



# HIAM Strategic Network Hierarchy

2022



# Contents

1.0 Context .....	3
2.0 Introduction.....	4
3.0 Code of Practice Guidance .....	5
3.1 Purpose of a Network Hierarchy .....	5
3.2 A Risk-Based Approach.....	5
4.0 Engaging with Relevant Stakeholders .....	6
5.0 Developing the Network Hierarchy.....	7
5.1 Overview .....	7
5.2 Automated Analysis .....	8
5.3 Manual Validation .....	8
5.4 Collaboration with Other Local Authorities .....	9
6.0 Inspection Frequencies .....	10
6.1 Assigning Inspection Frequencies to Hierarchy Category.....	10
7.0 Regular Review.....	10
8.0 Glossary .....	12
9.0 Bibliography .....	13
Appendix 1: SBC HIAM Carriageway Hierarchy Ruleset.....	14
Appendix 2: SBC HIAM Footway Hierarchy Ruleset.....	15
Appendix 3: SBC HIAM Traffic Generator Details.....	16

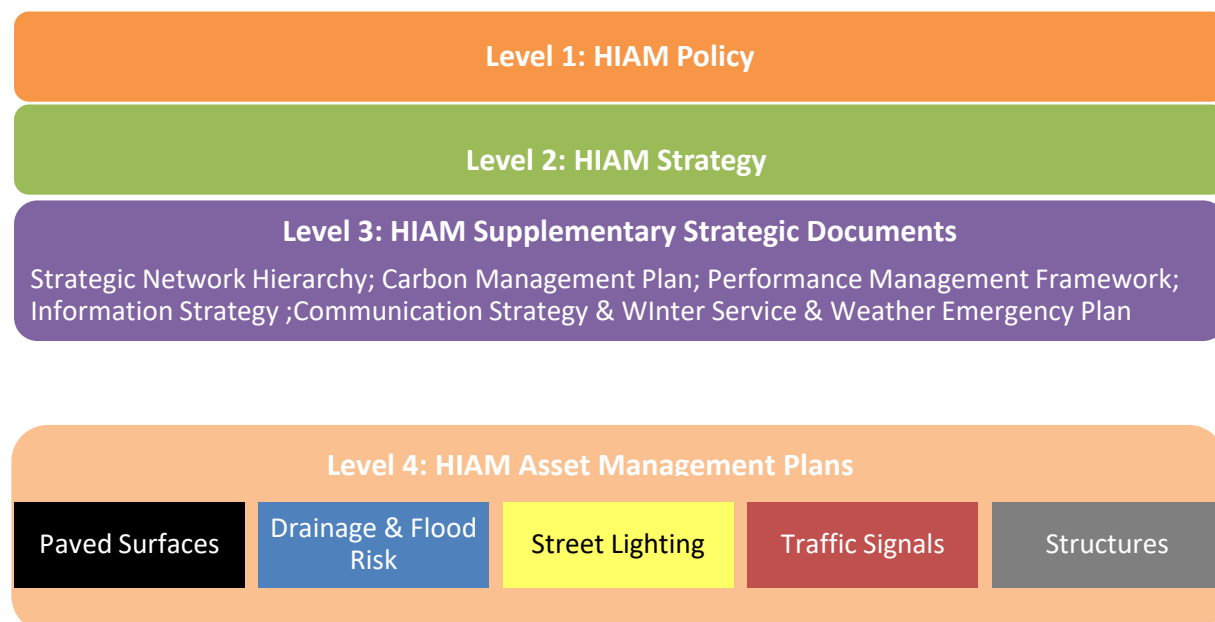
# 1.0 Context

The Vision for Swindon 2030 sets out how Swindon Borough Council (SBC) will shape the borough and deliver the growth to allow the community to prosper. To deliver the vision, SBC has developed a series of priorities and pledges, which enable officers to prioritise their work.

These priorities and pledges have been used to influence the Highway Infrastructure Asset Management (HIAM) Policy and Strategy, which have been approved by Cabinet and are available to view on the SBC website. These high-level documents are supported by a suite of Supplementary Strategic Documents (SSD's) which have an influence on the management of all asset groups and Asset Specific Operational; Inspection; Maintenance and Management Plans.

This HIAM Strategic Network Hierarchy is one of the key SSD's. A summary of the HIAM Asset Management Framework and status of this SSD within the hierarchy of this suite of documents is illustrated in figure 1.

Figure 1: SBC HIAM Documents Suite - Hierarchy





## 2.0 Introduction

Swindon Borough Council have reviewed and updated the Strategic Network Hierarchies for Highways and subsequently established a system of risk-based inspection frequencies based upon the new local hierarchy. This process is in alignment with the risk-based approach set out in 'The Code of Practice, Well Managed Highway Infrastructure, 2016' (referred to hereafter as "The Code" within this document).

