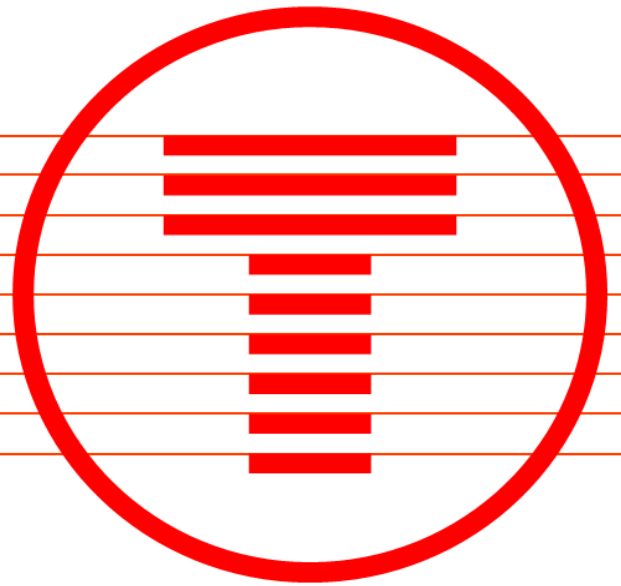




**TRAFNIDIAETH CYMRU**  
**TRANSPORT FOR WALES**

# **Default 20mph speed limit on restricted roads**

## **Monitoring framework document**



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**Revision**

**Final**

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**Issue Date**

**September 2023**

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# 1. Introduction

## 1.1. Background

This document outlines how Transport for Wales will be monitoring the initial effects of the new national 20mph default speed limit on restricted roads. It sets out what is being monitored and how the monitoring will take place.

The Welsh Government is introducing a default 20mph speed limit on restricted roads across Wales.<sup>1</sup> This is the first national scheme in the UK of its kind and is in force from 17 September 2023.

Following the recommendations of the ‘Welsh 20mph Task Force Group Final Report’ (July 2020), the Welsh Government worked with local authorities to implement 20mph speed limits in eight trial areas during 2021-22. The trial areas are referred to as phase 1 of the 20mph programme. The eight trial areas are listed in table 1 in implementation date order.

**Table 1: 20mph phase 1 trial areas**

Phase 1 trial area	Local authority	Implementation date
St Dogmaels	Pembrokeshire	16 June 2021
St Brides Major	Vale of Glamorgan	09 July 2021
Llanelli (North)	Carmarthenshire	20 August 2021
Buckley	Flintshire	28 February 2022
Cardiff (North)	Cardiff	11 March 2022
Cilfrew	Neath Port Talbot	16 March 2022
Abergavenny	Monmouthshire	18 May 2022
Sevenside (Caerwent, Caldicot, Magor, Undy)	Monmouthshire	18 May 2022

## 1.2. Rationale for intervention

The rationale for reducing speed limits on restricted roads to 20mph is much wider than simply reducing traffic speeds. It is intended to be a major behaviour change programme which benefits communities and the well-being of people in Wales.

Introducing a lower speed limit for traffic is expected to reduce the likelihood and severity of collisions on our roads. This will lead to fewer pedestrians and cyclists being seriously or fatally injured. The lower speed limit is designed to support the Welsh Government’s vision for walking, wheeling and cycling to be the natural mode of choice for short everyday journeys.<sup>2</sup>

<sup>1</sup> Restricted roads are defined by the Road Traffic Regulation Act 1984 as those with streetlights at least every 200 yards. Unless signed otherwise, the default speed limit on restricted roads was 30mph.

<sup>2</sup> This vision is set out in the Active Travel Act Guidance (July 2021).



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By reducing the number of injuries and fatalities on our roads and reducing the negative effects of car use on the wider environment, the change to 20mph is anticipated to have wide-reaching benefits.<sup>3</sup> These include:

- More people walking, cycling and wheeling (active travel), which will reduce the number of short distance car journeys in built-up areas.
- Increased social interaction within and across communities, leading to improved social cohesion.
- Improved physical and mental health outcomes, due to increased physical activity and greater social interaction.
- Reduced NHS and taxpayer costs and reduced NHS workload as a result of fewer collisions (and reduced severity of injuries) on our roads.
- Reduced NHS costs resulting from the improved physical and mental health outcomes brought about by increased active travel.
- Strengthened local economies in areas previously affected by traffic speed issues, as result of increased footfall and therefore increased retail and hospitality service activity.
- Contribution to the aims and objectives of the Well-Being of Future Generations (Wales) Act 2015, in particular to 'enable places to support the health and well-being of people and communities' within the 'healthier Wales' goal.

