

# An agent-based impact evaluation of the speed limit reduction on the Paris ring road (beltway)

Azise-Oumar Diallo ([azise-oumar.diallo@ifpen.fr](mailto:azise-oumar.diallo@ifpen.fr))

Giovanni De Nunzio ([giovanni.de-nunzio@ifpen.fr](mailto:giovanni.de-nunzio@ifpen.fr))



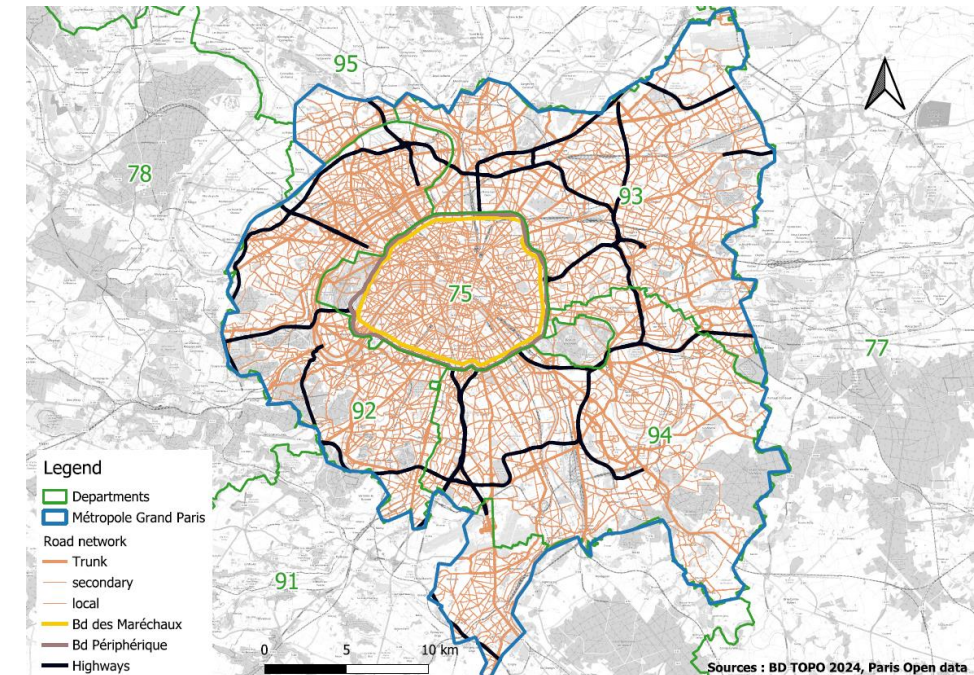
# AGENDA

- Introduction
  - General context
  - Research questions
- Methodology and assumptions
- Results
  - Change in mode choice
  - Traffic flow
  - Traffic speed
- Conclusion and perspectives

## RESEARCH OBJECTIVE

What is the **impact** of reducing the speed limit from **70 km/h to 50 km/h**?

- Evaluate the impact using **MATSim** and **real-world data**
- Consider **changes in individual mobility behaviors** (route choice, modal shift, etc.)
- Assess the effects on:
  - Traffic congestion
  - Rebound effects
- Analyze the **capability** of **MATSim** to perform this “kind” of assessment



# GLOBAL APPROACH

IdF calibrated  
model

Network  
Modification

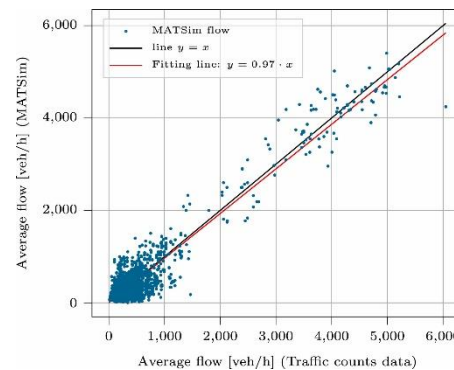
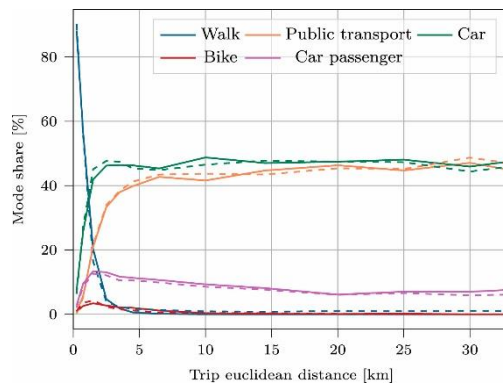
Simulations

Analysis

Hörl, S. and M. Balac (2021). Synthetic population and travel demand for Paris and Île-de-France based on open and publicly available data. *Transportation Research Part C*, **130**, 103291.

