Western Gateway Sub-national Transport Body

Board Meeting

Paper D

Date	**22 September 2021**
Title of report:	**Carbon Baseline**
Purpose of report:	**To update the Board on the development of a transport carbon baseline for the WGSTB area and to outline the process to develop a transport carbon forecast.**

Recommendations:

The Board is recommended to:

i. Note the process to develop the transport carbon baseline and its key outputs, and the outline process to develop a transport carbon forecast.

Introduction

1.1 A carbon audit (baseline) was agreed by the Western Gateway Shadow Sub-national Transport Body (SSTB) Partnership Board at its meeting on 16 September 2020 as part of the forward work programme.

1.2 Following engagement with other STBs, a brief was developed and subsequently agreed by the Senior Officer Group at its meeting on 1 February 2021. The key requirements of the brief were as follows:

1. Provide an assessment of the available/relevant methodologies for establishing a transport carbon baseline.
2. Provide an overview and review of the carbon baselining work undertaken by WGSTB authorities, Highways England (now called National Highways) and Network Rail.
3. Based on the above, recommend and utilise a methodology(ies) to provide a carbon baseline.
4. In preparation for the next stage of the WGSTB's carbon work, detail and cost:
    - an approach to establishing a baseline carbon forecast for transport up to 2050; and
    - a mechanism/tool that would enable the SWLTB to manipulate this data to see the effect of different interventions/measures.

1.3 Consultants WSP were subsequently appointed in March 2021.

Assessment of available methodologies

2.1 WSP's assessment of the available and relevant methodologies for establishing a transport carbon baseline are set-out in summary form in the table below.

Tool	Approach	Outputs	Accuracy
SCATTER	A top-down approach is undertaken. Data is taken directly from the regional and local authority dataset published by BEIS relating to energy consumption.	Transport emissions for local authority area, including some scope 3 emissions.	The SCATTER tool is useful for an estimate of regional emissions. However, traffic data is not available on a link by link basis for the majority of minor roads using BEIS published data. Therefore, the outcome may be an underestimate of emissions.
Department for Business, Energy & Industrial Strategy (BEIS)	Top-down approach to estimating emissions by using the latest year of BEIS regional emissions data and apply high-level assumptions to determine annual reductions in emissions.	Annual emissions for industry and commercial, domestic, and transport (road and diesel railway) at local authority level.	Useful for a high-level estimate of emissions. However, this approach is highly assumptive and won't provide an accurate estimate of regional emissions.

Tool	Approach	Outputs	Accuracy
WSP bespoke tool	The bespoke tool applies a bottom-up approach to estimating emissions based on raw traffic data for the entire road network and operational tram and rail data. The WebTAG methodology is then applied to estimate carbon emissions using UK specific emission factors that forecast into the future to take into account changes in fuel consumption.	Provides a detailed emissions estimate for the entire transport network within the area and provides a detailed breakdown of various emission splits, including emissions by road type and trip genesis.	As region specific data from the entire road, rail and tram network (as far as possible) are considered, this tool provides the most accurate estimate of emissions within a region. Furthermore, the tool provides granular detail of emissions in specific regions which can be used to inform specific policy measures to reduce carbon.
The Environmental Insights Explorer (EIE) from Google	The insights are a modeled estimate based on actual measurements of activity and infrastructure (the same underlying information that is made available in Google Maps). This is used to understand how people are moving around the world, and then scaling factors, efficiency and generic emissions factors are applied.	Emissions from road transport within city boundaries.	Google doesn't state what emission factors are used therefore it cannot be determined whether the factors are relevant to the UK/specific areas.

Tool	Approach	Outputs	Accuracy
Emissions Factor Toolkit from DEFRA	The toolkit provides emission rates from 2018 through to 2030 and takes into consideration information available from the National Atmospheric Emissions Inventory (NAEI) including, fleet composition and technology conversions in the national fleet.	Provides emission rates from 2018 through to 2030 for a specified year.	The tool only considers road traffic emissions and does not assess emissions from rail or trams. Furthermore, it does not consider emissions from the entire road network.
UK Energy Research transport model	The tool uses a number of parameters to determine transport demand. This includes GDP and population growth.	Travel demand, vehicle ownership and use, energy demand, life cycle emissions of 26 pollutants.	Although the tool can provide a detailed breakdown of emissions, the breakdown of emissions from using this tool would not be as granular as the breakdown can be by using raw traffic data to build up an estimate of emissions.

2.2 Further details on the above assessment are provided in Appendix 1.

Review of carbon baselining work undertaken by WGSTB authorities, National Highways and Network Rail

3.1 All the WGSTB authorities have completed a carbon baselining activity for transport to varying degrees of detail/granularity, with some authorities also having completed some future baselining. Where carbon baselining has been undertaken, a top-down approach has been applied (namely using BEIS data or SCATTER).

