WCC Modelling Protocol

Advice Note 005 – Mobile Network Data

Protocol Category	Data	Version	002
cc	Warwickshire County Council	File reference	WCC_MP_AN05.V002
Prepared by	Warwickshire County Council	Date	27 October 2023

Introduction

1. This advice note (AN) has been produced to supplement the Warwickshire County Council (WCC) Model Use Protocol (MUP) which governs the access and use of WCCs suite of models.

2. To supplement the WCC MUP, a series of advice notes have been produced to provide information and guidance around the data which is available both directly and indirectly from the existing suite of models.

Purpose of This Note

3. This note sets out expectations around the use of Mobile Network Data (MND) to inform the assessment of trip distribution patterns associated with developments which are proposed within the Warwickshire Area.

4. In this instance the note covers the origin of the MND and the necessary justification of its use instead of alternative data sources such as Census Travel To Work (TTW) data.

5. Due to the anonymisation and licensing requirements which govern the interrogation and application of information arising from the MND it is not possible for the full data set to be made available, rather any provision of trip distribution information arising from the MND will be in a post-processed form provided by either WCC or their transport modelling consultants.

Data Overview

6. To fully understand the origin of Mobile Network Data it is recommended that the reader refer to Section 3.2 of the Transport Systems Catapult (TSC) report 'Utilising Mobile Network Data for Transport Modelling'[1] which is provided in **Appendix 1** of this note.

7. In summary it is the collation of 'event data' occurring with mobile devices which is used to inform routing and trip patterns across a network.

8. By harvesting the data from the Mobile Network it is possible to obtain routing information across a wider area in a non-intrusive manner.

[1] https://www.gov.uk/government/publications/mobile-phone-data-in-transport-modelling

9. The MND is then used to create trips based on the location of events across the network. When a mobile signal is static the trip is assumed to be a trip end or 'dwell'. By reviewing, amongst other things, the frequency and duration of the 'dwell' it is possible to infer trip type across a number of basic categories.

10. By reviewing the frequency of events between dwells, considering the location and inferred speed, it is also possible to categorise the trip into mode.

11. The current MND has been tested and benchmarked against earlier MND (to aid the review of the trip patterns), population information (to inform the trip generation and concentration levels) and local knowledge to ensure that WCC consider it to be an appropriate reflection of the travel patterns across the county.

Use of MND over Existing Data Sources

12. WCC promote the use of MND for the purpose of distribution analysis as is considered to be more reflective of current network trip routing patterns and also contains a greater level of detail than is available from other data sources.

13. Traditionally Census data has been used to assess the likely distribution patterns of proposed developments and it is intended that MND can be used in lieu of Census data when it is agreed that Census is appropriate.

14. For certain development types (such as a large scale development being delivered in a remote or rural area with sparse existing population levels) a gravity model will still be the most appropriate tool to inform the development of distribution.

15. However, for the majority of developments focused within or in close proximity to existing population hubs within the County, MND would be considered the appropriate means of distribution estimation.

16. Whilst the level of granularity and collection methods means that MND predictions for short distance trips can be considered less reliable than long distance trips, it is not considered that the situation is significantly different from that which occurs when considering distribution patterns from Census data.

17. Critically, Census data was gathered in 2011 and 2021, with 2021 travel to work data having been impacted by the Covid-19 pandemic and therefore subject to limitations. The MND surveys were collected during 2016 and updated in 2022-23 making the data more relevant and ensuring the effects of the build out of key employment centres within and on the edge of the County (Such as Birch Coppice, JLR Gaydon and DIRFT) is considered within the analysis.

18. Census data is also limited to only work based trips and provides only one set of origin and destination patterns which are traditionally transposed to account for the periods being assessed (i.e. the pattern of 'trips to work from here' in the AM is often inverted to provide the PM return distribution). MND is more time-sensitive and provides an assessment of the distribution patterns for a variety of periods within the day.

19. The mode of travel data is more refined within census and, should slow modes be an important part of the assessment, then it is considered that census should be interrogates to

inform any mode split assumptions.

Disaggregation of Information

20. As has been highlighted earlier within this Note, the MND is disaggregated by both mode and purpose.

21. Additionally, it has been refined based on the time period which includes both the hour of departure and the day of departure. The various categories which the distribution information has been disaggregated into are outlined as follows:

Trip Disaggregation

22. Trip information is available based on the following modes:

- Highway (motorised)
- Rail
- Walking
- Other

23. In addition to the mode split, trip information is also available based on the following purposes:

- Home Based (e.g. Home-Work)
- Work Based (e.g. Work-Home)
- Other

24. The Home based trips are those with at least one trip end associated with the 'dwell' categorised as home whilst the work based trips) are those with a trip end associated with a dwell categorised as place of work.