While these wide-reaching benefits are anticipated, they cannot easily be measured and attributed to a single policy intervention. There are many Welsh Government policy interventions directed towards achieving similar well-being benefits. To assess the impact of 20mph implementation, specific measurable objectives that will contribute towards the wider societal benefits have been established. These objectives can be found in section 2 of this document.

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<sup>3</sup> This list of wide-reaching benefits is based on 'The Case for Change' set out in the Welsh 20mph Task Force Group report, July 2020



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### 1.3. Monitoring framework structure

This monitoring framework provides a structured approach to monitoring the initial effects of implementing a national default speed limit of 20mph on restricted roads. The monitoring framework identifies the objectives of the speed limit change, the indicators that will be used to measure success and the data that is to be collected for a period of up to five years post-implementation.

The main components of the monitoring framework are:

- Objectives – statements explaining what should be achieved by implementing a default 20mph speed limit.
- Key performance indicators (KPIs) – the main set of metrics that will be used to assess progress against the objectives.
- Data collection methods – the ways in which data will be collected and used to analyse the KPIs.

The approach set out in this monitoring framework has already been tested and was used to structure the [phase 1 interim monitoring report](#), published in March 2023.<sup>4</sup>

Monitoring is continuing in the eight phase 1 trial areas and the data obtained from these areas will contribute to monitoring the effects of the national roll-out. Data from across the rest of Wales will be added to the phase 1 trial area datasets.

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<sup>4</sup> Default 20mph speed limit on restricted roads phase 1: Interim monitoring report, TfW, March 2023



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## 2. Objectives and key performance indicators

### 2.1. Objectives

The 'Welsh 20mph Task Force Group Final Report' (July 2020) set out an initial list of 'desired outcomes' for 20mph implementation. These have now been grouped under three core objectives:

1. Reduce injury and death.
2. Encourage a change in travel behaviour.
3. Reduce negative effects of vehicle use on the wider environment.

Nested within the three core objectives are five specific measurable objectives for 20mph speed limit implementation, as set out in figure 1. These objectives are:

- Reduce the number of pedestrians and cyclists killed or seriously injured on the road network.
- Encourage mode shift from private car to walking and cycling for shorter journeys in built-up areas.
- Reduce motor vehicle dominance in vehicle and pedestrian interactions.
- Reduce carbon emissions from transport as a result of mode shift from private car to walking and cycling for shorter journeys in built-up areas.
- Maintain or improve local air quality due to smoother traffic speeds with less acceleration and deceleration.



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## 2.2. Key performance indicators

KPIs are the main set of metrics that will be used to assess progress against the objectives. Figure 2 presents the twelve KPIs that will be used for the national roll-out.

To check the effect that 20mph speed limit implementation has had on traffic speeds, the following three KPIs will be monitored:

- percentage traffic compliance with the 20mph speed limit (KPI 1.1)
- change in 85<sup>th</sup> percentile speed (KPI 1.2)<sup>5</sup>
- change in mean speed (KPI 1.3)

There are seven KPIs directly related to the objectives. These measures are:

- casualty rate for child pedestrians (aged 5-11 years) by sex and deprivation fifth, and by sex and urban or rural categorisation (KPI 2.1)<sup>6</sup>
- casualty rate for pedestrians and cyclists aged 12-74 years by sex and deprivation fifth, and by sex and urban or rural categorisation (KPI 2.2)
- casualty rate for older pedestrians and cyclists (aged over 75 years) by sex and deprivation fifth, and by sex and urban or rural categorisation (KPI 2.3)
- change in attitude to active travel use in built-up areas (KPI 3.1)<sup>7</sup>
- change in vehicle and pedestrian yielding behaviours (KPI 3.2)<sup>8</sup>
- change in local air quality based on nitrogen dioxide (NO<sub>2</sub>) concentrations (KPI 4.1)
- change in carbon dioxide (CO<sub>2</sub>) emissions (KPI 4.2)

In response to specific concerns identified in the '[Welsh 20mph Task Force Group Final Report](#)', two additional KPIs will be monitored. These are:

- Vehicle journey times and journey time variation on main through routes (KPI 1.4). This uses the difference between the 5<sup>th</sup> percentile and 95<sup>th</sup> percentile journey times as a proxy for journey time reliability.
- Change in public attitudes to 20mph speed limits (KPI 5.1). This will consider perceptions of traffic speeds, traffic noise and effects on communities and will be a qualitative assessment based on survey findings.