3.2 With regard to National Highways (formerly Highways England) and Network Rail:

- National Highways has commissioned WSP to undertake transport carbon emissions baselining of the strategic road network (SRN).

- Network Rail has set out a Decarbonisation Programme Workstream and a Traction Decarbonisation Network Strategy which outline a national framework for how Network Rail can contribute towards the Government's target of net zero carbon emissions by 2050. Network Rail are currently drafting a remit to enable them to take the findings of the national framework and produce a Regional Decarbonisation for the Wales and Western part of Network Rail. The regional strategy will look into how Network Rail plans to decarbonise the network and supply chains. The plan is to produce the strategy in 2021/22.

3.3 Further details on the above review are provided in Appendix 1.

Carbon baseline methodology

4.1 Based on the outcome of the above and feedback from Transport Officer Group representatives from each local authority at a carbon workshop held on 29 May 2021, WSP recommended that a bespoke transport carbon tool is developed for the WGSTB to accurately estimate carbon emissions from transport within the area. It is considered that a bespoke tool will provide the most comprehensive and granular breakdown of transport carbon emissions and provide the ability to 'slice and dice' the data as required.

4.2 As per the brief, the following information was sought:

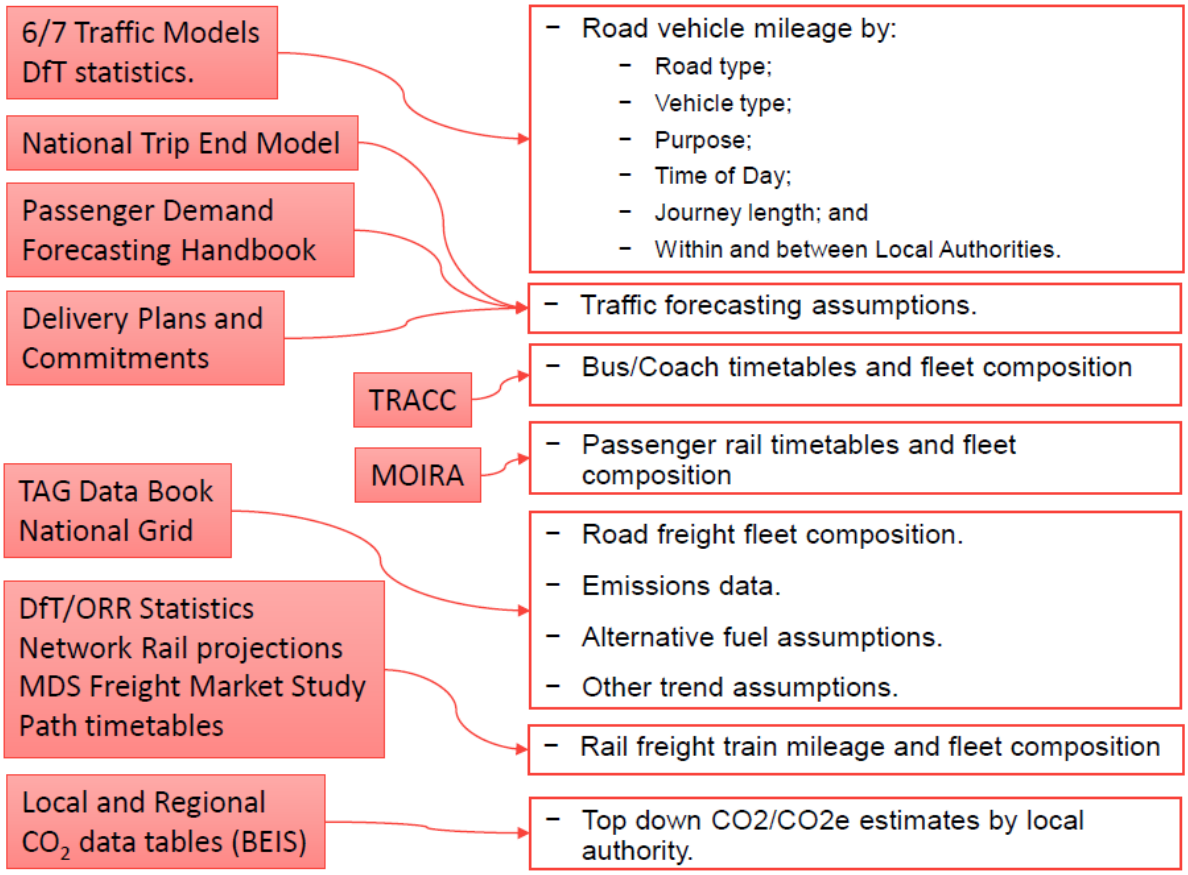
- An estimate of strategic transport carbon emissions in the WGSTB area split by mode (car, van, HGV, bus, coach and rail), trip length, time period and local authority area.
- An estimate of carbon emissions from transport for each of the following components:

Mode	Component
Road	
1a	Car kms on SRN
1b	Car kms on MRN
1c	Car kms on local network
2a	Van kms on SRN
2b	Van kms on MRN
2c	Van kms on local network
3a	HGV kms on SRN

Mode	Component
3b	HGV kms on MRN
3c	HGV kms on local network
4	Inter-city coach kms
Buses	
5	Local bus kms
Rail	
6	Stopper services kms
7	Inter-city services kms
8	Rail freight services kms

- In addition to these components, carbon emissions by local highway authority area were required shown by:
    - Car, Van, HGV trips:
        - Less than 1 mile
        - 1-5 miles
        - 5-10 miles
        - Over 10 miles.
    - Trip purpose (Commute, Business, Other) for roads.
    - Time period (AM, PM, Inter and Off-Peak), separately for road and rail.
    - Trips starting in area but travelling out, split by road, rail and road-based public transport.
    - Trips ending in area coming from outside, split by road, rail and road-based public transport.
    - Trips starting and ending in area, split by road, rail and road-based public transport.
    - Trips passing straight through, split by road, rail and road-based public transport.

4.3 To address the above requirements, the following data sources have been utilised:



4.4 The above data inputs are fed into a carbon calculation tool which provides the bottom-up carbon emission baseline for transport emissions in the WGSTB area.

Outputs

5.1 The carbon calculation tool will be in the form of an Excel spreadsheet which will:

- Be fully transparent - each SWSTB local authority will be able to interrogate the tool/data for its respective area and the wider STB region.
- Provide a dashboard providing high level results.
- Include tables containing results with and without BEIS data alignment.

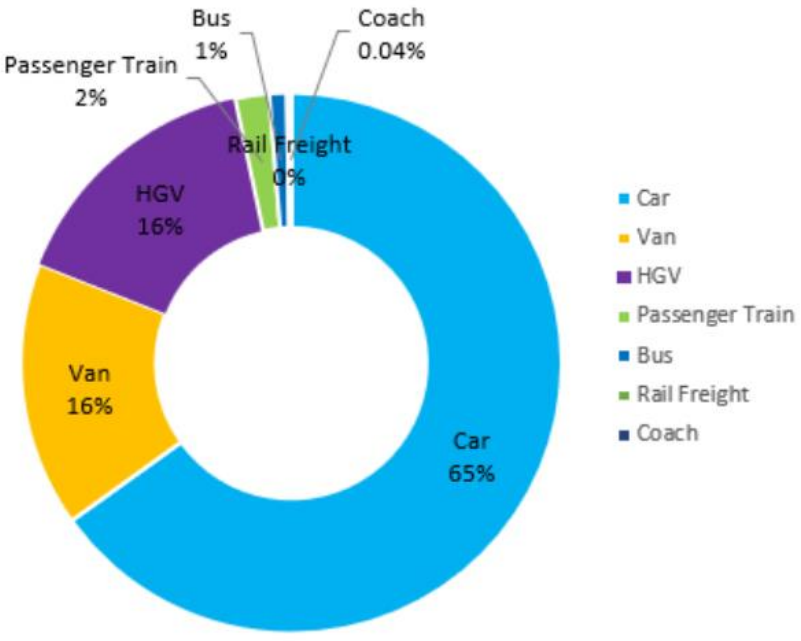
5.2 The summary high-level results of the tool are as follows:

Local Authority Summary 2019

(Car, Rail and Public Transport)

Local Authority	2019 tCO2e
Bath & North East Somerset	221,773.15
Bournemouth, Christchurch & Poole	386,055.89
City of Bristol	435,633.67
Dorset	665,289.24
Gloucestershire	1,197,918.30
North Somerset	460,887.61
South Gloucestershire	776,718.73
Wiltshire	1,069,416.71
WECA 2019 tCO2e (including Rail Freight)	1,897,961.30
WGSTB 2019 tCO2e (including Rail Freight)	5,225,101.32

Mode Summary 2019



5.3 Further details on the methodology and carbon calculation tool will be provided by WSP in a presentation to the Board at the meeting and in a subsequent report.