25. The Other trip type is between two dwell points where neither is classified as a home or work location.

Periodic Disaggregation

26. The MND is also disaggregated by period which is subsequently broken down in to two sub-categories; Day and Period (within the day). Day information is available for the following categories:

- Weekend (Sat, Sun)
- Weekday (Tue, Wed, Thur)

27. In most instances the Weekday (Tue, Wed, Thur) data will be the most appropriate although for some land uses such as retail and leisure may require distribution analysis for the Saturday period.

- Weekday AM (07:00 to 10:00)
- Weekday Interpeak (10:00 to 16:00)
- Weekday PM (16:00 to 19:00)
- Weekday Off-peak (19:00 to 07:00)
- Weekend Off-peak (10:00-16:00)

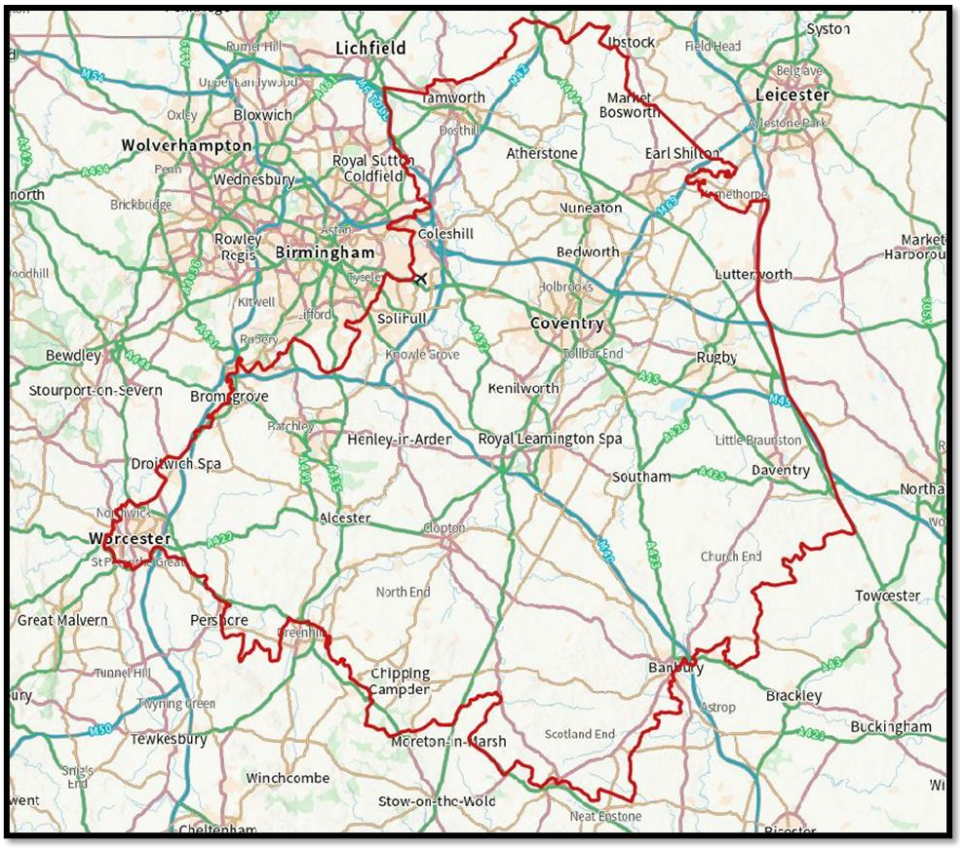
28. For traditional weekday assessments, AM and PM periods are the most critical although Interpeak may be desirable if the influence of education trips is also required (since these trips are most prevalent in that time period).

MND Interpretation and Outputs

29. It is expected that, for the reasons outlined previously, the MND should be used to project traffic distribution patterns across the study area. It is also possible that, for larger developments or developments which lie on the periphery of an existing model, MND can be interpreted to provide an indication of likely area of influence should there be a need to identify areas outside the existing suite of county models that need to be specifically considered.

30. The MND study area covered the entire county of Warwickshire plus surrounding areas including Solihull and Coventry with a LSOA buffer. Longer-distance trips were captured to a Local Authority level. **Figure 1** provides an illustration of the study area edged red.

