Christ's College Library: Critical review and alternative design proposal

October 2025

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1 Introduction

1.1 Context

Christ's College Library is a series of buildings on the grounds of Christ's College, Cambridge, located along St Andrew's Street and Christ's Lane. In 2025 new proposals were revealed for the demolition of a portion of the library complex facing onto Christ's Lane, replacing a two storey 1970s building with a new library facility for the college. The proposals were developed by Grafton Architects after winning a competition for the redesign of the site. The new designs show a larger five-storey facility in a contemporary architectural style, consisting of a buff brick façade punctuated by wall recesses, windows, and notably five large 'chimney' stacks along its length. These proposals were submitted for planning permission in July 2025.

1.2 Purpose of this note

Create Streets was commissioned to write this note to consider an example of an alternative scheme that could meet the College's needs, drawing on their design expertise and research into the links between place, design, happiness, wellbeing and prosperity. The note was commissioned by Christ's Lane Action Group, who are concerned by the scale, massing, height and design of the new proposals, and that they represent a missed opportunity to enliven and humanise the narrow Christ's Lane with more appropriately scaled development and a more attractive ground floor frontage.

In this note, we briefly assess the existing proposals, before sharing an alternative design approach more strongly informed by the local and historic context and which addresses the issues and concerns identified with the current designs. We also share the results of a Visual Preference Survey carried out by Deltapoll, which revealed overwhelming public preference for the alternative design.

An appendix compares street enclosures of the various proposals with existing narrow streets in Cambridge, while further appendices present Create Streets's research into the links between good design, public preferences and health and wellbeing.

2 Current Proposals

The currently proposed design by Grafton Architects

2.1 Room for improvement

- Height and massing. The scale, height and massing is excessive for a narrow yet well-used pedestrian lane. Rather than *giving* to pedestrians, the massing means the building ends up *taking* light, sky, and human-scale enclosure for what is a narrow lane, creating a canyon effect alongside the new building opposite. The height of the building (14.1m) along a 6m wide lane creates an enclosure ratio of about 2.3:1 (comparable to some parts

of Manhattan or Barcelona).[1] These concerns reflect comments by the Council in a 2002 Joint Planning Brief[2] for the then proposed Bradwells Courts redevelopment, which noted that:

> "Building heights along Christ's Lane will need to be designed to avoid Christ's Lane becoming canyon-like and oppressive, and to minimise the impact on the amenity of residents of Christ's College."

The same sentiment was shared by Ward Councillor Tim Bick at a Development Control Forum on 11.09.25, who stated:

> "I do share the concern about what has been called the canyon effect along the lane. It is impossible to look at the diagrams and not conclude that what is already quite a narrow passage with a very high building on one side of it is going to end up with an almost equally high building on the other side of it. And that, I think, is going to condition the way that Christ's Lane is experienced."

More comprehensive critiques of the building's scale and its impact on the Bodley Library can be found in an independent assessment by Alec Forshaw IHBC, MRTPI, MA and Historic England advice, published in October 2025.

- Active Frontage. The treatment of the ground floor is particularly poor and anaemic. Arguably there is not a single door, window or feature on the ground floor, with the lowest window sills at approximately head height. This presents a fully blank frontage to the pedestrian level and is a huge missed opportunity to enliven, animate and beautify Christ's Lane.[3] While stretches of blank walls (often enlivened by variations in colours and textures of weathered historic natural materials) are a feature of some historic buildings in Cambridge, these positive aspects of historic construction could not be replicated new in this context. The 2002 Bradwells Court planning brief referenced above, noted the importance of "active frontages to St Andrew's Street, Christ's Lane and Christ's Pieces."

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[1] Lovene M. Boys Smith, N. & Sereshine C. (2020). *Ibid* pp 32, provides a breakdown of street enclosure. Generally 1:1 to 1:2 enclosure ratio is seen as optimum for a human-scale sense of enclosure (although by no means always the case and it varies by climate).

