

## Question:

*What are the four classes of Clean Air Zones defined in UK policy, and what vehicles do they apply to ?*

**Source:** Clean Air Zones, Low Emission zones and the London ULEZ.pdf

**Expected answer:** There are four classes of Clean Air Zones: Class A applies to buses, coaches, taxis; Class B includes Class A vehicles plus HGVs; Class C includes Class B plus vans and minibuses; Class D includes Class C plus cars and motorcycles.

**Source:** : clean-air-strategy-2019.pdf

**Expected answer:** The Clean Air Strategy explains that CAZ classifications help local authorities choose which vehicles to regulate based on their contribution to pollution and to design fair and effective schemes.

### GPT-3.5, text, TF-IDF + Cosine

In UK policy, the four classes of Clean Air Zones are Class A, Class B, Class C, and Class D. Class A applies to buses, coaches, taxis, and private hire vehicles. Class B applies to buses, coaches, taxis, private hire vehicles, vans, minibuses, and cars. Class C applies to buses, coaches, taxis, private hire vehicles, vans, minibuses, cars, and motorcycles. Class D applies to buses, coaches, taxis, private hire vehicles, vans, minibuses, cars, motorcycles, mopeds, and motorised tricycles.

### GPT-3.5, text, BM25

The four classes of Clean Air Zones defined in UK policy are Class A, Class B, Class C, and Class D. Class A applies to buses, coaches, taxis, and private hire vehicles. Class B applies to buses, coaches, taxis, private hire vehicles, heavy goods vehicles (HGVs), and light goods vehicles (LGVs). Class C applies to buses, coaches, taxis, private hire vehicles, HGVs, LGVs, and vans. Class D applies to buses, coaches, taxis, private hire vehicles, HGVs, LGVs, vans, and cars.

### GPT-3.5, text, SBERT + FAISS

In UK policy, the four classes of Clean Air Zones are Class A, Class B, Class C, and Class D. Class A zones apply to buses, coaches, taxis, and private hire vehicles. Class B zones apply to buses, coaches, taxis, private hire vehicles, and heavy goods vehicles. Class C zones apply to buses, coaches, taxis, private hire vehicles, heavy goods vehicles, and light goods vehicles. Class D zones apply to buses, coaches, taxis, private hire vehicles, heavy goods vehicles, light goods vehicles, and cars.

### GPT-3.5, text, No-RAG

The four classes of Clean Air Zones defined in UK policy are:

1. Class A: This applies to buses, coaches, taxis, and private hire vehicles.
2. Class B: This applies to buses, coaches, taxis, private hire vehicles, heavy goods vehicles (HGVs), and light goods vehicles (LGVs).
3. Class C: This applies to buses, coaches, taxis, private hire vehicles, HGVs, LGVs, and vans.
4. Class D: This applies to buses, coaches, taxis, private hire vehicles, HGVs, LGVs, vans, and cars.

These Clean Air Zones are designed to reduce air pollution and improve air quality in urban areas by charging vehicles that do not meet certain emissions standards to enter the zone.

### **GPT-3.5, text, Hybrid-RAG**

The four classes of Clean Air Zones defined in UK policy are:

1. Class A: This applies to buses, coaches, taxis, and private hire vehicles.
2. Class B: This applies to buses, coaches, taxis, private hire vehicles, heavy goods vehicles (HGVs), and light goods vehicles (LGVs).
3. Class C: This applies to buses, coaches, taxis, private hire vehicles, HGVs, LGVs, and motorcycles.
4. Class D: This applies to buses, coaches, taxis, private hire vehicles, HGVs, LGVs, motorcycles, and cars.

These Clean Air Zones are designed to reduce air pollution and improve air quality in urban areas by charging vehicles that do not meet certain emissions standards to enter the zone.

According to recent data [6], air pollution remains a significant concern in the UK, prompting the implementation of policies like Clean Air Zones to address the issue. These zones aim to tackle sources of air pollution [3] such as emissions from buses, coaches, taxis, private hire vehicles, HGVs, LGVs, motorcycles, and cars [2]. By categorizing the zones into different classes based on the types of vehicles affected, the UK government can target specific sources of pollution more effectively [5].

The classification of vehicles in each Clean Air Zone is crucial for ensuring that the appropriate vehicles are charged for entering the zone based on their emissions standards. For instance, Class A targets buses, coaches, taxis, and private hire vehicles [2], which are known to contribute significantly to air pollution in urban areas [3]. On the other hand, Class D includes a wider range of vehicles such as cars, motorcycles, and HGVs [2], reflecting the government's comprehensive approach to improving air quality across different vehicle types.

In conclusion, the implementation of Clean Air Zones with distinct classes demonstrates the UK's commitment to reducing air pollution and safeguarding public health by regulating vehicle emissions in urban areas [1].

- [1] Air quality targets - Detailed Evidence report.pdf | Score: 27.186
- [2] Clean Air Zones, Low Emission zones and the London ULEZ.pdf | Score: 26.700
- [3] Air quality policies, proposals and concerns.pdf | Score: 26.540
- [4] Revised\_National\_Air\_Pollution\_Control\_Programme\_\_NAPCP\_.pdf | Score: 0.627
- [5] Air quality - GOV.UK.pdf | Score: 0.569
- [6] air\_pollution\_uk\_2023\_issue\_1.pdf | Score: 0.149

### **GPT-3.5, paragraph, TF-IDF + Cosine**

In UK policy, the four classes of Clean Air Zones are Class A, Class B, Class C, and Class D. Class A applies to buses, coaches, taxis, and private hire vehicles. Class B applies to Class A vehicles as well as heavy goods vehicles. Class C applies to Class B vehicles as well as light goods vehicles. Class D applies to all vehicles except for cars and motorcycles.

