmentalists that a more rapid response to the climate change emergency is also possible (Sultana 2022, 118). But the sense of urgency that prompted these adaptations in work and mobility was short-lived, without regard to their potential benefits in responding to the climate crisis.

Using pandemic mitigation practices as a proof of concept in practice, I defend the proposition that governments (in coordination through a global agreement on the scale of the Paris Climate Accords) can and should require businesses and private citizens to reduce their discretionary travel, or to shift unavoidable travel to less emissions-intensive transportation alternatives. While I deal with ground transportation in this paper, my focus is on reductions in aviation emissions given their magnitude; distributive justice concerns and the need to limit impacts on those who can least afford immediate changes. In view of the urgency of the need to reduce transport emissions and their contribution to climate change, long-trip, short-term business and academic discretionary travel must be shifted to majority virtual conferencing as was done during the pandemic.

I. Applying Theory to Practice: *Décroissance* and Travel Limitations

There is some overlap between this paper's approach and the tenets of *décroissance*, a critical theory that objects to policies prioritizing economic growth over ecological and public health concerns (Kallis 2018, 91-108; Saito 2024, 16-18, 25) and proposes limitations on economic growth in the interest of other forms of human flourishing. Bringing Karl Marx's later work on deforestation and soil depletion to bear on the present challenge of climate change, Kohei Saito (2024) argues that elites who consume and travel the most – are “shifting the burden of environmental damage to the future” and “profit[ing] from the sacrifice of future generations” (Saito 2024, 24, 45-46, 105-107). Our mentality whenever we are asked to change our lifestyles or incur costs is “*après moi, le déluge*”, or, at best, a misguided optimism that somehow technological fixes will come on line fast enough to resolve a problem decades in the making (Saito 2024, 28, 37-38, 43-44, 142-143; Kallis 2018, 102-103).

Saito (2024) points to the Jevons paradox, which as applied here would mean that the more fuel efficient (but not carbon neutral) mobility becomes, the more consumption grows as costs and ethical qualms decrease, leading potentially to the same net level of emissions in a new equilibrium of greater efficiency yet higher consumption (Saito 2024, 51-52). Electric mobility technologies require more mining with environmental impacts on isolated Indigenous communities where nickel, cobalt, lithium and rare earth elements are sourced (Finn and

Stanton 2022, 343; Deberdt and Le Billon 2024, 2). At a global level, Celia Izoard¹ urges end users not to ignore their consumption of metals resulting from environmentally unsustainable mining processes in the production of zero-carbon emissions technologies (Izoard 2024, 301). In essence, “green technologies” can shift pollution from wealthy cities to disadvantaged mining communities, exacerbating environmental damage and exploitative political relationships with oppressed peoples in developing regions (Bauer and Parent 2018). In the long-term, the supposed “choice” between growth and degrowth is misleading. Giorgios Kallis (2018) argues that if we do not act to drastically constrain emissions now, economic growth will decline later in this century due to climate change related dislocation, natural disasters, and the unavoidable cost of mitigation. In short, today’s hyper-mobile elites need to consider what changes to their work routines they can make today for the sake of younger people and future generations as the adverse impacts of climate change accelerate during their lifetimes. Real reductions in emissions require us to reconsider discretionary travel for work that can be performed as efficiency through remote conferencing software, when it is not absolutely necessary to perform work-related tasks.

Emissions Reductions in Practice: Climate Impacts and the COVID-19 Reprieve

While carbon dioxide atmospheric levels remain on the rise when averaged over longer time spans, human-generated global carbon dioxide emissions declined in 2020 for the first time in decades, with a 5.8 to 6.4 percent drop in CO₂ emissions recorded during the first year of the global coronavirus pandemic (Pathak et al. 2022, 60; Tollefson 2021, 343). Looking at historical records, Glen Peters, the Research Director at the Centre for International Climate Research, found that “you’d have to go back to 1945 – the end of the Second World War and the emissions this conflict generated – to see a relative drop bigger than this” (McSweeney and Tandon 2020). Even emissions from electricity usage – needed to power the remote conferencing and residential energy use expended by remote workers– declined 15 percent in 2020 (Ibid). Government travel restrictions and voluntary curbs on discretionary air travel resulted in declines in aviation emissions of 45 to 48 percent between 2020 and 2021 (Pathak et al. 2022, 57; Tollefson 2021, 343). The Intergovernmental Panel on Climate Change found that to limit the average global temperature increase to a high-impact but still humanity-adaptable level of 2 degrees Celsius (above the 1.5°C threshold where multi-year sea ice would disappear, adversely impacting ocean currents and global weather), global emissions would have to stabilize at 2020 lockdown levels (Pathak et al. 2022, 82). To accomplish this goal, shifts in mobility behaviour as seen during the pandemic will have to drive decarbonization in the short-term. Technological changes cannot be implemented quickly enough to decrease emissions in this manner alone.

