



Data and insights from Google's Environmental Insights Explorer (EIE) support Greater Manchester 2040 Right Mix

TECHNICAL CASE STUDY



SUMMARY

Greater Manchester (GM) is using [Google's EIE data](#) to inform the transport estimates used to track the progress of its Local Transport Plan, which defines the city's sustainable urban mobility strategy for the year 2040. EIE is a tool utilising various data sources and modelling capabilities to assist cities in assessing emissions sources, conducting analyses, and formulating strategies for impactful actions. EIE provides Greater Manchester (GM) with regional-level data helping them update their traffic reduction targets for 2040 in an evidence-based manner. Traffic reduction targets are currently being updated, they are a key pillar in achieving GM's carbon emission reduction targets.

AIMS / OBJECTIVES

1. Understanding how data from EIE and GM Travel Survey (TRADS) is compared and contrasted
2. Improving the understanding of city to city trips that either originate or end in the GM region
3. Recalculating transport estimates with an improved understanding of trips made by non-residents
4. Using Google's EIE data, both by mode and spatial theme, to update 'Right Mix' targets for 2040 based on evidence
5. Monitoring progress towards existing targets

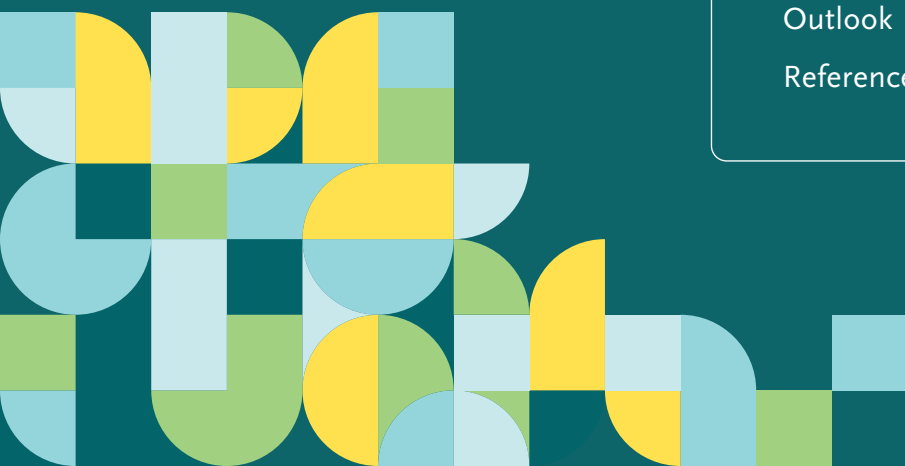
OUTCOMES

1. GM developed an improved understanding of non-resident trips in GM and updated their 'Right Mix' targets
2. Estimated trips (and person-km) by mode and spatial theme
3. Improved understanding of how EIE compares to TRADS survey
4. EIE was able to better understand the data.
For example, GM provided estimates of a shortfall in the number of bus trips estimated by Google

Cover image: Unsplash / William McCue

TABLE OF CONTENT

Introduction	3
Greater Manchester's climate and sustainable mobility strategy	3
EIE Data for Greater Manchester	4
Transport emissions and mobility data analysis	4
Outcomes and impact of the study	5
City perspective	6
Outlook	7
References	5



INTRODUCTION

Greater Manchester (GM) is a metropolitan county and combined authority area. It includes ten metropolitan boroughs: Bolton, Bury, Manchester, Salford, Stockport, Tameside, Trafford, Oldham, Rochdale, and Wigan. Its total population is about 2.9 million, making it the third most populous county in the United Kingdom after Greater London and the West Midlands. It spans 1,277 km² and is poly-centrally structured with every borough concentrated around a large town or a city.

GM and ICLEI Europe have been working together since 2021, to determine the value EIE brings to the city region. Through access to the tool, Greater Manchester has used the data and methodologies to develop a deeper understanding of the tool. In addition, the city region has been exploring different uses of the tool for their climate action planning processes, with an emphasis on the transport sector and their long-term sustainable mobility strategy implementation.