[2] Bradwells Court Joint Planning Brief, Cambridge City Council, March 2002

[3] Jan Gehl's work presents a fascinating overview of the importance of active frontages (Gehl, J. (2006), *Close encounters with buildings* (pp.29-47). Another famous study by Charles Montgomery (Edible Urbanism Project, *Happy Seattle,)* revealed people were five times more likely to help lost pedestrians outside an active façade than an inactive façade.

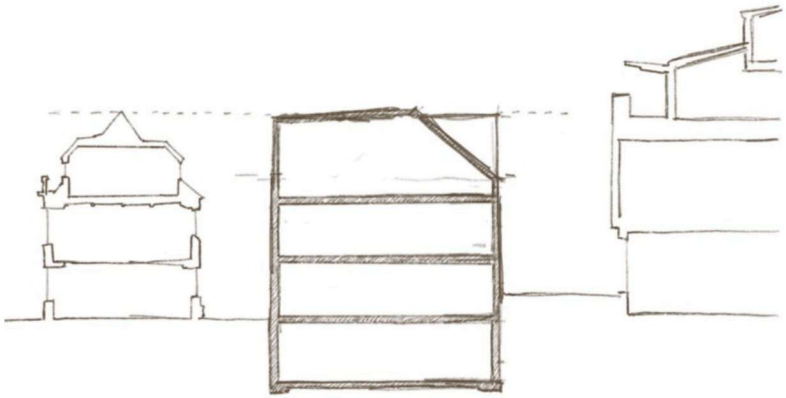
Furthermore, in a 2004 Committee Report[4] for Bradwells Court (application 04/0632), the planning officer concluded thus:

> "8.24 The treatment of Christ's College wall is subject to a separate application for listed building consent. To enable the development to proceed, internal alterations to the layout of Christ's College are also required and again will be subject to an application for listed building consent. The basic principle for the improvement of the appearance of the wall is to attach a tensioned wire mesh along its length and grow climbing plants from a specifically designed planting trench up it, thereby softening and greening its appearance. The concept is to continue the feeling of a landscaped walk from Christ's Pieces down Christ's Lane and into the city centre. A strategy for Public Art will also be directed at the appearance of the wall and will particularly examine opportunities for 're-inventing' the appearance of a large kitchen flue that is unable to be removed. I am confident that these proposed works will contribute positively to the appearance of Christ's Lane."

These improvements were never implemented but they highlighted the council's concerns, at the time, about the blank wall along Christ's Lane, which Grafton Architects' proposal does not address.

3 Potential alternative design proposal

Following concerns over the height, lack of active frontage and massing of the existing proposals for the new library building, an alternative design has been developed by Create Streets which reflects a design more appropriate for its setting, both urbanistically and architecturally, and which overcomes the issues highlighted in Chapter 2. The alternative design has been created to show how a new library on the site can be a better fit for Christ's Lane while retaining the important function of being a library. These proposals are not definitive but rather seek to show a design that presents an attractive, more contextual response befitting of the location and role of Christ's Lane in Cambridge. The proposal



Sketch section of the alternative proposal

[4] Bradwells Court Planning Committee report, Applic. No: C/04/0632, 20th October 2004

takes as its starting point the massing and scale of a previous 2016 proposal by Rick Mather Architects, which included a basement level.

3.1 Design approach

The following images demonstrate the alternative design overlaid on the same viewpoints of Christ's Lane shown in the current proposals. These proposals address the highlighted issues by adopting a different design approach while retaining the necessary function, space and GIA for a new library structure:

- Reduced height and massing. By restoring the basement level, the building height has been reduced without loss of internal area. The alternative proposal's ridgeline is level with the Bodley Library's, reducing the height of the current proposals by approximately 5 metres. Rather than presenting a singular solid mass of wall on Christ's Lane, the façade is broken up with rhythmic series of gables and vertical arrangements of symmetrical windows, its proportions and scale reflecting that of the Bodley Library.