Dib, A., Balac, M., & Sciarretta, A. (2025). Deep learning approach to predict microscopic pollutant emissions from mesoscopic traffic simulations. *Transportation Research Part D: Transport and Environment*, **146**, 104791.

- Cross-border traffic (cordon surveys)
- HERE network

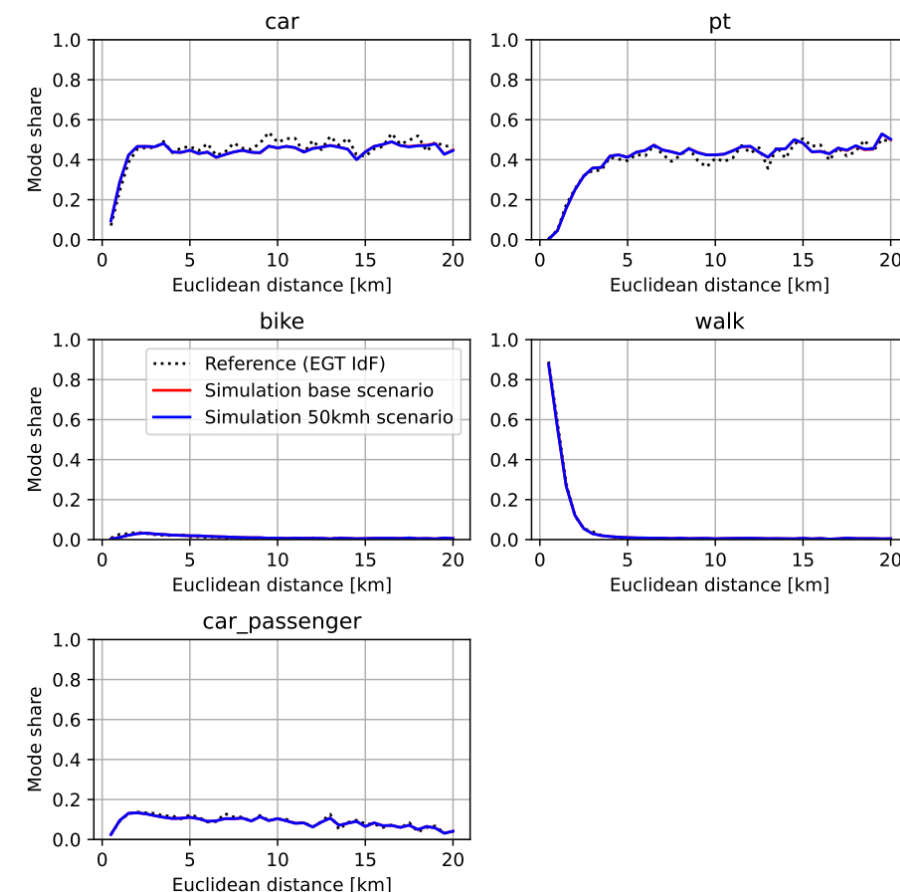


# IMPACT ON MODAL CHOICE

	All IdF			Paris O or D			Paris without internal		
	Car	PT	Bike	Car	PT	Bike	Car	PT	Bike
Survey (EGT)	30.7	20.6	1.6	12.8	42	2.3	24.1	68.1	1
70 km/h scenario	31.4	20.5	1.7	20.3	38.6	2.4	33.3	56.5	0.2
50 km/h scenario	31.3	20.6	1.7	20.2	38.7	2.4	33.1	56.7	0.2
<b>Variation (%)</b>	<b>-0.3</b>	<b>+0.5</b>	<b>0</b>	<b>-0.5</b>	<b>+0.3</b>	<b>0</b>	<b>-0.6</b>	<b>+0.4</b>	<b>0</b>