GREATER MANCHESTER'S CLIMATE AND SUSTAINABLE MOBILITY STRATEGY

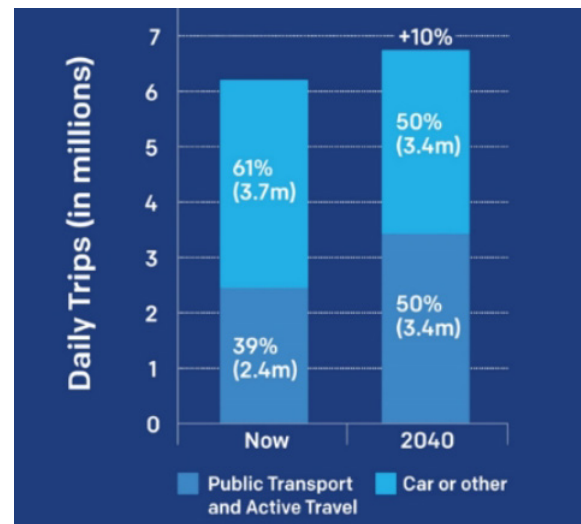
In its 5-year Environment Plan for Greater Manchester (2019-2024) the city region established a long-term environmental ambition for carbon neutrality by 2038, aiming to also improve local air quality, increase city resilience to climate change and enhance the region's sustainable growth.

Currently, the transport sector alone is responsible for 30% of GM's carbon emissions and its share is expected to grow in the future, as lower-carbon technologies are not yet widely available in the transport sector unlike other sectors such as power generation and manufacturing industry. Growing demand for travel with increasing population and economic growth adds to the difficulty of reducing transport emissions. In this context, the local government body Transport for Greater Manchester (TfGM) has designed a long-term policy framework aiming for a "world-class integrated transport network that supports long-term sustainable economic growth and access to opportunity for all". The Greater Manchester Transport Strategy 2040, updated in 2021, sets a wide range of actions that will contribute to reducing CO₂ emissions and delivering air quality improvements.

Greater Manchester has defined a '2040 Right Mix' approach to quantify this vision. It establishes a goal for 50% of trips to be made by sustainable modes by 2040. This includes public transport or active travel (walking, cycling), significantly reducing car use and leading to zero net growth in motor vehicle traffic within Greater Manchester between 2017 and 2040 (See Figure 1).



Figure 1: Right Mix Goal 2040

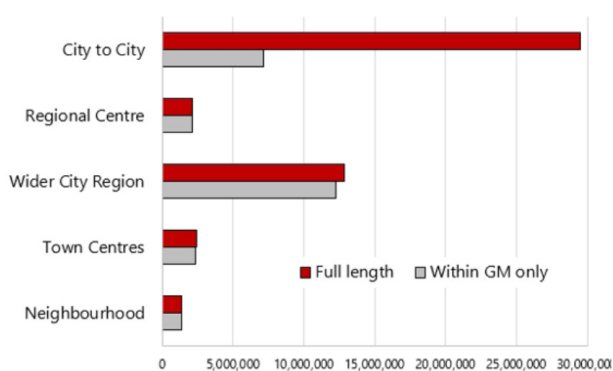


GOOGLE'S EIE DATA FOR GREATER MANCHESTER

Currently, EIE provides Transportation Emissions and Mobility Data for GM and its constituent boroughs from the years 2018 to 2022. Greater Manchester Transport Authority has its own EIE workspace with the 10 boroughs shown individually. Initially, this data allowed GM to identify an opportunity and improve the analysis of trips across GM by five spatial themes: neighbourhood, town centres, the wider city region, the regional centre and city to city. Spatial themes are types of trip, defined by their origin and destination and trip-lengths. Trips in the wider city region and city-to-city spatial themes are made mostly by car with high average trip-lengths, thus reducing traffic will require redistributing some of the trips in those spatial themes to neighbourhood, town centres, and the regional centre (the densely developed centre of the GM city-region).

Transport for GM aimed to use EIE to update their 'Right Mix' targets. EIE transport data has been provided to GM broken down by mode and spatial themes.

Figure 2: Daily Car Person KMs (Right Mix 2017 Baseline)



Most car-person-km - and hence most of the carbon emissions from personal travel - are generated by trips in two spatial themes: City-to-City and Wider City-Region (TRADS-based estimates)

TRANSPORTATION EMISSIONS AND MOBILITY DATA ANALYSIS

Greater Manchester assesses their carbon emissions via commissioned research, aligned with the Setting City Area Targets and Trajectories for Emissions Reduction (SCATTER) model which accounts for emissions systematically for several UK cities and provides different emission reduction pathways for GM. Specifically for transport, data is obtained combining traffic activity data with fleet composition data and fuel consumption/emission factors.

To better account for trips, TfGM carries out continuous Travel Diary Surveys (TRADS). The 'travel market' of GM residents is segmented into different journey-types - 'spatial themes', each with individual targets:

1. Neighbourhood trips – short and local, outside the Regional Centre
2. Regional Centre trips – trips to/from/within the Regional Centre, excluding longer inter-urban trips
3. Town Centre trips – trips to/from/within any of the 11 main town centres in GM
4. Wider City-Region trips – longer trips, not to/from the Regional Centre or town centres, extending up to 10km beyond the GM boundary
5. City to City trips - trips to/from GM extending more than 10km outside the GM boundary

The Right Mix targets for 2040 in GM aim to redistribute trips towards the Town Centre, Neighbourhood, and Regional Centre spatial themes, where non-car mode share is higher.