Similar declines in fossil fuel emissions occurred in 2020 as governments mandated that businesses allow employees to work from home to mitigate the spread of COVID-19, resulting in a decline in fuel use for commutes from home to the office. The United States contributed most to the global dip in emissions in 2020 (13 percent) due to a sharp decline in personal vehicle usage in a country with limited mass transit options outside its largest urban corridors

¹ In *La Ruée Minière au XXI^e Siècle : Enquête Sur les Métaux à l'Ère de la Transition*.

(Tollefson 2021b). This moment of sacrifice and possibility has been lost as institutions and governments return to the pre-pandemic status quo with associated air travel, commuting, and other emissions-generating practices.

Pandemic mitigation practices taught many of us how to reduce mobility related emissions while still accomplishing essential business tasks. Communications advances have made it easier to work from home, meet, and conduct business remotely. The pandemic proved that these measures can be implemented at scale. There are costs and tradeoffs – both economic and intangible – associated with a shift to widespread remote interactions in business, education, and other sectors of society. Business travel and in-person office work has the benefit of bringing people together to exchange ideas, but those same people can now meet virtually to accomplish the same goals. We must ask whether the intangible benefits of frequent in-person work interactions are worth the environmental costs that were foregone during the pandemic. Beyond COVID-19 social distancing measures, emissions savings from virtual meetings are still an important reason for transitioning from in-person to virtual conferencing. This step can reduce the carbon footprint of a meeting by 94% (Tao, Steckel, Klemeš, and You 2022, 5).

Pandemic-era travel restrictions can be used as a guideline for determining what constitutes necessary and discretionary travel. Another somewhat related scheme for examining how travellers might adapt their transportation choices to meet ecological imperatives can be found in the shift, improve, and avoid framework. Pandemic-adaptation practices showed us that a wider range of jobs could be performed at a distance, including teaching, civil service functions, and medical consultations that do not require lab tests. Foregoing travel when it is possible to accomplish the same work related task through telework fits within the “avoid” framework (Leroutier and Qurion 2023, 7). The shift framework to alternative forms of transportation – from cycling in Leroutier and Qurion’s study of Paris, to public transit elsewhere presumes either a short commute or that mass transit options are available, which is not an option in smaller North American cities. The improve framework is available in North America in terms of increasing the fuel efficiency (CAFE) of the existing vehicle fleet by mandating higher emissions and efficiency standards for new model years (Sallee 2011). Unfortunately, this CAFE efficiency “improvement” feature will not have an immediate effect as vehicle fleets in America continue to age for economic reasons (Bureau of Transportation Statistics 2022).

II. The Green Transition in Low-Population Density Jurisdictions: Some Challenges

The technological fixes that are available for transportation emissions reductions are not sufficiently affordable for low-income citizens that rely on cheaper but less energy efficient used vehicles for personal transportation. Long-term adoption of mass transit is important but not immediately feasible in car-dependent, low-population density areas in North America (and Australia) where insufficient usage discourages investment. Air travel is essential for inter-regional mobility in North America in the absence of extensive high-speed rail networks. Here,

slow airplane fleet replacement prevents the rapid implementation of emissions-reduction technologies. However, lower-income citizens also contribute less to aviation emissions since they rarely take flights, making ground transportation their main priority.