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<sup>5</sup> The speed at which 85% of drivers drive at or below under free-flowing conditions.

<sup>6</sup> The term 'deprivation fifth' refers to the Welsh Index of Multiple Deprivation, which ranks areas in Wales according to their relative levels of multiple deprivation.

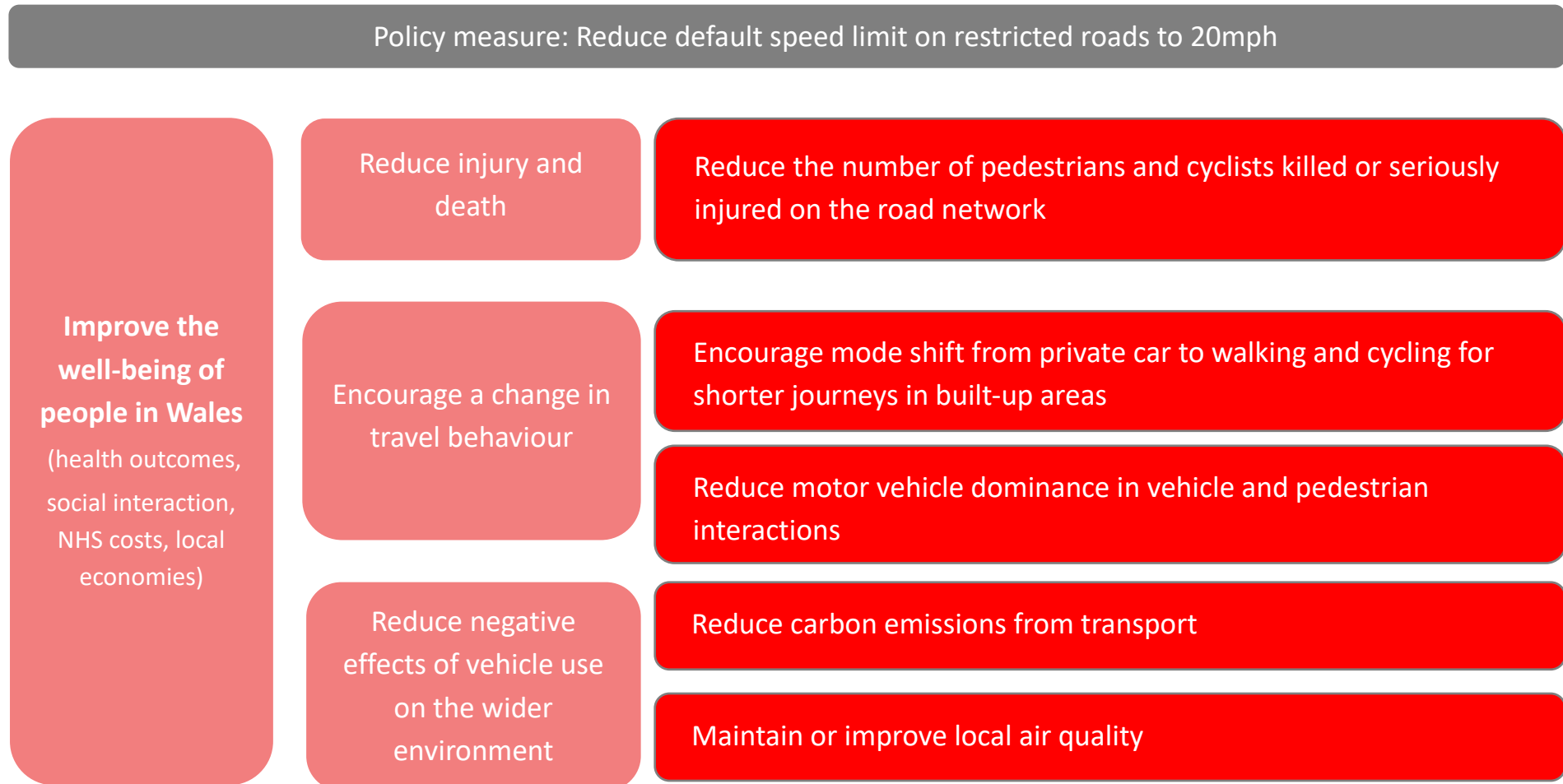
<sup>7</sup> Active travel refers to journeys being made by walking, wheeling and cycling.