Due to the lack of the data from non-resident travellers, GM used other data sources, including EIE, to estimate trips by spatial theme. EIE provides data until 2022, which is especially interesting because transport in 2021 was still affected by the Covid-19 pandemic. For this, GM has provided Google with GIS files defining the different spatial themes to facilitate access for more granular data in the future.

GM has used EIE trips data to compare with TRADS results in 2019 and made an interim estimate (called 'GM travel') of all trips to/ from/ within but not through GM.

OUTCOMES AND IMPACT OF THE STUDY

TfGM has provisionally concluded that both Greater Manchester's TRADS survey and EIE are under-recording trips. For TRADS data, an interim uplift factor of 1.25 reflects a combination of non-resident trips that are outside the survey's scope, as well as a more general estimated under-recording of trips. Consequently, GM revised the baseline trips in 2017 and updated their targets for 'The Right Mix 2040' by spatial theme. EIE confirmed that TfGM's TRADS survey produced broadly reliable results, by using a much larger sample size and a broader sample of travel activity (residents but also commuters from outside the area, tourists). The case study validated both sources, allowing confidence for TfGM to use them in combination: the validity of TRADS as an in-depth source, while also having confidence in using EIE as an initial snapshot.

With EIE 2022 data available, TfGM intends to use it for an evidence-based update of both their interim estimates as well as their 'Right Mix' targets for 2040. GM also expressed interest in having access to EIE data beyond regional boundaries, aiding their understanding of transboundary trips.

References

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Talks with Transport for Greater Manchester (TfGM)

Talks with the EIE team

Unsplash / Joe Cleary



Experience from the city, contributed by
Julian Laidler and **Mick Edwardson**

VALUE TO CITIES

What value did you personally find in Google's EIE Data?

A better understanding of baseline volumes of travel in - the number of trips, trip-lengths, and mode split within Greater Manchester.

The data supplemented TRADS survey - a continuous household travel diary survey that provides a picture of travel in Greater Manchester by residents, excluding information about the significant amount of travel in Greater Manchester by non-residents.

OPERATIONAL IMPACT

How do you think Google's EIE Data will support your city or local government's operations?

By facilitating estimates of a complete picture of travel by mode to/from/within Greater Manchester, it will improve policy decisions.

GLOBAL IMPACT

What do you see will be the impact for all cities?

The collaboration between EIE and Transport for Greater Manchester (TfGM) provides an example of how locally-collected data combined with EIE data can make the best possible estimates of travel to/ from/ within specific cities.



Unsplash / Fraser Cottrell

OUTLOOK

Based on GM's work with EIE, transport authorities from other cities and regions with robust plans to foster sustainable urban mobility can understand how to compare different sources of data to complement and validate existing local tools. Furthermore, this case study provides an example on how EIE can inform local and regional government's strategic requirements. In the case of GM the borough-level data as well as the specific spatial themes data, provided additional data sources to inform their targets and future monitoring strategies.

This case study also shows how both sides can inform and learn from each other. On one side, EIE can provide detailed data on new and local mobility. Greater Manchester, on the other hand, is an example of how data in EIE can be refined through exchange with local ways of working with transport data. As Julian Laidler (Senior Development Officer) and Mick Edwardson (Intelligence Officer) from TfGM note, "*The collaboration between Google EIE and TfGM provides an example of how locally-collected data can be combined with EIE data*

to make the best possible estimates of travel to, from and within specific cities."

Recently, the TfGM EIE Insights Workspace has been whitelisted for 2021 GTFS bus data. The advantage here is to have improved data on VKT (Vehicle kms travelled) and therefore CO₂ emissions as compared to the previous initial data (location-based methods for dense urban areas tend to overestimate since there are no reliable per-city occupancy counts). This is another example of how both, the cities and regions as well as Google, can complement each other as TfGM provided feedback on the data.

Lastly, EIE has the potential to become part of data sources that inform and create SUMP, determine priorities for investment, as well as provide information about other similar cities, so that benchmarking activities can drive changes. The next step for TfGM is to use EIE data to inform their Transport Strategy 2040 (eg. for climate action planning).

ICLEI Europe

ICLEI – Local Governments for Sustainability is a global network working with more than 2500 local and regional governments committed to sustainable urban development. Active in 125+ countries, we influence sustainability policy and drive local action for low emission, nature-based, equitable, resilient and circular development.



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