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Sustainable transport policy, car ownership, and cost: A comparison of Dublin and Vienna

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ABSTRACT

CENTRAL EUROPEAN UNIVERSITY

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The effects of rising rates of car ownership are increasingly a problem that cities have attempted to address through various measures. In Europe, some cities have sought to transition to sustainable forms of transport, such as through car-restrictive measures and by encouraging alternative travel modes. This thesis takes the example of Vienna and Dublin and compares their sustainable urban transport policies. It also interviews car-owning residents from both cities regarding their motivations for car use, car-related costs they face, and opinions of their cities' transport policies. It then uses the data to estimate the costs of transport modes for one participant per city and estimates the time and cost required for some potential journeys they may take. This thesis finds cars to be the most expensive form of transport for both cities, but that other factors contribute to the interviewees' ownership of cars. It also details the similarities and differences in motivations, costs, and perceptions of policy among participants from the two cities.

Keywords: policy, transportation, Vienna, Dublin, cars

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CHAPTER 1 – CARS IN URBAN SPACES

The urbanization of the world is among the defining phenomena to have taken place since the mid-20th century. Driven by factors such as economic opportunity and population growth[1], a growing share of the world is living in cities. In 1950, 29.5 percent of the world's population lived in cities – this has grown to 55.3 percent in 2018, and is expected to reach 68.4 percent by 2050.[2] Cities typically are centers of economic, political, and cultural activity; and as the global population increasingly concentrates itself in urban areas, concerns about quality of life, equity, and efficient use of resources in such places will become increasingly important. This urbanization trend is running parallel to another global phenomenon: growing rates of car ownership. Across the world, in both developed and developing countries, the car ownership rates per capita has been on the rise. A 2007 study on car ownership rates among 45 countries found that this number increased in every country. Among countries in the Organisation for Economic Co-operation and Development (OECD), the car ownership rate on average rose from 150 cars per 1000 people in 1960 to 550 in 2002, with the study authors predicting this to rise to 713 cars per 1000 people in 2030.[3] Growing car ownership can be linked to a reduction in public transportation services that in itself can be the result of lower density settlement patterns that are facilitated by car ownership, as seen in a large number American urban areas since the 1960s.[4]

1. Barney Cohen, "Urbanization in developing countries: Current trends, future projections, and key challenges for sustainability," *Technology in Society* 28, no. 1-2 (January-April 2006): 64, 69.
2. United Nations, Department of Economic and Social Affairs, Population Division, *World Urbanization Prospects: The 2018 Revision (ST/ESA/SER.A/420)*, 2019, New York: United Nations, 9.
3. Joyce Dargay, Dermot Gately, and Martin Sommer, "Vehicle Ownership and Income Growth, Worldwide: 1960-2030," *The Energy Journal* 28, no. 4 (2007).
4. Kumares C Sinha, "Sustainability and Urban Public Transportation," *Journal of Transportation Engineering* 129, no. 4 (2003), 333.

Both urbanization and rising vehicle ownership have affected countries in Europe. Statistics from the United Nations mark Europe as a region that has similarly been shifting from rural to urban settlement, with the portion of the European population living in urban areas rising from 51.7 to 74.5 percent from 1950 to 2018, respectively, and this figure is projected to rise to 83.7 percent by 2050.[5] In addition, while the urban growth rate continues to fall in Europe, the urban population is still expected to grow from 553 million in 2018 to 599 million in 2050.[6] Concurrently, car ownership across EU countries as a whole has climbed. According to Eurostat statistics, car ownership rates averaged across all EU countries rose from 486 passenger vehicles per 1000 inhabitants in 2011 to 563 in 2022.[7] These trends indicate that Europe – like the rest of the world – has in general become both more urban and more powered by cars.

While necessary for particular industries, residents, and uses, car use in urban areas at excessive levels can result in various negative effects on society. Car drivers can crash into pedestrians or other drivers, leading to injury, fatalities, or property damage. Vehicles, which are still predominantly powered by fossil fuels, also play a major role in urban air pollution, releasing particulate matter, volatile organic compounds, and particularly NOx emissions. Across the European Union (EU), road transport was the largest source of NOx emissions, 37 percent, in 2020.[8] NOx emissions can be hazardous to human health, and a study estimated that NOx emitted from diesel vehicles alone may have led to more than 9000 premature deaths in Europe in 2013, in addition to worsening eutrophication[9]. Furthermore, vehicles

5. United Nations, *World Urbanization Prospects*, 26.
6. United Nations, *World Urbanization Prospects*, 26.
7. Eurostat (Passenger cars – per thousand inhabitants; Accessed March 14, 2024), https://doi.org/10.2908/ROAD_EQS_CARHAB.
8. European Environment Agency, *Air Quality in Europe 2022*, November 2022, https://doi.org/10.2800/488115.
9. J E Jonson et al., "Impact of excess NO_x emissions from diesel cars on air quality, public health and eutrophication in Europe," *Environmental Research Letters* 12, no. 9 (2017), https://doi.org/10.1088/1748-9326/aa8850.

contribute significantly to noise pollution in cities, which can lead to health effects such as nervousness, worsened sleep quality, hearing impairment, hypertension, and depression.[10] Vehicles also take up a great amount of space in cities, which is a particularly acute problem due to cities having a higher population density and competition for space than in non-urban areas. According the City of Vienna's Urban Mobility Plan, an individual in a car travelling 40 km/hour occupies 60 square meters worth of space, whereas a passenger in a full bus only occupies 9.4 square meters (per person), a cyclist only 3, and a pedestrian merely 0.8 square meters[11]. These effects encompass a few of the ways in which too many cars can leave a localized impact on urban areas.

They also leave a global imprint. According to the International Energy Agency, the transport sector is responsible for more than a third of global greenhouse gas emissions (in terms of end users), with the majority of emissions coming from fossil-fuel based vehicles.[12] Transport emissions continue to rise yearly (with the exception of 2020), and the emissions from road transport have been edging toward their 2018 peak in the years following the pandemic. As of 2022, around 8 Gt of CO_2 have been emitted from the transport sector, with 5.87 Gt of that from road transport alone.[13] The vast majority of vehicles are still run on fossil fuels despite a recent growth in electric vehicles (EVs), which now occupy 2 percent of the global light-duty vehicle fleet.[14] In addition, while the data from the study by Dargay, Gately, and Sommer (2007) indicate that OECD countries generally have a higher rate of car ownership than do non-OECD ones, the ownership rates in these latter countries is projected

10. Sahar Geravandi et al., "Noise Pollution and Health Effects," *Jundishapur Journal of Health Sciences* 7, no. 1 (2015): 3, https://doi.org/10.5812/jjhs.25357.
11. City of Vienna, *STEP 2025 Thematic Concept: Urban Mobility Plan Vienna*, 2014, 48.
12. "Transport," International Energy Agency, updated July 11, 2023, https://www.iea.org/energy-system/transport#.
13. "Transport," International Energy Agency.
14. "Cars and Vans," International Energy Agency, updated July 11, 2023, https://www.iea.org/energy-system/transport/cars-and-vans.

to rise more rapidly.[15] This, along with a higher overall population and population growth, mean that vehicle emissions in non-OECD countries will likely continue to grow and spur a ballooning of global vehicle emissions in the future, which is the opposite trend needed to hinder climate change.

Given the local negative impacts and in alignment with their climate goals, several cities have sought to promote mobility beyond the private car among residents. Despite its higher rates of vehicle ownership compared with non-OECD countries,[16] many European cities have been centers of innovation in sustainable transportation. In a 2022 study, five out of 10 of the world's highest ranking public transportation systems were located there,[17] and cities such as Amsterdam and Copenhagen are world-famous for their cycling culture. These did not come about by accident – they were the result of local initiative and government willpower. In Amsterdam, for example, public campaigns to limit car use and cancel motorway plans led to a reorientation of the city government toward cycling.[18] Other European cities have in recent years attempted to enact policies to discourage car ownership, such as London and its congestion charge covering the city center[19] and Madrid through its recent parking management system.[20] Such plans have been made with the intention to reduce local negative externalities of cars in cities or to help meet climate change goals.

This thesis seeks to analyze how cities' car-restricting policies affect car ownership and sustainable mobility, with a comparison between Vienna and Dublin. Both cities are capitals

15. Dargay, Gately, and Sommer, "Vehicle Ownership and Income Growth," 20.
16. Dargay, Gately, and Sommer, "Vehicle Ownership and Income Growth," 5.
17. Guillaume Thibault et al., *Urban Mobility Readiness Index 2022 Report*, Oliver Wyman Forum, 2023, 12.
18. Melissa Bruntlett and Chris Bruntlett, *Building the Cycling City: The Dutch Blueprint for Urban Vitality* (Washington, DC: Island Press, 2018), 89-97.
19. Samuel Chng et al., "To drive or not to drive? A qualitative comparison of car ownership and transport experiences in London and Singapore," *Transportation Research Interdisciplinary Perspectives* 2 (2019), 2.
20. Juan Nicolas Gonzalez et al., "What impact do private vehicle restrictions in urban areas have on car ownership? Empirical evidence from the city of Madrid," *Cities* 116 (2021), 4.

of small European countries and the centers of politics, business, and cultural sectors within Austria and Ireland. Yet their differences in culture, history, and geography may yield varying transport policies. This research will compare theses cities' car-restricting policies and their mobility situations. I will then conduct interviews with car drivers residing in Vienna and Dublin to understand how these policies affect drivers, the financial costs of car ownership, why they continue to drive cars, and their opinions regarding their cities' policies. A sample of possible journeys will also be taken from the interview data to compare the costs and travel times needed for each trip across transport modes, as well as a general estimate of yearly cost for each transport mode. A clear understanding at the individual level of these cities' policies and results could yield insights into important factors for crafting effective sustainable mobility policies for other cities. This thesis will first present the mobility and policy contexts of Vienna and Dublin, then review the literature regarding transportation policies aimed at reducing car ownership within both cities, and then describe the methodology used in this research. It will then present the results of the interviews and significant themes arising from them, show the cost comparison of travel modes for a sample of trips taken from the interviews, and then discuss the implications of the results.

CHAPTER 2 – BACKGROUND OF THE CITIES

2.1 EU legislation

The EU has outlined a set of goals and policies regarding climate change and transportation that affect the strategies adopted in Vienna and Dublin. In 2018, the EU set out its long-term climate strategy and declared its goal to achieve net-zero greenhouse gas emissions by 2050. Member states, including Ireland and Austria, are required to submit national strategies to achieve this plan.[21] From this overarching goal, the European Green Deal defines a sub-goal of reducing greenhouse gas emissions by 55 percent by 2030 compared to 1990 levels, in addition to pursuing a decoupling of economic growth from resource use.[22] Regarding the transport sector, this policy specifies that carbon emissions from cars should be cut by 55 percent and those from vans by 50 percent by 2030, and that new cars should all be emission-free by 2035. It also stipulates that the EU's emissions trading scheme will cover road transport by 2026, thereby placing a price on vehicle emissions and incentivizing a transition to less polluting vehicles.[23] The European Climate Law enacted in 2021 set into law the 2030 and 2050 goals,[24] while the specific policies developed to achieve the 2030 goal are outlined in the Fit for 55 strategy, which reiterates the 2030 vehicle emission goals and mandatory targets for hydrogen refueling and EV recharging facilities along roads.[25] Overall, the

21. Directorate-General for Climate Action (European Commission), "A Clean Planet for all: A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy" (Document 52018DC0773, November 11, 2018).
22. Directorate-General for Communication (European Commission), "European Green Deal: Delivering on our Targets" (NA-02-21-151-EN-C, Luxembourg: July 30, 2021), https://doi.org/10.2775/373022, 4.
23. Directorate-General for Communication (European Commission), "European Green Deal," 11-12.
24. European Parliament and Council of the European Union, "Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('European Climate Law')," (Document 32021R1119, July 9, 2021).
25. European Commission, "Commission welcomes completion of key 'Fit for 55' legislation, putting EU on track to exceed 2030 targets," news release, October 9, 2023, https://ec.europa.eu/commission/presscorner/detail/en/ip_23_4754

transport sector is featured within these EU climate policy documents as a crucial element in the EU's long-term climate goals.

This climate focus is visible in transport-related European legislation. The Sustainable and Smart Mobility Strategy developed by the European Commission sets out goals for 2050 such as having nearly all vehicles on the road release no emissions and a doubling of rail freight.[26] It also envisions the operation of the Trans-European Transport Network (TEN-T), a project to enhance trans-EU transport network connectivity.[27] It aims to connect all European areas to urban "cores", followed by a connecting of these cores into "corridors" across Europe that encompass rail, road, waterways, and aviation.[28] In addition, the Clean Vehicles Directive promotes the gradual phasing in of low-emission vehicles in public procurement, including in public transportation systems. The targets for Austria and Ireland are for 38.5 percent of light-duty vehicles, 15 percent of trucks, and 65 percent of buses to be low-emission ones by 2030.[29] Several of these climate and transport strategies are referenced in related documents issued by the Vienna and Dublin city governments.[30] Table 1 gives an overview of sustainable transport policies in both cities.