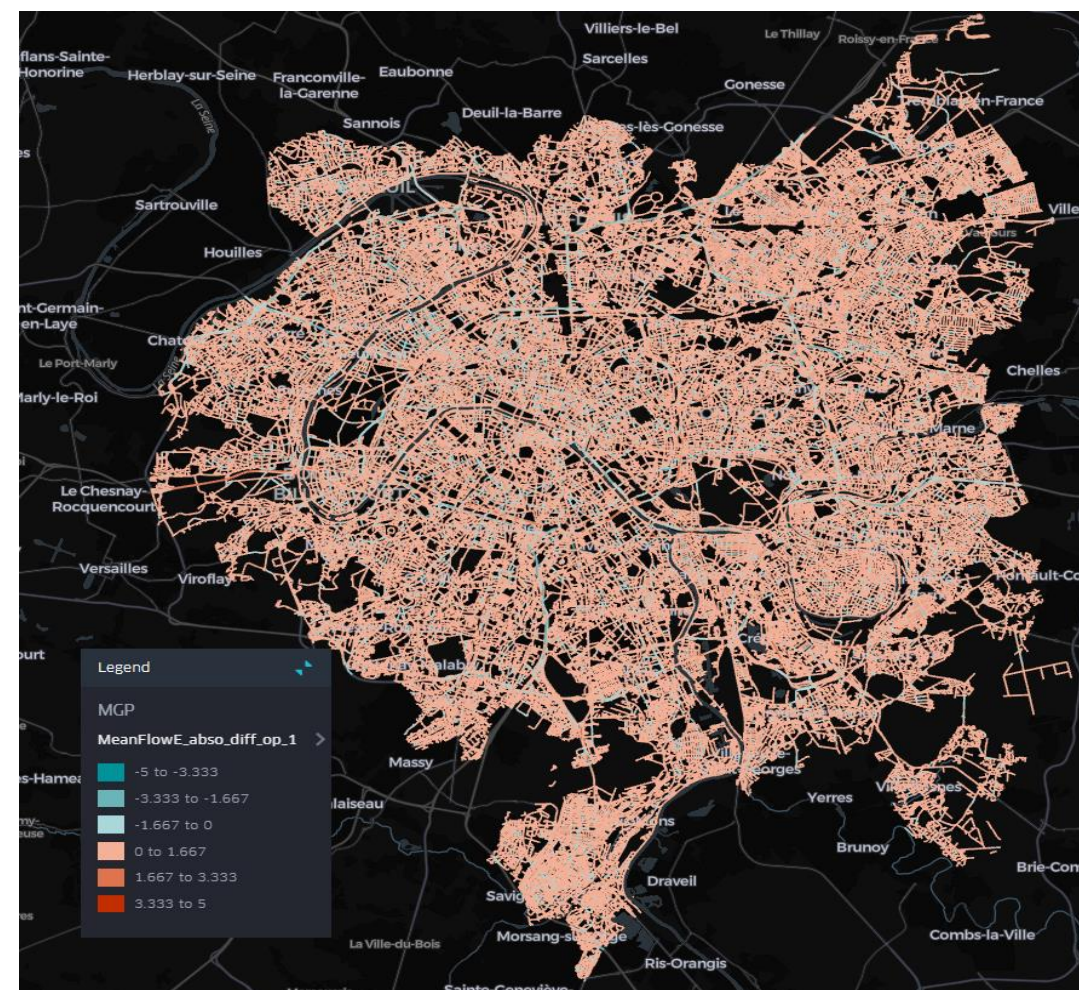
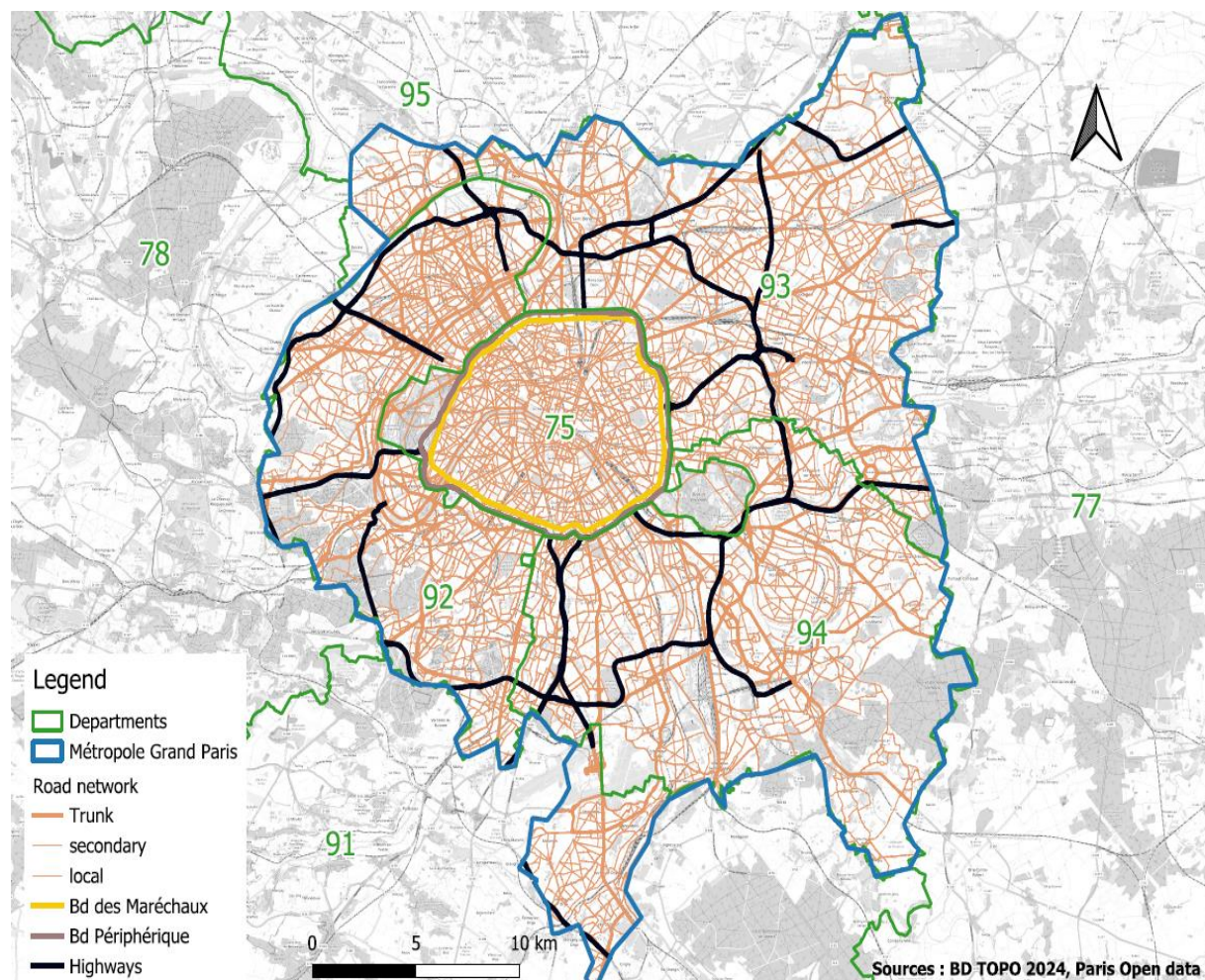
→ Simulation results suggest that such a measure **does not significantly impact** on modal choice!