<sup>8</sup> The term 'yielding' is used in this document in place of 'giving way'.



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**Figure 1: Objectives of default 20mph speed limit implementation**

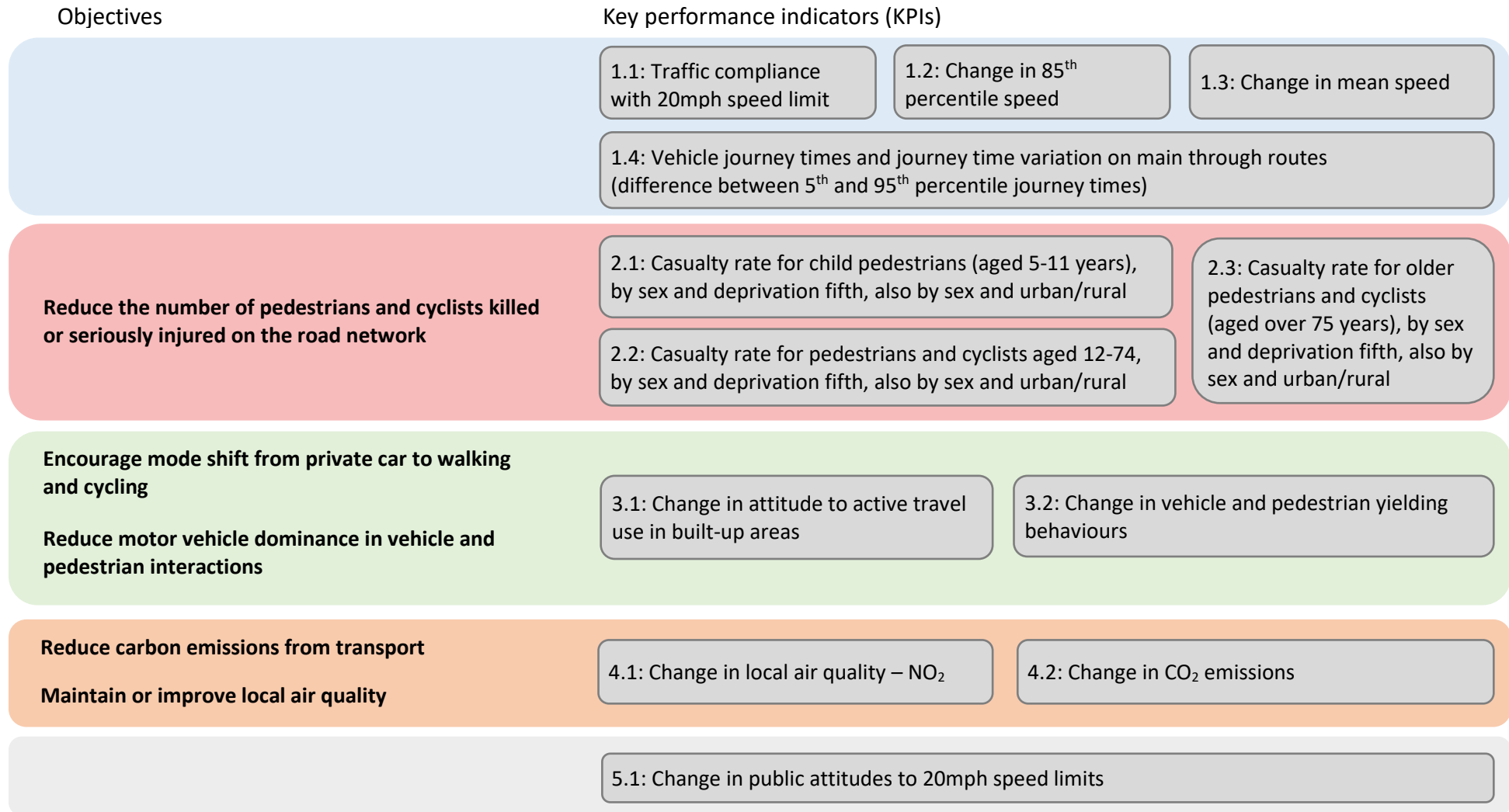






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**Figure 2: KPIs for assessing the effects of the default 20mph speed limit implementation**





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## 3. Data requirements

### 3.1. Overview

The new national default 20mph speed limit on restricted roads is in force from 17 September 2023. Relevant baseline data has already been collected to allow for before and after comparisons. Tables 2 and 3 summarise the baseline data collection arrangements.