26. Directorate-General for Mobility and Transport (European Commission), "COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Sustainable and Smart Mobility Strategy – putting European transport on track for the future" (Document 52020DC0789, December 9, 2020).
27. Directorate-General for Mobility and Transport (European Commission), "Sustainable and Smart Mobility Strategy."
28. Directorate-General for Communication (European Commission), "Creating a Green and Efficient Trans-European Transport Network" (NA-06-21-207-EN-C, December 14, 2021). https://doi.org/10.2775/30576.
29. "Clean Vehicles Directive," Directorate-General for Mobility and Transport, European Commission, accessed March 21, 2024, https://transport.ec.europa.eu/transport-themes/clean-transport/clean-and-energy-efficient-vehicles/clean-vehicles-directive_en.
30. National Transport Authority, *Greater Dublin Area Transport Strategy 2022-2024* (Dublin), https://www.nationaltransport.ie/wp-content/uploads/2023/01/Greater-Dublin-Area-Transport-Strategy-2022-42-1.pdf, 35; City of Vienna, *Vienna Climate Guide: Towards a climate-friendly city*, March 2022, 55

Table 1. A selection of sustainable transport policies in Dublin and Vienna

Vienna	Dublin
Net-zero emissions goal by 2040 (across sectors). Goal to reduce transport emissions by 50 percent by 2030, and 100 percent by 2040.	Goal of reducing greenhouse gas emissions by 51 percent by 2030.
Parkpickerl (parking permit system) and no free on-street parking.	Paid on-street parking, and residential parking permit system (for Dublin City and Dún Laoghaire-Rathdown counties).
Pedestrianized streets, play streets, shared streets, and traffic-calming.	Various road reallocation projects (car lanes to bike lanes, turn lanes to pedestrian space, extended bus lane hours, etc).
U-bahn expansion. Very cheap public transport annual pass (costing EUR 1 per day).	Light rail system (Luas) established in 2004 and expanded. BusConnects upgrades since 2017.
More cycling paths and parking.	More cycling paths.
Goal of emission-free delivery vans by 2030, taxis by 2025, and no new fossil fuel-powered vehicle purchases by 2025.	Goal of 30 percent of country-wide car fleet to be EVs by 2030. Initiative to issue grants to replace vehicles with EVs since 2022.

Sources: Buehler et al. (2017), City of Vienna (n.d., 2014, 2022), Dublin City Council (n.d., 2024), Dún Laoghaire-Rathdown County Council (n.d., 2024), Fingal County Council (n.d., 2024), Halpern and Orlandi (n.d.), Mobilitätsagentur Wien (n.d.), National Transport Authority (n.d.), South Dublin County Council (n.d., 2024), Statistics Vienna (2023), Zero Emission Vehicles Ireland (Department of Transport; 2024).

2.2 Vienna

2.2.1 City background

Vienna is the capital of Austria. Sitting along the Danube River, the city has a size of 414.9 square kilometers and contains roughly 2 million inhabitants with an average population density of 4778 people per square kilometer.[31] The city proper is divided into 23 districts,

31. Statistics Vienna, *Vienna in Figures 2023*, Vienna, Austria, August 2023, 7.

including a historic inner core. Until the 1980s, the city had been characterized by a declining population and suburbanization.[32] The population has been growing in recent years, from 1.6 million inhabitants in 2002 to 2 million in 2023. Projections by the city indicate that this could grow to 2.3 million by 2053.[33] Despite this population growth, the city has managed to largely avoid urban sprawl due to urban renewal strategies that mainly re-used existing buildings and the preservation of the city's Greenbelt.[34] The average household in Vienna has 2.19 people (as of 2021),[35] and the average GDP per capita is EUR 53,000.[36]

2.2.2 Transportation in Vienna

The car ownership rate in Vienna is around 370 vehicles per 1000 residents, the lowest rate of all provincial capitals in Austria.[37] There were 17,805 EVs in 2022, a small part of the city's car fleet, but one that has grown 86 percent increase since 2020.[38] The main motorways in the city include the ring road that encircles the central part of the city west of the river, as well as several autobahn roads that enter Vienna from various directions. As of 2022, the model split of all trips made in Vienna is 35 percent walking, 30 percent public transport, 9 percent cycling, and 26 percent driving.[39]

32. Anna-Katharina Brenner et al., "What drives densification and sprawl in cities? A spatially explicit assessment for Vienna, between 1984 and 2018," *Land Use Policy* 138 (2024), https://doi.org/10.1016/j.landusepol.2023.107037.
33. "Summary: Small-Scale Population Projection for Vienna 2023-2053," Economic Affairs, Labour and Statistics (City of Vienna), accessed March 28, 2024. https://www.wien.gv.at/english/administration/statistics/population-projection-2053-summary.html.
34. Brenner et al., "What drives densification and sprawl?"
35. "Household projections," Statistics Austria, January 29, 2024. https://www.statistik.at/en/statistics/population-and-society/population/families-households-living-arrangements/household-projections
36. Statistics Vienna, *Vienna in Figures 2023*, 19.
37. Statistics Vienna, *Vienna in Figures 2023*, 17.
38. Statistics Vienna, *Vienna in Figures 2023*, 17.
39. Statistics Vienna, *Vienna in Figures 2023*, 17.

Vienna's public transportation system includes an underground metro (the U-Bahn), local trains (S-Bahn), trams, and buses. According to Wiener Linien – the city-controlled company that runs most public transport services – the U-Bahn contains 109 stations and 83 kilometers of service, the tram system has 1076 stops and 225 kilometers of service, and the bus system 4291 stops and 861 kilometers.[40] Satisfaction with the city's public transportation network was ranked at 1.70 (with 1 being the best and 5 being the worst scores) in 2013.[41] Annual, monthly, and semester passes can be purchased to access most of these services. The city also has launched a bike share system, WienMobil Rad. The total fleet contains 1000 bikes at 185 stations.[42] As of 2022, a total of 443,061 square meters of cycle paths currently run across Vienna.[43] Several car sharing networks also operate within the city, some with fixed stations and others that are free-floating.

2.2.3 Transport policies

After the Second World War, Vienna oriented itself toward low-density development in the city outskirts that encouraged car ownership, as this was considered modern at the time, while preserving the historic inner core. Road construction and parking spaces were prioritized, and major motorways were developed.[44] Due to oil crises, a burgeoning environmental movement, and negative externalities from cars, demand grew for better public transport services in the city, which culminated in the opening of the city's U-bahn network in 1978.[45] Since Austria's accession into the European Union, it has benefitted from investments into its national transport infrastructure, allowing it to both raise its status as a

40. "Public transport 2014 to 2019," Economic Affairs, Labour and Statistics (City of Vienna), accessed April 5, 2024. https://www.wien.gv.at/english/administration/statistics/public-transport.html.
41. City of Vienna, *STEP 2025 Urban Mobility Plan*, 26.
42. "Bike rentals," City of Vienna, accessed April 5, 2024. https://www.wien.gv.at/english/transportation-urbanplanning/cycling/citybike.html.
43. Statistics Vienna, *Vienna in Figures 2023*, 16.
44. Charlotte Halpern and Caterina Orlandi, *Technical Note No. 10: Comparative Analysis of Transport Policy Processes Vienna*, CREATE Project, 2.
45. Halpern and Orlandi, *Technical Note No. 10,* 2.

major city in a larger Europe and to meet environmental issues that have taken on growing importance over the past few decades.

The Austrian government has committed itself to achieving net-zero emissions by 2040, and the Vienna city government is similarly pursuing this same target.[46] From this, it has calculated that it has a remaining carbon budget of 60 million tonnes of CO_2 equivalent left to emit from 2021 to 2040.[47] As an average from the years 2014 to 2018, transport emissions have annually accounted for 43 percent of the city's emissions that fall under its net-zero goal. Vienna projects a reduction of these transport emissions of 50 percent by 2030, and to zero emissions by 2040.[48] To achieve this, the Vienna city government is generally trying to reduce the proportion of trips that are made by private vehicle and increase the proportion made by public transport or active mobility (such as cycling and walking) in order to achieve a modal split in which 85 percent of all trips are made using eco-friendly modes (active mobility, public transport, or shared transport) by 2030, with this increasing to well above 85 percent by 2050.[49] In terms of car ownership, the city aims to reduce this rate to 250 vehicles per 1000 residents and to lower the amount of car traffic that crosses the city boundaries by 50 percent.[50]

A key pillar in its strategy is to disincentivize car travel, mainly through parking management – a concept introduced in Vienna's Urban Development Plan (STEP) 1994[51] – and road allocation toward uses other than car driving. The streets in all districts have been designated

46. City of Vienna, *Smart Climate City Strategy Vienna*, 2022, Vienna Municipal Administration, 19.
47. City of Vienna, *Vienna Climate Guide*, 45.
48. City of Vienna, *Vienna Climate Guide*, 50-51.
49. City of Vienna, *Smart Climate City Strategy Vienna*, 55.
50. City of Vienna, *Smart Climate City Strategy Vienna*, 51.
51. Eugen Antalovsky and Jana Löw, *Why Vienna gets high marks*, European Investment Bank, 2019, 8.

as short-term parking zones, meaning that there is no longer free street parking in the city. In addition to this, a city-wide permanent parking permit system known as Parkpickerl was launched in 2022, in which a fee is paid for the right to park one's car in their district of residence, and parking outside this district incurs parking fees. Parking enforcement officers can scan a vehicle's license plate with their phones to check whether its owner purchased a parking permit.[52]

The city has also introduced restrictions on driving on certain streets and at certain times. An example of this are pedestrian zones, in which streets are given over mainly to pedestrians. The total length of these zones in the city has grown from a little over one kilometer in 1974 to over 21 km in 2019.[53] Prominent examples of such streets today include Mariahilferstrasse and Meidlinger Hauptstrasse. Play streets are another instance of pedestrianized streets, albeit temporarily. The city government helps coordinate the running of play streets, in which sections of the street are closed to vehicle traffic in order for children to play in the afternoon and participate in activities hosted by trained teams. Such streets have proliferated across the city.[54] Vienna has also implemented traffic calming in a rising number of streets, which can result in lower traffic fatalities and discourage through-traffic. Aside from placing speed limits of 30 km/h on roads (1732 km as of 2019)[55]; shared streets in which cyclists, pedestrians, and cars have equal right to the entire road at a speed limit of 20 km/h have also been introduced. Other subtle measures to lower traffic speeds have been applied, including the addition of at least 2000 speed bumps and widened sidewalks at major intersections.[56]

52. "Short-term parking – permanent parking permit ('Parkpickerl') for residents," City of Vienna, accessed April 14, 2024, https://www.wien.gv.at/english/e-government/transportation/parking/residents/parking-permit.html.
53. Mobilitätsagentur Wien, *Vienna Mobility Report 2019*, Vienna, 13.
54. City of Vienna, *STEP 2025 Urban Mobility Plan*, 52.
55. Mobilitätsagentur Wien, *Vienna Mobility Report 2019*, Vienna, 13.
56. Mobilitätsagentur Wien, *Vienna Mobility Report 2019*, Vienna, 13.

The Vienna city government plans to continue developing these car-restrictive strategies. It plans to support the expansion of shared streets, better facilitate the concept of temporary pedestrian zones (such as for flea markets or street fairs) and have each district try out these zones on a street until 2025, and support the introduction of more play streets.[57] The city also supports the conversion of some street lanes currently used for traffic – including driving, turning, and parking lanes – for other uses, particularly active mobility and public transport. It will prioritize these on streets where cyclists and pedestrians lack sufficient space, where there is more than one lane in each direction, or where a new street happens to run in parallel.[58] In addition, Vienna aims to gradually shift permanent on-street parking into car parks or hired spaces in public garages.[59]

Another crucial element that has allowed Vienna to reduce its dependence on the car has been its prioritization of public transport networks within its urban mobility plans. The city's U-bahn network has expanded from three lines in 1978 to five today (with a sixth planned for the future). Investments have been made for greater capacity in metro, tram, and bus travel, including designating some street lanes for trams and buses, and introducing some night-time services.[60] Organizational changes have also facilitated a greater expansion of public transport. The Verkehrsverbund Ost-Region (VOR) regional network was formed in 1984 and links transport networks among Austria's eastern states: Vienna, Lower Austria, and Burgenland. It coordinates the services provided by over 40 operators that run more than 900 bus and rail lines over this region.[61] Within Vienna proper, the Wiener Linien was formed in

57. City of Vienna, *STEP 2025 Urban Mobility Plan*, 49-52.
58. City of Vienna, *STEP 2025 Urban Mobility Plan*, 53-54.
59. City of Vienna, *STEP 2025 Urban Mobility Plan*, 54.
60. Halpern and Orlandi, *Technical Note No. 10,* 3-4.
61. City of Vienna, *STEP 2025 Urban Mobility Plan*, 124.

