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Traffic Congestion in Luxembourg: Implications for Labour and Housing Markets

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Growing number of cross-border commuters and employment concentration in Luxembourg have made traffic congestion an increasingly central feature of daily mobility. This policy brief examines the impact of a 50% increase in motorway congestion on jobs, wages, housing costs and inequality in Luxembourg and the Greater Region, emphasising the role of congestion as a key factor in linking transport constraints to labour and housing market outcomes.

Why Commuting Conditions Matter for Luxembourg's Economy

Luxembourg relies heavily on cross-border labour. Each day, more than 200,000 workers commute into the country from France, Belgium, and Germany, which is extraordinary for a country of 650,000 residents. Cross-border workers now represent 47% of total employment (ADEM, 2023), and 74% of the workforce holds foreign nationality (Government of Luxembourg, 2024). This inflow supports Luxembourg's economy and its GDP per capita, but it simultaneously generates externalities in the form of traffic congestion, environmental pressures, and housing affordability challenges.

Attracting and retaining talent is a stated policy priority. The Ministry of the Economy chairs the High Committee for the Attraction, Retention and Development of Talent, established in 2024 under the Coalition Agreement (Ministry of the Economy, 2024). According to estimates from the General Inspectorate of Social Security (IGSS), Luxembourg will need 335,000 new hires by 2040 — 180,000 to replace retirees and 155,000 to fill newly created positions (Chamber of Commerce, 2024). The OECD has identified road congestion as "*a key deterrent for French, Belgian and German talents who live close to the border with Luxembourg and might want to work there*" (OECD, 2025).

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Continued growth in cross-border and domestic commuting could put further strain on Luxembourg's transport infrastructure in the coming years, leading to higher levels of traffic congestion. Understanding how congestion affects residential and workplace decisions, who gains, or who loses when commuting conditions change, is therefore directly relevant to Luxembourg's economic strategy.

Modelling and Simulations

This policy brief draws on research by Burzynski, Kudashev and Verheyden ("Trading Miles for Rents: A Radiation Model of Cross-Border Commuting and Residential Location"). The authors developed an economic model replicating the housing and labour markets of Luxembourg, Lorraine, Wallonia, and the German border regions, based on over 10,000 cells of 1 km².

The model provides a unified framework for understanding how commuting, housing, and labour markets interact across the Greater Region.

Why? To enable policymakers to simulate the consequences of various policies before they are implemented. For example, how would job and residence decisions, as well as housing prices and economic activity, be impacted by mobility infrastructure investments or telework arrangements?

In the model, workers face two interrelated decisions:

Job choice is conditional on current residence: workers search for jobs starting from the closest locations and accept a position if it improves their quality of life, based on wages, leisure time and job quality. The more people spend time commuting, the less they enjoy leisure.

Residential choice depends on maximizing utility net of housing costs: individuals may change residence when new job opportunities appear or when travel times make other locations more appealing. Housing prices rise in places where many people want to live.

These decisions interact. When traffic congestion increases, it affects the attractiveness of jobs (by reducing leisure time for commuters), which in turn affects where people want to live, which reshapes housing markets. The model captures these interdependencies across each square kilometre of the entire Greater Region.

Congestion and jobs. The model incorporates real road network data (actual speeds registered by CITA motorway cameras) and distinguishes between eight occupation groups — from managers to elementary workers — allowing analysis of distributive effects.

The scenario: a 50% increase in traffic congestion on Luxembourg's motorway network. While the original paper examines a "free-flow" scenario (eliminating peak-hour congestion), this brief focuses on the opposite case to reveal what happens when conditions deteriorate rather than improve.

Results

Changes in jobs and residents

Figure 1 shows the aggregate effects by country. Luxembourg experiences a modest loss of 229 jobs (-0.06%) but gains 2,169 residents (+0.76%). This reflects a shift: increased congestion reduces commuting *to* Luxembourg, while incentivizing some Luxembourgish residents to work *outside* their country.

