

## 1 Background



Recent government initiatives are promoting electric vehicle (EV) ownership, (GOV.UK, 2024). Charging points require driveways to be located in close proximity to built form.



Since 2010, Oxford city has lost three times as many front garden spaces to driveways, (RHS, 2024). Over 5 million front garden spaces in the UK now contain no plant material able to combat climate change by absorbing CO<sub>2</sub>, (RHS, 2015).



This research will produce a matrix to be used alongside the new 2040 Oxford local plan, apprising front garden designs, ensuring they are resilient to climate change.

## 2 Aim + Objectives

To develop an appraisal tool to assess the environmental resilience of front gardens in mitigating climate change in Oxford.

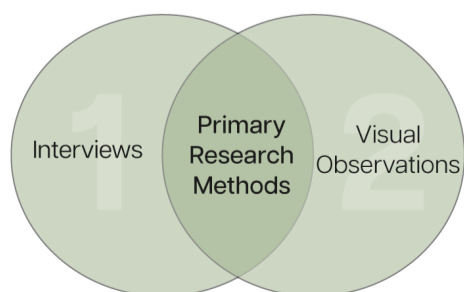
	Objective	Methods	Outcome
OB1	To understand what variables impact the resilience of front gardens in mitigating climate change	Literature review	Appraisal tool
OB2	To use policy reviews and case study analysis to develop an assessment scale for the variables mapped in objective 1	1. Policy review 2. Case study analysis (Secondary sources)	Assessment scale added to the appraisal tool
OB3	To test and refine the tool by 1) applying it to the evaluation of a typical Oxford terraced suburban street and 2) by discussing it with experts	1. Visual observations 2. Interviews (Primary sources)	Test and refine tool

## 4 Methodology

A qualitative, mixed-methods approach to research informs the development of the appraisal tool:

1. Semi-structured interviews with environmental professionals, urban designers and members of Oxford city council refines the tool, (Bryman, 2016).

2. It is then tested for success and failures through visual observations of existing planning application: 24/00294/FUL. This planning application represents a typical Oxford suburban terraced residential front garden space.



### Formulate Tool

Literature Review  
Policy Review

### Initial Tool

### Refine Tool

Professional Interviews

### Refined Tool

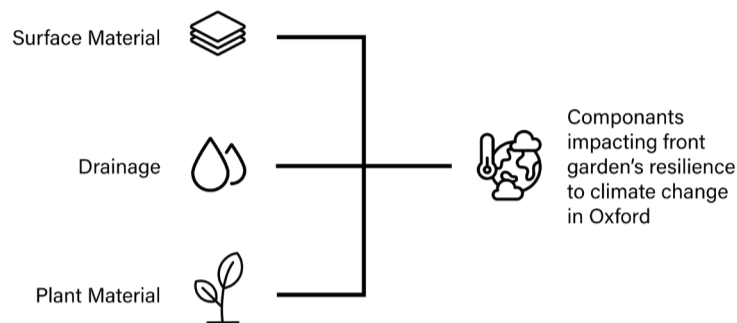
### Testing

Visual Observation

### Results + Conclusions

## 5 Results

Three key components of front garden climate change resilience are established from literature:



This informed an initial matrix of features relating to each component. Inspired by a typical vulnerability index, the tool is designed to produce a definitive score of climate change resilience. Interviews with professionals gathered rich feedback from a wide variety of perspectives. Strengths and weaknesses identified within the interviews informed a revision of the matrix illustrated below:

"...the tool is fast to use, simple and aligns with government and city council priorities relating to climate change response..."

(Oxford City Council Member, 2024)

"...if the tool included plant types and geology, this would be the most useful component..."

(Environmental Professional, 2024)

"...size of gardens is a fundamental factor to include, the scoring element is useful in a variety of planning contexts..."

(Urban Designer, 2024)

(Example of some of the feedback provided from interviews)

APPRAISAL MATRIX FOR OXFORD CITY FRONT GARDEN'S RESILIENCE TO CLIMATE CHANGE

INSTRUCTION: For use in appraising private residential front gardens in Oxford city, supplementing planning applications alongside the Oxford 2040 local plan. Complete the matrix to attain climate change resilience score.

ADDRESS:

SIZE:  (METRES SQUARED) SOIL TYPE:  Clay  Clay + Sand  Sand  
(Indicate soil type with a circle)

FRONT GARDEN COMPONENTS	FEATURES <small>THE SOIL TYPE EACH FEATURE RELATES TO IS INDICATED</small>	DETAILS	SCORE (MARKED WITH AN 'X')			TOTAL SCORE
			NOT PRESENT (0)	PRESENT NOT TO REQUIRED SPECIFICATION (1)	PRESENT (2)	
Surface	Measures to minimise soil erosion	1-2 inches of buffer strips or mulching				/10
	Lawn	Real grass, no astro-turf present				
	Gravel	Presence of gravel surfacing or paved beds of 4-20mm aggregate				
	Permeable surface material	Majority of surface material is permeable to liquid				
Drainage	Soil	Presence of soil as a surface material				/8
	Sustainable urban drainage solutions (SuDS)	Presence of any SuDS interventions				
	Bioretention facilities	Presence of a rain garden				
Plant Material	Water feature	Presence of any type of water feature				/16
	Surface water runoff management interventions	Obvious intervention of a surface water management strategy				
	Trees	Presence of native British trees separated by 2 metres				
	Hedges	Presence of any height hedges				
	Hardy plants	Half Hardy or Full Hardy on RHS scale				
	Succulents	Presence of succulents defined by RHS cactus and succulent plant type				
	Wetland plants	Presence of any wetland plant, defined by the Freshwater Habitats Trust				
Green-grey leaf	Presence of silver leaved plant matter					
Halophytes	Presence of any kind of salt tolerant plant in accordance with RHS RHS database of plants				/16	
Plant material screening built form	Observable plant material fully screening built form from public realm					
TOTAL =						/34

SCALE

0-9	10-18	19-27	28-34
Very Vulnerable	Vulnerable	Resilient	Very Resilient

(Indicate score band with a circle)

DATE:  SIGNATURE:

(Refined final version of the front garden climate change resilience appraisal tool, intended to be scaled to a single A4 page)

## 6 Conclusions

When tested using planning permission: 24/00294/FUL the appraisal tool functioned successfully. Resulting in a score of 12, indicating the vulnerability of its design to the effects of climate change.

### Areas for further research and development include:

- Making separate tools for different soil types, due to significantly different desired characteristics in clay and sand soil types.
- Including a wider variety of environmental variables to expand the tools robustness.
- Include the climate change benefit of adding active travel infrastructure into a front garden.
- Consider joining this tool with a supporting tool, assessing climate change resilience in back gardens.

## 7 References

1. GOV.UK. (2024). Low-emission vehicles eligible for a plug-in grant. [Online]. Gov.uk. Available at: <https://www.gov.uk/plug-in-vehicle-grants>
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4. RHS. (2015). 3 million front gardens have been completely paved since 2005. Let's try to reverse this trend.. [Online]. Low Impact. Available at: <https://www.lowimpact.org/posts/3-million-front-gardens-have-been-completely-paved-since-2005-lets-t>
5. Bryman, A. (2016). Social Research Methods. 4th ed. Oxford: Oxford University Press.

## 8 Contact



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