2001 and oversees the city's bus, tram, and U-bahn services. From 2012, a very affordable annual transport pass of EUR 365 – in essence, a Euro per day – was rolled out for all public transport services within the Vienna region, including S-bahn and regional train journeys within the city limits. A 2017 study found that even steeper discounts were offered for seniors (61 percent discount) and students (83 percent discount), but that Vienna cheap public transport fares meant the system relies on subsidies for nearly half of its operating expenses.[62]

Several new public transport projects have been planned or are under construction across Vienna's networks. For the S-bahn, the goal is to increase the intervals between trains for one to arrive every 15 minutes on the outer branches of Vienna's core network, or even shorter for stations that service as connections to other lines.[63] The STEP 2025 urban mobility plan lists several top priority S-bahn projects, including the creation of an east-west axis which would connect with other rail lines that run across the city borders in various directions.[64] Aside from the planned U5 line, the U6 will also be extended toward the southern end of the city toward the Wienerberg neighborhood.[65] Tram lines will also be extended, particularly to serve as connections between other rail lines or to connect new developments with other public transport services, as developing tram networks is considerably cheaper than extending metro lines.[66]

Although a somewhat more recent focus of Vienna's urban transport policy,[67] cycling has taken upon major importance in the city as an alternative to cars. The total length of cycle

62. Ralph Buehler et al., "Reducing car dependence in the heart of Europe: lessons from Germany, Austria, and Switzerland," *Transport Reviews* 37, no. 1 (2017): 19, http://dx.doi.org/10.1080/01441647.2016.1177799.
63. City of Vienna, *STEP 2025 Urban Mobility Plan*, 90.
64. City of Vienna, *STEP 2025 Urban Mobility Plan*, 90-91.
65. City of Vienna, *STEP 2025 Urban Mobility Plan*, 91-92.
66. City of Vienna, *STEP 2025 Urban Mobility Plan*, 91-92.
67. Buehler et al., "Reducing car dependence in Europe," 15.

paths has increased by 20 percent since 2013,[68] and bike parking spaces have almost doubled from 27,249 spaces in 2010 to 49,101 in 2019.[69] Traffic calming, such as through designated shared streets and infrastructure that slows down vehicles, and the promotion of public transport also indirectly encourage cycling by reducing the danger of high-speed motorists and generally encouraging non-car mobility. To further promote cycling, the city government plans to increase bike short-term bike parking in high-frequency public spaces, particularly on former parking or traffic lanes rather than on sidewalks.[70] Improvements in cycling infrastructure such as the conversion of car lanes (such as parking or turn lanes) into cycling paths, the extension and closing of gaps in the current cycling network, and the roll-out of long-distance cycleways (with the Karlsplatz-Leopoldsdorf, Northern, and Western routes prioritized) are also in the works.[71]

To achieve its climate goals, Vienna is also aiming to phase out fossil fuel-powered vehicles in favor of EVs. In 2022, there were nearly 18,000 EVs on the road in Vienna (an 86 percent increase from 2020), which made up 2.4 percent of the current vehicle fleet.[72] The EV market and EV-related policies are a more recent development, but the city government has made phasing out the internal combustion engine a crucial part of its climate policies, particularly as the city has adopted a commitment to net-zero emissions by 2040 – a decade earlier than the EU deadline of 2050. According to the City of Vienna's Climate Guide, a set of policies must be adopted by the city government: the differentiation of road pricing and parking charges based on a vehicle's size and/or CO_2 emissions rate, restricted access or parking bans for high-emissions vehicles for parts of the city (ie, low-emission zones), and the installation

68. Statistics Vienna, *Vienna in Figures 2023*, 16.
69. Mobilitätsagentur Wien, *Vienna Mobility Report 2019*, Vienna, 16.
70. City of Vienna, *STEP 2025 Urban Mobility Plan*, 86.
71. City of Vienna, *STEP 2025 Urban Mobility Plan*, 88-89.
72. Statistics Vienna, *Vienna in Figures 2023*, 17.

of a greater number of charging points in public spaces or car parks.[73] These policies are designed to support the transition to emission-free vehicles of various types, including delivery vans by 2030, taxis by 2025, and ultimately the end of new purchases of petrol or diesel-powered vehicles by 2025 (unless exceptions are needed for vehicles with special purposes that are not available in electric form yet).[74] The STEP 2025 Urban Mobility Plan highlights the city's provision of grants for businesses to switch to using electric vehicles, although so far it has been taken up "reticently" by such businesses. The plan also noted that the city will not differentiate its parking management strategy between electric and non-electric vehicles,[75] which may contradict with the Climate Guide's call for differentiated parking charges and access.

2.3 Dublin

2.3.1 City background

Dublin is the capital of Ireland and is located by the Irish Sea. The city constitutes Dublin County, which is divided into the administrative districts of Dublin City, South Dublin, Dún Laoghaire-Rathdown, and Fingal. With an area of 925.6 square kilometers, Dublin has a population of 1.5 million people living at an average density of 1575 residents per square kilometer.[76] Like Vienna, Dublin has a historic core containing much of the city's most important landmarks (including many national government offices). Ireland's economy – and that in Dublin in particular – grew at a rapid rate from the 1990s until 2008, an era known as "Celtic Tiger". This led to a revitalization of the inner city core, as well as an outward sprawl

73. City of Vienna, *Vienna Climate Guide*, 55-56.
74. City of Vienna, *Vienna Climate Guide*, 56.
75. City of Vienna, *STEP 2025 Urban Mobility Plan*, 80, 82.
76. Central Statistics Office (F1011 – Population Density and Size Area; Accessed March 29, 2024), https://data.cso.ie/table/F1011.

of the city aided by the construction of new motorways.[77] Dublin's population has been growing, rising from 1.1 million inhabitants in 1997[78] to its current population size. This number is expected to grow to 1.8 million by 2036.[79] The total income per person among Dublin residents was EUR 44,000 (in 2021),[80] and the average household size is 2.7 people as of 2022.[81]

2.3.2 Transportation in Dublin

The main motorways in Dublin include the M50 ring road and several radial motorways or national primary roads that merge into major motorways. While data on car ownership rates in the city per individual is difficult to find, the 2022 census found that roughly 41 percent of residents travelling to work in Dublin did so by car, including both drivers and passengers of cars. The modal split of work commutes was also 20 percent using public transport, 19 percent walking, and 7 percent cycling.[82] While these numbers do not represent all types of trips, it shows that cars remain predominant at least for work commutes.

Dublin's public transportation system consists of buses that mainly operate under the state-owned company Dublin Bus, trams (Luas), and various commuter trains (including the Dublin Area Rapid Transit; DART). The DART network contains 31 stations operating on a single line that partly runs along the coast. The Luas network currently has two lines, 67

77. Zorica Nedovic-Budic et al., "Measuring urban form at community scale: Case study of Dublin, Ireland," *Cities* 55 (2016), http://dx.doi.org/10.1016/j.cities.2016.02.014, 151-152.
78. Central Statistics Office (PEA07 - Estimated Population [Persons in April]; Accessed 4 April 2024), https://data.cso.ie/table/PEA07.
79. Central Statistics Office (PEB07 – Projected Population; Accessed 4 April 2024), https://data.cso.ie/table/PEB07.
80. Central Statistics Office (RAA02 – Estimates of Household Income; Accessed 4 April 2024), https://data.cso.ie/table/RAA02.
81. Central Statistics Office (F3069 – Private Households by Size, Total Persons in the Household and Average Household Size; Accessed 4 April 2024), https://data.cso.ie/table/F3069.
82. Central Statistics Office (F7065 – Population usually resident and present in the State; Accessed April 12, 2024).

stops, and has 42.8 km of service.[83] It was used more than 48 million times in 2023, or for an average of more than 132,000 trips per day.[84] The total bus trips (under all bus companies) for 2023 was nearly 163 million.[85] A survey of public transportation users of bus, trains, and tram networks across Ireland found that the majority (83 percent) were satisfied by their public transport systems[86] – a survey for Dublin specifically could not be found. A proposed underground rail network, Metrolink, is currently in the planning stage. The city has a bikeshare system called DublinBikes.

2.3.3 Transport policies

Similar to Vienna, Dublin's urban development patterns fundamentally changed after the Second World War. The city originally had a dense urban inner core. In the post-war period, however, suburban developments were pursued by both private and social housing construction, leading to a growing dependence on the car for transportation and spread of the built environment on the city outskirts.[87] This shift was accelerated during the Celtic Tiger period, during which European structural funds allowed for Ireland's economy – and particularly that of Dublin – to rapidly develop until the 2008 Recession. During this period, Dublin's population increased by a quarter of a million residents, and major motorways including the M50 ring road were built. These new roads, in addition to the easy availability of credit, allowed for new housing to be built outside of the city core and for the dispersal of retail and job opportunities to the suburbs,[88] with public transport links to these new

83. Central Statistics Office (TOA10 – Luas infrastructure; Transport Infrastructure Ireland, Accessed April 13, 2024).
84. Central Statistics Office (TII03 – Passenger Journeys by Luas; Transport Infrastructure Ireland; Accessed April 13, 2024).
85. Central Statistics Office (THA25 – Passenger Journeys by Public Transport; National Transport Authority; Accessed 13 April 2024).
86. Transport for Ireland, *TFI Customer Satisfaction 2023 On location survey*, December 2023.
87. Nedovic-Budic et al., "Measuring urban form," 153.
88. Nedovic-Budic et al., "Measuring urban form," 151-152.

settlements often lagging behind housing construction.[89] The financial crisis of 2009, along with a housing over-supply and market speculation, caused the property market to crash.[90] While this severely dampened housing construction, the demand for housing continued to grow. This mismatch remains a key reason for the city's rising housing prices, particularly in the city center, which pushes lower income residents to suburban settlements further out.[91]

Nevertheless, the Dublin city governments plan to reduce their climate footprint, including by encouraging sustainable transport modes. This year, the city counties have published their climate action plans for the 2024-2029 period. All of them aim to reduce their greenhouse gas emissions by at least 51 percent by 2030, while three of them (Fingal, Dún Laoghaire-Rathdown, and South Dublin) also plan to improve energy efficiency by 50 percent by 2030.[92] The national-level government projects the country's transport-related emissions to decline 50 percent by 2030,[93] and these are similarly reflected in the plans of Fingal, Dún Laoghaire-Rathdown, and South Dublin counties.[94] The Greater Dublin Area (GDA) Transport Strategy 2022-2042, which covers these Dublin administrative counties as well as its surrounding counties (Wicklow, Meath, and Kildare), generally calls for a more sustainable system by encouraging active mobility and public transport while tackling car dependency, and the strategy adopts the principle of Avoid-Shift-Improve: lower the length and frequency of trips, shift trips toward sustainable modes like active travel or public

89. Brian Caulfield and Aoife Ahern, "The green fields of Ireland: The legacy of Dublin's housing boom and the impact on commuting," *Case Studies on Transport Policy* 2 (2014), 21-22. http://dx.doi.org/10.1016/j.cstp.2013.12.001.
90. Nedovic-Budic et al., "Measuring urban form," 152.
91. Richard Waldron, "Generation Rent and housing precarity in *'post-crisis'* Ireland," *Housing Studies* 38, no. 2 (2023), 189, 192-193, https://doi.org/10.1080/02673037.2021.1879998.
92. Dublin City Council, *Climate Neutral Dublin 2030*, 2024, 5; Fingal County Council, *Climate Action Plan 2024-2029*, 2024, 6; Dún Laoghaire-Rathdown County Council, *Climate Action Plan 2024-2029*, 2024, 4; South Dublin County Council, *Climate Action Plan 2024-2029*, 2024, 4.
93. Department of the Environment, Climate and Communications, *Climate Action Plan 2023 CAP23*, Government of Ireland, 2022, 190.
94. Fingal County Council, *Climate Action Plan*, 51; Dún Laoghaire-Rathdown County Council, *Climate Action Plan*, 57; South Dublin County Council, *Climate Action Plan*, 63.

transport, and promote fuel and vehicle efficiency.[95] Through the policies recommended in this document, the modal share of car trips for "Metropolitan Dublin" is projected to fall from 52 percent in 2016 to 42 percent in 2042. Those for public transport and cycling are expected to rise from 17 percent and 4 percent in 2016 to 20 percent and 12 percent in 2042, respectively, while that for walking is expected to decrease slightly from 26 to 24 percent.[96]

Policies in Dublin regarding parking, speed limits, and other car-related measures are each separately controlled by each of Dublin's administrative counties. Dublin City county is divided into zones with different street parking charges, ranging from EUR 4 per hour in the "yellow zone" to EUR 1.20 in the "orange zone". Parking is free outside the designated hours posted on the parking sign and on holidays.[97] Residents living next to residential streets with paid street parking may also apply for a parking permit (typically costing EUR 50 for a year) for the right to park within that street.[98] Fingal, Dún Laoghaire-Rathdown, and South Dublin counties have their own street parking fees, street parking zone classifications, and resident permit parking charges.[99] Dublin City and Dún Laoghaire-Rathdown also enable residents to apply for their street of residence to have paid street parking, which is intended to discourage commuter or business parking on their streets.[100] Dublin City, Fingal, and Dún Laoghaire-

95. National Transport Authority, *Greater Dublin Area Transport Strategy*, 56.
96. National Transport Authority, *Greater Dublin Area Transport Strategy*, 216.
97. "Pay and Display Parking," Dublin City Council, accessed April 18, 2024, https://www.dublincity.ie/residential/parking-dublin-city-centre/pay-and-display-parking.
98. "Criteria for the introduction of a Pay and Display and Permit Parking Scheme," Dublin City Council, accessed April 18, 2024, https://www.dublincity.ie/residential/parking-dublin-city-centre/start-parking-scheme/criteria.
99. "Pay and Display Parking Machines Provision," Fingal County Council, accessed April 18, 2024, https://www.fingal.ie/council/service/pay-and-display-parking-machines-provision; "Residential Parking Permit," Fingal County Council, accessed April 18, 2024, https://www.fingal.ie/council/service/residential-parking-permit; "Council Paid Parking Areas in Dun Laoghaire Rathdown County Council," Dún Laoghaire-Rathdown County Council, accessed April 18, 2024, https://www.dlrcoco.ie/parking/council-paid-parking-areas-dun-laoghaire-rathdown-county-council; "Parking Permits," Dún Laoghaire-Rathdown County Council, accessed April 18, 2024, https://www.dlrcoco.ie/parking/parking-permits; "Parking," South Dublin County Council, accessed April 18, 2024, https://www.sdcc.ie/en/services/transport/parking/.
100. "Criteria for Pay and Display," Dublin City Council; "Request for the introduction of Paid Parking Control Scheme in your area," Dún Laoghaire-Rathdown County Council, accessed April 18, 2024, https://www.dlrcoco.ie/travel-transport/parking/request-introduction-paid-parking-control-scheme-your-area.