Here, empathy and messaging matters. It is important that policymakers are sensitive and responsive to the concerns of lower-income, rural residents in isolated and low-population density areas with few public transit options where long-distance commuting is common. Climate-related regulations on mobility have to be communicated with precision and sensitivity to a public that is sceptical about initiatives that may raise the cost of living (carbon taxes on ground transportation) or curtail freedom (rationing travel). Messaging failures fuelled the *gilet jaune* movement in France and the “Axe the Carbon Tax /*Abolir la Taxe*” movement in Canada since the evidence about how rebates can mitigate the regressive features of fuel taxation are being lost in the political debate (Anne-Braun and Guésdon 2022, 59, 81; Winter, Dolter, and Fellows 2023, 36). In short, gasoline taxes are regressive for low-income and rural households in Canada and the United States but earmarking this revenue for rebates for these taxpayers can help overcome this problem (Sallee 2011, 31-32; Winter, Dolter and Fellows 2023, 36). Even so, populists are portraying carbon pricing as a measure whose costs will fall on low-income rural residents with long commutes who cannot afford new electric vehicles (Poilievre 2023; Boudia et al. 2024, 140). To challenge this narrative, it is important to emphasize shared sacrifices and income supports (and costs for elite transportation choices) as part of a just transition.

Canada is an example of a vast, car-dependent, low-population density country with minimal mass transit options outside the major cities which nonetheless instituted a carbon tax despite intense political opposition. By contrast, in the USA, which is equally car-dependent, Congress has repeatedly rejected a federal carbon tax or gas tax increases (though the USA and California use fleet fuel economy standards (CAFE) to the same ends (Sallee 2011, 4; Anne-Braun and Guésdon 2022, 59). Canada’s federal government has committed to reducing emissions by imposing a steadily increasing consumer carbon tax that will substantially increase the price of motor fuel by 2030 (by 37.43 Canadian cents per litre) (Canada Revenue Agency 2023). In Canada, there is a clear climate policy disconnect between centrist policymakers who represent urban constituencies and citizens in the less affluent, vast “regions” of rural and exurban ridings. An electoral map from the 2021 federal election illustrates this divide – dark blue indicates Conservatives who now oppose the federal carbon tax, red indicates the Liberal Party which introduced the federal carbon tax.



Figure 1 (left): The geographic political divide in Canada as illustrated by the outcome of the 2021 federal election at the riding level (blue represents the Conservative Party whose support is concentrated in rural and fossil fuel (oil and natural gas) producing areas in Western Canada).

Figure 2 (centre): A billboard in an isolated Northern Ontario city (Thunder Bay) sponsored by the Conservative Party led by Pierre Poilievre (blue) promising to abolish the carbon tax initiated by Prime Minister Justin Trudeau's Liberal Party (red) if the conservatives win the next federal election (to be held no later than October 2025).

Figure 3 (right): A sign near the halfway point of the Trans-Canada highway north of Sault-Sainte-Marie, Ontario reminding motorists that neither fuel nor electric vehicle charging is available for long, sparsely populated stretches of the only major east-west highway that connects the entire country (in the absence of reliable mass transit options connecting regional centres).

The leader of the Conservative Party, Pierre Poilievre, has vowed to repeal the carbon tax in Canada, and this is one of the reasons why his party is favoured to win the next federal election. From a rural and exurban perspective, climate policy is viewed by populist movements as though it were designed for wealthy, urban residents who can walk, bike, or take public transit to work in large cities, and drive electric cars or take high-speed rail to more distant destinations, which are options that are unavailable to them. Air travel is the only way to access isolated northern communities or to travel between Canada's far-flung major cities in a single day. Even so, few Canadians are frequent flyers. Only half of the population flies in a given year and 10 percent are eligible for frequent flyer airline rewards programs (Zheng 2024). The vast majority of Canadians commute regionally by car and are more affected by gasoline tax increases. Since most Canadians do not travel by airplane in any given year, aviation carbon taxes are not as controversial as fuel taxes that affect most Canadians every day.

III. Affluenza: Moving Beyond Short-Term Discretionary Business and Academic Travel

High-status professionals contribute disproportionately to climate change through their travel behaviours. They are not price-sensitive – if travel is taxed at a higher rate, their institutions often can still afford to pay for their travel. For some elite workers, business travel costs nothing out of pocket, and many see this as a perk of the job. But the majority do not have this privilege. Even in affluent nations, most citizens do not fly often (McDonagh 2021). 97 to 98 percent of the world's population does not participate in international air travel in any given year because it is too expensive and time-consuming (Gössling and Cohen 2014, 200). On one

account, only 20 percent of the world's population has ever taken a flight (Gemenne 2021, 24). Frequent participation in long-range tourism is also the preserve of a "hyper-mobile" global elite that constitutes 2-3 percent of the world's population (Rutty et al. 2015, 43). While local trips that are within the economic means of working-class citizens do not contribute substantially to tourism-based emissions (especially those undertaken by train), long-haul aviation represents the single largest factor at 40 percent of tourism's overall global carbon footprint (Ibid., 44).