Data collection will continue in the eight phase 1 trial areas (which already have a 20mph speed limit) and phase 1 control areas after the national default 20mph speed limit is implemented. Data collection in these areas will become part of the standard ongoing post-implementation monitoring programme. Data will also be collected in other areas of Wales. Tables 2 and 3 summarise the post-implementation data collection arrangements.

### 3.2. Timescales

There are four parts to the overall 20mph monitoring programme:

- **Phase 1 baseline:** Data collection completed in the phase 1 trial areas during 2021-22, before the phase 1 20mph speed limits were introduced. This work is complete with the [phase 1 interim monitoring report](#) published in March 2023.<sup>9</sup>
- **Phase 1 monitoring:** Data collection during phase 1 (2021 to 2023), but before national 20mph speed limit implementation. Data collection is complete, with data collected up to November 2022 reported in the phase 1 monitoring report. Data collected up to May 2023 will be published in a second report in autumn 2023.
- **National baseline:** Data collection in phase 1 control areas and across Wales before national 20mph speed limit implementation. Primary data collection is complete and will be analysed and published in line with the national reporting timescales explained in section 4.
- **National monitoring:** Data collection from September 2023 onwards which will also be published in line with the national reporting timescales explained in section 4.

Some datasets will be collected occasionally, while other datasets will be collected continuously. Data collection timescales are set out in tables 2 and 3.

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<sup>9</sup> Default 20mph speed limit on restricted roads phase 1: Interim monitoring report, TfW, March 2023



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### 3.3. Primary data

#### Primary data type 1: Traffic speed, volume and vehicle classification

Monitoring devices will be installed to obtain the data needed for all three speed-related KPIs (KPIs 1.1-1.3). The data will determine whether the new 20mph speed limit has resulted in a change in traffic speeds.

Traffic volume, speed and vehicle classification data obtained from these devices will also be used to inform carbon emission estimates (KPI 4.2). This will involve analysis over a period of at least one year before any estimates can be reported.

#### Primary data type 2: Vehicle and pedestrian interactions

Cameras will capture vehicle and pedestrian interactions at a small number of crossing locations. Data will be anonymised and, using specialist software, analysis will determine how drivers react in response to pedestrians intending to cross or already crossing the road (KPI 3.2).

#### Primary data type 3: Roadside air quality

Data obtained from air quality monitoring devices will be analysed to identify whether there is any difference between nitrogen dioxide (NO<sub>2</sub>) levels at a site where the speed limit has been reduced to 20mph and a nearby site where the speed limit has remained at 30mph (KPI 4.1). While it will not be possible to attribute any differences in NO<sub>2</sub> levels directly to 20mph speed limit implementation, it will be possible to confirm whether or not differences in air quality exist.

#### Primary data type 4: Qualitative attitudinal surveys

We will examine the attitudes and perceptions of people living in areas where the speed limit has been reduced using attitudinal surveys after the national roll-out. The surveys will include questions on attitudes towards using active travel modes (walking, wheeling and cycling) for local journeys in built-up areas (KPI 3.1) and will also consider respondents' perceptions on matters relating to traffic speed, traffic noise and effects on communities (KPI 5.1). There will be a particular focus on more vulnerable groups in society when collecting attitudinal data.

#### Primary data locations

Primary data will be sampled from locations across Wales, as set out in table 2. Vehicle and pedestrian interaction camera surveys and roadside air quality monitoring will continue solely in the phase 1 areas and related control sites. Traffic speed monitoring and qualitative attitudinal surveys will take place across Wales.



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### 3.4. Secondary data

#### Secondary data type 1: Ordnance Survey MasterMap highways network speed data

This data is based on GPS data from in-vehicle navigation systems. It will be used as a secondary estimate for the change in bi-directional mean speeds on restricted roads in Wales, with annual averages calculated for different time periods during the day (KPI 1.3).