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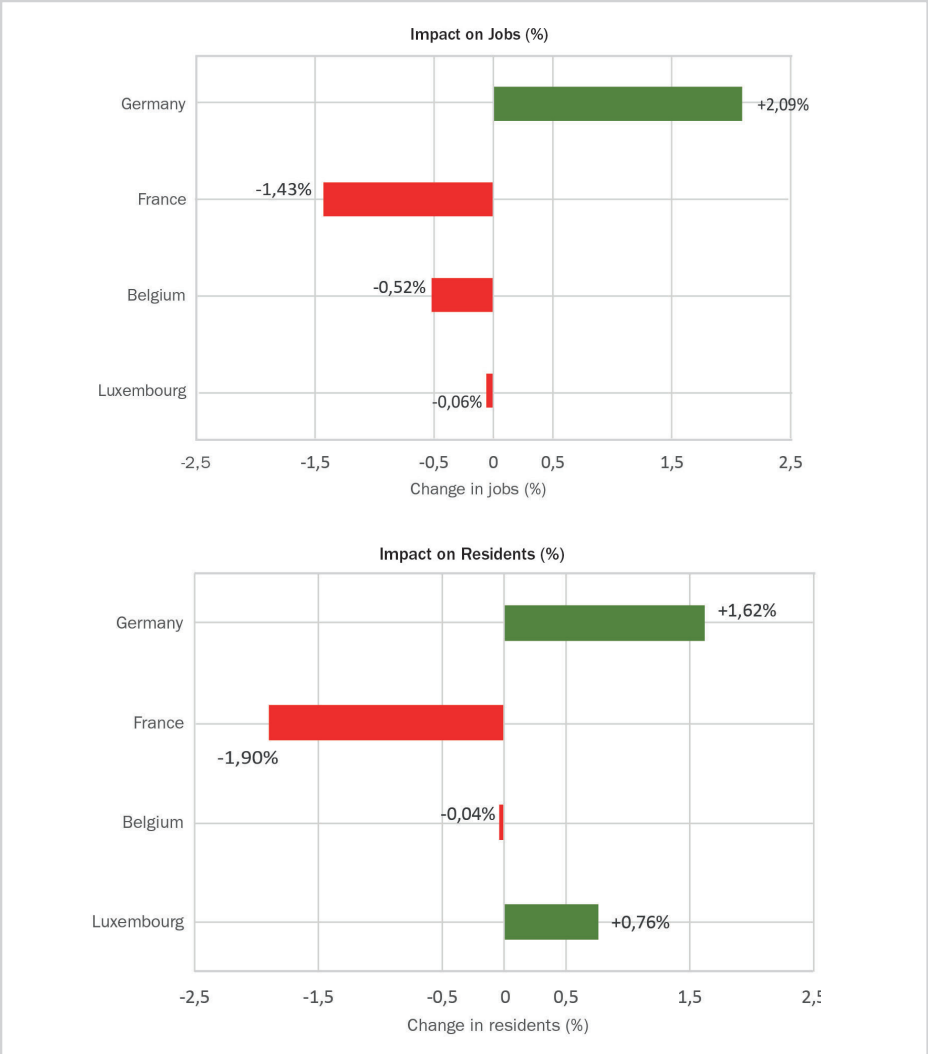


Figure 1: Regional Shifts in Jobs and Population

Note: Simulated effect of 50% increase in motorway congestion

The main beneficiary is Germany, particularly the Trier area, which gains nearly 4,000 jobs (+2.09%) and a similar number of residents. Three factors explain this result. First, the scenario only increases congestion on *Luxembourg's* motorways — German roads are unaffected, making locations like Trier relatively more attractive. Second, German workers have a moderate exposure to Luxembourg's labour market: 54,500 German residents commute to Luxembourg, compared to 119,900 from France and 52,400 from Belgium (STATEC, 2023). Fewer Germans are therefore hurt when commuting to Luxembourg becomes more costly. Third, Trier has a strong local economy that can absorb some of the displaced economic activity.[1]