In the short-term, technological fixes will not reduce aviation emissions quickly enough to meet the emissions targets in the Paris Climate Accords by 2050, necessitating more drastic restrictions now. Technical changes implemented in new aircraft will be phased in over decades with the gradual replacement of the existing fleet over a 30-year life span (Schäfer, Heywood, Jacoby and Waitz 2009, 144-145). As of yet, alternative fuels are inadequate to meet the energy-density and range needs of existing aircraft, and redesigns to incorporate zero-emissions fuels like hydrogen are cost-prohibitive (Bridger 2013, 25, 27-43; Ahmad 2018, 43-44; Qasem 2024, 7). Thus, in the meantime, we are left with carbon-intense kerosene for aviation. The World Economic Forum predicts that CO₂ emissions from aviation for tourism show no sign of abating, as they will increase by 2.7 percent to 2035, concentrated among wealthy travellers for whom demand is inelastic notwithstanding rising carbon taxes (Hall, Gössling and Scott 2015, 28). This means that taxes and "frequent flyer levies" of the kind suggested by Greenpeace alone cannot be expected to reduce business travel. A number of studies have suggested that carbon levies on frequent fliers would do very little to reduce carbon emissions since business travel and the travel of affluent tourists is inelastic and not price sensitive (Gössling and Dolnicar 2023, 4). Rationing that cannot be circumvented through a personal carbon trading regime is likely needed to change the behaviour of business travelers.

Academic travel is an emission generating activity where appeals to moral responsibility may have the potential to change behaviour by exposing the gap between a university's stated values and its emissions-producing activities. Senior university administrators and faculty want to position themselves as values-driven leaders, and environmental responsibility is no exception. Leading academic health professionals have signed on to a joint editorial in 220 medical journals to describe the health emergency of climate change during a year in which their meetings were confined by government regulations and personal responsibility to remote meetings (Atwoli et al. 2021). The editorial was mostly dedicated towards asking others – government officials – to act, without any commitments to change in areas where the signatories have the power to influence how knowledge is disseminated, and careers are built in academic medicine. It remains to be seen whether these public relations statements will carry through to their actual behaviour and their expectations of rising scholars that will shape their profession's response to climate change and travel going forward. Organizing and mainstreaming virtual conferences is an issue they can address directly. Early career researchers in the medical profession report that they see the value of their in-person conference presentations as "dubious" (Gundling, Ettinger, Baylen, and Ackerman 2023). They also report that conference attendance takes away from their duties as teachers,

practitioners, laboratory supervisors of graduate students, and their personal responsibilities as caregivers to young children. Still, they persist in this activity because their grants require it (Ibid). Few participants in this focus group of young health professionals saw any decline in the quality of their networking interactions. The study allowed them to reflect on academic medicine's responsibility to "place issues of health equity, environmental justice and care of the most vulnerable front and center" (Ibid).

Businesses, universities, and other institutions could decide to take action voluntarily to limit employee travel by maintaining pandemic-era work-from-home policies and virtual meetings as a public relations exercise to show that they are good corporate citizens committed to environmental responsibility. Universities are facing more strident opposition from stakeholders for not changing fast enough. Younger students – teaching being a part of the mission of every university – involved in the Extinction Rebellion and other environmental protest movements are demanding significant cuts to discretionary travel in the interests of their future health and well-being (Dillon 2019; Higham and Font 2021; Chavalarias et al. 2024, 173). They are also demanding the universities divest the portion of their endowment they invested in fossil fuel companies (Lieberman and Gordon 2021, 239). They argue that as climate change accelerates, today's youth will have to live with the climate impact of university administrators' decisions long after they are gone, which is a practical lesson in intergenerational justice. Political philosopher Henry Shue echoes this argument about generational responsibility by stating that we are a "pivotal generation" for the climate. By this he means we are now at a tipping point where we need to dramatically cut emissions as the consequences of inaction are becoming more difficult to reverse and undermining the life prospects of our younger students and future generations (Shue 2021, 24-26). On average globally, nearly every year this century has been warmer than the last, particularly in the high northern latitudes, enhancing natural disasters and triggering feedback loops where natural carbon sinks are being depleted.