#### Secondary data type 2: STATS19 collision data

STATS19 data will be used to assess whether the new default 20mph speed limit might have affected road casualty rates across Wales (KPIs 2.1-2.3). The data is collected as standard by police forces and is then verified and supplied to the Welsh Government on a quarterly basis.

Casualty rates will be calculated based on the population of the lower super output areas (LSOAs) in which the collisions occurred. Data for all LSOAs will be aggregated by sex, deprivation fifth (based on the Welsh Index of Multiple Deprivation) and rurality for all of Wales.<sup>10</sup>

#### Secondary data type 3: Hospital attendance and admissions

In combination with the STATS19 data, hospital attendance and admission data will be used to assess the extent to which 20mph speed limit implementation might have affected casualty rates across Wales (KPIs 2.1-2.3). Reasons for attendance at emergency departments and in-patient admissions are recorded by hospitals with the focus for this analysis being ICD-10 codes V01 to V09.<sup>11</sup> Data will be sourced from health boards by Public Health Wales (PHW).

Casualty rates will be calculated based on the populations of the LSOAs in which the casualties reside as collision locations would not be recorded by hospitals. Data for all LSOAs will be aggregated by sex, deprivation fifth and rurality for all of Wales.

#### Secondary data type 4: GPS highway journey time data

Vehicle telematics data, sourced through an existing Welsh Government contract with INRIX, will determine the extent to which 20mph implementation might have resulted in a change to journey time reliability (KPI 1.4). The data is collected from in-vehicle GPS, providing a sample of approximately 2-3% of vehicles travelling in Wales. The INRIX user interface allows specific road corridors to be analysed.

#### Secondary data type 5: Bus GPS data

We will use bus service punctuality data for the full length of a sample of bus routes passing through built-up areas extracted from the CitySwift system, sourced through an existing Transport for Wales (TfW) contract. The data will identify changes in bus journey time reliability (KPI 1.4).

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<sup>10</sup> Lower super output areas (LSOAs) are a geographic division of the UK designed to improve small area statistics reporting. Each LSOA usually has a resident population of between 1,000 and 3,000 people. There are approximately 1,900 LSOAs in Wales.

<sup>11</sup> International Classification of Diseases (ICD) 10<sup>th</sup> revision. Codes V01 to V09 are for pedestrians injured in transport collisions.



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### 3.5. Data collection summary

Tables 2 and 3 summarise the data to be collected, data collection methods, who is responsible, locations and timescales.

**Table 2: Primary data sources**

Data type	Data collection overview				Timescales	
	Use of data (KPIs)	Method	Responsibility	Locations	Baseline	Post-implementation
Traffic speed, volume and vehicle classification	Assess change in traffic speeds (1.1, 1.2, 1.3) Estimate change in carbon emissions (4.2)	Traffic speed and vehicle classification monitoring devices such as pneumatic tube, radar or permanent loop	TfW, working with the relevant highway authorities. TfW to procure surveys centrally if required.	Phase 1 – at least 50 locations across the eight phase 1 trial areas and phase 1 control sites  National – at least 50 additional locations across a range of built-up areas considering population size and urban/rural mix <sup>12</sup>	Phase 1 – 2021-22, minimum of four weeks of data  National – July and September 2023, minimum of four weeks of data	Ongoing regular surveys in all locations. Minimum of four weeks of data in every six months.
Vehicle and pedestrian interaction	Pedestrian yield comparisons (3.2)	Camera surveys undertaken by specialist survey company	TfW to procure centrally	One location in each of three phase 1 areas (Abergavenny, Buckley, Cardiff) and three control sites (Gilwern, Queensferry, Cardiff)	No baseline (due to pandemic). Control sites can be used to assess background changes.	Periodically – two to three fortnight periods every year
Roadside air quality	Change in local air quality – NO <sub>2</sub> levels (4.1)	Air quality sensors adjacent to carriageway	TfW to procure centrally	Three phase 1 areas with adjacent 30mph control sites. Abergavenny, Cardiff and Magor (Severnside).	Phase 1 and national – use 30mph control sites for comparisons	For 18 months, reporting after six and 18 months.
Qualitative attitudinal surveys	Qualitative assessment of active travel attitudes and perceptions (3.1, 5.1)	Surveys undertaken by specialist research organisation	Welsh Government and TfW	National population sample, with greater emphasis on more vulnerable groups living in areas where the speed limit has reduced.	Not applicable	Annually