The approach to implement The Code builds upon work carried out by the regional South West Asset Management Group (SWAMG) to produce common descriptors for 11 different hierarchies of road across the region. The standardised descriptors (referred to hereafter as "The SWAMG Network Hierarchy" within this document) enable the resultant hierarchies for each authority to be simply compared when roads cross administrative boundaries.

The approach to implement The Code also accords with more specific guidance published by the London Technical Advisers Group (LoTAG) (referred to hereafter as "The LoTAG Guidance" within this document). The LoTAG Guidance has been adopted by a number of other local authorities with similar characteristics to Swindon throughout the UK.

The local network hierarchy which has been developed provides the basis for determining a wide range of risk-based decisions including:

- How frequently to conduct highway safety inspections;
- Which defects present significant risk;
- How quickly should defects be rectified;
- What treatments should be used to repair defects; and
- How to prioritise investment to refurbish or renew assets.

This document explains the process which has been carried out to develop the network hierarchies and to determine new frequencies for routine safety inspections.

## 3.0 Code of Practice Guidance

### 3.1 Purpose of a Network Hierarchy

The Code recommends that Local Authorities develop a network hierarchy which reflects:

‘The whole highway network and the needs, priorities and actual use of each infrastructure asset’ (The Code, 2016: p22).

A range of key recommendations are provided within The Code which guide Local Authorities to the scope of the work required and facilitate a measure of parity between authorities. Recommendation 12 of The Code states:

‘A network hierarchy, or a series of related hierarchies, should be defined which include all elements of the highway network, including carriageways, footways, cycle routes, structures, lighting and rights of way. The hierarchy should take into account current and expected use; resilience; and local economic and social factors such as industry; schools; hospitals and similar; as well as the desirability of continuity and of a consistent approach for walking and cycling’ (The Code, 2016: p23).

The local network hierarchy which has been developed covers the breadth of the assets and range of factors that are recommended in The Code.

### 3.2 A Risk-Based Approach

The Code explains the important role the network hierarchy plays in a risk-based approach:

‘A network hierarchy based on asset function is the foundation of a risk-based maintenance strategy’ (The Code, 2016: p22).

The network hierarchies which have been developed provides the basis for determining a wide range of risk-based decisions including:

- How frequently to conduct highway safety inspections;
- Which defects present significant risk;
- How quickly should defects be rectified;
- What treatments should be used to repair defects; and
- How to prioritise investment to refurbish or renew assets.

Further information as to how The Code and the resultant network hierarchies have been used to influence decisions may be found by referring to the HIAM Strategy and pursuant HIAM Plans (published on the SBC website as part of this suite of documents).

## 4.0 Engaging with Relevant Stakeholders

A wide range of stakeholders were engaged during the development of the Network Hierarchies and the pursuant HIAM inspection and management plans. This breadth of engagement has ensured that the approach taken to implement the recommendations in The Code meets the wider objectives of the authority. Stakeholders who assisted in the development of the suite of documents include:

- Asset Management Engineers;
- Operational Managers
- Safety Inspectors;
- Network and Road Safety Officers;
- Insurance Representatives;
- Asset Managers in neighbouring SWAMG authorities; and
- Asset Managers in neighbouring Heart of England authorities.

# 5.0 Developing the Network Hierarchy

## 5.1 Overview

The Code states that the network hierarchy should consider:

- Current and expected use;
- Resilience;
- Local economical and social factors (such as industry; schools and hospitals); and
- The needs and priorities of the whole highway network.

As local factors; resilience; needs and priorities are fundamentally different for the wide variety of urban and rural authorities in the SW region, the SWAMG working group used the current and expected use of the highway network as the common denominator to develop descriptors for eleven different hierarchies of carriageway and five hierarchies of footway across the region. As a predominantly urban metropolitan authority, the SBC highway network does not have roads which match all these descriptors.

Once the high level regional categories and descriptors were agreed, SBC followed the process in The LoTAG Guidance to develop a detailed local ruleset to account for the other factors recommended in The Code. These rulesets governed how each section of each road in the Borough was placed into an appropriate hierarchy based upon strategic function and usage.

As traffic count data is generally only available for motorised traffic on principal classified roads, the rulesets that were developed assigned scores to local traffic generators such as schools; hospitals and key bus and cycle routes to understand how each section of the network was used.

The local hierarchy rulesets and their respective traffic generators; functionality definitions and data sources are referenced in appendices 1-3.

## 5.2 Automated Analysis

As there were approximately 5,000 carriageway sections and 7,000 footway sections to be assessed in Swindon, the initial analysis was undertaken using a Geographic Information System (GIS) mapping platform to efficiently identify traffic generators and assign a hierarchy category to each road section within the borough.

