



What can more walking and cycling achieve for Ireland's climate targets?

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Ireland's commitments to Climate Action



A legal obligation to a 51% reduction in GHG CLIMATE emissions for Ireland by 2030 compared to 2020. **ACTION** This roughly translates to An Bille um Ghníomhú ar son na hAeráide agus um Fhorbairt Ísealcharbóin 7% per year reduction in **PLAN** (Leasú), 2021 **GHG** emissions Climate Action and Low Carbon Development (Amendment) Bill 2021 2019 Mar a tionscnaiodh As initiated To Tackle Climate Breakdown



Programme for Government

Our Shared Future

Targets for sustainable technologies, public services and low carbon schemes



Where do Ireland's Green House Gas Emissions come from?



[1] Environmental Protection Agency, 2021 accessible at https://www.epa.ie/ghg/transport/

Policy makers

- Policy documents
- Needs of the public
- Emissions targets
- Modelling blind spots





Modellers

- Modelling Tools
- Analytical capacity
- Policy blind spots





[2] Environmental Protection Agency, 2020. *Ireland's Environment - An Integrated Assessment 2020*. [online] Available at: https://www.epa.ie/media/EPA-Ireland's-Environment-2020-Chapter11.pdf [Accessed 26 March 2021].







The Irish Transport Emissions and Mobility Model (IPTEM Model) provides a historical look and a future projection of the total passenger transport demand by:

- 1. Mode
- 2. Trip length
- 3. Trip purpose

For Ireland. It is based on the Irish Car Stock Model [3] and the National Travel Survey [4]

[3] Daly, H., Ó Gallachóir, B.P., 2011. Modelling private car energy demand using a technological car stock model. Transp. Res. Part D Transp. Environ. <u>https://doi.org/10.1016/j.trd.2010.08.009</u>
 [4] Central Statistics Office, National Travel Survey, <u>https://www.cso.ie/en/statistics/tourismandtravel/nationaltravelsurvey/</u>

Private car is the most common transport mode in Ireland





Passenger transport demand by trip purpose





Occupancy rates of transport modes in Ireland





Occupancy is the average number of people travelling in a mode of transport. It is based on an estimation from recorded passenger numbers from Bus Éireann, Dublin Bus and Irish Rail Annual Reports [5], [6], [7]. Private vehicle occupancy estimates are based on Eurostat figures [5].

Emissions per passenger kilometre for transport modes in Ireland







Exploratory climate action targets are applied using the LEAP simulation model and scenario analysis. This allows the construction of pathways to low carbon transport and the estimation of carbon budgets for the period 2020 – 2030 [6].



Identify key government end year targets for 2030

[6] Mac Uidhir, T., Rogan, F., Gallachóir, B.Ó., 2020. Develop a LEAP GHG Ireland Analytical Tool for 2050 Report No. 349. Available at: https://www.epa.ie/pubs/reports/research/climate/Research_Report_349.pdf (Date Accessed: 16th December 2020)



Scenario	Assumptions
Reference	Assumes no change in share of transport modes from 2019 levels
Cycling accounts for 10% of the shortest trips	 Share of cycling passenger kilometres increases until it reaches the value of passenger kilometres that represents 10% of the shortest trips
Cycling and walking 450,000 trips per day	 Walking and cycling trips increase proportionally to their current shares until 450k trips per day are either by walking or cycling
Cycling accounts for 10% of work passenger kilometres by 2030	 Cycling rate increases for work related travel until 10% of passenger kilometres for work is by cycling
Cycling is 10% of work and education passenger kilometres	 Cycling rate increases for work and education related travel until 10% of passenger kilometres for work and education is by cycling
Cycling accounts for 10% of trips of typical cycling journey length	 Cycling accounts for 10% of trips of typical cycling length
Cycling accounts for 10% of ALL passenger kilometres	 Cycling services 10% of ALL passenger kilometre demand each year (This is equivalent to the rate of cycling in the Netherlands)





- Reference

Cycling is 10pc of work pkm Cycling accounts for 10pc of shortest trips Cycling is 10 pc of ALL pkm by 2030 Cycling and walking 450k trips per day Cycling accounts for 10pc of trips with typical cycling journey lengths



Scenario	Reduction in 2030 compared to 2020
	MtCO ₂
Active modes = 10% of shortest trips	0.5
Cycling = 10% of trips with typical cycle journey length	0.9
Active modes = 450k trips per day	1
Actives modes = 10% of all PKM by 2030	0.7
Active modes = 10% of work and education PKM	0.3
Active modes = 10% of work PKM	0.2



- In 2019, 1.7% of trips were made by bike, far below the 2009 "Smarter Travel" 10% target for 2020 [7]
- Private car is the most common transport mode in Ireland many more journeys could be via public transport or active modes
- Active modes could deliver between 0.2 and 1 MTCO2 emissions reduction in 2030.
- E-bikes may extend the potential for longer car trips to be replaced [8]
- Demand reduction scenarios the Irish Passenger Transport Modelling Framework could investigate the impacts of remote work on passenger transport emissions
- The individual impact of these policy measures will be different than the sum of the emission savings, due to the interaction effect this is an area for future work

 [7] Department of Transport, "Smarter Travel: A Sustainable Transport Future," 2009. [Online]. Available: <u>http://www.smartertravel.ie/sites/default/files/uploads/2012_12_27_Smarter_Travel_english_PN_WEB%5B1%5D_0.pdf</u>.
 [8] J. E. Bourne et al., "The impact of e-cycling on travel behaviour : A scoping review," J. Transp. Heal., vol. 19, no. August, p. 100910, 2020, doi: 10.1016/j.jth.2020.100910.