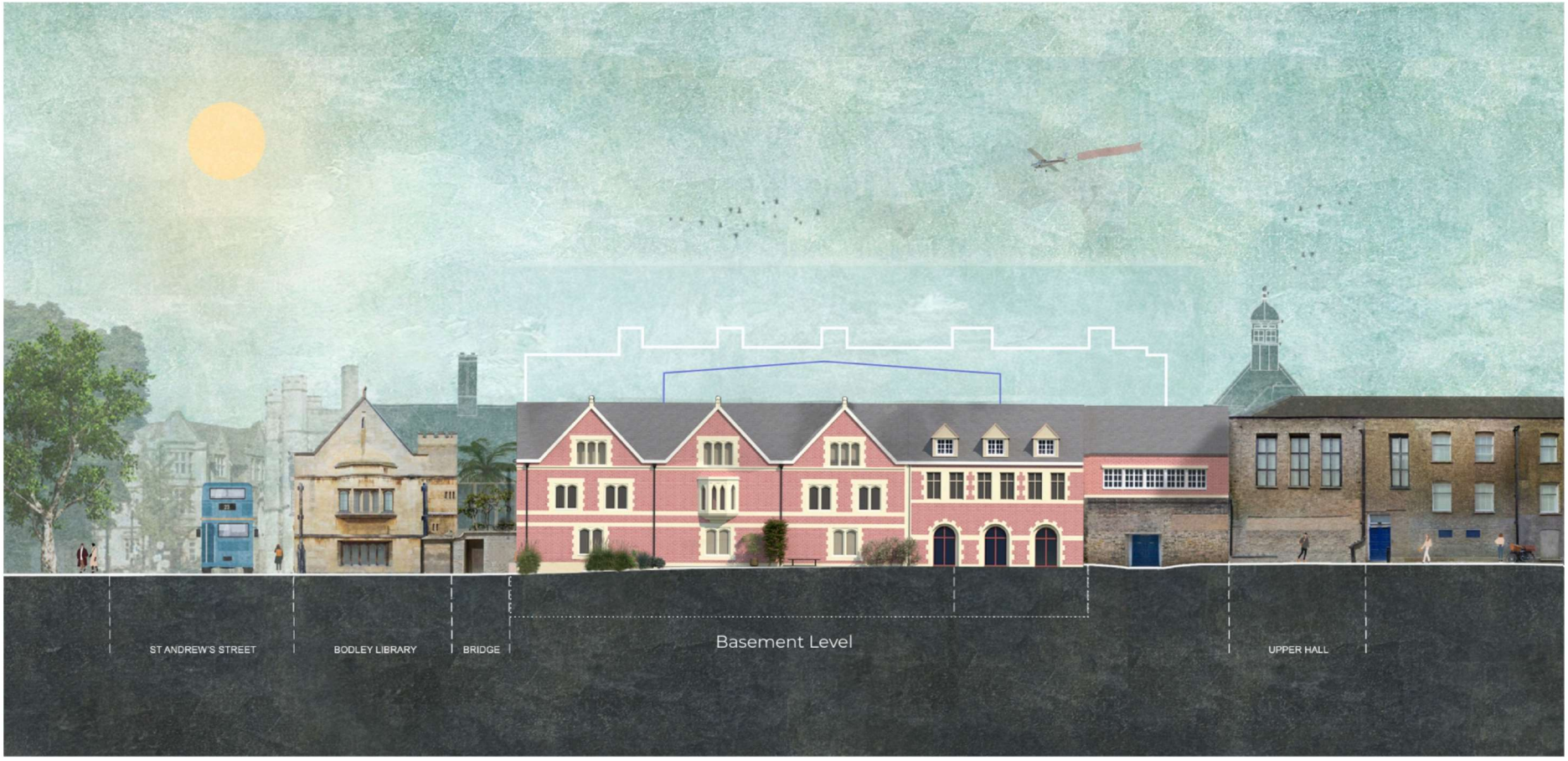
Create Streets' alternative proposal as seen from St Andrew's Street (left) and from further south along St Andrew's Street (right)

- Active ground floors. In the alternative proposal, windows now run along the ground level, connecting Christ's Lane to the interior of the building and vice versa. Rather than a fortress-like ground level, the presence of windows creates permeability between the life of the street with the life of the building.

- Greenery and public seating. At present, Christ's Lane is a hardscaped environment with no greenery. Our proposal therefore includes border planting along the ground, with a bench to offer respite along the length of the Lane. This approach addresses the Council's concerns in Paragraph

8.24 of the Bradwells Court report, as well as Paragraph 8.54 with its reference to creating "an active and interesting shopping environment in this location that is pedestrian friendly."