Rathdown have also imposed a 30 km/h speed limit in most residential zones.[101] The GDA Transport Strategy advocates for the spread of 30 km/h areas to include not only residential areas, but also urban centers in order to improve road safety for non-car users, and also proposes a variable speed limit scheme on the M50, in which the speed limit will vary according to traffic conditions.[102] The strategy outlines potential further restrictions on parking, particularly in the city center and other urban or suburban settlements that are well-connected to public transport and with greater population densities. For example, it recommends that local authorities institute a maximum parking standard (such as up to 0.5 parking spaces per residential unit in central Dublin) and plan for largely car-free housing development in the city center. It also suggests these authorities to find ways to reduce parking spaces in destinations like retail centers, streets, and workplaces, such as by introducing a workplace parking levy within denser settlements.[103]

Several schemes are currently in place that entail the reallocating of road space away from cars and toward other uses. Public transportation has been reinforced at College Green in the city center, for example, by extending the bus lane hours there from being for the only daytime hours during the working week to being specifically for buses at all times every day. A turn lane will also be eliminated at nearby Foster Place in order to expand pedestrian space there.[104] Several projects also contain traffic calming measures that involve changes in the physical infrastructure of the street, including speed bumps. In other cases, road space is

101. "Speed limits in Dublin City," Dublin City Council, accessed April 18, 2024, https://www.dublincity.ie/residential/transportation/speed-limits-dublin-city; Fingal County Council, *Fingal County Council Special Speed Limit Bye-Laws 2021*, 2021; "30 km/h Road Traffic Special Speed Limit Bye Law," Dún Laoghaire-Rathdown County Council, accessed April 18, 2024, https://www.dlrcoco.ie/travel-transport/traffic-management/30-kmh-road-traffic-special-speed-limit-bye-law.
102. National Transport Authority, *Greater Dublin Area Transport Strategy*, 184-185.
103. National Transport Authority, *Greater Dublin Area Transport Strategy*, 188-193.
104. "Traffic Management Measures and On-Street Enhancements at College Green and Foster Place," Dublin City Council, accessed April 19, 2024, https://www.dublincity.ie/residential/transportation/roads-and-traffic-projects/traffic-management-measures-and-street-enhancements-college-green-and-foster-place.

diverted for cyclists, as can be seen in the case of the Liffey Cycle Route that is currently under construction, in which a lane previously for private vehicles has been designated for cyclists.[105] The GDA Transport Strategy suggests that the road infrastructure should be prioritized toward pedestrians and other modes first, with private vehicles ideally being at the bottom of this hierarchy. As such, it recommends that traffic signals allow for more time for pedestrians to cross streets and for shorter pedestrian wait times, which would mean shorter periods for cars to cross at intersections.[106] The Draft Dublin City Centre Plan 2023, which focuses on the inner core of Dublin and references the GDA Transport Strategy, contains many proposals of reallocating road space from private vehicles to pedestrians, cyclists, and public transport services. According to these proposals, the road on parts of the South Quays, for example, would be only used for buses, while the road in front of the Custom House Quay would be entirely pedestrianized to form a large plaza where events could be held.[107] Such plans show that a shift toward supporting sustainable mobility at the expense of private vehicles is currently taking place, particularly for the city center.

That the city center would be most active in promoting such a travel hierarchy is perhaps logical, as it is also the part of the city with the most dense coverage of public transport services. Current plans, however, will extend these links to the city outskirts. The DART+ Programme that is currently underway envisions a tripling of the current network, from 50 km of rail operating on a single north-south coastal line to 150 km with lines spread in four directions from the city center. Work has begun on producing 750 new electric trains for the DART rail fleet, and construction is set to begin in 2024 on the line heading west (DART+ West). The other lines are currently in the procurement process, tender process for the

105. "Liffey Cycle Route," Dublin City Council, accessed April 19, 2024, https://www.dublincity.ie/residential/transportation/active-travel/projects/liffey-cycle-route.
106. National Transport Authority, *Greater Dublin Area Transport Strategy*, 99-100.
107. Dublin City Council, *Draft Dublin City Centre Transport Plan 2023*, 2023, 30-31, 34-35.

construction phase, or undergoing a railway order application.[108] The Luas tram network, which began operations in 2004, has been gradually extended since then, and the two lines of the network were connected in 2017 under a projected called Luas Cross City. According to the GDA Transport Strategy, the size and population density of Dublin lends itself to be better serviced by trams and buses in an economic sense than by metro (Metrolink), except for very high-frequent routes like that connecting the airport to the city center. Therefore, the strategy supports the extension of the green line further north and south, as well as the construction of a new line toward the west within the timescale of the plan.[109] The Metrolink line, on the other hand, would connect the northern neighborhoods of Dublin and the city's international airport to the city center.[110] The project is still in the market consultation phase.[111] The city's bus network has been undergoing an overhaul process known as BusConnects since 2017, which includes the addition of radial and orbital bus routes, the development of bus routes that provide connections within local areas, the transition to a zero-emission bus fleet, and a range of other measures. An expanded bus network can extend the range of Dublin's public transport system and connect outlying parts of the city to other services, such as the Luas network. [112]

The city has also recently promoted cycling as an alternative to car travel. Cycling paths have emerged on roads in the city. In Dublin City county, these paths tends to follow the river, run through or adjacent to parks, or follow the coastline. The National Transport Authority's plan for Dublin's cycling network will connect this cycling network into a series of radial and

108. "What is DART+ Programme," DART+ Programme, accessed April 20, 2024, https://www.dartplus.ie/en-ie/about-dart.
109. National Transport Authority, *Greater Dublin Area Transport Strategy*, 143-149.
110. National Transport Authority, *Greater Dublin Area Transport Strategy*, 147.
111. "Dublin MetroLink Preliminary Market Consultation – M100 Advance Work Contract Packages – November 2023," MetroLink, updated November 27, 2023, https://www.metrolink.ie/en/news/latest-news/dublin-metrolink-preliminary-market-consultation-m100-advance-works-contract-packages-november-2023/.
112. National Transport Authority, *Greater Dublin Area Transport Strategy*, 126-142.

orbital paths, secondary paths, greenways, and even inter-urban cycling lines. These will be concentrated in the metropolitan area, but will also connect outlying towns to Dublin.[113] The National Transport Authority plans to provide 322 km of primary paths in the cycle network, 1060 km of secondary paths, and 954 km of greenways by 2042.[114] It also encourages local authorities to facilitate more bike parking in workplaces, residential areas, and near public transport hubs in order to reduce demand for street bike parking, which can then be used more for short-term parking. The city's bikeshare strategy aims for the expansion of bike sharing schemes, the introduction of electric bikes within these ventures, and progress toward making the various bike sharing services interoperable.[115] These are a few of the strategies that support the goal of increasing the portion of Dublin's trips that are made by cycling.

Like Vienna, Dublin also sees EVs as an important part of decarbonizing its transport sector, and as such supports the transition from petrol and diesel vehicles to electric ones in the city, which contains a quarter of Ireland's total car fleet.[116] This falls under the national government's goal of 30 percent of the country's private car fleet to have transitioned to EVs by 2030, and the Irish government launched the Zero Emission Vehicles Ireland initiative in 2022 to support this transition by providing grants for the owners of various types of vehicles (including heavy-duty and commercial vehicles) to convert to electric ones.[117] However, the Greater Dublin Area Transport Strategy acknowledges that the 2030 EV goal, along with that for biofuel use and the other transport measures, would still not fully halve transport-related greenhouse gas emissions by 2030. Therefore, the strategy has identified three additional approaches that could help close this gap, one of which involves electrifying vehicles even

113. National Transport Authority, *2022 Greater Dublin Area Cycle Network*, 2023, 2.
114. National Transport Authority, *Greater Dublin Area Transport Strategy*, 107.
115. National Transport Authority, *Greater Dublin Area Transport Strategy*, 111-114.
116. Celine Cluzel et al., *Dublin Local Authority Electric Vehicle Charging Strategy*, Element Energy, 2022, 2.
117. "Zero Emission Vehicles Ireland," Zero Emission Vehicles Ireland (Department of Transport), updated February 19, 2024, https://www.gov.ie/en/campaigns/18b95-zero-emission-vehicles-ireland/.

further. It mentions the possibility of hydrogen power being used in heavy goods vehicles, although this technology remains under development. Other potential pathways, however, remain: more use of rail freight, using lighter freight vehicles that are easier to convert to zero-emission technology, and using "consolidation centers" for more efficient goods delivery.[118]

118. National Transport Authority, *Greater Dublin Area Transport Strategy*, 206-207.

CHAPTER 3 – DEBATES ON THE CITIES' POLICIES

Several scholars have written about the development of and current issues with transportation in Vienna and Dublin. The literature on Vienna (in English) tends to focus on the history of the city's transportation system, whereas that in Dublin tends to propose ideas for how Dublin can reduce car dependency and congestion. The general narratives surrounding both cities different in that the literature on Vienna considers the city to be a successful case of sustainable mobility, whereas that in Dublin sees the city's car-related travel patterns as an enduring problem. Although the literature reviewed in this thesis does not encapsulate all that has been written about Dublin and Vienna (particularly Vienna, as I am only looking at English-language sources), it allows for a view of how experts regard the two cities' overall transport situation and relevant issues. This section will compare several readings about transportation in Vienna and Dublin in order to present the debates and narratives taken in both these objects of study.

The literature on Vienna tends to consider the city to be a successful case of policies that discourage car use and encourage other forms of transportation. Vienna's top ranking in the Mercer Quality of Living comparisons and other city rankings are attributed to its transportation system, particularly in articles by Hermann Knoflacher, a professor at the Vienna University of Technology who was involved in designing a plan to limit through-traffic in Stephansplatz and surrounding commercial streets.[119] These articles recount in detail the challenging process of introducing the first car restrictions in the city, including

119. Hermann Knoflacher, "A Key Factor in Vienna Becoming the 'Greenest City' in 2020 was the Paradigm Shift in the Transport System 50 Years Earlier," *Green Energy and Environmental Technology* 2, no. 1 (2023): 1-2, https://doi.org/10.5772/geet.18; Hermann Knoflacher, Harald Frey, and Ulrich Leth, "Smartness of urban mobility and 'quality of life' in Vienna," (paper presented at 7th Transport Research Arena TRA 2018, Vienna, Austria, April 16-19, 2018), 2.

limiting driving in the 1st district and implementing parking management. In addition to courageous officials and in-depth stakeholder consultations, they also emphasize the politically stable environment that allowed these reforms to happen, which is also mentioned in a 2017 article by Buehler, Pucher, and Altshuler.[120] These authors, in the course of conducting expert interviews, found that parking management and improving the public transport system were the main reasons for the rapid modal shift away from cars since 1993. Another study (with several of the same authors) that compared the modal split in Vienna, Zurich, and several German cities also highlighted the importance of parking management, although it also attributed the rise in public transport use in all the cities after their establishment of a Verkehrsverbund – a region-wide transport coordination body.[121] This small review of available English-language articles revealed the core reasons for Vienna's transition to sustainable transportation: a suitable political climate, stakeholder engagement, limiting parking spaces, and a well-developed public transportation system.

Several articles, however, mention areas of improvement for Vienna's transport system, or at least its limited application as a model for other cities. Knoflacher, Frey, and Leth (2018) find that, despite recent improvements, the cycling network remains of variable quality,[122] which perhaps may be due to what Buehler et al. described as Vienna's relatively late recognition and promotion of cycling.[123] While the previously mentioned articles show Vienna's policies in a more positive light, a report from a study trip published by Sciences Po takes a somewhat more critical view, indicating that the city could go even further in making its transport system more sustainable and highlighting the uneven resources the city has compared with

120. Ralph Buehler, John Pucher, and Alan Altshuler, "Vienna's path to sustainable transport," *International Journal of Sustainable Transportation* 11, no. 4 (2017): 261, https://doi.org/10.1080/15568318.2016.1251997.
121. Buehler et al., "Reducing car dependence in Europe," 18, 22.
122. Knoflacher, Frey, and Leth, "Smartness of urban mobility," 5-6.
123. Buehler et al., "Reducing car dependence in Europe," 15.

neighboring Lower Austria.[124] It found the way in which modal share data is collected to be biased toward higher sustainable travel results because it is conducted through surveys (which may favor "socially desirable" positions). The authors of this report also describe how freight vehicles continue to be a major contributor to air and noise pollution to the city, an issue which they consider the city to be addressing inadequately. Finally, they note the high amount of federal subsidies that Vienna receives compared with other cities that may contribute to the large differences in modal split between Vienna and Lower Austria.[125] On the other hand, the generous federal support was seen by others as enabling the city to developed such a comprehensive public transport system.[126]

The literature on Dublin's transport policy has tended to recognize the city's traffic congestion to be a major problem and called for economic disincentives or restrictions on driving over the course of roughly 30 years. The oldest article reviewed dated back to 1996, not long after the Dublin Transportation Initiative (DTI) was released. According to David Rafter (1996), this was among the first transport policy documents to consider more than simply attempting to meet travel demand and to consider sustainability, notably by recommending an expanded bus and heavy rail network, the introduction of a light rail network, parking restrictions, better walking and cycling infrastructure, and the completion of the M50 ring road (to divert traffic from city center). While Rafter considered the DTI to be a good first step by promoting more sustainable transport infrastructure, it did not go far enough in terms of economic disincentives to car use, such as fuel taxes and more road tolling. In effect, it lacked a carrot-and-stick approach.[127]

124. Christophe Mina, Clara Ouvrier, and Anna-Maria Spicher, "2.1 Unpacking mobility dynamics in the city of Vienna," *Vienna 2021 Master GETEC*, Sciences Po École Urbaine, 2021, 35-41.
125. Mina, Ouvrier, and Spicher, "Unpacking mobility dynamics," 36-40.
126. Buehler, Pucher, and Altshuler, "Vienna's path to sustainable transport," 264.
127. David O. Rafter, "Sustainable transport planning and the Dublin transportation initiative," *European Planning Studies* 4, no. 2 (1996): 225-231, 234, 236. https://doi.org/10.1080/09654319608720342.