Figure 1: MND Study Area



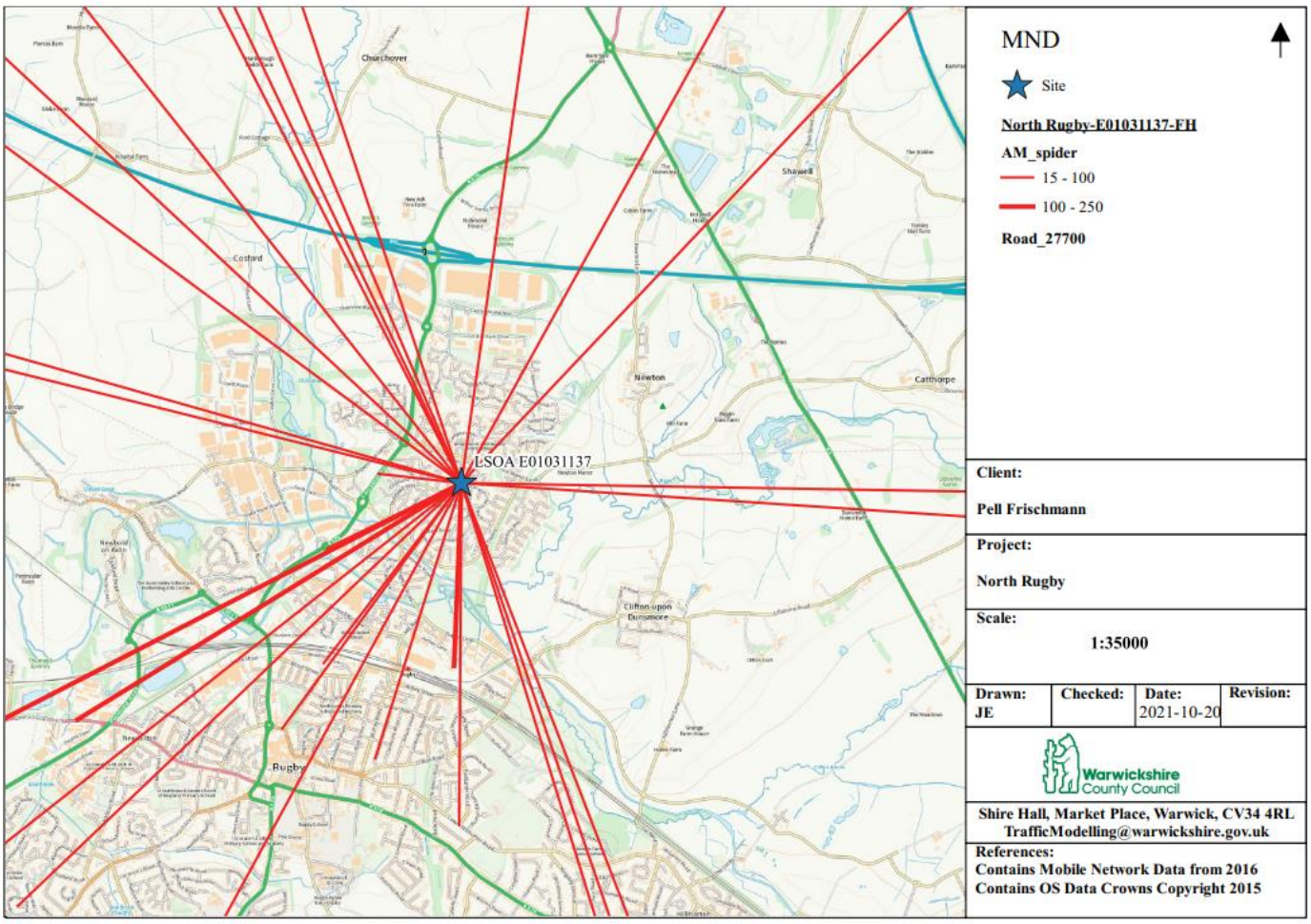
31. As a minimum, within the study area, data is available at the Lower Super Output (LSOA) level. Some longer-distance trips outside the study area are captured at the level of Local Authority (e.g. District/Borough/City) boundaries.

32. This information can be presented in the form of distribution tables and, if necessary, GIS plots which illustrate the distribution pattern observed within the model. An example distribution plot is provided within **Figure 2** overleaf.

33. When the MND is being used alongside the County microsimulation models it is possible for the information to be provided in a manner which complies with the model zone system and therefore will provide a means of informing an assessment of development impacts across a modelled area.

34. Where the development is too small to justify an assessment within an existing transport model, or where no model exists, MND can be used to both assess the area of influence and, more specifically, how development flows are likely to traverse the site access and any critical junctions in close proximity.

Figure 2: Example MND Illustrative plot



Access to MND

35. Access to MND for the purpose of including within an assessment to be completed using one of the existing traffic models can be provided either through a request to WCC or WCC's Modelling Framework consultants.

36. Access to MND for assessment purposes where a traffic model does not exist can be provided following a request to WCC.

37. In both instances the request should stipulate:

- The development composition being tested.
- The Location of the development
- The point (or points) of access onto the existing transport network.
- The disaggregation parameters to be utilised (tip and periodic)

38. There are costs associated with the access, processing and provision of MND outputs which will be confirmed at the time of the request being made available. Any access costs are levied on the basis that they are retained for the purpose of updating the MND via a new data collection exercise at the point at which the current data is considered to be outdated (most likely when the data exceeds 5 years old).