- In harmony with its context. With its rhythm of gables along Christ's Lane, the alternative design sits in harmony alongside the Bodley Library while still being distinctly separate. The mix of red brick with stone reflects nearby buildings. It feels "of Cambridge" rather than feeling like it could be anywhere. The more northerly section of the proposal has a Classical design to blend with the existing building.



Elevation of the current proposal (top) and Create Streets's proposal (bottom), with the white outline indicating the current design proposal's height and profile. The blue outline shows the elevation of the 2016 proposals.

4 What do people think?

4.1 Using a Visual Preference Survey to reveal public preference between the two designs

Create Streets submitted the two design proposals to a polling firm, Deltapoll, to find out which building the public liked more. Our research consistently shows that the evidence discussed in Chapter 2 is also revealed in public attitudes to the places and buildings they like most and least.

The two proposals were shown to 2,073 carefully sampled members of the British public between August 15th to 18th. Respondents were shown two images: one showing the Grafton proposals, and the other showing the alternative design. Both images were identical street views looking northeast along Christ's Lane, except for the change of building. Respondents were also shown the corresponding elevations alongside the street view. A 'don't know' option was also provided. For each group, respondents were asked a deliberately neutral question:

> 'A new university college library building has been proposed in Cambridge. Assuming all other things being equal, which ONE of these options do you yourself prefer?'

4.2 Findings

The British public overwhelmingly prefer the alternative design to the Grafton Architects proposals: 71% of people polled chose the alternative design as their preferred building, while just 21% opted for the Grafton Architects proposal. 8% said they didn't know. This demonstrates the significant extent to which the public positively responded to the reduced height and massing of the building, as well as the architecture which more robustly follows local detailing and materiality. This preference for the alternative design is highly consistent across gender, age, income and voting record. Strong majorities of all segments preferred the alternative design:

- Men and women agreed. Both genders equally preferred the alternative design by some margin, with 72% of men and 72% of women choosing it.
- People of different social grades and income completely agree. There was only a few percentage points difference between different social grades (ABC1 and C2DE) and income level.
- The alternative proved most popular with younger and university-aged people. All age groups significantly preferred the alternative design, however the 18 - 24 age range delivered a significant 79% preference. Just 18% from this group preferred Grafton Architects' proposal.

- The alternative design enjoyed huge popularity with Liberal Democrat voters and equal popularity across Conservative and Labour voters. Those intending to vote Liberal Democrat overwhelmingly preferred the alternative design, with 77% of preferences. Conservative and Labour voters held almost identical preference for it, at 68% and 69% respectively.

The two images that were shown to respondents in the Deltapoll survey. The alternative design (right) received a far higher number of preferences than the Grafton proposals (left).

Appendix i: comparison of street enclosure ratios

Christ's Lane (present)	Christ's Lane (Grafton proposal)	Christ's Lane (Create Streets proposal)
Approx. height: 8m Approx width: 6m Approx height to width ratio: 1.3:1	Approx. height: 14.1m Approx width: 6m Approx height to width ratio: 2.3:1	Approx. height: 10m Approx width: 6m Approx height to width ratio: 1.7:1

Trinity Street	Rose Crescent	Silver Street
Approx. height: 11m Approx width: 7m Approx height to width ratio: 1.6:1	Approx. height: 9m Approx width: 6m Approx height to width ratio: 1.5:1	Approx. height w/out chimneys: 9m With chimneys: 14m Approx width: 8.75m Approx height to width ratio W/out chimneys: 1:1 With chimneys: 1.6:1

Appendix ii: the attraction of enclosure (from *Of Streets and Squares*)

Some designers have argued that the success of a street is determined by size and proportion. Can you see the sky? Does it feel dark and overwhelming, or dull and too stretched out? A street might be nicely wide. However, if surrounded by buildings which are too high, or too boring, it might feel shadowy or unpleasantly cavernous. On the other hand, it might have beautifully articulated façades, which are so low compared to its width, that it feels more like a pretty race track than a place to be. Medium-rise buildings, it has been argued, can imbue a street with a pleasing sense of enclosure, with dynamism and spatial continuity.