One institutional policy response is for academics who are not required on site all year, consolidating short conference travels into a longer-term research stay that leads to a presentation, feedback, and revisions of a paper has the potential to reduce emissions (one trip) and enhances feedback and networking there over a longer period of time. Short-term academic networking events like conferences could eventually be replaced with virtual gatherings (which also cost universities less in reimbursements). A second more drastic response which may be needed if voluntary persuasion and institutional measures are insufficient to reduce emissions-generating travel involves government mandated rationing. During the Second World War, fuel rations were effective in limiting mobility across socio-economic classes in solidarity with the war effort in the United Kingdom despite the existence of a black market (Roodhouse 2013). On a more limited scale, COVID-19 brought a return to

mobility restrictions with widespread government messaging invoking wartime solidarity imagery to encourage citizens to comply voluntarily (Gutteres 2020; Trudeau 2020)².

Restricting mobility for the climate crisis would be different because it is ongoing and without an end date. Rationing would have to apply to affluent individuals, and they should not be allowed to pay more for extra emissions. A carbon emission regulation system would need to penalize black market evasion strategies and protect vulnerable groups with higher mobility needs.

IV. Rationing Discretionary Air Travel as a Starting Point

In this section, I examine policies aimed at rationing that are already in place or in discussion, with a view towards finding a starting point for implementation (among those who have the resources to adjust) with further implementation in the longer-term.

Emissions from global aviation are substantial (3.1 percent of global emissions and rising). Unlike the electrifying ground transportation sector (though the sourcing of materials and cost are still problems), air travel remains fossil-fuel intensive and a privilege for most of humanity which can often be replaced with remote conference technology. In the first year of the COVID-19 pandemic, these measures combined with government travel restrictions resulted in a decline in aviation emissions from over 1000 mT of CO₂ to less than 600 mT of CO₂ (Qasem et al. 2024, 6). With the end of restrictions without regard to the climate crisis, aviation emissions are returning to pre-pandemic levels. Even aviation industry trade associations admit that aviation will triple in its fuel use and double in its emissions from 2020-2050 (Gössling, Balas, Mayer and Sun 2023, 2). Sustainable aviation fuels are a long-term solution that is projected to remain cost-prohibitive and technically infeasible through 2050 (Qasem et al 2024, 7).

In the short-term, then, pandemic-style rationing is still needed to reduce aviation emissions as part of a broader effort to limit global warming to 2°C or less (United Nations Climate Change 2016, 2; Pathak et al. 2022, 82). This measure would target wealthier frequent flyers who can afford the costs of adapting. Exemptions would have to be made for rights-essential travel by vulnerable, low-income persons, such as to provide for family reunification (i.e. children in joint-custody arrangements) or asylum. These restrictions would have a minimal impact on low-income, site-necessary workers who are unable to upgrade to more efficient forms of transportation. Discretionary air travel restrictions could be voluntary at first, relying on normative arguments directed at employers that are sensitive to the public relations implications of being seen as ecologically irresponsible. Universities and grant funders that portray themselves as ecological leaders and socially responsible organizations are prone to this form of moral persuasion. Without institutional pressure, high-profile knowledge workers

² In Parliament in April 2020, three weeks after Canada closed its borders to the world, Prime Minister Justin Trudeau implored Canadians to sacrifice: “The front line is everywhere: in our homes, in our hospitals and care centres, in our grocery stores and pharmacies, at our truck stops and gas stations...courage and strength are not defined by what we say or do loudly in public, but by the actions we take quietly in private, like staying home. Even as we stand apart, we stand united in our resolve to do what we must until COVID-19 is defeated.”

or business travelers may not be willing to curtail their high-emissions short-term travel under current incentive structures that favour these activities for individual career advancement. But if institutions and grant-funders begin to score funding proposals based on their ecological impact, denying funding for proposals that rely on frequent short-term, high-emissions travel, rational knowledge workers may respond to changing incentives and alter their behaviour accordingly. Given the widespread replacement of in-person meetings with virtual conferencing during the pandemic, most knowledge workers have experience adapting to telework arrangements, meetings and networking at a distance as an alternative to on-site meetings. We cannot assume that all organizations will be equally responsive to moral persuasion to revive some of their pandemic-era work arrangements to decrease their emissions in response to the longer-term climate crisis. If persuasion is insufficient to alter elite individual and corporate travel practices to what is necessary to reduce their GHG emissions to pandemic-era levels as part of their contribution to mitigating climate change, then government mandates will become necessary. But it is best to start by working with stakeholders to enlist their efforts to determine what would be the best use of their carbon-intensive in-person meetings and where cuts can be made, fostering culture change, cooperation, and reducing enforcement costs.