Four years later, the traffic situation has apparently not improved. E Gibbons and M O'Mahony, in their 2000 paper, find that the DTI plan is already outdated because of an unexpected increase in economic growth leading to even higher levels of car ownership and congestion. In comparing various financial instruments to tackle this, they advocated for higher costs on car use in order to internalize the external costs on society by using a car. While they recommend a differential pricing system, they also project that a congestion charge would bring more welfare than other measures.[128] A congestion charge was also called for in a 2007 conference paper by Martin Rogers, Cathal Eagney, and Eamonn Maguire. These authors also reference the DTI and mention a 2001 document, *A platform for change 2000-2016*, that serves as an update to it due to large rises in car ownership and congestion and lagging infrastructure projects related to public transportation that derailed the original projections. The authors recommend a EUR 10 congestion charge to enter the central business district during peak times.[129]

Parking provision becomes the focus in a 2013 study by a team of authors that included Martin Rogers again, finding that while the center area of Dublin has appropriately restricted parking spaces in accordance with its public transport availability, several outlying districts including South Dublin and Fingal still provide too many parking spaces considering their connectively too public transport. The authors reference again the 2001 *A platform for change* document and its public transport investments from the time, but also discussing the

128. E. Gibbons and M O'Mahony, "Transport policy prioritisation for Dublin," *Transportation* 27 (2000): 165-178.
129. Martin Rogers, Cathal Eagney, and Eamonn Maguire, "A congestion charge for Dublin," Paper presented at the *Inaugural construction management and economics 'Past, Present and Future' conference CME25, University of Reading, Reading, UK, July 16-18, 2007*. Reading: School of Construction Management and Engineering, University of Reading, https://centaur.reading.ac.uk/31329/1/#page=1651%20.

need to limit parking spaces where such services are subsequently available.[130] Eight years later, in 2021, the conversation remained similarly about the need to pair together "carrot" and "stick" approaches in a study that used a model to analyze various policy measures to promote a travel behavioral shift away from single-occupancy vehicles using only "carrot" policies like improving walking and cycling infrastructure, improving public transport services, and encouraging car-sharing. The result of these scenarios was only a modest shift away from single-occupancy car use, thus signaling that incentives for sustainable travel must be paired with disincentives for unsustainable travel[131] – the same conclusions that were made in the 1996 paper.

These readings, regarding both Vienna and Dublin, give a snapshot into the successes and challenges both cities face regarding their transport systems. The sample literature on Vienna provides a historical backdrop to the development of its highly regarded transport network, while that of Dublin shows the ideas that have floated in terms of tackling its congestion issues while sustainable transport infrastructure is development within the city. The points mentioned by experts in this section were referenced by the interviewees, showing their relevance for understanding the nature of transport within these two cities.

130. Margaret Rogers, Martin Rogers, and Barry O'Riordan, "The sustainability of parking provision in Ireland," *Transport* 166 (2013): 315-324. http://dx.doi.org/10.1680/tran.11.00010.
131. Páraic Carroll, Brian Caulfield, and Aoife Ahern, "Appraising an incentive only approach to encourage a sustainable reduction in private car trips in Dublin, Ireland," *International Journal of Sustainable Transportation* 15, no. 6 (2021): 474-485. https://doi.org/10.1080/15568318.2020.1765054.

CHAPTER 4 – METHODS

So far, this thesis has described the transportation policies of both Vienna and Dublin concerning both cars and alternative forms of transport. For both cities, despite their governments both supporting or permitting more car-dependent development in the mid-20th century, they have later switched toward promoting restrictions on vehicle use (such as parking management and car-free zones) as well as non-car transport such as public transport or active mobility. Given the rising prominence of climate concerns among policy priorities, these cities have also integrated these transport modes within their climate policies, and as such have also enacted (or plan to enact) initiatives to phase in electric vehicles. Nevertheless, it remains to be seen if these policies will succeed in helping cities reach their transport and climate goals. Policies that are crafted well on paper may encounter numerous challenges that impede successful results. The design or implementation of them may be flawed, they may be unpopular among residents, or they may run over-budget or fall behind schedule (particularly in the case of major infrastructure projects). If the ultimate goal is to provide viable alternatives to car transport in cities, it is important to understand the motivations and experiences of those who drive these cars within them. By understanding the transport-related lifestyles and opinions of the car-driving residents of cities, policymakers and planners can have more insight into why these residents still drive vehicles despite policies discouraging them to do so, how city leaders could better fulfil their transport needs, and the changes to their transport systems that these residents themselves would prefer to see.

A similar study by Chng et al. (2019) was conducted using interviews to compare car-restrictive policies in London and Singapore. This method was adopted in order to explore the experience of the interviewees, factors that influenced their transport decisions,

differences in culture, and the opinions of their and the other city's transport policies.[132] That study extended to residents irrespective of car ownership while this current thesis focuses on car owners, yet interviews in either case can allow for nuances and perceptions to emerge that may not be fully captured by other methods like surveys, such as perceptions of cars in society and reflections on their own need to own a vehicle.

For this thesis, interview participants were contacted through a variety of means, including personal contacts, alumni, and transport organizations for individuals from both cities. For Vienna, five people were interviewed, with an average age of 30 years and average interview length of 43 minutes. In Dublin, the interviewees numbered four people with an average age of 61 years and average interview length of 57 minutes. These interviews were conducted either in person or over video call. They were recorded with their consent for the purposes of this thesis, with information that would identify them omitted.

The interviews were conducted in a semi-structured format, allowing for a natural flow of conversation while adhering to an interview guide. The participants were guided to discuss their experiences and motivations for driving, the costs they have encountered for car driving in the city, and opinions regarding their cities' transport policies. These were then transcribed and closely read multiple times, until key quotes and their themes emerged. These quotes were next re-examined in order to identify sub-themes. The interview guide can be found in the Appendix.

132. Samuel Chng et al., "To drive or not to drive?" *Transportation Research Interdisciplinary Perspectives* 2 (2019), 1-2.

The interview data of one participant per city was also used to compare the costs of each transportation mode on an annual and daily basis. A sample of possible journeys for each were also created to allow for a cost and time comparison for their commutes (along with a more occasional trip for one participant). This comparison of estimated trips allows for a further analysis of transport behavior and reported reasons for using cars for journeys.

CHAPTER 5 – RESULTS

The interviewees came from a variety of backgrounds and were living through various stages of life. Of the five interviewees in Vienna, two were employed, one was a student, and two were working and studying simultaneously. Of the four interviewed from Dublin, one was employed, one was retired, one was semi-retired and employed, and one was a student and retired. The fact that one's status of being employed, studying, or retired among many participants was not simply within one category was notable, as this can lead to transport behavior that is atypical among those who are only employees, students, or retirees. For example, one interview participants (Dublin3; see Table 2) is retired but continues working on a part-time basis. Since she typically drives to work, she may thus be likely to make more car trips than a fully retired person. More information about the Vienna and Dublin participants' demographic information may be found in Tables 2 and 3, respectively.

Table 2. Demographic data for Vienna participants

	Vienna1	**Vienna2**	**Vienna3**	**Vienna4**	**Vienna5**
Age	48	25	24	25	26
Gender	Male	Male	Male	Female	Female
Highest education	Master's degree	Bachelor's degree	High school	High school	High school
Employment status	Employed	Employed	Student + employed	Student + employed	Student
Income (EUR/year)	30,000-39,000	20,000-29,000	10,000-19,000	0-10,000	0-10,000
District of residence	6th	16th	16th	23rd	7th
District of work/school	5th	3rd	3rd	23rd (work) / 1st (study)	10th
Number of cars in household	1	1	1	2	1
Number of members of household (children in parentheses)	4(2)	2(0)	3(0)	2(0)	4(0)
Frequency of car use	1-2 times/2 weeks	2-3 times/month	1-2 times/week	2-3 times/week	1-2 times/month

Note: The upper row shows the codename used for each participant (eg, Vienna1). The child members of households in parentheses is included in the total number.

Table 3. Demographic data for Dublin participants

	Dublin1	**Dublin2**	**Dublin3**	**Dublin4**
Age	41	67	67	70
Gender	Female	Male	Female	Female
Highest education	Master's degree	Master's degree	Bachelor's degree	Master's degree
Employment status	Employed	Retired	Retired + employed	Student + retired
Income (EUR/year)	70,000-79,000	40,000-49,000	50,000-59,000	20,000-29,000
County of residence	Fingal	Dún Laoghaire-Rathdown	Dún Laoghaire-Rathdown	South Dublin
County of work/school	Dublin City	n/a	Dún Laoghaire-Rathdown	Dublin City
Number of cars in household	2	1	1	1
Number of members of household (children in parentheses)	5(3)	2(0)	2(0)	2(0)
Frequency of car use	daily	3-4 times/week	daily	daily

Note: The upper row shows the codename used for each participant (eg, Dublin1). The child members of households in parentheses is included in the total number.

Of the Vienna and Dublin residents, only two and one were originally raised in those cities, respectively. The rest were raised outside it, and most of these individuals obtained their drivers' licenses and first cars outside Vienna and Dublin. Common uses among participants for driving included shopping, access to hobbies and activities, and travel outside the city. All were also users of public transportation, and some also mentioned that they were cyclists (two in Dublin and one in Vienna). Participants from both cities were likely to avoid driving their cars into the city center as much as possible, with a common reason being the difficulty of finding parking.

Common costs cited by the interviewees from both cities were insurance, maintenance, inspections, and gas. The two cities, however, did have some different cost types and values. The drivers in Dublin, for example, had to pay a national annual motor tax costing between EUR 120 and 415. The rates vary by CO2 emission levels for vehicles registered after 1 July 2008 and by engine size for vehicles registered before 2008.[133] Drivers in both cities had to pay for an annual car inspection. The price for this varied in Vienna, whereas that in Dublin (and Ireland in general) is fixed at EUR 55. None of the Dublin drivers had a paid residential parking permit, as their homes all had driveways where they could park their cars, whereas all except one of the Vienna drivers had purchased a Parkpickerl. Table 4 shows several common costs (excluding the price of the car itself) and their price range among the two cities.

Table 4. Major costs and their price ranges across Vienna and Dublin

	Vienna	**Dublin**
Parking	120-924 / year	n/a
Insurance	280-750 / year	350-700 / year
Maintenance	180-1250 / year	150-400 / year
Inspection	50-200 / year	55 / year
Gas	360-960 / year	600-1800 / year
Motor tax	n/a	120-415 / year

Note: All costs are in euros. Vienna's parking permit (Parkpickerl) costs annually EUR 120, but other long-term parking arrangements in the city may be priced differently. Maintenance costs may fluctuate drastically across years.

133. Motor Tax Online (Department of Transport), accessed May 13, 2024, https://www.motortax.ie/OMT/omt.do#.

Several of the interviewees had received their cars as a gift from relatives (such as receiving an old car after passing their driving test). A few participants, particularly in Vienna, rarely used their cars in the city. The highest frequency among the Vienna participants of using a car within a week was two or three times, and the lowest frequency was only once or twice a month. By contrast, three of the four Dublin interviewees said that they used the car nearly daily, particularly for commuting to work, school, travelling to a park-and-ride spot to access the city by public transport, or to access childcare.

5.1 A cost comparison of trips

Both Dublin and Vienna are broadly aiming to shift the transport modes of journeys from private vehicles to public transport, cycling, or walking. The cities have both pursued various measures to financially incentivize the latter and disincentivize the former. When people choose among methods of travel for their trips, financial cost is factor, in addition to time, comfort, convenience, and other considerations that can be specific to an individual. As such, this section will feature the journeys of one participant from each city, including both frequent commutes and more occasional trips, using both cars and alternatives. It will conduct a very simple comparison among travel modes for these real journeys, thereby providing individualized snapshots into transport connectivity that may possibly reflect the experiences and travel habits of others within the same city. It is important to note that all locations used in this study are theoretical examples of journeys – they do not reflect participants' actual home, work, or school addresses (unless otherwise stated).

5.1.1 Vienna

Vienna2 got his vehicle seven years ago as a gift from a family member after he obtained his driver's license. Although he did not pay for the car, there have been other related expenses.

This includes costs from the driving lessons and test, the Parkpickerl, a payment for a "vignette" sticker that allows vehicles to drive on tolled roads for a year, gas, insurance, and other regular costs. A more detailed the car-related expenses of Vienna2 can be seen in Table 5. Note that the maintenance fee listed is what he paid the previous year, but this analysis will assume that it is an annual average. A popular alternative for trips in Vienna is public transport, with an annual pass costing EUR 365 that allows you to access all public transport types within the city limits. Cycling requires a bicycle, bike locks, a helmet, and lights. While prices for these can widely vary, this analysis will assume a cost of EUR 200 for a (cheaper) bicycle, EUR 15 for a bike lock, EUR 40 for a helmet, and EUR 10 for bike lights, to a grand total of EUR 265 for the purchase of all these. Walking, of course, is free.

Table 5. Annual cost comparison of Vienna2's transport options

Driving	**Public transport**	**Cycling**	**Walking**
Car purchase: 0/7=0	Annual city pass: 365	Bike purchase: 200/7=28.57	
Registration: 200/7=28.57		Bike lock: 15/7=2.14	
Parking: 120		Bike helmet: 40/7=5.71	
Insurance: 280		Bike lights: 10/7=1.43	
Maintenance: 400			
Inspection: 70			
Vignette: 100			
Driving lessons and test: 1200/7=171.43			
Gas: 420			
Total annual cost: 1590	**Total annual cost: 365**	**Total annual cost: 37.85**	**Total annual cost: 0**
Daily cost (total/365): 4.36	**Daily cost (total/365): 1**	**Daily cost (total/365): 0.10**	**Daily cost (total/365): 0**

Note: All costs are in euros. All one-time costs (eg, car registration, bike purchases) are divided by the number of years of car ownership (in this case, seven years). Data source for car costs: Interview with Vienna2. Costs for purchases of cycling equipment are estimates.