The architectural writer, Christopher Alexander, has argued that well-enclosed public spaces make us comfortable and that we are biologically programmed to seek the edge;

> '*The success of urban space depends on what can occur along its boundaries. A space will be lively only if there are pockets of activity all around its inner edges*.'[5]

A key metric for thinking about this is the street's height-to-width ratio. This is defined as the proportion of the height of the building to the width of the street. It is a measure of a 'sense of enclosure'.

A good ratio positively influences human perception of the space – helping it feel safe and naturally constrained. A bad ratio might create a sense of claustrophobia (if too high) or dispersion (if too low). A British academic, Matthew Carmona, has suggested the following possible guidelines:

- A height-to-width ratio of 1:4 or above: more sky is visible than buildings so there is very little sense of 'enclosure';
- A height-to-width ratio of between 1:2 and 1:2.5: the portion of sky and buildings visible are about equal leading to a reasonable sense of enclosure;
- A height-to-width ratio of 1:1 or below: means that it is not possible to have a comprehensive view of the buildings without looking up. This reduces light levels and, it has been argued, can induce feelings of claustrophobia. A ratio of 1:1 'is often considered the minimum for comfortable urban roads.'[6]

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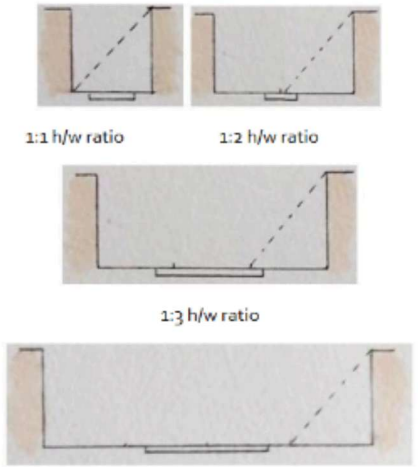
[5] Alexander C (1977), *A Pattern Language: towns, buildings, construction.* (Pattern 160, p. 752).
[6] Carmona, M., Heath, T., Oc, T., & Tiesdell, S. (2012). *Public Places-Urban spaces*.

This argument is based on studies of environmental perception, which have shown that the human field of view generally has a peripheral angle of view of 180 degrees horizontally and 150 degrees vertically, with a clear field of view of 27 degrees height and 45 degrees width. These angles decrease as speed increases.[7] We can see more broadly when we are standing still, least widely when we're zooming past.



Examples of strong, medium and low spatial enclosure.

A 1974 environmental perception study, by Professor Samuel Franklin and Scott Hayward, was the most robust we've been able to find. It concluded that a sense of enclosure did not depend on the size of space, but was determined by its height-to-width ratio. They randomly selected 20 undergraduate students. Observers were given twelve drawings of architectural spaces, four images of small size places (3x3m), four images of medium size places (6x6m) and four images of large size places (12x12m). For each set of images, four different height-to-width ratios were depicted: 1:1, 1:2, 1:3 and 1:4. Observers were asked to judge levels of enclosure on a ten-point scale, where 1 indicated minimum enclosure and 11 indicated maximum enclosure. The study found that:

- Increased height-to-width ratios corresponded to increased perception of enclosure. On the 1 to 11 scale, a 1:1 height-to-width ratio corresponded to an 8.6 mean rating of enclosure while a 1:4 height-to-width ratio corresponded to a 4.0 mean rating of enclosure;
- However, there was no significant influence of size on perception of enclosure, with only 0.9 points of difference between small and large places, 0.6 between large and medium, and 0.3 between medium and small ones.[8]

This positive association between higher height-to-width ratios and increased sense of enclosure was explained by the American architect and planner, Paul Spreiregen, in 1965:

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[7] Lynch, K. (1958). *Site Planning,* 1962. Especially Chapter Five *Visual Forms,* and Chapter Eight. *The Process of Site Planning*. & Tunnard, C., & Pushkarev, B. (1963). *Man-made America: Chaos or control?* & Pollock, L. S. (1972). *Relating urban design to the motorist: an empirical viewpoint*. In Rapoport, A. (2016). *Human aspects of urban form: towards a man—environment approach to urban form and design*. (p. 181).