Beyond the emissions generated by air travel, there are distributive justice benefits in starting with air travel limits for frequent flyers and their employers. 97-98 percent of the population does not take a long-distance flight in any given year, either for business or pleasure; either it is beyond their financial reach, or their more modest occupations do not require it. The remaining three percent of workers and their employers have greater flexibility and resources at their disposal to adapt (and they may save in travel costs in the process). Exceptions can be made for infrequent long-distance travel that is required for human rights reasons, like the transportation of refugees from conflict zones and facilitating international family reunification without undermining the overall integrity of the rationing system. Guest workers and international students would not be banned from travelling but would have to limit their voyages back home. This is simply a starting point as pollution from other forms of discretionary travel (by road) need to be shifted to lower-emissions alternative as they become available to meet the ambitious emissions reductions set forth in the Paris Climate Accords.

To briefly mention one encouraging venture, in France, a more ambitious carbon rationing proposals are being developed by a group entitled *Forum Vies Mobiles* with a view towards demonstrating how 4 real people in France with specific mobility needs (including family care responsibilities) could alter their mobility behavior through mild rationing towards reaching the objectives set forth in the Paris Climate Accords. Avoid, shift, and improve frameworks are being employed here (Leroutier and Qurion 2023). This is an encouraging step but one that would have to be scaled up with significant infrastructure investments and behavioral changes for it to be applicable in low-density and mass-transit poor North American suburban and regional centers (Bloch and Passalacqua 2021).

Conclusion

The purpose of this working paper was to highlight the environmental damage resulting from discretionary travel for business purposes that can be conducted remotely, and to look to pandemic-era travel restrictions as a teaching moment for considering what workplaces have and can continue to do to meet emissions restrictions targets. For discretionary travel, I argue for a rationing regime that will limit trips to the equivalent of the carbon emissions incurred by a single passenger in a trans-Atlantic commercial flight once a year. This quota can be divided between trips but not sold or reallocated to another person, except a child travelling with a caregiver. This regime would also apply to intermediate cases, limiting a guest worker or international student to a single return trip each year except in a limited number of compassionate circumstances which would require a waiver. Since 97-98 percent of travellers do not fly at all in a single year, this would have a minimal effect on the overall travelling public while greatly reducing emissions from frequent fliers (Gössling and Cohen 2014, 200). I also address discretionary travel by commuters using other forms of carbon-intensive transportation to travel to perform work that can be done remotely, and argue for penalizing businesses that require commuters to return to the office, while rewarding those who retain work from home policies. Commuters who perform work tasks that cannot be performed at a distance (i.e. site work in health care) and their employers should be exempt from similar penalties. Human rights related travel should remain outside the rationing regime to protect those fleeing climate-change related natural disasters, violence, and instability.

A transition to sustainable workplace mobility practices with reduced non-essential business travel will displace low-income workers in the aviation and hospitality sectors. To ensure that this transition is distributively just, government subsidies need to be available for retraining these workers for new jobs in the green economy, akin to similar measures in the mining sector (Abraham 2017, 222; United Nations 2016, 21). In white-collar occupations that are amenable to remote work, managers can be trained to use conferencing platforms more effectively to enhance culture, foster collaboration, and remind workers about mission objectives through online meetings and other interactions. Travel restrictions and rationing regimes will not need to last indefinitely, but they will need to be in place until technological advancements in aviation and commuting travel result in net-zero carbon emissions without relying on exploitative mining practices, and this is a high hurdle. To return to unencumbered mobility, governments and mobility-dependent businesses must invest in research and development to fast-track low-emissions mobility technologies and to ensure that as many of their source materials as possible are recycled (as part of the circular economy) or mined (as a last resort) in a just and environmentally responsible manner.

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