Vienna2 lives in the 16th district of Vienna but works in the 3rd. He typically takes the U-bahn into work, but let's assume for a moment that he decides to drive his car to work one day. From roughly the center of the 16th district to the center of the 3rd district, a car journey would require approximately 32 minutes. Since the Parkpickerl only applies to one's district of residence, in the 3rd district Vienna2 would need to purchase a parking spot on either the

street or in a parking garage. An on-street parking spot can only be occupied for up to two hours at a time during 9 am to 10 pm, meaning Vienna2 would have to leave work and find a new parking spot every two hours. As this would be quite a hassle, a nearby parking garage would be a better option, with the daily rate being EUR 8.[134] This parking charge, added to the daily cost of owning the car (see Table 4) would mean that driving his car to work for one day would cost EUR 12.36. With the annual public transport pass, the price of public transport by the day is EUR 1, and in this case the trip via the U-bahn would take 38 minutes. The daily cost of cycling would be EUR 0.10 (see Table 4) and require 26 minutes for the journey. While walking is free, this trip on foot would take 1 hour and 40 minutes. See Figure 1 for a map showing the routes over various transport methods.

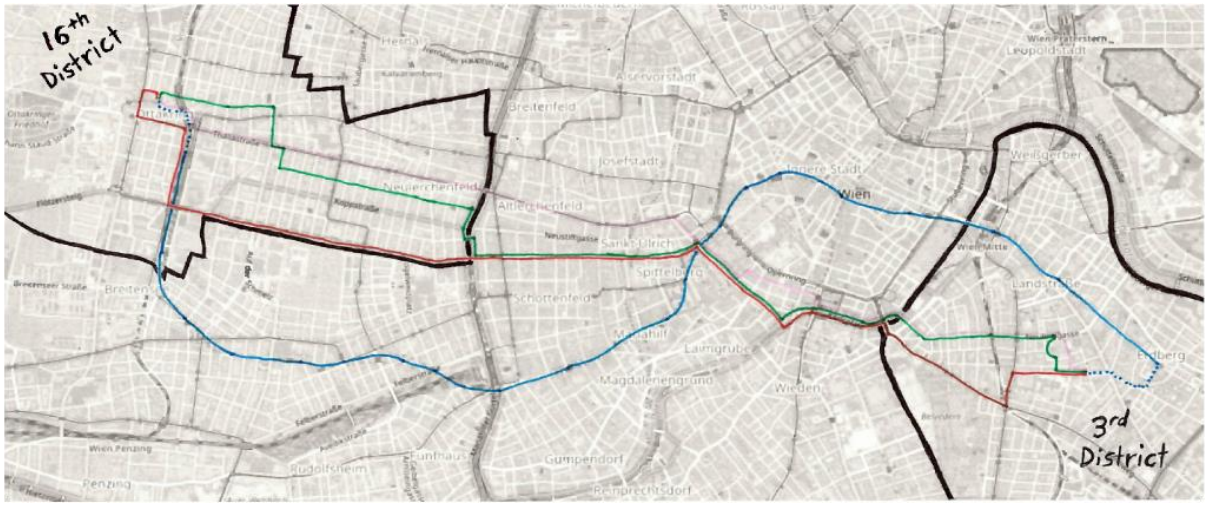

Figure 1. Possible route of Vienna2 from residence to work place.
Routes correspond roughly from center of 16th district to center of 3rd district. The driving route is shown in red, the U-bahn route is in blue, cycling is in green, and walking is in pink. Base map: OpenStreetMap. Trip data: Google Maps.[135]

134. "Garage Fiakerplatz," Best in Parking, accessed May 14, 2024, https://www.bestinparking.com/en/at/garage/garage-fiakerplatz.
135. Google Maps, "Directions for Driving from 48.214603, 16.308627 to 48.196564, 16.393720," accessed May 14, 2024, https://maps.app.goo.gl/JQ4qfp5dQA7CdgMz8.

Vienna2 on occasion also travels to a large shopping center just south of Vienna. In this case, he often travels by car. This trip by car would take him 35 minutes. The shopping center has a parking lot with free parking for up to two hours.[136] If he stays within this time limit , the cost of this trip by car would cost him the base daily price of car ownership (EUR 4.36). While it is possible to travel to this shopping center by public transport, it would incur an additional cost because it is technically outside the city limits. If taking public transport there from the middle of the 16th district, Vienna2 could take the U-bahn and then switch to the tram, which could take around 51 minutes. While much of this journey would be covered by his Vienna transport pass, the last few stations on the tram would be outside the city limits and thus require the purchase of an additional ticket for EUR 2. Thus, the cost of this trip to and from the shopping center using public transport would in total cost EUR 5 (the daily cost of the Vienna public transport pass along with additional tickets to and from the city limits). As for cycling, assuming that the center has bicycle parking, the cost would remain EUR 0.10, but the journey would take 1 hour and 3 minutes. Walking there would take 3 hours. Figure 2 shows the routes for going to the shopping center across transport modes.

If Vienna2 were to not own a car but still desire the convenience of one for this trip, he could also choose to hire a taxi, but the costs would be much higher. The standard fare for Vienna for one taxi ride includes a base fare of EUR 3.80, with the addition of EUR 0.95 per kilometer of travel for the first 5 km, followed by a per kilometer fee of EUR 0.58. Every minute of travel also incurs a fee of EUR 0.58.[137] For a 35-minute taxi ride over roughly 16 km, this would lead to the cost of one trip being EUR 35.23, leading to a round-trip price of EUR 70.46 – by far the most expensive option.

136. "Car Park," Westfield Shopping City Süd, accessed May 14, 2024, https://www.westfield.com/en/austria/scs/services-detail/car-park.
137. "Taxi-Gewerbe," City of Vienna, accessed May 28, 2024. https://www.wien.gv.at/wirtschaft/gewerbe/taxitarif.html#hoehe.

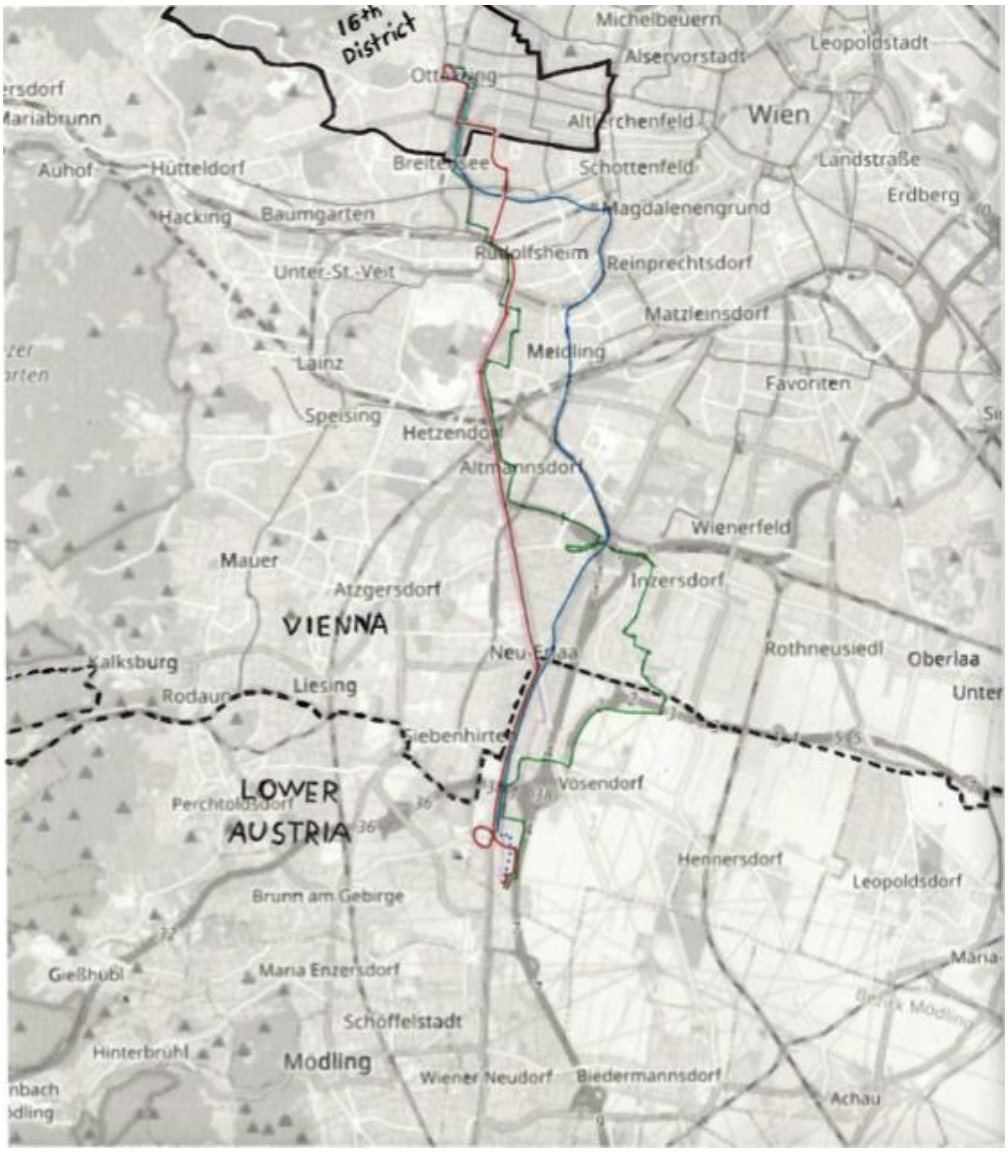

Figure 2. Possible route of Vienna2 from residence to a shopping center south of Vienna. Routes correspond roughly from center of 16th district to the Westfield Shopping Center Süd. The driving route is shown in red, the U-bahn/tram route is in blue, cycling is in green, and walking is in pink. The dashed line shows the Vienna/Lower Austria border. Base map: OpenStreetMap. Trip data: Google Maps.[138]

As mentioned earlier, Vienna2 explained that he owns a car to allow him to make trips to the shopping center and to travel outside the city to visit his family. According to him, driving to his parents' place by train would take two hours, whereas by car he only needs to drive for

138. Google Maps, "Directions for Driving from 48.214603, 16.308627 to Westfield Shopping City Süd, Vösendorf," accessed May 14, 2024, https://maps.app.goo.gl/ernpp4qfHES13HDt6.

around 30 minutes. He said that he uses the U-bahn often to meet with friends or do his shopping. However, he said that he often drives when he goes to the large shopping center south of the city, depending on how much he has to carry.

> *"It's a big shopping mall. And so when I have big bags and heavy stuff, I go there by car. And if it's in Vienna, or [I buy] small stuff, I go by U-bahn."* [Vienna2]

5.1.2 Dublin

Dublin4 bought her car, a hybrid, 18 years ago for EUR 28,000. According to her, through careful care of her car it "still looks like new and hasn't let [her] down so far." Her home has a driveway, so she does not have to pay for on-street parking or purchase a residential parking permit there. Dublin4 decided to become a university student again after retiring and often drives to school, and her university also has free parking. As such, her overall parking costs are very little. Table 6 contains more information about her car-related expenses. Unlike in the example of Vienna2, Dublin4's expenses on tolls is minimal, as she mostly uses her car to go to school and does not go on a toll road for that. However, she does have to pay the annual motor tax. She could not recall having to pay to register the car, and she said that the cost of her driving exam back when she took it was likely very low (and preceding Ireland's adoption of the euro). Public transport is free for Dublin4 because she is over 66 years old.[139] This applies to most public transport options in Ireland including the services used commonly in Dublin: Dublin Bus, the Luas, and DART. The same estimated costs for a bicycle, bike lock, helmet, and bike lights will be used to compare the costs of Dublin4's travel options as in the case of Vienna2. Walking remains free.

139. Department of Social Protection, "Free Travel Scheme," Gov.ie, updated May 14, 2024, https://www.gov.ie/en/service/9bba61-free-travel-scheme/.

Table 6. Annual cost comparison of Dublin4's transport options

Driving	**Public transport**	**Cycling**	**Walking**
Car purchase: 28000/18=1555.56		Bike purchase: 200/18=11.11	
Insurance: 350		Bike lock: 15/18=0.83	
Maintenance: 300		Bike helmet: 40/18=2.22	
Inspection: 55		Bike lights: 10/18=0.56	
Gas: 1200			
Motor tax: 415			
Total annual cost: 3875.56	**Total annual cost: 0**	**Total annual cost: 14.72**	**Total annual cost: 0**
Daily cost (total/365): 10.62	**Daily cost (total/365): 0**	**Daily cost (total/365): 0.04**	**Daily cost (total/365): 0**

Note: All costs are in euros. All one-time costs (eg, car purchase, bike purchases) are divided by the number of years of car ownership (in this case, 18 years). Data source for car costs: Interview with Dublin4. Costs for purchases of cycling equipment are estimates.

Dublin4 lives in South Dublin and regularly drives to her university nearby in the suburbs of Dublin City. She often takes her car there because she has to carry equipment for her studies. She described her school as being outside the center of Dublin City, with just a short drive necessary to reach it from her home. While I did not gather data on the exact school or Dublin4's home address, this analysis will assume that she lives on the edge of South Dublin near the limits to Dublin City. In this case, a car trip would take 11 minutes. As the school provides free parking and does not require the use of toll roads, the cost of this trip would remain the base daily price of driving, EUR 10.62 (see Table 5). A bus could also be taken to reach the school, with the total journey requiring 31 minutes and costing EUR 0. A cycle

journey would take 11 minutes, and walking would require 47 minutes. Figure 3 shows the route details of this trip across transport modes.