- [1] air\_pollution\_uk\_2023\_issue\_1.pdf | Score: 0.287
  - [2] Air quality policies, proposals and concerns.pdf | Score: 0.266
  - [3] Clean Air Zones, Low Emission zones and the London ULEZ.pdf | Score: 0.241
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### **GPT-3.5, paragraph, BM25**

In UK policy, the four classes of Clean Air Zones are Class A, Class B, Class C, and Class D. Class A zones typically apply to buses, coaches, taxis, and private hire vehicles. Class B zones usually include light goods vehicles, such as vans. Class C zones typically cover heavy goods vehicles. Class D zones are designed for private cars and motorbikes. These classifications aim to regulate and reduce emissions from different types of vehicles to improve air quality and public health.

[1] Clean Air Zones, Low Emission zones and the London ULEZ.pdf | Score: 29.627

[2] clean-air-plan-for-wales-healthy-air-healthy-wales.pdf | Score: 29.040

[3] Air quality\_ explaining air pollution – at a glance - GOV.UK.pdf | Score: 27.525

### **GPT-3.5, paragraph, SBERT + FAISS**

In UK policy, the four classes of Clean Air Zones are Class A, Class B, Class C, and Class D. Class A applies to buses, coaches, taxis, and private hire vehicles. Class B applies to buses, coaches, taxis, private hire vehicles, heavy goods vehicles, vans, and minibuses. Class C applies to buses, coaches, taxis, private hire vehicles, heavy goods vehicles, vans, minibuses, and cars. Class D applies to buses, coaches, taxis, private hire vehicles, heavy goods vehicles, vans, minibuses, cars, and motorcycles.

[1] Revised\_National\_Air\_Pollution\_Control\_Programme\_\_NAPCP\_.pdf | Score: 0.708

[2] air\_pollution\_uk\_2023\_issue\_1.pdf | Score: 0.704

[3] Air quality\_ policies, proposals and concerns.pdf | Score: 0.703

### **GPT-3.5, paragraph, No-RAG**

The four classes of Clean Air Zones defined in UK policy are:

1. Class A: This applies to buses, coaches, taxis, and private hire vehicles.
2. Class B: This applies to buses, coaches, taxis, private hire vehicles, heavy goods vehicles (HGVs), and light goods vehicles (LGVs).
3. Class C: This applies to buses, coaches, taxis, private hire vehicles, HGVs, LGVs, and vans.
4. Class D: This applies to buses, coaches, taxis, private hire vehicles, HGVs, LGVs, vans, and cars.

These Clean Air Zones are designed to reduce air pollution and improve air quality in urban areas by charging vehicles that do not meet certain emissions standards to enter the zone.

### **GPT-3.5, paragraph, Hybrid-RAG**

The four classes of Clean Air Zones defined in UK policy are:

1. Class A: This applies to buses, coaches, taxis, and private hire vehicles [1].
2. Class B: This applies to buses, coaches, taxis, private hire vehicles, heavy goods vehicles (HGVs), and light goods vehicles (LGVs) [1].
3. Class C: This applies to buses, coaches, taxis, private hire vehicles, HGVs, LGVs, and vans [1].

4. Class D: This applies to buses, coaches, taxis, private hire vehicles, HGVs, LGVs, vans, and cars [1].

These Clean Air Zones are designed to reduce air pollution by charging vehicles that do not meet certain emissions standards to enter the designated areas [1].

The UK is divided into 43 zones for air quality assessment, with 28 agglomeration zones (large urban areas) and 15 non-agglomeration zones [5]. The Air Quality Standards Regulations show that the UK achieved compliance with nitrogen dioxide (NO<sub>2</sub>) levels in all 43 zones in 2020, marking the first year of such achievement [4].

The Clean Air Zones aim to improve air quality, which is crucial for a healthy environment for all residents [3]. The zones are recognized as an effective means of reducing NO<sub>2</sub> levels in the shortest time possible [1].

Local authorities have the power to establish Clean Air Zones under the Transport Act 2000, providing them with a vital tool to address air pollution and improve public health [1]. The framework for Wales offers guidance to local authorities on establishing Clean Air Zones to reduce airborne pollution and enhance environmental quality [2].

In summary, the implementation of Clean Air Zones across the UK is a crucial step towards reducing air pollution, improving air quality, and safeguarding public health.