[1] *A back-of-the-envelope calculation suggests that a 50% increase in traffic congestion is likely to be caused by a 30-40% increase in commuting, which adds 20,000-25,000 cross-border workers from Germany to Luxembourg (see the estimates of traffic congestion elasticities relative to volume in Kucharski, Mahmassani, 2017 and in Gore et al., 2023). Therefore, the increase in 4,000 jobs in Trier region could be interpreted as a mitigation of the first-order effect.*

France and Belgium, by contrast, lose both residents and jobs, as illustrated in Maps 1 and 2. French border residents are heavily dependent on Luxembourg's labour market, and when commuting becomes more costly, they bear the largest losses. The Thionville area is particularly affected. Some workers and firms relocate towards Trier; others move south to Metz. Within Luxembourg, the model shows a shift in job distribution away from Luxembourg City towards secondary centres (Esch, Mersch, Nordstad).

Wages and housing prices

Average wage rates predominantly fall across the region, and average incomes drop by approximately 5–6% in Luxembourg, France, and Belgium. Workers in Germany gain modestly (+2%), but these gains are largely offset by rising housing prices in Trier (more than 10% increase). Similar housing price increases occur in Nordstad and, to a lesser extent, Metz. Border regions in Luxembourg and the surroundings of Thionville and Bastogne experience moderate reductions in housing prices, see Map 3.

Distributive effects across occupations

The external effects of increasing congestion (mitigating the potential cause of higher congestion due to more commuters to Luxembourg) differ substantially across occupations (Figure 2). Skilled workers — managers, professionals, and office workers — are significantly more sensitive to commuting conditions than less skilled workers. In Luxembourg, managers experience utility losses of nearly 11%, while office workers lose nearly 13%. This pattern reflects the geography of job opportunities: skilled workers tend to commute longer distances because suitable jobs are more concentrated in city centres.

Less skilled workers travel shorter distances and are thus less affected. In Luxembourg, craft workers and operators experience small *gains* in utility (+0.26% and +0.85% respectively). French residents lose significantly more than other groups due to their high dependence on cross-border commuting. The overall effect is a dampening of inequality: white-collar workers experience substantial losses, while some blue-collar workers in Luxembourg gain slightly.

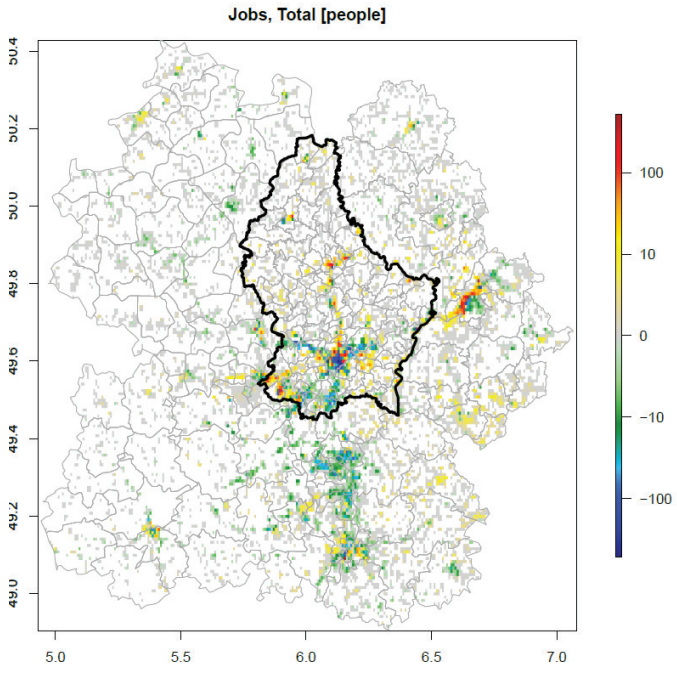
Policy Implications

From the perspective of Luxembourgish policymakers, the results highlight a trade-off. Allowing traffic congestion to increase would lower the country's economic potential — shifting the centre of gravity towards Rhineland-Palatinate — but would also dampen inequality through differential effects on white-collar and blue-collar workers. Job creation would scatter around the country (especially the North and Esch-Pétange) at the expense of Luxembourg City.