Our impact



Emissions Reduction in Transport:

Submission to Oireachtas Committee on Climate Action

April 6th 2021

Brian Ó Gallachóir, Paul Deane, Tomás MacUidhir, Vera O'Riordan, Shane McDonagh, Vahid Aryanpur and Fionn Rogan



How the pandemic led to a cycling renaissance



Updated / Wednesday, 7 Oct 2020 16:03



"People cycle because it keeps them f enjoy

> Analysis: cycling wa lockdown, but more long-term difference

Here's how more walking and cycling will reduce carbon emissions

Updated / Wednesday, 15 Jul 2020 09:29

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"Relatively short journeys are a good opportunity to switch from carbon intensive modes (such as driving) to zero carbon modes (such as walking and cycling)"

More f

By Hannah Daly, Ver

Analysis: if half of all car journeys under 6km switched to cycling or walking, we'd see a fall of 0.12 million tonnes of emissions in a year

By Vera O'Riordan, Fionn Rogan, James Fitton and Brian Ó Gallachóir, UCC



"Healthy Planet, Healthy Communities"

- Active modes of travel reduce car usage free the roads for those who really need them
- The health benefits of exercise are well researched, walking and cycling infrastructure can facilitate this
- By reducing CO2 emissions by switching from car use to bike use, we look after our physical health, mental health and the wellbeing of our planet by reducing CO2 emissions





Questions & suggestions welcome! Thanks for listening!



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Proportion of passenger travel demand by overall journey distance, 2019



References



[1] Environmental Protection Agency, 2021 accessible at https://www.epa.ie/ghg/transport/

[2] Environmental Protection Agency, 2020. Ireland's Environment - An Integrated Assessment 2020. [online] Available at: https://www.epa.ie/media/EPA-Ireland's-Environment-2020-Chapter11.pdf> [Accessed 26 March 2021].

[3] Daly, H., Ó Gallachóir, B.P., 2011. Modelling private car energy demand using a technological car stock model. Transp. Res. Part D Transp. Environ. https://doi.org/10.1016/j.trd.2010.08.009

[4] Central Statistics Office, National Travel Survey, <u>https://www.cso.ie/en/statistics/tourismandtravel/nationaltravelsurvey/</u>

[5] European Environment Agency, accessible at : <u>https://www.eea.europa.eu/data-and-maps/indicators/occupancy-rates-of-passenger-vehicles/occupancy-rates-of-passenger-vehicles</u>

[6] Mac Uidhir, T., Rogan, F., Gallachóir, B.Ó., 2020. Develop a LEAP GHG Ireland Analytical Tool for 2050 Report No. 349. Available at: <u>https://www.epa.ie/pubs/reports/research/climate/Research_Report_349.pdf</u> (Date Accessed: 16th December 2020)

[7] Department of Transport, "Smarter Travel: A Sustainable Transport Future," 2009. [Online]. Available: http://www.smartertravel.ie/sites/default/files/uploads/2012_12_27_Smarter_Travel_english_PN_WEB%5B1%5D_0.pdf.

[8] J. E. Bourne et al., "The impact of e-cycling on travel behaviour : A scoping review," J. Transp. Heal., vol. 19, no. August, p. 100910, 2020, doi: 10.1016/j.jth.2020.100910.



- Scenario analysis uses a simulation tool to compare a new target, which is quantified in a new scenario against the 'Business as Usual' or 'no target' scenario which is called the "Reference" scenario
- By comparing the relative difference in emissions, we can get an insight into the effectiveness of the policy target in reducing carbon dioxide emissions <u>if it is</u> <u>achieved by a given date.</u>
- More details about the LEAP Ireland 2050 model can be found <u>here</u> [9].

[6] Mac Uidhir, T., Rogan, F., Gallachóir, B.Ó., 2020. Develop a LEAP GHG Ireland Analytical Tool for 2050 Report No. 349. Available at: https://www.epa.ie/pubs/reports/research/climate/Research_Report_349.pdf (Date Accessed: 16th December 2020)

COVID-19 & Passenger Transport Demand





[3] Daly, H., Ó Gallachóir, B.P., 2011. Modelling private car energy demand using a technological car stock model. Transp. Res. Part D Transp. Environ. https://doi.org/10.1016/j.trd.2010.08.009
[6] Mac Uidhir, T., Rogan, F., Gallachóir, B.Ó., 2020. Develop a LEAP GHG Ireland Analytical Tool for 2050 Report No. 349. Available at: https://www.epa.ie/pubs/reports/research/climate/Research_Report_349.pdf (Date Accessed: 16th December 2020)