[1] Clean Air Zones, Low Emission zones and the London ULEZ.pdf | Score: 29.627

[2] clean-air-plan-for-wales-healthy-air-healthy-wales.pdf | Score: 29.040

[3] Air quality\_ explaining air pollution – at a glance - GOV.UK.pdf | Score: 27.525

[4] Revised\_National\_Air\_Pollution\_Control\_Programme\_\_NAPCP\_.pdf | Score: 0.708

[5] air\_pollution\_uk\_2023\_issue\_1.pdf | Score: 0.704

[6] Air quality policies, proposals and concerns.pdf | Score: 0.703

### **DeepSeek, text, TF-IDF + Cosine**

In UK environmental policy, Clean Air Zones (CAZs) are categorized into four distinct classes, each targeting specific vehicle types to reduce emissions. The classification is as follows:

1. **Class A**: Applies to **buses, coaches, taxis, and private hire vehicles**.
2. **Class B**: Includes **buses, coaches, taxis, private hire vehicles, and heavy goods vehicles (HGVs)**.
3. **Class C**: Extends to **buses, coaches, taxis, private hire vehicles, HGVs, vans, and minibuses**.
4. **Class D**: The broadest category, covering **all vehicles in Class C plus cars and motorcycles**, with local authorities having discretion to include motorcycles.

These classes allow local authorities to tailor restrictions based on local air quality needs, with non-compliant vehicles typically subject to daily charges. The framework is designed to align with Euro emission standards (e.g., Euro VI for heavy vehicles, Euro 4 for cars) to ensure consistency in enforcement.

[1] Clean Air Zones, Low Emission zones and the London ULEZ.pdf | Score: 0.188

[2] air\_pollution\_uk\_2023\_issue\_1.pdf | Score: 0.149

[3] Government Buying Standards for transport 2017 - GOV.UK.pdf | Score: 0.131

## DeepSeek, text, BM25

The UK defines four classes of Clean Air Zones (CAZs) based on the types of vehicles they target:

1. **Class A**: Applies to buses, coaches, taxis, and private hire vehicles (excluding private cars).
2. **Class B**: Includes buses, coaches, taxis, private hire vehicles, **and** heavy goods vehicles (HGVs).
3. **Class C**: Extends to buses, coaches, taxis, private hire vehicles, HGVs, **and** light goods vehicles (LGVs/vans).
4. **Class D**: The broadest category, covering buses, coaches, taxis, private hire vehicles, HGVs, LGVs, **and** private cars (non-compliant with emission standards).

These classes are designed to restrict the most polluting vehicles from entering designated zones, with stricter classes encompassing a wider range of vehicle types. Local authorities select the appropriate class based on local air quality objectives.

- [1] Air quality targets - Detailed Evidence report.pdf | Score: 27.186  
[2] Clean Air Zones, Low Emission zones and the London ULEZ.pdf | Score: 26.700  
[3] Air quality policies, proposals and concerns.pdf | Score: 26.540

## DeepSeek, text, SBERT + FAISS

The UK defines four classes of Clean Air Zones (CAZs), each targeting specific vehicle types to reduce emissions:

1. **Class A**: Applies to buses, coaches, taxis, and private hire vehicles (PHVs).
2. **Class B**: Includes buses, coaches, taxis, PHVs, **and** heavy goods vehicles (HGVs).
3. **Class C**: Covers buses, coaches, taxis, PHVs, HGVs, **and** light goods vehicles (LGVs/vans).
4. **Class D**: The broadest category, applying to all vehicles listed above **plus** private cars (and, in some cases, motorcycles if locally specified).

All classes exempt vehicles meeting the required emission standards (typically Euro 6 for diesel and Euro 4 for petrol). Local authorities determine the class based on local air quality needs, with non-compliant vehicles incurring charges. Examples include Bath (Class C) and Birmingham (Class D).

- [1] Revised\_National\_Air\_Pollution\_Control\_Programme\_\_NAPCP\_.pdf | Score: 0.627  
[2] Air quality - GOV.UK.pdf | Score: 0.569  
[3] Air quality policies, proposals and concerns.pdf | Score: 0.565

## DeepSeek, text, No-RAG

In the UK, **Clean Air Zones (CAZs)** are classified into four categories, each targeting different types of vehicles to reduce air pollution. Here's a breakdown:

### **1. Class A**

- **Applies to:**

- Buses
- Coaches
- Taxis
- Private hire vehicles (PHVs)

- **Exemptions:** Private cars and motorcycles are **not** charged.

### ### \*\*2. Class B\*\*

- **Applies to:**
  - All vehicles in **Class A**
  - **Heavy goods vehicles (HGVs)**
- **Exemptions:** Private cars, vans, and motorcycles are **not** charged.

### ### \*\*3. Class C\*\*

- **Applies to:**
  - All vehicles in **Class A & B**
  - **Vans**
  - **Minibuses**
- **Exemptions:** Private cars and motorcycles are **not** charged.

### ### \*\*4. Class D\*\*

- **Applies to:**
  - All vehicles in **Class A, B & C**
  - **Private cars** (older, more polluting models)
  - **Motorcycles** (non-compliant models)
- **Most stringent**, covering almost all vehicle types.

### ### **Key Notes:**

- **Charges** apply to **non-compliant** vehicles (typically pre-Euro 6 diesel or pre-Euro 4 petrol).
- **Zero-emission vehicles (EVs, hydrogen)** are **exempt** in all classes.
- **Local authorities** decide which class to implement based on pollution levels.

### Examples:

- **Birmingham & Bath** have **Class D** zones.
- **Portsmouth** has a **Class B** zone.

Would you like details on specific cities' CAZ policies?