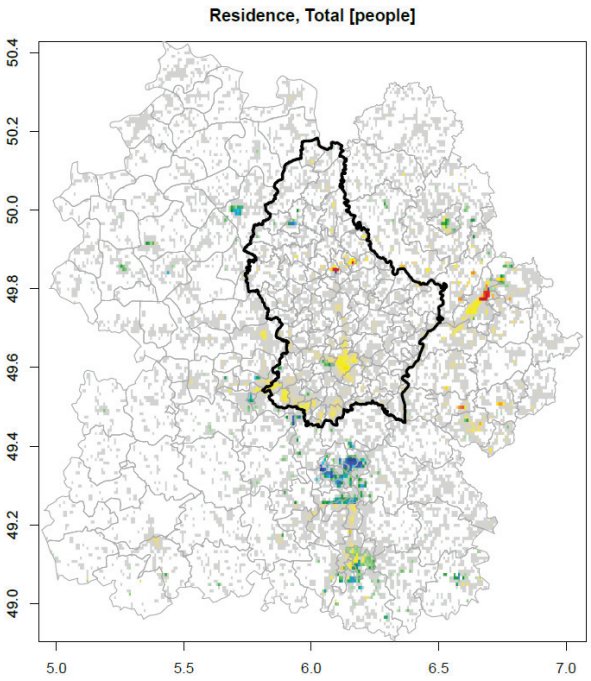
Efficient commuting across borders is in the interest of French and Belgian residents, whose dependence on the Luxembourgish labour market is crucial for maintaining living standards. In contrast, residents in Germany would be less affected by — or even benefit from — policies that increase congestion to Luxembourg. The scenario also provides insight into the effects of telework policy. Reducing the number of telework days effectively increases congestion, with distributive consequences similar to those presented here.

More traffic congestion lowers Luxembourg's economic potential, but dampens inequality through differential effects on white-collar and blue-collar workers. Economic benefits accrue to the peripheries (especially the North and Esch-Pétange) at the expense of Luxembourg City.

Map 1: Change in the number of jobs by pixels



Map 2: Change in the number of residents by pixels



Map 3: Percent change in housing prices by pixels

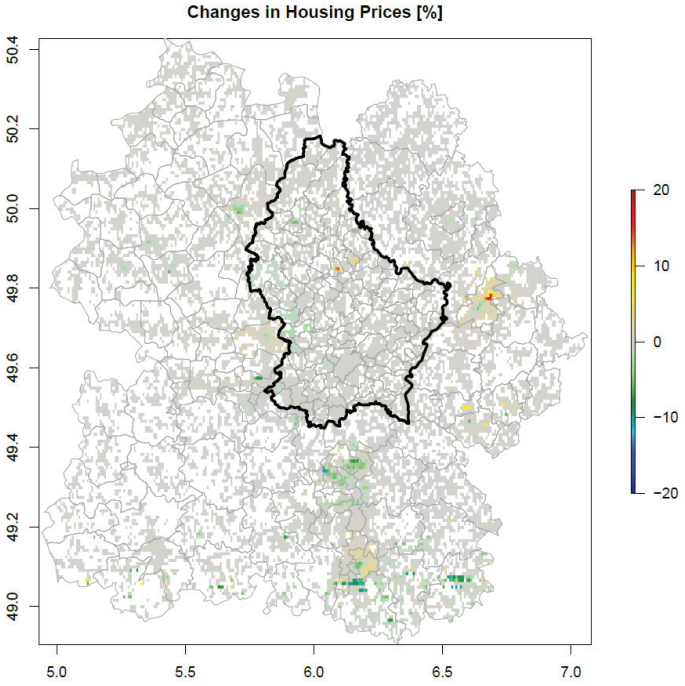


Figure 2: Who Wins and Who Loses? Change in utility by occupation and country (%)

Conclusion

Mobility policies reshape the Greater Region's economic geography. Any significant intervention — tram extensions, rail tunnels, telework frameworks, or motorway expansions — should be assessed in terms of commuting flows, residential migration, wage adjustments, housing pressures, and inequality. The model presented here provides policymakers with a tool to simulate these consequences before decisions are made.

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