The automated hierarchies were made available using thematic maps with each respective hierarchy being identified by colour. Details of how each section of street had been scored were exported into an EXCEL spreadsheet.

The spatial data used for the analysis was obtained from a variety of sources including SBC internal databases and openly published data sources.

## 5.3 Manual Validation

The spatial mapping approach used definitive rules to identify trip generators and to score them in accordance with the rulesets. Although this was by far the most efficient process, it was recognised at an early stage that the use of an automated process using fixed rules could lead to errors. For example, on paper the presence of a school on a street would mean that it would automatically receive a high score. In practice however, if the only entrances to the school were on the opposite side of the building to the street, very little traffic would be likely to be generated so the score would give a false picture of the function and usage of that street.

In order to sift out the automated errors, local officers with a good local knowledge of the area referred to thematic maps and manually validated each section, correcting the spreadsheet of sections where necessary. The corrected spreadsheet was imported back into the spatial mapping system and the updated thematic maps reviewed again. This process was repeated a number of times and by a number of officers until no further errors could be found. The manual validation process resulted in the re-categorisation of approximately 10% of the automatically assigned hierarchies.



The final validated Local Network Hierarchy map may be accessed by following the link to the web map [HERE](#).

## 5.4 Collaboration with Other Local Authorities

Before developing the local network hierarchy, SBC worked in collaboration with other authorities within the regional SWAMG to produce common descriptors for different hierarchies of road across the region. Once the SW regional hierarchy had been developed, the common descriptors enabled SBC to share and compare the network hierarchies with other SWAMG members and Heart of England Authorities. This was of particular use when validating the hierarchy of roads which crossed into neighbouring administrative boundaries.

During the development of the local hierarchy, the approach to implement The Code accorded with The LoTAG Guidance. As this guidance has been adopted by a number of other Local Authorities with similar characteristics to SBC throughout the UK, it was useful to review how those authorities had assessed and scored the importance of trip generators in their network and contextualise this locally. Targeted engagement also provided the opportunity to share datasets and reduce the overall workload.

Whilst efforts were made to align processes and practices with other authorities, due to differing priorities and service drivers, this was not always possible. This was due to the differences between the functionality definitions or factors used between different authorities, which include:

- Varying political priorities;
- Differing usage levels;
- The availability of alternative routes to a destination; and
- Availability of datasets.

# 6.0 Inspection Frequencies

## 6.1 Assigning Inspection Frequencies to Hierarchy

### Category

A risk-based approach has been taken to establish practicable inspection frequencies for each major asset group. The approach and resultant frequencies are detailed in the respective Inspection and Management plans for these assets, which form part of this HIAM suite of documents.

For general highway safety inspections, the inspection frequencies are monthly; 3 monthly; 6 monthly and annually. These frequencies have been tested in the Courts over the years and have been found to be a proportionate response to escalating levels of risk. As the sections had been grouped into four carriageway and four footway hierarchy categories, these were able to be simply assigned to the existing tested frequencies.

# 7.0 Regular Review

The base data; spatial data and the EXCEL spreadsheet which details how each section of street has been scored is electronically stored in shared folders available to all HIAM and Operational officers. All other stakeholders may access an online version of the Local Network Hierarchy and Inspection Frequencies by following the link to the web map [HERE](#).

The Code states that:

‘Hierarchies should be dynamic and regularly reviewed to reflect changes in network characteristics and functionality so that maintenance strategy reflects the current situation, rather than the use expected when the hierarchy was originally defined.’

Annual reviews will be undertaken by the HIAM Group to ensure the Local and Regional Network Hierarchies remains fit for purpose as the network evolves. The reviews will include:

- Whether additional sections of street have been adopted or Stopped-Up since the last review and need to be assessed or removed from the Network Hierarchies;
- Whether any new traffic generators have been built or demolished since the last review and need to be assessed or removed from the Local Network Hierarchy;
- Whether the inspection frequencies associated with each local hierarchy category continue to be a proportionate response to risk; and
- Collaboration with neighbouring and similar urban authorities outside the region to see if changes to the SBC regional hierarchy affect their network hierarchy and vice versa.

Any information relating to revisions of the network hierarchies will be stored in the shared electronic folders; updated in the WDM Information Asset Management system and reflected in the publically available online maps.