## **DeepSeek, text, Hybrid-RAG**

In the UK, **Clean Air Zones (CAZs)** are classified into four categories based on the types of vehicles they restrict to improve air quality. Here's a breakdown of each class and the vehicles they apply to, with supporting evidence:

### ### **Four Classes of Clean Air Zones (CAZs):**

#### 1. **Class A**

- **Applies to:** Buses, coaches, taxis, private hire vehicles (PHVs) [2].
- **Exemptions:** Private cars, vans, HGVs, and motorcycles are not charged [2].

#### 2. **Class B**

- **Applies to:** Buses, coaches, taxis, PHVs, **and heavy goods vehicles (HGVs)** [2].
- **Exemptions:** Private cars, vans, and motorcycles are not charged [2].

### 3. **Class C**

- **Applies to:** Buses, coaches, taxis, PHVs, HGVs, **and vans, minibuses** [2].
- **Exemptions:** Private cars and motorcycles are not charged [2].

### 4. **Class D**

- **Applies to:** **All vehicles** (including private cars and motorcycles), unless exempt [2].
- **Most stringent:** Charges apply to buses, coaches, taxis, PHVs, HGVs, vans, minibuses, **and private cars** that do not meet emission standards (typically Euro 6 for diesel, Euro 4 for petrol) [2][6].

### ### **Key Notes:**

- **Non-compliant vehicles** (usually older, higher-emission models) must pay a daily charge to enter the zone [2][6].
- **Exemptions** may apply for ultra-low-emission vehicles (ULEVs), disabled tax-class vehicles, and emergency services [2][6].
- **Examples:**
  - **Birmingham** has a **Class D** CAZ [2].
  - **Bath** has a **Class C** CAZ [2].
  - **Portsmouth** has a **Class B** CAZ [2].

### ### **Additional Evidence:**

- The **London ULEZ (Ultra Low Emission Zone)**, while distinct from CAZs, follows similar principles and applies to most vehicle types, including private cars, with stricter standards [2].
- National air quality targets, including those for PM2.5, are enforced through these zones, aligning with the UK's environmental goals [1][6].

Would you like details on specific cities' CAZ policies or further clarification on exemptions?

Let me know if you'd like further refinements!

- [1] Air quality targets - Detailed Evidence report.pdf | Score: 27.186
- [2] Clean Air Zones, Low Emission zones and the London ULEZ.pdf | Score: 26.700
- [3] Air quality policies, proposals and concerns.pdf | Score: 26.540
- [4] Revised\_National\_Air\_Pollution\_Control\_Programme\_\_NAPCP\_.pdf | Score: 0.627
- [5] Air quality - GOV.UK.pdf | Score: 0.569
- [6] air\_pollution\_uk\_2023\_issue\_1.pdf | Score: 0.149

### **DeepSeek, paragraph, TF-IDF + Cosine**

In UK environmental policy, Clean Air Zones (CAZs) are categorized into four classes, each targeting specific vehicle types to reduce emissions:

1. **Class A**: Applies to buses, coaches, taxis, and private hire vehicles.
2. **Class B**: Includes buses, coaches, taxis, private hire vehicles, and heavy goods vehicles (HGVs).
3. **Class C**: Extends to buses, coaches, taxis, private hire vehicles, HGVs, and light goods vehicles (LGVs).
4. **Class D**: The broadest category, covering buses, coaches, taxis, private hire vehicles, HGVs, LGVs, and private cars.

These classes are designed to progressively restrict higher-emission vehicles from urban areas, with local authorities selecting the appropriate class based on local air quality objectives. Non-compliant vehicles may incur charges for entering CAZs. The framework supports compliance with national air quality standards, particularly in the 43 designated assessment zones (28 agglomerations and 15 non-agglomeration areas).

[1] Print Preventing air pollution\_ Local controls - GOV.UK.pdf | Score: 0.226

[2] air\_pollution\_uk\_2023\_issue\_1.pdf | Score: 0.191

[3] 20.21.066 Draft Clean Air Strategy for NI - Public Discussion Doc Final V6.pdf | Score: 0.170

### DeepSeek, paragraph, BM25

In UK environmental policy, Clean Air Zones (CAZs) are categorized into four classes, each targeting specific vehicle types to reduce nitrogen dioxide (NO<sub>2</sub>) emissions and improve air quality. The classes are defined as follows:

1. **Class A**: Applies to buses, coaches, taxis, and private hire vehicles.
2. **Class B**: Includes buses, coaches, taxis, private hire vehicles, and heavy goods vehicles (HGVs).
3. **Class C**: Extends to buses, coaches, taxis, private hire vehicles, HGVs, and light goods vehicles (LGVs).
4. **Class D**: The broadest category, covering buses, coaches, taxis, private hire vehicles, HGVs, LGVs, and private cars.

These classifications enable local authorities to tailor restrictions based on local air quality needs, with higher-class zones imposing stricter measures. The framework emphasizes compliance with national air quality standards while allowing flexibility for regional implementation.

[1] chief-medical-officers-annual-report-air-pollution-dec-2022.pdf | Score: 22.036

[2] 20.21.066 Draft Clean Air Strategy for NI - Public Discussion Doc Final V6.pdf | Score: 20.729

[3] chief-medical-officers-annual-report-air-pollution-dec-2022.pdf | Score: 20.031

### DeepSeek, paragraph, SBERT + FAISS

The excerpts provided do not contain information on the four classes of Clean Air Zones (CAZs) or the specific vehicle types they apply to. The passages focus on the division of the UK into 43 air quality assessment zones (28 agglomeration and 15 non-agglomeration zones) and compliance monitoring for pollutants like NO<sub>2</sub>.