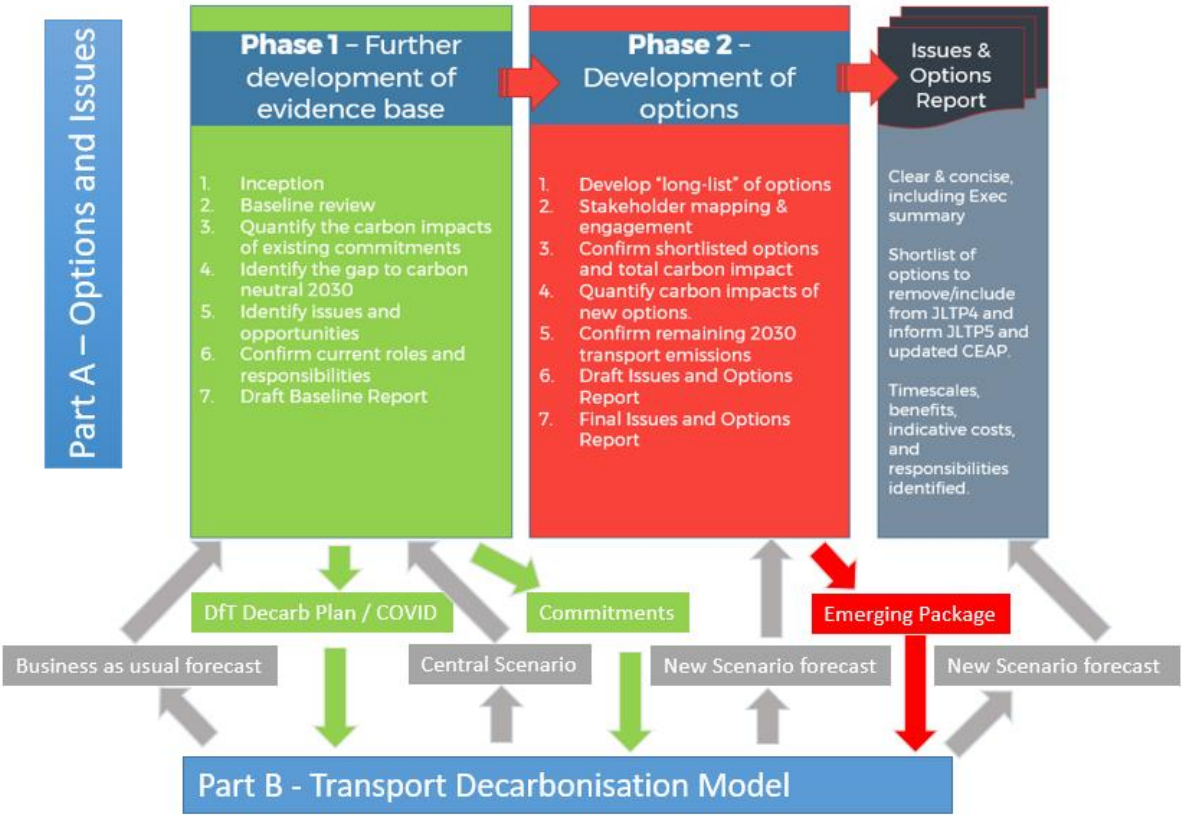
Transport carbon forecast

6.1 The next stage of the transport carbon work would be to develop a forecast tool to 2050 (and relevant intermediate years).

6.2 The West of England Combined Authority (WECA) is currently developing a proposal with WSP to undertake a Transport Decarbonisation Study broken down into two parts:

- Part A - Issues and Options: provide WECA with a transport decarbonisation route map; and
- Part B - Transport Decarbonisation Model: provide for WECA and the WGSTB a forecasting tool to provide the evidence for Part A and the development of the WGSTB's long-term Strategic Transport Plan.

6.3 The proposed approach to the above is set out below:



6.4 While Part A is currently focussed on the WECA area, it could provide a template and tool for other constituent authorities in the WGSTB area. As for the baseline tool, the Part B Transport Decarbonisation Model will be available to each SWSTB local authority to interrogate the tool/data for its respective area and the wider STB region.

Risks

7.1 There are not considered to be any significant risks as a result of this report.

Consultation, communication and engagement

8.1 The Rail Officer Group has been re-established with officers drawn from the all the Western Gateway local authorities. It now meets monthly. The Senior Officer Group has been consulted on this report.

8.2 Public participation in the work of the task forces will provide useful local insights and promote awareness of proposals and the wider Rail Strategy. An engagement plan will be drawn up.

Equalities Implications

9.1 There are no direct equalities implications as a result of this report.

Legal considerations

10.1 The Western Gateway STB remains an informal non-statutory partnership.

Financial considerations

11.1 This is as per agreed budget allocations.

Conclusion

12.1 The Partnership Board is asked to note the process to develop the transport carbon baseline and its key outputs, and the outline process to develop a transport carbon forecast.

Appendices

Appendix One: WSP Carbon Management Paper

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Appendix One
WSP Carbon Management Paper