/!\ Need more deeper analysis on impacted agents



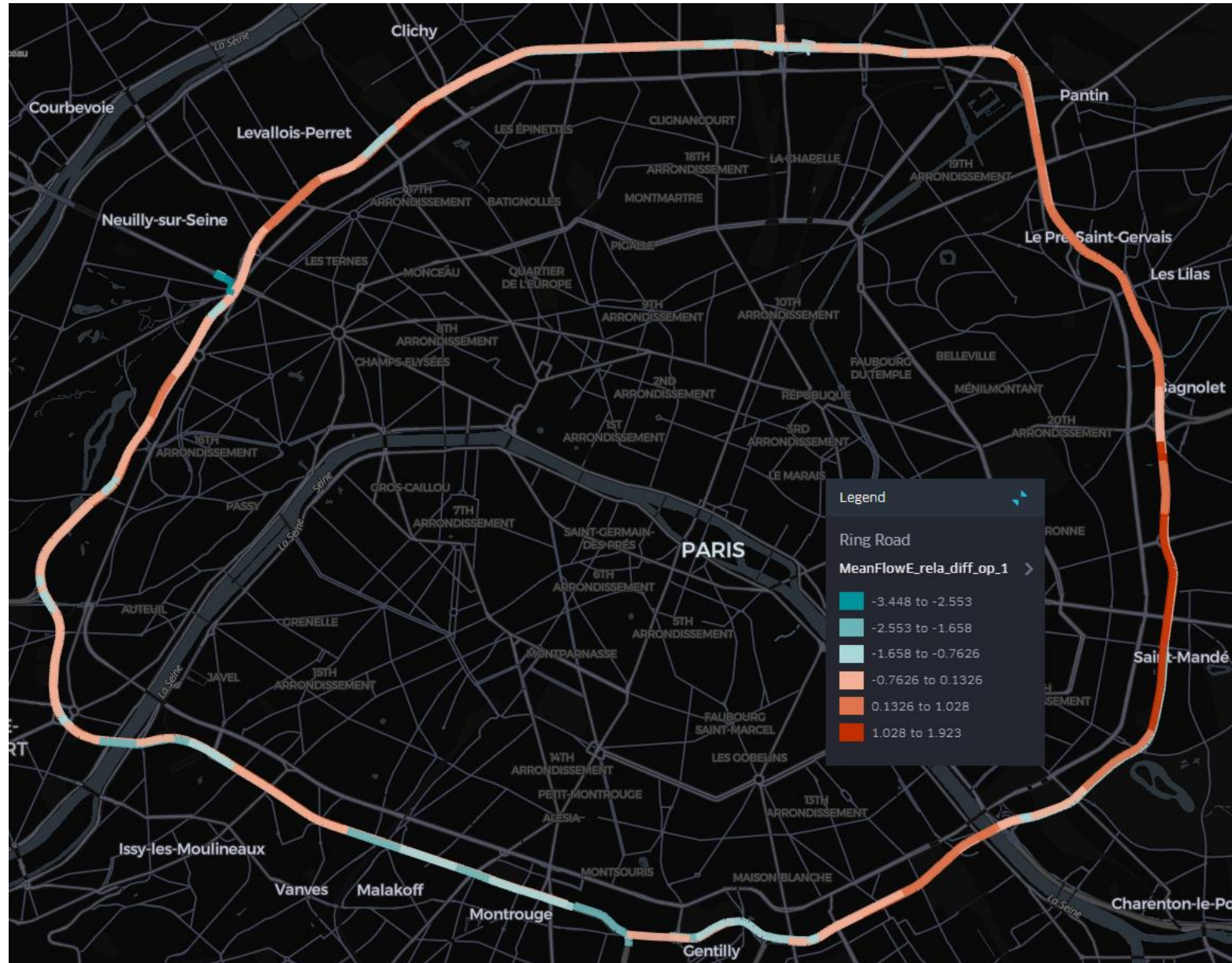


# TRAFFIC FLOW ACCORDING *MATSIM* AT THE SCALE OF THE *MÉTROPOLE DU GRAND PARIS (MGP)*



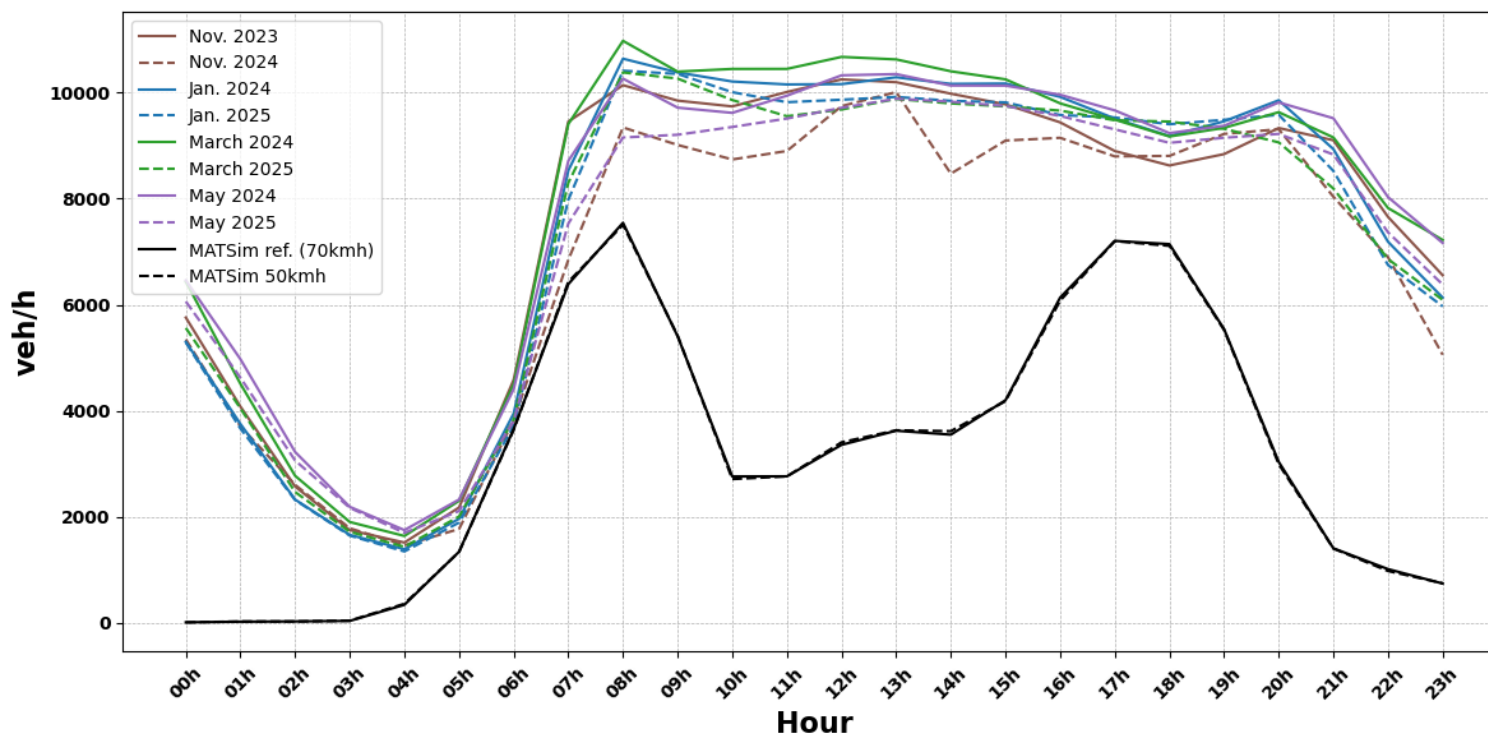


# TRAFFIC FLOW ON THE BELTWAY LINKS MATSIM 70KMH VS 50KMH



# TRAFFIC FLOW ON THE BELTWAY LINKS FROM COUNT DATA AND MATSIM

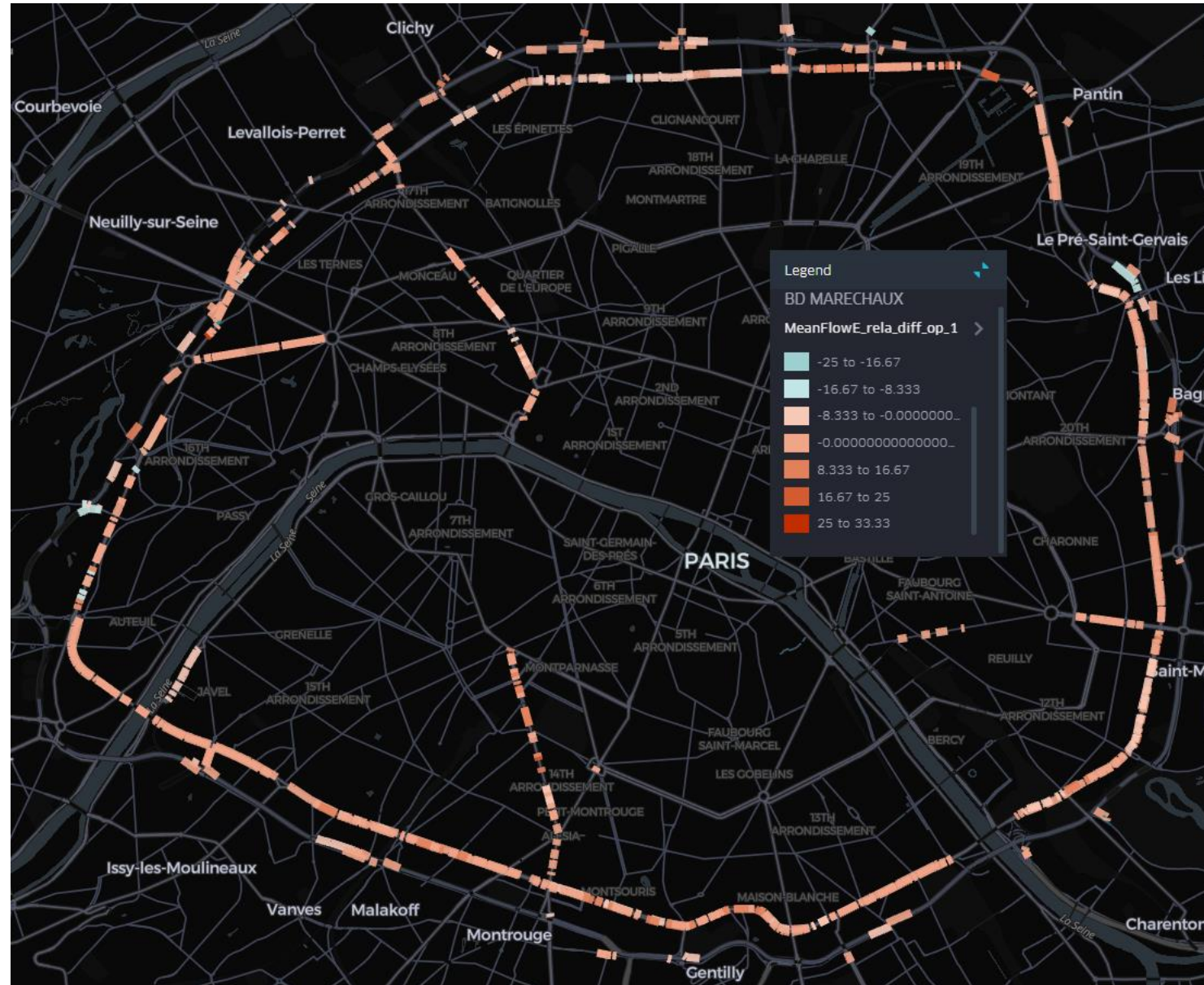
	MATSim		Traffic count data*													
	Sim. 70kmh	Sim. 50kmh	Nov 23	Nov 24	Dec 23	Dec 24	Jan 24	Jan 25	Feb 24	Feb 25	Mar 24	Mar 25	Apr 24	Apr 25	May 24	May 25
Flow (v/h)	3216	3211	7512	6913	7660	7486	7551	7363	7872	7395	7888	7360	7916	7437	7804	7347
Variation (%)	<b>-0.2</b>		<b>-8</b>		<b>-2.3</b>		<b>-2.5</b>		<b>-6</b>		<b>-6.7</b>		<b>-6</b>		<b>-5</b>	



[https://opendata.paris.fr/explore/dataset/comptages-routiers-permanents/information/?disjunctive.libelle&disjunctive.etat\\_trafic&disjunctive.libelle\\_nd\\_amont&disjunctive.libelle\\_nd\\_aval](https://opendata.paris.fr/explore/dataset/comptages-routiers-permanents/information/?disjunctive.libelle&disjunctive.etat_trafic&disjunctive.libelle_nd_amont&disjunctive.libelle_nd_aval)