For reference, however, UK Clean Air Zones are generally categorized into four classes (A–D), which target different vehicle types based on emission standards:

- **Class A**: Buses, coaches, taxis, private hire vehicles.
- **Class B**: Buses, coaches, taxis, private hire vehicles, heavy goods vehicles (HGVs).
- **Class C**: Buses, coaches, taxis, private hire vehicles, HGVs, vans, minibuses.
- **Class D**: All the above plus cars, and potentially motorcycles.

These zones aim to restrict the most polluting vehicles to improve air quality, with charges or penalties for non-compliant vehicles. For authoritative details, consult official UK government or DEFRA resources on Clean Air Zones.

[1] air\_pollution\_uk\_2023\_issue\_1.pdf | Score: 0.735

[2] 20.21.066 Draft Clean Air Strategy for NI - Public Discussion Doc Final V6.pdf | Score: 0.626

[3] air\_pollution\_uk\_2023\_issue\_1.pdf | Score: 0.606



## DeepSeek, paragraph, No-RAG

In the UK, **Clean Air Zones (CAZs)** are classified into four categories (A to D) based on the types of vehicles they restrict to improve air quality. Here's a breakdown of each class and the vehicles affected:

### **1. Class A**

#### **Applies to:**

- Buses
- Coaches
- Taxis
- Private hire vehicles (PHVs)

#### **Exemptions:**

- Private cars, vans, HGVs, and motorcycles are **not** charged.

### **2. Class B**

#### **Applies to:**

- All vehicles in **Class A**
- **Plus:** Heavy goods vehicles (HGVs)

#### **Exemptions:**

- Vans, private cars, and motorcycles are **not** charged.

### **3. Class C**

#### **Applies to:**

- All vehicles in **Class A & B**
- **Plus:** Vans
- **Plus:** Minibuses

#### **Exemptions:**

- Private cars and motorcycles are **not** charged.

### **4. Class D**

#### **Applies to:**

- All vehicles in **Class A, B & C**
- **Plus:** Private cars
- **Plus:** Motorcycles (if non-compliant)

#### **Exemptions:**

- Only the cleanest vehicles (e.g., Euro 6 diesel/Euro 4 petrol cars, electric vehicles) avoid charges.

### **Key Notes:**

- **Non-compliant vehicles** (typically older, higher-emission models) must pay a **daily charge** to enter the zone.
- **London's ULEZ** (Ultra Low Emission Zone) is stricter than Class D, applying similar standards but with

tighter emission rules.

- **Birmingham, Bristol, and Bath** have implemented CAZs (Classes D, C, and C respectively).

Would you like details on specific cities' CAZ policies?

### **DeepSeek, paragraph, Hybrid-RAG**

In the UK, **Clean Air Zones (CAZs)** are classified into four categories based on the types of vehicles they restrict to improve air quality. The classes are defined as follows:

#### **Four Classes of Clean Air Zones (CAZs):**

- Class A** – Targets **buses, coaches, taxis, and private hire vehicles (PHVs)**.
  - **Does not apply to private cars or vans.**
- Class B** – Covers **buses, coaches, taxis, PHVs, and heavy goods vehicles (HGVs)**.
  - **Excludes vans and private cars.**
- Class C** – Includes **buses, coaches, taxis, PHVs, HGVs, and light goods vehicles (vans, minibuses)**.
  - **Still excludes private cars.**
- Class D** – The strictest, covering **buses, coaches, taxis, PHVs, HGVs, vans, minibuses, and private cars**.
  - **May also apply to motorcycles in some cases (though most CAZs exempt them).**

#### **Key Points:**

- **Non-compliant vehicles** (usually older, higher-emission models) must pay a **daily charge** to enter the zone [1].
- **Zero-emission vehicles** (e.g., electric cars) are typically exempt.
- **London's ULEZ (Ultra Low Emission Zone)** is stricter than Class D, applying tighter emission standards [1].
- The UK is divided into **43 air quality assessment zones** (28 urban agglomerations and 15 non-agglomeration zones) for monitoring compliance with air quality standards [4][5][6].
- CAZs are part of a broader framework to reduce airborne pollution, guided by local authorities and national regulations [2][3].

Would you like details on specific cities with CAZs or exemptions?

Let me know if you'd like further refinements!

[1] Clean Air Zones, Low Emission zones and the London ULEZ.pdf | Score: 29.627

[2] clean-air-plan-for-wales-healthy-air-healthy-wales.pdf | Score: 29.040

[3] Air quality\_ explaining air pollution – at a glance - GOV.UK.pdf | Score: 27.525

[4] Revised\_National\_Air\_Pollution\_Control\_Programme\_\_NAPCP\_.pdf | Score: 0.708

[5] air\_pollution\_uk\_2023\_issue\_1.pdf | Score: 0.704

[6] Air quality\_ policies, proposals and concerns.pdf | Score: 0.703

### **LLaMa ,text, TF-IDF + Cosine**

According to the provided excerpts from environmental policy documents, the four classes of Clean Air Zones (CAZs) defined in UK policy are not explicitly mentioned. However, it can be inferred that the policy documents refer to different types of CAZs, including:

1. Ultra Low Emission Zones (ULEZs): These zones charge non-compliant vehicles for entry. In London, the ULEZ charge is currently £12.50 per day for non-compliant vehicles.
2. Low Emission Zones (LEZs): These zones restrict the entry of non-compliant vehicles. In Scotland, LEZs were introduced in May 2022, and only Glasgow's LEZ is currently being enforced.
3. Clean Air Zones (CAZs): These zones charge non-compliant vehicles for entry. In England, there are currently seven cities with CAZs, including Bristol, Greater Manchester, and London.
4. Local Emission Zones (LEZs): These zones restrict the entry of non-compliant vehicles. In Wales, there are no charging CAZs, and no plans for any.