[8] Hayward, S. C., & Franklin, S. S. (1974). *Perceived openness-enclosure of architectural space*.

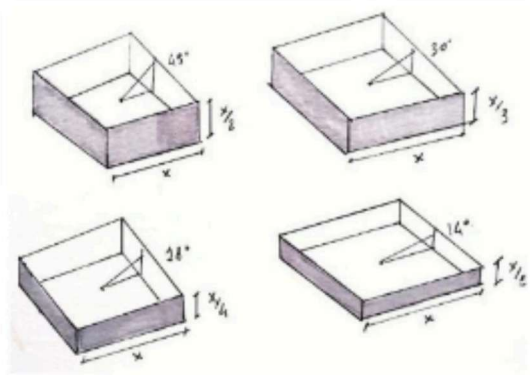
'when a façade height equals the distance we stand from a building (a 1:1 relationship) the cornice is at a 45-degree angle from the line of our forward horizontal sight. Since the building is considerably higher than the upper field of forward view (30 degrees), we feel well enclosed.[9]

But does this matter? Is it actually reflected in the reality of how streets 'feel' and how popular they are? Certainly, many clearly very popular streets have a ratio of between 1:1 and 1:1.5. In other words, the buildings are as high as the street is wide, or the street is not more than 50 per cent wider.

For example, John Massengale has argued that one of the key reasons that Manhattan's 70th Street, between Park Avenue and Lexington Avenue, is so attractive is due to its height-to-width ratio.[10] The street is just over 18m wide. The buildings are 4.5 to 5 storeys (about 16m) high. In other words, the ratio is very nearly 1:1.

Mean ratings of enclosure (scale of 1 to 11)					
Size	1:4	1:3	1:2	1:1	Average enclosure rating per size
Small (3x3m)	3.6	4.2	5.7	8.6	5.5
Medium (6x6m)	3.8	4.7	6.2	8.6	5.8
Large (12x12m)	4.6	5.7	7.1	8.5	6.5
Average enclosure rating per ratio	4.0	4.9	6.3	8.6	

Mean 'enclosure scores' on a scale from 1 to 11



Sense of enclosure and human field of view.

[9] Spreiregen, P. D. (1965). *The architecture of towns and cities*. (p. 75).
[10] Dover, V., & Massengale, J. (2013). *Street design: the secret to great cities and towns*.

In his excellent book, *Great Streets,* Allan Jacobs surveyed 15 of the 30 streets he personally judged to be the most beautiful in the world. He found that most of them were in the range of 1:1.1 to 1:2.5 height-to-width ratio, with a building height of less than 30.5 metres.

Appendix iii: the importance of active facades (from *Of Streets and Squares*)

Facades should have variety in a pattern

As long ago as 1961, the American urbanist Jane Jacobs argued that busy street facades with multiple uses, openings, variety and forms would attract more activity and encourage the sort of neighbourly interactions that strengthen social ties and provide increased natural surveillance.[11] Jan Gehl has used the distinction of 'walking architecture' versus 'driving architecture' to encapsulate this. 'Walking architecture' is readily appreciated at pedestrian speed or at eye level. It tends to be fine-grained urban and rich in details. 'Driving architecture' is characterised by simpler design, which offers unambiguous signals to those driving at speed.

'The best courtyards have many entry points, a view to the streets beyond, and enclosing walls that are fenestrated, not blank. These are used most often."[12]

[11] Jacobs, J. (1961), *The Death and Life of Great American Cities.*
[12] Alexander, C. (1977). *A pattern language: towns, buildings, construction*. (Pattern 115. P. 561).