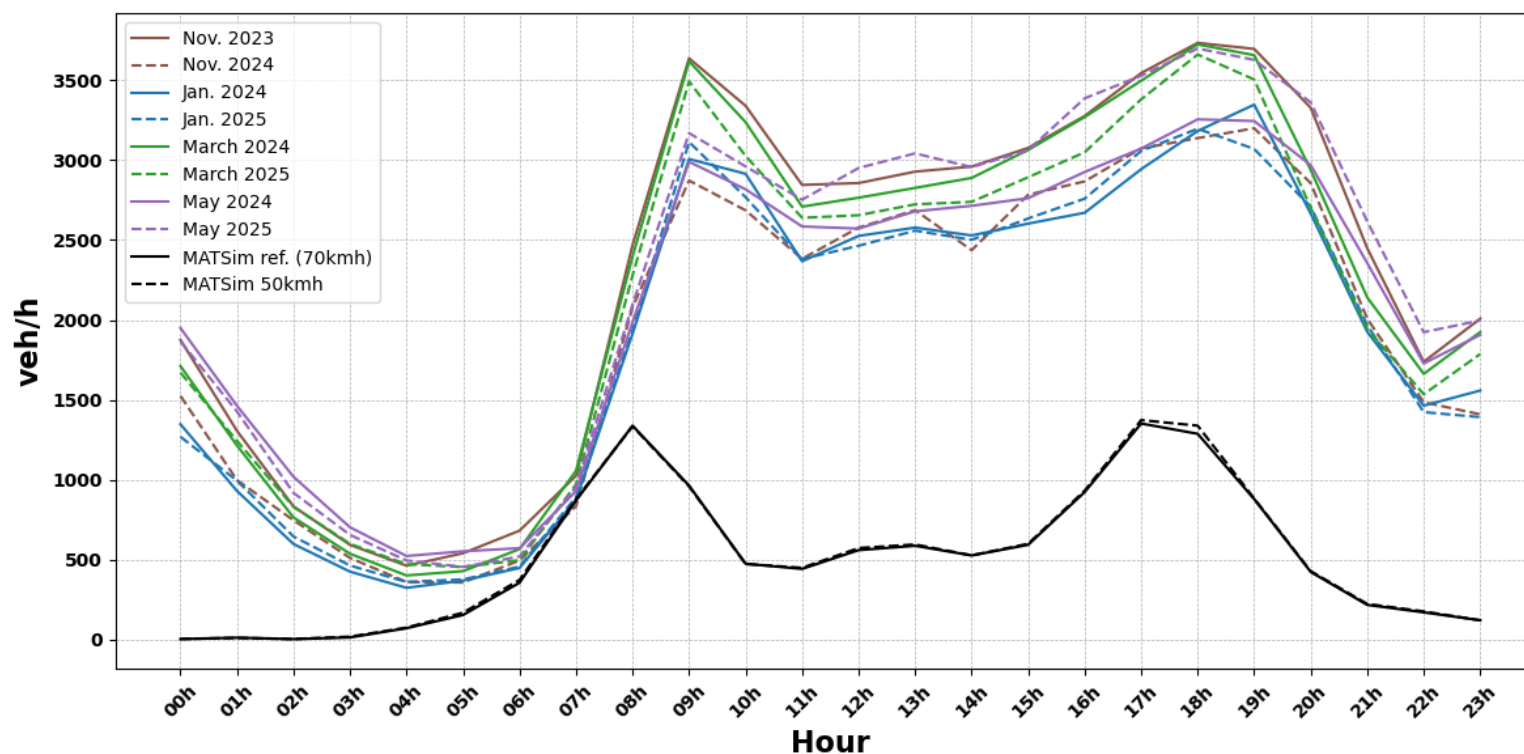


# TRAFFIC FLOW ON THE *BD MARÉCHAUX* LINKS MATSIM 70KMH VS 50KMH

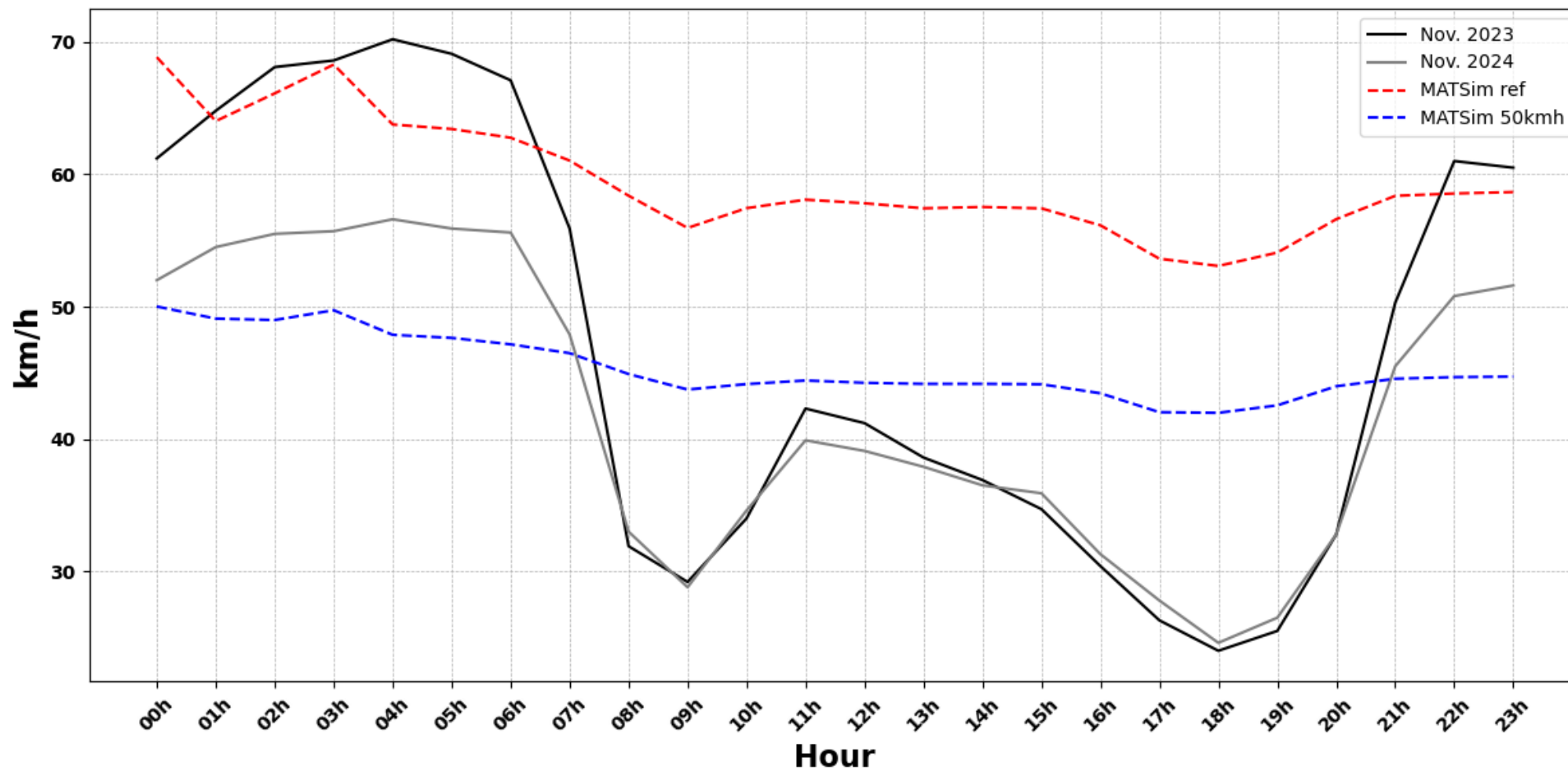


# TRAFFIC FLOW ON THE *BD MARÉCHAUX* LINKS FROM COUNT DATA AND *MATSIM*

	MATSim		Traffic count data													
	Sim. 70kmh	Sim. 50kmh	Nov 23	Nov 24	Dec 23	Dec 24	Jan 24	Jan 25	Feb 24	Feb 25	Mar 24	Mar 25	Apr 24	Apr 25	May 24	May 25
Flow (v/h)	514	521	2300	1932	2249	2213	1896	1891	2007	2033	2208	2114	2160	2336	2094	2267
Variation (%)	<b>+0.02</b>		<b>-16</b>		<b>-1.6</b>		<b>-0.3</b>		<b>+1.3</b>		<b>- 4.2</b>		<b>+8.1</b>		<b>+8.2</b>	



# SPEED PROFILES ON THE RING ROAD LINKS AVERAGE: REF\* VS MATSIM



<https://www.institutparisregion.fr/mobilite-et-transport/barometre-du-boulevard-peripherique/>



## CONCLUSION/DISCUSSION

### ● Investigating work

- Built upon an in-depth **calibration effort** of MATSim (Dib, A., Balac, M., & Sciarretta, A. (2025))
- Aimed to **evaluate a mobility policy: reducing** the speed limit of the Paris ring road
- Based on **real-world data**

### ● Findings /!\

- No significant impact observed on modal choice
- Traffic “reduction” effects observed

### ● Next Steps / Needs

- What are the relevant calibration validation indicators?  
→ Move toward a standardization or consensus on validation metrics

*Innovating for energy*

Find us on:

 [www.ifpenergiesnouvelles.com](http://www.ifpenergiesnouvelles.com)

 @IFPENinnovation



# TRAFFIC FLOW ON THE BELTWAY LINKS FROM COUNT DATA AND MATSIM