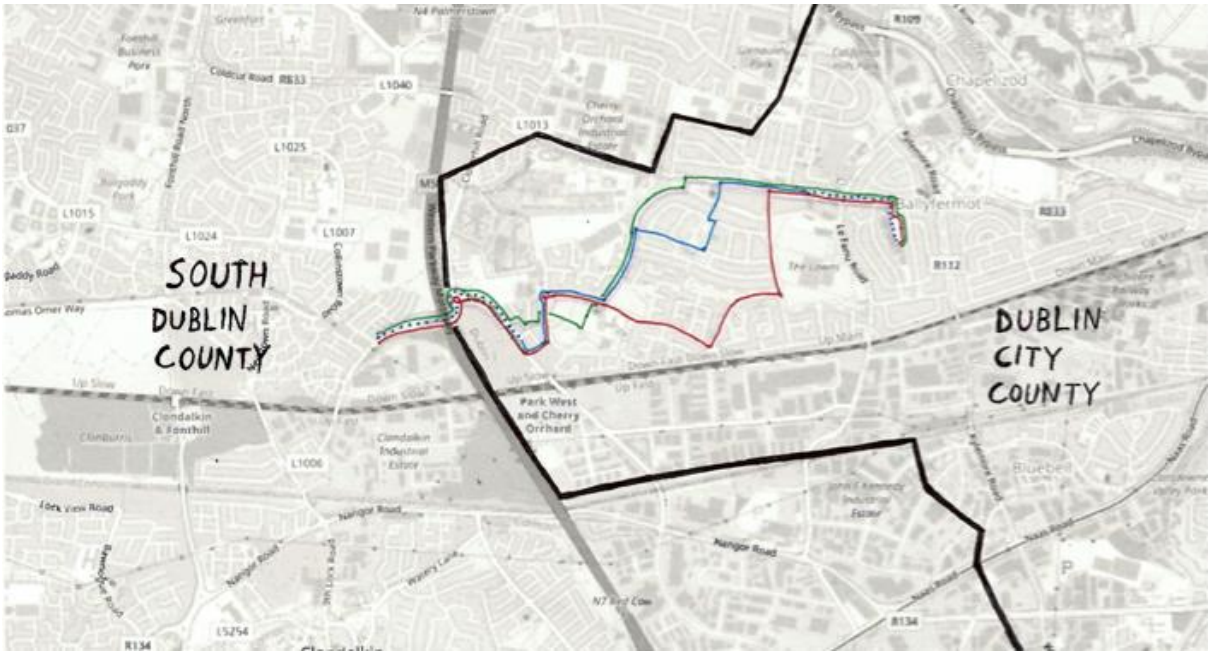

Figure 3. Possible route of Dublin4 from residence to school.
Routes correspond roughly from the edge of South Dublin County to a university outside the center of Dublin City County. The driving route is shown in red, the bus route is in blue, cycling is in green, and walking is in pink. Base map: OpenStreetMap. Trip data: Google Maps.[140]

Other than making it easier to take the equipment she needs for school with her, Dublin4 also prefers to use a car for her commute because it can protect her from Dublin's weather, which is often cold and rainy. She mentioned that the bus that she could take to school is a little far from her house, and so by walking there she has already traveled a considerable distance towards the school.

140. Google Maps, "Directions for Driving from 53.335964, -6.391097 to Ballyfermot College of Further Education (Main Building), Co. Dublin," accessed May 15, 2024, https://maps.app.goo.gl/u8Jt3vui2gwNUA8XA.

"It would nearly be easier for me to talk. By the time I go to the bus stop, wait at the bus, I'd enjoy the walk. I hate waiting. I'd have to walk part of the way to get a bus, so it would be as easy for me to just keep going walking." [Dublin4]

Despite its time-savings benefits and relatively low cost, Dublin4 appeared wary of cycling in the city. She worries that it is dangerous due to potential crashes with other vehicles on the road, and mentioned that a student at her university recently was fatally struck by a truck while cycling near the school.

"I'm not a cyclist. I would find the city too dangerous for me to cycle. I just wouldn't do it." [Dublin4]

Dublin4 sometimes travels outside the city. She said that if she travels to another city in Ireland and expects to remain within the city, she may take public transport there, while going to the countryside or traveling as a group may make using a car to get there more convenient.

5.1.3 Takeaways

While Vienna2 and Dublin4 are in different stages of life, live in different cities, and have different commuting preferences, they both have weighed a series of factors in deciding their modal choices. The main difference between both their commutes is that Vienna2 takes public transport to work, whereas Dublin4 uses a car. This could be influenced by the fact that Dublin4's school has free parking, whereas Vienna2 may have to pay for parking near his workplace. Another factor could be the ease of both individuals of accessing public transport. Vienna2 can travel to work using the U-bahn, which travels very fast with trains arriving at short intervals, whereas Dublin4 would have to walk for a while to access the bus

that can take her to school. Another aspect that influenced both their decisions on using cars for trips is whether they would have to transport lots of things. For example, Dublin4 mentioned that traveling to school with equipment makes using a car more convenient, while Vienna2 travels to the large shopping center south of Vienna by car if he knows he will have much to carry.

The annual and daily cost estimates for transport modes presented here are particular to the individuals, and may not be representative to others in Dublin or Vienna. Vienna2, for example, received his car for free, which substantially lowers the annual cost of owning a car. Dublin4's annual costs too may be lower than average, as she has kept her car for 18 years. Dublin4 also has free parking at both her home and school, which keeps her parking expenses low. It is also notable that her school is not in the center of Dublin City, which could otherwise possibly lead to longer travel times due to traffic.

5.2 Common themes from interviews

This section will describe some of the themes that emerged from the interviews. A substantial portion of the interview content fell roughly into the following categories of topics among participants from both cities. This shows their views on subjects ranging from their motivations for owning a vehicle, what they perceive as high costs, and the ways in which they approve or disapprove of their cities' transport policies.

5.2.1 Reasons for owning a car

The primary reason for many interviewees to own a car was to commute to work, school, or a regular hobby or obligation. Such trips often require punctuality, making driving a car more

convenient if public transportation is lacking or unreliable. Work was the most important reason for owning a car especially among the Dublin interviewees.

> *"If I had the early shift from my civil duty [Zivildienst], there wouldn't be any buses. So I needed a car to get there. It wasn't that long of a drive. It was just like a 20-minute drive. But when you start at half past 5am, there are no buses."* [Vienna3]

> *"I bought a car for work purposes…and I did a lot of mileage in that car. I would have been on the road two or three times a week all over Ireland, clocking up major miles in a car. Like the car was my office."* [Dublin1]

> *"I needed my car when I was working. Because when I'd be in the office, a lot of the times I'd have to go out on sites during the day."* [Dublin2]

Many mentioned that shopping was another common reason for using a car, particularly when travelling to large shopping centers or purchasing many things that would be inconvenient to transport without a car.

> *"I started baking bread last year, and now I frequently buy five-kilo packs of flour, and I don't want to drag them through Vienna. There the car's quite handy."* [Vienna3]

> *"In terms of the weekly shop, I don't think I would use public transport for that even if it was available, because we're carrying huge, big shopping bags. So I would probably still take the car for that."* [Dublin2]

Some participants mentioned that keeping cars allows them to make trips outside the city more easily, either for recreation or to visit family. Public transport availability tends to lag outside the city.

> *"Every time I want to see my parents, I have to get there by car, because by train it's like two hours to get there."* [Vienna2]

> *"[A car] makes possible for me journeys that add quite a lot of value to my life. So I can just get in the car and head up to Belfast where I come from and see my sister."* [Dublin3]

A couple of participants cited having children has a reason for them to use a car. One used the car to access childcare, and another mentioned the ease of having one when travelling with children.

> *"I have the baby in the car. If I take him in the buggy, I can't take the buggy on the DART. So I drive him [to the crèche] and leave the car and then commute on the DART [to work]."* [Dublin1]

> *"I started [driving] lessons before I had my first [child]. I realized I needed a car to get around. It was not possible to do the things you had to do with children without a car."* [Dublin3]

Several interviewees from both cities said that part of the reason they owned cars was because of a lack of public transport services to the destinations they needed to reach. This tended to be brought up among participants who lived or worked outside the city center.

"*I'm from the 23rd district. Because it's not in the inner city, there's no subway, only like buses and trams. And everyone just does it [gets a driving license]. That's why I did it too."* [Vienna4]

"In Dublin, the public transport routes tend to have been arterial, not orbital. And so because my work is a little bit in the hinter area, it's very difficult to get public transport to that. So I use my car on the days going to work." [Dublin3]

5.2.2 Parking

As mentioned earlier, Vienna's Parkpickerl system has been extended across all of Vienna's districts since 2022, in which all spots have paid parking with a two-hour limit except for at night, unless one has a Parkpickerl parking pass in their district of residence. Several participants from Vienna said that this made it easier to park during the day, but made it more difficult to find a parking space at night.

"It's quite easy to find a parking space, especially in the area where you live, because there are special zones that are just parking areas for people who live in that district…It's harder in the early morning and later in the day, because there are lots of people who are still commuting by car in Vienna from one district to another, and so they all come back like at 5 or 6pm." [Vienna1]

"I drove from [visiting] my family at a Sunday night. I came back at 10pm and looked for a parking space for 40 minutes…at the 16th district, my place. That was hard." [Vienna2]

Some also noted that the introduction of the Parkpickerl system has meant fewer cars from outside the city occupying parking spaces within Vienna.

> *"Many people would go from Lower Austria around Vienna, go by car into one of the outer districts of Vienna, park there for free, and then go on with public transportation…It was kind of really hard for the people living there because they didn't find parking spaces in their own district because of that. Since the Parkpickerl is now in every district, we solved some of those problems."* [Vienna1]

Similarly, one participant from Dublin mentioned that the presence of several big firms attracted many commuters from outside her residential area. As the company offices lacked parking spaces, many had to park on the residential roads, leading for requests by residents for a paid parking scheme.

> *"The main reason that the residents asked [my] council to put in paid parking was because gradually more and more people were parking for free on our road for the whole day, and we couldn't park our cars."* [Dublin3]

Most of the interviewees in both cities tried to avoid driving into the city center because of either the high cost of parking or a lack of spaces. Many preferred to take public transport or cycle due to the parking situation.

> *"I think [the Parkpickerl] is a good system because…I think there would be more cars if there wasn't permission to only park in your district. So if I'm driving to another district, I'm like, Oh, do I want to pay? No. Okay, I'm leaving the car at home."* [Vienna4]

"There's nowhere to park [in Dublin City center]. And if you do park, the cost of parking is extortionate." [Dublin1]

"[Parking] is generally restricted to three hours…the three-hour limit means there's more of a turnover of parking, and it's good for businesses that shoppers can come in and they'll probably find a space. Whereas if there was no limits to the parking, people could be driving into work and parking there and leaving the car there for the day." [Dublin2]

None of the participants from Dublin paid for parking at home, because they all had homes with parking spaces included. This was in contrast to the participants from Vienna, who nearly all paid for a Parkpickerl to access on-street parking. But some of the Dublin participants also mentioned that residential areas were being redesigned to discourage car use. This has led to some controversy.

"A lot of people are losing their parking outside their houses, on-street parking where people park their cars outside their houses on the road. And that is one of the big controversial problems with providing new bus lanes, new cycle lanes…" [Dublin2]

"In Dublin now, there's a real drive with the new building estates, residential estates, to have narrow roads and no spaces for cars." [Dublin1]

5.2.3 High costs

Fuel prices were among the more commonly cited costs that participants considered to be particularly high. Some interviewees from both cities cited taxes as a contributor to the high price.

"Now there's the CO_2 taxes. It started this year, and now [fuel] is more expensive again…I guess I agree with the taxes, but every time I'm there paying I don't agree. So conceptually I agree, personally I don't." [Vienna3]

"The [fuel] prices in the south…they went up on Monday with excise duty. A lot people will be going across the border to get their fuel because it's cheaper, and then coming back into the Republic." [Dublin1]

Insurance was another area in which some interviewees said the costs were especially high. Several Dublin participants described the high cost of insurance as a nationally recognized issue.

"The car insurance is crazy money. It's absolutely crazy…But that's an ongoing issue in Ireland, the cost of car insurance. Nobody gets cheap car insurance." [Dublin1]

"I think the insurance companies here are still making a killing. They really are. It's been talked about for decades…Until recently, actually, they [the insurance companies] actually had a point, because our courts gave absolutely ludicrous compensation payments to people who had been caught in accidents and maybe broke a wrist or something…And that was because it was a jury system. There have been big changes to that recently, and it is hoped that that will reduce insurance prices to the ordinary driver." [Dublin3]

5.2.4 Public transport and cycling

All of the participants said that they use non-car transport at least occasionally. Several participants from both cities talked about the state of the public transport system. In Vienna, they tended to highly regard the system in the city center.

> *"I'm living in the kind of center, in the 7th district. In front of me there's a bus station and a train station. The time schedule is really good, so every two or three minutes something is about to come and take you where you want to."* [Vienna5]

Some of the Dublin participants noted the recent improvements in the city's public transportation system, particularly the BusConnects upgrades and improvements in the DART.

> *"The regularity of the bus services have improved. The regularity of the DART electric train has improved. The BusConnects has also provided for a big increase in the actual fleet of buses."* [Dublin2]

> *"It [BusConnects] has started to roll out what they call 'orbital routes'…Which means you can get to places [outside the city center] without going into the city center and back out again."* [Dublin2]

Some interviewees said that, while the public transport services are adequate in the city center, connections to enter the city center from the outskirts could be improved.