Subsequent research is justifying these concepts. Jan Gehl has conducted the best-known studies and found that the 'treatment of the city's edges, particularly the lower floors of buildings, has a decisive influence on life in city space.' In many cities around the world, the most attractive shopping centres all share the same rhythms: 15 to 20 shops per 100 metres of street, which corresponds to new experiences for pedestrians every four to five seconds.[13]

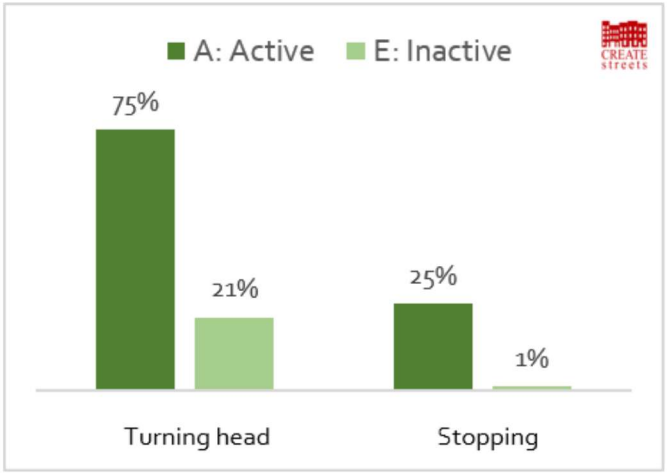
The evidence certainly seems clear that active, interesting facades promote street life, neighbourliness and even enhanced social support, and (in some cases) better physical health.

For example, in one Copenhagen study, two very different types of façade were compared. The first, the active façade, featured 'varied facades with many doors, visual contact between outside and inside and various functions.' The second, the more passive façade, was composed of 'uniform facades with few doors, blind or no windows and few or no functions.' Gehl's team then compared the number of people passing, their speed and the number of people who stopped, or turned their heads, on a series of summer days and autumn evenings. They found that:

- Pedestrian traffic was 13 per cent slower along the interesting facades;
- 75 per cent of people turned their heads, along the interesting facades, compared to only 21 per cent along the less interesting facades; and
- 25 per cent of pedestrians stopped in front of the interesting facades, compared to only 1 per cent in front of the sterile facades.

The chart below shows the results of the observations.

[13] Gehl J., (2010), *Cities for People*. (p.75, 76).



Percentage of people turning their head towards, and stopping in front of, the Active façade (A) and Inactive façade (E).

'Walking' (left) vs. 'driving' (right) façade types.

In aggregate, Gehl's team calculated that there was around seven times as much activity in front of the active facades as the passive. Other studies, in Madrid, Melbourne and Stockholm had similar findings.[14] It isn't just that people stop more either. Sterile 'edges' have actually been proven to affect levels of sociability and helpful behaviour – all meaningfully correlated with wellbeing. A recent experiment, led by Charles Montgomery in Seattle, selected two facades in the same neighbourhood. One was highly 'active', with 'a high concentration of small businesses, opportunities for pedestrians and a high level of visual interest.' The other, a 'block-long blank warehouse wall was highly 'inactive.' Volunteers posed as lost tourists at both locations. They stood on the pavement, looking confused and with an open map. The 'lost tourists' did not approach anyone. They waited for random passers-by to offer help.

> *'The results were remarkable. Pedestrians at the active façade site were nearly five times more likely to offer assistance than at the inactive façade site:10 per cent of passers-by offered assistance at the active site versus 2.2 per cent at the inactive site. Of those who helped, seven times as many at the active site offered to let our 'tourist' use their phone (7 per cent versus 1 per cent). Four times as many offered to actually lead our tourist to their destination (4 per cent vs 1 per cent).'*[15]

Active (left) and inactive (right) facades led to different behaviour from pedestrian behaviour.

[14] Gehl, J. (2006), *Close encounters with buildings*. (p.29-47).

[15] Edible Urbanism Project, *Happy Seattle*, www.thehappycity.com/wp-content/uploads/2015/03/Editable-Urbanism-Report.pdf. In addition to these findings, people at the active façade reported a significantly higher level of trust in strangers (5.1 vs. 4.8 out of 10), walked more slowly and lingered more.