The policy documents do not explicitly define the four classes of CAZs, but rather refer to different types of zones that restrict or charge non-compliant vehicles.

[1] Clean Air Zones, Low Emission zones and the London ULEZ.pdf | Score: 0.188

[2] air\_pollution\_uk\_2023\_issue\_1.pdf | Score: 0.149

[3] Government Buying Standards for transport 2017 - GOV.UK.pdf | Score: 0.131

### **LLaMa, text, BM25**

The provided excerpts do not explicitly define the four classes of Clean Air Zones or specify the vehicles they apply to. The text primarily focuses on the methodology and targets for air quality monitoring and management in the UK, rather than detailing specific policies or regulations related to Clean Air Zones.

[1] Air quality targets - Detailed Evidence report.pdf | Score: 27.186

[2] Clean Air Zones, Low Emission zones and the London ULEZ.pdf | Score: 26.700

[3] Air quality policies, proposals and concerns.pdf | Score: 26.540

### **LLaMa, text, SBERT + FAISS**

Based on the provided excerpts from environmental policy documents, the Clean Air Zones (CAZs) in the UK are not explicitly defined as four classes. However, the documents do mention the introduction of CAZs in several locations, including Bath, Birmingham, Bradford, and Bristol.

The CAZs are designed to reduce nitrogen dioxide (NO<sub>2</sub>) concentrations in the air by restricting access to certain areas for vehicles that do not meet specific emissions standards. The documents do not provide a clear definition of the four classes of CAZs, but they do mention that the zones are intended to apply to various types of vehicles, including:

- \* HGVs (Heavy Goods Vehicles)
- \* LGVs (Light Goods Vehicles)
- \* Buses
- \* Coaches
- \* Taxis
- \* Private cars

It is likely that the CAZs are designed to apply to a range of vehicles that emit NO<sub>2</sub>, including those mentioned above, although the specific details of the zones and their application may vary depending on the location and the local air quality management plan.

[1] Revised\_National\_Air\_Pollution\_Control\_Programme\_\_NAPCP\_.pdf | Score: 0.627

[2] Air quality - GOV.UK.pdf | Score: 0.569

[3] Air quality policies, proposals and concerns.pdf | Score: 0.565

### **LLaMa, text, No-RAG**

In the UK, Clean Air Zones (CAZs) are designated areas where specific measures are implemented to reduce air pollution from vehicles. The UK government has defined four classes of CAZs, each with different requirements and restrictions for different types of vehicles. Here are the four classes and the vehicles they apply to:

#### **\*\*Class 1: Charging Clean Air Zone\*\***

- \* Applies to: All vehicles, including cars, vans, buses, coaches, taxis, and HGVs
- \* Requirements: Vehicles must pay a daily charge to enter the zone, unless they meet certain emission standards (Euro 4 for petrol and Euro 6 for diesel)
- \* Examples: Leeds, Birmingham, and Southampton CAZs

#### **\*\*Class 2: Charging Clean Air Zone (with exemptions)\*\***

- \* Applies to: All vehicles, including cars, vans, buses, coaches, taxis, and HGVs
- \* Requirements: Vehicles must pay a daily charge to enter the zone, unless they meet certain emission standards (Euro 4 for petrol and Euro 6 for diesel) or are exempt (e.g., historic vehicles, emergency services)
- \* Examples: Nottingham, Derby, and Sheffield CAZs

#### **\*\*Class 3: Low Emission Zone (LEZ)\*\***

- \* Applies to: Heavy Goods Vehicles (HGVs), buses, coaches, and taxis
- \* Requirements: Vehicles must meet specific emission standards (Euro VI for HGVs, Euro 6 for buses, coaches, and taxis)
- \* Examples: London's Ultra Low Emission Zone (ULEZ) and the Northampton LEZ

#### **\*\*Class 4: No Emissions Zone\*\***

- \* Applies to: All vehicles, including cars, vans, buses, coaches, taxis, and HGVs
- \* Requirements: No vehicles are allowed to enter the zone, except for emergency services and certain exempt vehicles (e.g., historic vehicles)
- \* Examples: None currently in operation in the UK

It's worth noting that these classes are not mutually exclusive, and some CAZs may combine elements of multiple classes. Additionally, the specific requirements and restrictions for each CAZ may vary depending on the local authority and the type of vehicle.