> *"If you're in the city, the public transport is really nice. But to get in the city, that's the problem. I think it took me with the tram like half an hour or more. And the tram is so slow."* [Vienna4]

"Beyond Dublin, it's very hard to travel around Ireland. Even if you're a visitor coming into the airport, we don't have a rail service from the airport to the city center. You have to get a bus, you? It's difficult." [Dublin1]

A couple of the Dublin participants brought up improvements to the city's cycling network and regarded them as a positive development.

"There are good cycle tracks near where I live, and there have been quite a lot of improvements done in the Dún Laoghaire area. It's been very good." [Dublin2]

"There's a big push to link up various parts of suburban Dublin with cycling lanes and make travel between those places easier if you have a bike." [Dublin1]

5.2.5 Complaints about city policy

All the participants across both cities had at least some complaints about various policies or services related to transport. These were wide-ranging, with some disapproving of certain measures used by the city to promote sustainable transport. A few felt that their city was still not doing enough to discourage car use.

"It [pedestrianizing Mariahilferstraße] is a good thing. But we don't need just this big project, we need many small ones. There's so many little streets in Vienna where you can do something." [Vienna1]

The Parkpickerl system was brought up by some Vienna participants as being inconvenient at times, such as for its paid parking time periods, bureaucratic difficulties in changing one's car registration, and for the strictness of enforcement.

"I think 10pm [when free parking begins under the Parkpickerl system] is just ridiculous. If you try to visit some friends or anything, you can't go with your car because you won't start your journey at nine or half past nine. The night is over before you get there." [Vienna3]

"If my car is broken and I'm using the car of my mother, I can't park because the Parkpickerl is dedicated to one car, not the person. So if my car's broken, I don't have a car…I wanted to register the Parkpickerl for a new car, and they're like, Okay, two to four weeks. And it's like, Okay, what should I do for two to four weeks?" [Vienna4]

Some in Vienna recommended that more park-and-ride areas be provided, or at least that they be more advertised or cheaper.

"When you come here and want to visit the city as a tourist or something…it's difficult. I think you can do more park-and-ride spaces." [Vienna5]

Several of the interviewees still did not feel safe enough when cycling in the city, usually because of too many other cars or because they found the cycle path quality poor.

"Cycling is not that good in Vienna, I would say personally. I don't feel comfortable riding my bicycle on the big roads with 20 cars shooting by." [Vienna3]

"Sometimes there are no cycle paths at all. And when you have to go left or something and you have to cross totally through the street, and there are a lot of cars – there are some parts I don't feel safe." {Vienna5}

When EVs were brought up, along with the cities' plans to increase their number in the car fleet, some participants from both cities said that they remain too expensive for the average driver, and it was also suggested that more charging points be built.

> *"It's always said that it [EVs] are more accessible. But in reality, what's the cheapest electric car you can get? It's like 30k. I don't have that kind of money."* [Vienna3]

> *"I think number one [of what the government should do to promote EVs] is far more charging points. A big increase in charging points would help. Another thing would be possibly some incentive, like a grant of five or ten thousand [euros] to provide a subsidy to help people buy them, because I think there's a perception out there that they are far too expensive."* [Dublin2]

A couple of the participants found public transport services to still be lacking, particularly on the outskirts of the city. One also mentioned the long-promised Metrolink project in Dublin that has yet to appear.

> *"I think it's essential to have a car in the suburbs where the buses drive like three times a day. And then if you miss the bus, you just can't go out…What if you have a dog, and the dog has some emergency and needs the vet? And then you don't have a car and you can't go there?"* [Vienna4]

> *"Metrolink has been going on for like – I don't know – 20 years they've been talking about this. It just never seems to happen. People have lost all faith that it'll ever come to pass."* [Dublin1]

Several of those from Dublin tied the city's ongoing housing crisis to the transportation situation. One, for example, said that the Celtic Tiger period of economic growth saw

housing prices pushed up to the point where many had to move outside the city center, and nowadays the high cost of accommodation keeps away those who could work in public transit.

> *"They [the city] are not providing the public transport necessary. And this is because, apparently, they have a crisis in drivers. And this in turn is because…the level of money and wages that they get will not support the horrendous price of renting accommodation in Dublin."* [Dublin3]

Congestion was also described as being particularly bad by some of the Dublin participants. Some reasons mentioned were that many parents leave with their cars at the same time to drop their young children off at school, and that housing built along the M50 slows down traffic there.

> *"Peak traffic is still very bad in Dublin, because there's a huge amount of parents who drive their kids to school. So between half seven and half nine, an awful lot of local roads…are clogged."* [Dublin2]

> *"It is often said here by pundits…that a big mistake that the state made was to allow dormitory villages, a huge amount of residential development, to happen along the M50. It's supposed to be a quick way to get around [the city]. But in fact there's all sorts of holdups because people are bogging it up and then going off in the little slip streams to go where they live, just beside the M50."* [Dublin3]

A few of the Dublin interviewees believe that there is a lack of consultation by the city government with stakeholders before embarking on their sustainable transport projects. One of them brought up a sidewalk extension that she believes was poorly planned, and another

said that recent projects do not sufficiently consider accessibility among those with limited mobility.

> *"There's not enough time spent to have brainstorming sessions with interested parties and to work out the hidden knock-on effects of a particular policy."* [Dublin3]

> *"Sometimes it's easier to drive your car. Not everyone has that physical function that they can get to a bus, get up on a bus, balance on the bus while the bus moves to find a seat."* [Dublin4]

CHAPTER 6 – DISCUSSION

The interviewees across Dublin and Vienna indicated some similar perceptions, challenges, and car-related costs. Both groups tried to avoid driving in their city centers, which pushed many to use public transport, cycling, or walking when moving through there. This was due to a mixture of parking management by both cities, as well as adequate or improving provision of non-car alternatives, particularly public transportation. In the case of Dublin, this was also due to high levels of traffic congestion. Both groups recognized that their cities have been working to discourage parking, with Vienna implementing the Parkpickerl system and Dublin limiting parking times and reducing parking spaces. It is notable that some participants in both Vienna and Dublin noticed that parking restrictions nearby had resulted in commuters shifting their parking to residential areas that still had free parking, which was then followed by a city-wide expansion of paid parking (in Vienna) or residents requesting a paid street parking scheme in their neighborhood (in Dublin). This results in a similar system by which parking by non-residents is not free and residents pay for the right for unlimited access to local street parking for (relatively) cheap. Such a situation is meant to discourage non-resident parking, which is a way of reducing parking capacity while respecting the needs of those who live there. This is an important balance to strike, as removing parking spaces remains politically controversial in many cities.

Residents of both cities were also generally supportive of enhancements to public transportation, with some Dublin participants also particularly enthusiastic about improvements to the cycling infrastructure. Both cities have developed plans to expand infrastructure for public transport, cyclists, and pedestrians, thereby showing an overall consensus over the direction future transport development should take. Both cities have

heavy rail, light rail, and bus systems. The two cities also employ cheap fare prices to encourage using public transportation for at least a portion of the population. Vienna, for example, provides an annual pass costing the equivalent of EUR 1 per day, whereas Dublin allows seniors to travel for free. Participants of both cities also brought up the lack of public transport services outside the centers of their cities, especially for journeys with destinations that remain outside the center of the city. Providing adequate services and quality infrastructure for non-car transport is essential to reducing the modal share of cars.

The interviews have also shed light on several differences between Dublin and Vienna in terms of policy and driver experiences. Participants faced several different costs between the two cities. While the Vienna interviewees typically paid for parking at home in the form of the Parkpickerl (and, in one case, a long-term parking garage spot), all from Dublin could park at home for free. The Dublin interviewees, however, had to pay an annual motor tax. Some of their perceptions in terms of their city's transport systems differed as well. For example, many of those from Vienna had something to say about the city's Parkpickerl policy, including positive statements that it was good for ensuring that residents could find parking spaces in their districts and that it effectively reduced parking by those from outside the city, as well as some complaints that it made parking difficult to find at night and was inconvenient for those who are not residents of Vienna or who had to change cars. In general, the Dublin group appeared to use their cars more often, and unlike those in the Vienna group were reliant on their cars for work (or had been before they retired). While the city has made steps to manage parking, Dublin has not developed a system quite as extensive as Vienna's Parkpickerl. Unlike the Vienna participants, the ones from Dublin also brought up several problems more specific to their city, such as the severe housing crisis and congestion within the city center. The housing crisis and its links to the city's transport situation is an

interesting connection that merits more study, as it concerns the impacts that a sudden influx of foreign investment, a real estate bubble, spatially dispersed housing development, and the affordability of urban life have on transport systems.

In the case of Vienna, the results broadly align with how the literature perceives the city's transport quality. Even if they found aspects of it annoying, most of the interviewees could understand the rationale of policies like the Parkpickerl, pedestrianizing major shopping streets, or generally restricting car use in the city. The comments by some of the participants on their feelings of safety while cycling in Vienna echoes the observation made in one article about the variable quality of the city's cycling network.[141] The interview results from Dublin, as well as the transportation services provided by the city today, show the legacy of the DTI back in the 1990s. Several developments contained in it are now features of the city today, such as the light rail system, the completed M50 road, and developments in pedestrian and cycling infrastructure. The interviews indicate that congestion remains a problem, despite this being a topic of concern since the earliest articles in the literature. The overall message from the Dublin readings is that both incentives to use non-car transport and disincentives for car use are needed, but that only the former have been planned in the city. The interviews indicate that fuel prices are high for some of the participants, and that this is at least partially due to fuel taxes. However, some of the literature's recommended economic disincentives to driving, such as a congestion charge,[142] have not been implemented to date.

Although policy documents by both cities contain detailed and long-term plans for phasing out private car use and promoting sustainable transport systems, they do not reach to the

141. Knoflacher, Frey, and Leth, "Smartness of urban mobility," 5-6.
142. Rogers, Eagney, and Maguire, "A congestion charge for Dublin."

individual level to understand why some residents still choose to own cars and how they interact with some of these cities' policies. The comparison of costs among transport modes from a selection of trips plausibly taken by several participants shows the relatively higher costs of car ownership, but also other considerations the individuals face when choosing their transport modes. The interviews conducted for this thesis provide information from a small sample as to why they still use private cars in these cities, basic data on the economic costs of owning cars there, and how they perceive the policies taken by Vienna and Dublin to encourage a modal shift away from cars. Such interviews are helpful for policy analysis because they at least partially capture the reality of residents at the individual scale, allowing cities to determine the factors that inform their travel behavior, how they perceive the trajectories of their cities' development, and any unintended problems emerging from the implementation of transport policies by capturing the nuanced lived experiences of residents. A city is not made up of just laws or markets or infrastructure, but also of people and opinions and decisions.

This thesis has a number of limitations. The sample of interviewees is not meant to be representatives whatsoever, and is very small. The "snowball" method of gathering interviewees was used, meaning that the sample could also be less representative of the general car-owning populations of each city because the participants were often connected in some way. The information for costs were supplied by the participants themselves, which could possibly lead to biases, such as by minimizing certain reported expenses or by simply forgetting specific amounts. For the cost-benefit analysis of trips, the start and end destinations of nearly all trips were estimations and are therefore unlikely to completely reflect the commutes of Vienna2 and Dublin4. The costs both have of car ownership for them is also likely to be lower than average because of their particular circumstances. Their yearly

car costs also may not fully account for irregular trips that could not be generalized on an annual basis. The costs of cycling in both cases were also very simple estimates given a lack of data on average prices of cycling gear particular to both cities.

Future studies could go in various directions. They could employ a larger sample and gain more representative data to form a more complete picture of travel behavior in both cities. They could also present the participants with a range of policies from other cities to gauge their preferences for their own city. A more detailed cost-benefit analysis could be used to analyze the transport options for more types of trips, or even to compare the costs of car ownership versus the time and money costs incurred if all the same trips (including both commutes and more occasional travel) were done in the absence of one's own vehicle. Another path for future research could also be to compare more different cities to understand the effects of density, culture, wealth, demographics, or other factors on transport behavior and sustainable transport policies.

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APPENDIX – INTERVIEW GUIDE

Demographic data

Name
Age
Gender
Highest education
Employment status (employed, unemployed, retired, etc)
Annual personal income (within a 10,000-euro block; eg, 20,000-29,999)
District/county of residence in Vienna/Dublin
District/county of work in Vienna/Dublin
Number of cars in household
Number of members in household (and number of children)

Experiences of car ownership

When did you first get a driver's license? When did you first get a car in Vienna/Dublin?

Why did you decide to have a car in Vienna/Dublin? How often do you use it? For what purposes?

How long is your average commute (whether or not it's usually in a car)? Does using a car save you time?

How would you rate the road infrastructure? Do you enjoy driving?

Costs of car ownership

What kind of car do you have? Why did you choose this kind of car?

What type of expenses have you had when it comes to owning a car?

Driving exam?
Insurance?
Buying car?
Registration?
Gas?
Parking?
Maintenance?
Inspection?
Tolls?
Other costs?

Do you think that these expenses are reasonable? Should any aspect of car ownership be more (or less) affordable for people in Vienna/Dublin?

Would you say that owning a car is a considerable expense within the household budget?

Opinions of Vienna's/Dublin's policies

Parking management (on-street paid parking, resident parking permits, etc)

Taxes/tolls/gas

Alternative transport modes (walking, cycling, public transport)

Pedestrianization/road reallocation from cars/speed limits

Electric vehicles

Other policies or important points brought up

Is there anyone else I could speak with?