<sup>12</sup> Selected areas for additional traffic speed monitoring: Cwmbran/Pontypool, Lampeter, Llanddowror, Llanrug, Newport (Allt-yr-yn), Newtown, Pembroke Dock, Penrhyn Bay, Swansea, Tylorstown, Wrexham



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**Table 3: Secondary data sources**

Data type	Data collection overview				Timescales	
	Use of data (KPIs)	Method	Responsibility	Locations	Baseline	Post-implementation
OS mean speed data layer	To assess change in mean speeds on restricted roads across Wales (1.3)	OS MasterMap highways network speed data layer	TfW to obtain updated datasets on annual basis	National coverage	May 2022 to May 2023 dataset (obtained May 2023)	Annual update
STATS19 collision data	To identify changes in casualty rates by age, sex, deprivation level, urban or rural categorisation (2.1-2.3)	STATS19 quarterly release. Casualty rates calculated based on the LSOA in which the collision occurred.	Welsh Government to supply verified STATS19 data to TfW	National coverage Use South West England (official STATS19 data) and Northern Ireland (PSNI data) for comparison and control	Review data from five years before implementation (2015 to 2019 inclusive)	Annually for up to five years
Hospital attendance and admissions	To identify changes in casualty rates by age, sex, deprivation level, urban or rural categorisation (2.1-2.3)	Attendances and emissions recorded focusing on ICD-10 codes V01 to V09. Casualty rates calculated based on the LSOA in which the casualty resides.	PHW to obtain updated datasets annually from health boards	Nationwide from all health boards in Wales	Review data from five years before implementation (2015 to 2019 inclusive)	Annually for up to five years
GPS highway journey times	Assess vehicle journey time reliability on main through routes (1.4)	INRIX journey time analytics (GPS-based data), using 5 <sup>th</sup> and 95 <sup>th</sup> percentile journey times	TfW to extract relevant data from INRIX database	Phase 1 – key through routes (i) A40 Abergavenny, (ii) B5128 Buckley, (iii) A469 Cardiff, (iv) B4245 Severnside  National – at least five additional routes across Wales	Collate data from six months before implementation.	Review every six months after implementation
Bus GPS	Assess journey time reliability specifically for bus services (1.4)	GPS-based data provided by CitySwift	TfW to extract relevant data from CitySwift system	Small number of routes passing through a range of built-up area types	Collate data from six months before implementation	Review every six months after implementation



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### 3.6. Control data

#### Traffic speed and 'vehicle and pedestrian interaction' monitoring control sites

The potential impact of the coronavirus pandemic on phase 1 trial area traffic speed monitoring and vehicle and pedestrian interactions has been considered. Control sites that are entirely separate from the phase 1 trial areas are included in the monitoring programme to provide additional information on background trends if required.

Data from the control sites will also provide useful 'before' implementation data for the national roll-out which can be compared to 'after' data in the same locations.

#### Air quality monitoring control sites

Air quality monitoring control sites are located on the same stretch of road as the main monitoring sites but on a 30mph speed limit section that remains beyond the extent of the new 20mph speed limit. The control sensor is therefore sited where traffic speeds are not expected to change. The main monitoring sensor is nearby in a location where traffic speeds are expected to change.

#### Collision and hospital attendance statistical controls

We need to source comparison and control data for collisions and hospital attendance from another part of the UK. This will help in drawing conclusions as to whether roads in built-up areas in Wales are becoming safer. South West England and Northern Ireland have population distributions and densities that are comparable with Wales and are therefore suitable for comparison purposes. Scotland cannot be used for this purpose as many Scottish local authorities are already implementing significant 20mph programmes.



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## 4. Reporting

### 4.1. Formal reporting timescales

Transport for Wales is responsible for reporting against the KPIs set out in this monitoring framework and collating information from a range of data sources and specialist analysts.

Transport for Wales will prepare an interim report on the initial effects of the national default 20mph speed limit on restricted roads based on data collected through to six months after implementation (October 2023 to March 2024). The report will be published in June 2024. A further report on the first full year of implementation will be published in December 2024. Formal reporting will then take place annually.

Traffic speed data summaries will be published earlier than the formal reports. The first set of post-implementation speed data will be published in January 2024.