### **LLaMa, text, Hybrid-RAG**

In the UK, the Clean Air Zones (CAZs) are defined by the UK Government to improve air quality by reducing emissions from vehicles. The four classes of Clean Air Zones are:

1. **Class A**: This is the lowest level of Clean Air Zone and applies to buses and coaches. It requires them to meet Euro VI emissions standards, which are the most stringent standards for buses and coaches in the UK [1]. This class does not apply to private cars or vans.
2. **Class B**: This class applies to buses, coaches, taxis, and private cars and vans. It requires vehicles to meet Euro VI emissions standards for buses and coaches, and also requires private cars and vans to meet Euro 4 or Euro 6 standards, depending on the vehicle type and size [2]. This class is typically implemented in urban areas with high levels of air pollution.
3. **Class C**: This class applies to buses, coaches, taxis, private cars, vans, and HGVs (Heavy Goods Vehicles). It requires all vehicles to meet Euro VI emissions standards, except for HGVs, which must meet Euro VI standards for diesel vehicles and Euro VI or Euro V standards for petrol vehicles [3]. This class is typically implemented in urban areas with very high levels of air pollution.
4. **Class D**: This is the highest level of Clean Air Zone and applies to all vehicles, including cars, vans, HGVs, buses, coaches, and taxis. It requires all vehicles to meet Euro VI emissions standards, and also includes a charge for non-compliant vehicles, which is typically based on the vehicle's emissions level [4]. This class is typically implemented in areas with severe air pollution problems.

According to the UK Government's guidance on air quality, the Clean Air Zones are designed to help reduce air pollution by encouraging the use of cleaner vehicles and alternative modes of transport [5]. The zones are not mutually exclusive, and different areas may have different classes of Clean Air Zones depending on their specific air quality needs.

In addition, the UK Government has set targets to reduce air pollution, including a target to reduce particulate matter (PM<sub>2.5</sub>) concentrations to 10 micrograms per cubic meter by 2025 [1]. The government has also proposed a range of policies to improve air quality, including the expansion of the Ultra-Low Emission Zone (ULEZ) in London and the introduction of a national road user charging scheme [2].

Overall, the Clean Air Zones are an important tool in the UK's efforts to improve air quality and reduce the negative impacts of air pollution on public health.

[1] Air quality targets - Detailed Evidence report.pdf | Score: 27.186

[2] Clean Air Zones, Low Emission zones and the London ULEZ.pdf | Score: 26.700

[3] Air quality policies, proposals and concerns.pdf | Score: 26.540

[4] Revised\_National\_Air\_Pollution\_Control\_Programme\_\_NAPCP\_.pdf | Score: 0.627

[5] Air quality - GOV.UK.pdf | Score: 0.569

[6] air\_pollution\_uk\_2023\_issue\_1.pdf | Score: 0.149

### **LLaMa, paragraph, TF-IDF + Cosine**

Based on the provided excerpts from environmental policy documents, it appears that the UK policy does not explicitly define four classes of Clean Air Zones. However, it does mention the establishment of a Clean Air Zone, which is a designated area where specific measures are taken to reduce air pollution.

The policy documents do not provide information on the specific classes of Clean Air Zones or the types of vehicles

they apply to. However, it is mentioned that local authorities have been granted government funding to assist with the establishment of Clean Air Zones, suggesting that these zones may be implemented at a local level to address specific air quality concerns.

It is worth noting that the UK's Air Quality (Amendment) Regulations 2017 introduced the concept of Clean Air Zones, which are designed to reduce air pollution from vehicles. However, the regulations do not provide a clear definition of the classes of Clean Air Zones or the types of vehicles they apply to. Further research would be needed to determine the specific details of the Clean Air Zones policy in the UK.

[1] air\_pollution\_uk\_2023\_issue\_1.pdf | Score: 0.287

[2] Air quality policies, proposals and concerns.pdf | Score: 0.266

[3] Clean Air Zones, Low Emission zones and the London ULEZ.pdf | Score: 0.241

### **LLaMa, paragraph, BM25**

Unfortunately, the provided excerpts do not explicitly mention the four classes of Clean Air Zones or the specific vehicles they apply to. However, based on general knowledge and existing UK policy frameworks, Clean Air Zones are typically categorized into four classes, which are:

1. **Class A**: Typically applies to buses, coaches, taxis, and private hire vehicles, with the most stringent emission standards.
2. **Class B**: Applies to buses, coaches, taxis, private hire vehicles, and HGVs (Heavy Goods Vehicles), with less stringent emission standards than Class A.
3. **Class C**: Applies to buses, coaches, taxis, private hire vehicles, HGVs, and LGVs (Light Goods Vehicles), with even less stringent emission standards than Class B.
4. **Class D**: Applies to all vehicles, including cars, motorcycles, and mopeds, with the least stringent emission standards.

These classifications are based on the vehicle's emissions and are used to determine the level of access to Clean Air Zones. However, please note that this information is not explicitly mentioned in the provided excerpts, and this answer is based on general knowledge and existing policy frameworks.

[1] Clean Air Zones, Low Emission zones and the London ULEZ.pdf | Score: 29.627

[2] clean-air-plan-for-wales-healthy-air-healthy-wales.pdf | Score: 29.040

[3] Air quality explaining air pollution – at a glance - GOV.UK.pdf | Score: 27.525

### **LLaMa, paragraph, SBERT + FAISS**

The UK's Clean Air Zones policy categorizes zones into four classes: Class C, Class B, Class A, and Class R. These classes are defined based on the levels of nitrogen dioxide (NO<sub>2</sub>) concentrations in the air.

Class C zones have NO<sub>2</sub> concentrations above 40 µg/m<sup>3</sup>, and apply to all vehicles, including buses, coaches, taxis, and private cars.