Recent academic research is starting to explain why. A study of 29 shopping areas, in Maastricht, was conducted by Harmen Oppewal and Harry Timmermans, to determine which public areas

people preferred to visit. 214 participants were asked to rate 128 images of places, based on a list of 10 attributes of appearance, layout and furnishing of shopping centres. They found that the four most important variables, that mostly influenced people's choices, were; maintenance levels, shop-front appearance and presence of activities and cafes with the presence of green areas a little way behind. Maintenance levels, attractive large shop windows, the number of street activities and the number of cafes all had what statisticians call p-values of 0.000 or 0.001. This means that there is almost 100 per cent probability that the appearance of the place depends on these factors. The amount of greenery also had a positive relationship, but with a p-value of 0.010 – still important, but suggesting an almost 100 per cent probability that the appearance of the place depends on the amount of greenery.[16]

[16] Oppewal, H., & Timmermans, H. (1999). *Modeling consumer perception of public space in shopping centers*.

Appendix iv: Deltapoll survey results

Deltapoll Survey Results
Prepared by Deltapoll for Create Streets

Sample size: 2,073 adults in Great Britain
Fieldwork: 15th to 18th August 2025

DELTAPOLL

	Total	Gender		Age					Region							Social Grade	
		Male	Female	18 to 24	25 to 34	35 to 54	55 to 64	65+	London	Rest of South	Midlands	North	Wales	Scotland		ABC1	C2DE
		A	B	C	D	E	F	G	H	I	J	K	L	M		N	O
All GB Adults	2073	996	1074	241	278	757	327	470	276	673	342	501	100	181		1174	887
Unweighted Sample	2073	957	1113	255	369	666	324	459	265	666	352	512	105	173		1310	751
QCS1. A new university college library building has been proposed in Cambridge. Assuming all other things being equal, which ONE of these options do you yourself prefer?																	
	1476	713	760	191	189	533	233	331	205	480	237	347	80	127		855	615
	71%	**72%**	**71%**	**79%**	**68%**	**70%**	**71%**	**70%**	**74%**	**71%**		**69%**	**80%**	**70%**		**73%**	**69%**
				D							237		*	*			
	439	206	233	44	78	165	62	90	62	155	80	101	14	27		230	206
	21%	**21%**	**22%**	**18%**	**28%**	**22%**	**19%**	**19%**	**22%**	**23%**	**23%**	**20%**	**13%**	**15%**		**20%**	**23%**
					F.G								*	*			
	158	78	80	6	11	59	32	49	9	38	25	52	6	27		89	66
Don't know	**8%**	**8%**	**7%**	**3%**	**4%**	**8%** C	**10%** C.D	**11%** C.D	**3%**	**6%**	**7%**	**10%** H.I	**6%** *	**15%** H.I.J*		**8%**	**7%**

Annual Household Income					Children 18 or Under		Working Status		Current Voting Intention					GE 2024 Vote				
Under £14k	£14k to £21k	£21k to £34	£34k to £48k	More than £48k	Yes	No	Working (All)	Not Working (All)	Con	Lab	Lib Dem	Reform	Other	Con	Lab	Lib Dem	Reform	Other
P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH
246	227	522	364	606	647	1411	1267	804	311	431	192	521	271	385	609	199	233	249
229	224	476	339	722	734	1324	1316	755	288	538	165	517	225	352	733	136	232	149
177	152	355	281	430	436	1028	883	593	210	297	148	362	189	254	429	151	161	176
72%	**67%**	**68%**	**77%**	**71%**	**67%**	**73%**	**70%**	**74%**	**68%**	**69%**	**77%**	**70%**	**70%**	**66%**	**70%**	**76%**	**69%**	**71%**
			Q.R								*					*		*
51	47	118	62	152	162	276	296	143	72	98	37	120	66	96	139	35	53	53
21%	**21%**	**23%**	**17%**	**25%**	**25%**	**20%**	**23%**	**18%**	**23%**	**23%**	**20%**	**23%**	**24%**	**25%**	**23%**	**18%**	**23%**	**21%**
				S	V		X				*					*		*
17	28	49	21	24	50	108	87	68	28	35	6	39	16	35	41	13	19	20
7%	**12%**	**9%**	**6%**	**4%**	**8%**	**8%**	**7%**	**8%**	**9%**	**8%**	**3%**	**7%**	**6%**	**9%**	**7%**	**7%**	**8%**	**8%**
	S.T	T									*					*		*