# 8.0 Glossary

CIHT	Chartered Institution of Highways and Transport
GIS	Geographic Information System
HIAM	Highways Infrastructure Asset Management
LA	Local Authority
LoTAG	London Technical Advisers Group
SBC	Swindon Borough Council
SIP	Service Improvement Plan
SWHA	South Western Highway Alliance
SWAMG	South West Asset Management Group
UKRLG	UK Roads Liaison Group

# 9.0 Bibliography

Well-Managed Highway Infrastructure – A Code of Practice (UKRLG CIHT, 2016)

Guidance on Developing a Highway Management Hierarchy (LoTAG, 2017)

Vision for Swindon 2030 (SBC, 2018)

Vision for Swindon 2030 Draft Consultation Document (SBC, 2021)

SBC Local Plan 2026 (2015)

SBC Local Plan 2036 Draft Consultation Document (SBC, 2021)

SBC HIAM Policy (2018)

SBC HIAM Strategy (2018)

HIAM Guidance (HMEP, 2013)

Code of Practice on Transport Infrastructure Assets (CIPFA, 2013)



## Appendix 1: SBC HIAM Carriageway Hierarchy Ruleset

Carriageways			
Hierarchy Band	Functionality Factor	Functionality Definition	Frequency
1	Prestige	High Profile	Weekly
2	Very High Traffic Volume	A Road   AADF ( > 10000 )   Local Knowledge	Monthly
	Essential Services	Hospital	
	Major Traffic Generators	Educational Institution > 1000 Pupils   Town Centre   Event Venue ( > 10000 Capacity, > 5000 Weekly Attendance )   Swindon Train Station   > 4 Traffic Generators	
	Very High Cyclist Volume	Local Knowledge	
	Major Bus Route	> 30 buses per hour	
3	High Traffic Volume	AADF ( > 5000 )   Local Knowledge	Quarterly
	Medium Traffic Generators	Educational Institution: 501 -1000 Pupils   District Centre   Key Employment Area   Tourist Attraction   Sport Centre   Large Supermarket   Wroughton Park and Ride   > 2 Traffic Generators	
	High Cyclist Volume	Local Knowledge	
	Minor Bus Route	> 15 buses per hour	
4	Medium Traffic Volume	AADF( > 2500 )   Local Knowledge	6 Monthly
	Minor Traffic Generators	Educational Institution: 1-500 Pupils   Public Centre   Place of Worship   Small Supermarket   GP   Local Centre   Park Entrance   Small Event Venue	
	Infrequent Bus Route	> 0 buses per hour	
	Vulnerable Users	Housing Care	
5	No Traffic Generator	None of the above	Annual

## Appendix 2: SBC HIAM Footway Hierarchy Ruleset

Footways			
Hierarchy Band	Functionality Factor	Functionality Definition	Frequency
1	Prestige	High Profile	Weekly
2	Essential Services	Hospital	Monthly
	Major Traffic Generators	Educational Institution > 1000 Pupils   Town Centre   Event Venue ( > 10000 Capacity, > 5000 Weekly Attendance)   Swindon Train Station   > 4 Traffic Generators	
	Very High Cyclist Volume	Local Knowledge	
	Major Bus Route	> 30 buses per hour	
3	Medium Traffic Generators	Educational Institution: 501 -1000 Pupils   District Centre   Key Employment Area   Tourist Attraction   Sport Centre   Large Supermarket   Wroughton Park and Ride   > 2 Traffic Generators	Quarterly
	High Cyclist Volume	Local Knowledge	
	Minor Bus Route	> 15 buses per hour	
4	Minor Traffic Generators	Educational Institution: 1-500 Pupils   Public Centre   Place of Worship   Small Supermarket   GP   Local Centre   Park Entrance   Small Event Venue	6 Monthly
	Medium Cyclist Volume	Local Knowledge	
	Infrequent Bus Route	> 0 buses per hour	
	Vulnerable Users	Housing Care	
5	No Traffic Generator	None of the above	Annual

## Appendix 3: SBC HIAM Traffic Generator Details

Category	Traffic Generator	Source
Community Facility	Place of worship	Open Source - <u>Total Swindon</u>
	Public Centre	Swindon Borough Council
	Supermarket	
Health	Hospital	NHS
	GP	
	Housing Care	Swindon Borough Council
Transport	Bus Route	Swindon Borough Council
	Train Station	
	Wroughton Park and Ride	

Category	Traffic Generator	Source
Education	Educational Institution	Department for Education
Economic Area	Town Centre	Swindon Borough Council
	District Centre	
	Local Centre	
	Key Employment Area	
Leisure	Tourist Attraction Site	Swindon Borough Council
	Park	
	Sport Centre	
	Event Venue	

**Highway Infrastructure Asset Management**

Economy and Development Directorate

Swindon Borough Council

Wat Tyler House

Beckhampton Street

Swindon

SN1 2JH

[www.swindon.gov.uk](http://www.swindon.gov.uk)

This information can be reproduced in large print or other accessible formats by emailing:

[customerservices@swindon.gov.uk](mailto:customerservices@swindon.gov.uk)

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