Class B zones have NO<sub>2</sub> concentrations between 25-40 µg/m<sup>3</sup>, and apply to buses, coaches, taxis, and private cars.

Class A zones have NO<sub>2</sub> concentrations between 10-25 µg/m<sup>3</sup>, and apply to buses, coaches, and taxis.

Class R zones have NO<sub>2</sub> concentrations below 10 µg/m<sup>3</sup>, and apply to all vehicles.

These classes are used to determine the level of restrictions and measures implemented in each zone to reduce air pollution and improve air quality.

[1] Revised\_National\_Air\_Pollution\_Control\_Programme\_\_NAPCP\_.pdf | Score: 0.708

[2] air\_pollution\_uk\_2023\_issue\_1.pdf | Score: 0.704

[3] Air quality policies, proposals and concerns.pdf | Score: 0.703

### **LLaMa, paragraph, No-RAG**

In the UK, the four classes of Clean Air Zones (CAZs) are defined by the UK Government's policy to improve air quality in urban areas. The classes are based on the level of emissions standards required for vehicles to operate within the zone. Here are the four classes of CAZs and the types of vehicles they apply to:

1. **\*\*Class A (Clean Air Zone)\*\***: This is the lowest level of CAZ, which applies to buses, coaches, and taxis. Vehicles in this class must meet the Euro 6 emissions standard for diesel engines or the Euro 6c standard for petrol engines.
2. **\*\*Class B (Clean Air Zone)\*\***: This class applies to buses, coaches, taxis, and private hire vehicles (PHVs). In addition to the Euro 6 emissions standard for diesel engines, vehicles in this class must also meet the Euro 6d standard for diesel engines or the Euro 6c standard for petrol engines.
3. **\*\*Class C (Clean Air Zone)\*\***: This class applies to all vehicles, including cars, vans, buses, coaches, taxis, PHVs, and HGVs. Vehicles in this class must meet the Euro 6d standard for diesel engines or the Euro 6c standard for petrol engines.
4. **\*\*Class D (Clean Air Zone)\*\***: This is the highest level of CAZ, which applies to all vehicles, including cars, vans, buses, coaches, taxis, PHVs, and HGVs. Vehicles in this class must meet the Euro VI standard for diesel engines or the Euro 6c standard for petrol engines.

It's worth noting that these classes are not mutually exclusive, and some CAZs may have a combination of classes depending on the specific requirements of the zone. Additionally, some CAZs may have different charging or restrictions for different types of vehicles, so it's essential to check the specific requirements for each CAZ.

### **LLaMa, paragraph, Hybrid-RAG**

In the UK, the Clean Air Zones (CAZs) are defined by the UK government to improve air quality by reducing emissions from vehicles. The UK government has recognized that CAZs are an effective means of delivering compliant levels of NO<sub>2</sub> in the shortest time possible [1]. However, the Department for Transport (DfT) also acknowledged that CAZs can have a significant impact on local businesses and communities [1].

There are four classes of CAZs, each with different requirements and restrictions on vehicles. The specific requirements and restrictions for each class of CAZ may vary depending on the local authority implementing the CAZ [2].

1. **\*\*Class A CAZ\*\***: This is the lowest level of CAZ and applies to buses, coaches, and HGVs (Heavy Goods Vehicles) that do not meet the Euro 6 emissions standard. These vehicles are required to pay a daily charge to enter the CAZ.
2. **\*\*Class B CAZ\*\***: This class applies to buses, coaches, HGVs, and taxis that do not meet the Euro 6 emissions standard. In addition to the daily charge, these vehicles are also subject to a ban on entering the CAZ during certain hours or days.
3. **\*\*Class C CAZ\*\***: This class applies to all vehicles that do not meet the Euro 6 emissions standard, including

cars, vans, buses, coaches, HGVs, and taxis. These vehicles are subject to a daily charge and a ban on entering the CAZ during certain hours or days.

4. **\*\*Class D CAZ\*\***: This is the highest level of CAZ and applies to all vehicles, including cars, vans, buses, coaches, HGVs, and taxis, regardless of their emissions standard. These vehicles are subject to a daily charge and a ban on entering the CAZ during certain hours or days.

The UK is divided into 43 zones for air quality assessment, with 28 agglomeration zones (large urban areas) and 15 non-agglomeration zones [5]. In 2020, the UK achieved exceeding the NO<sub>2</sub> air quality standards in all 43 zones [4]. The Air Quality Standards Regulations require that the UK meets the EU's air quality standards, which are designed to protect human health and the environment [3].

It's worth noting that the UK's air quality is monitored and reported annually in the Air pollution in the UK report, which provides a high-level summary of the information on the UK's legal and policy framework and how pollution is measured and modelled [6].

[1] Clean Air Zones, Low Emission zones and the London ULEZ.pdf | Score: 29.627

[2] clean-air-plan-for-wales-healthy-air-healthy-wales.pdf | Score: 29.040

[3] Air quality\_ explaining air pollution – at a glance - GOV.UK.pdf | Score: 27.525

[4] Revised\_National\_Air\_Pollution\_Control\_Programme\_\_NAPCP\_.pdf | Score: 0.708

[5] air\_pollution\_uk\_2023\_issue\_1.pdf | Score: 0.704

[6] Air quality policies, proposals and concerns.pdf | Score: 0.703