Urban Design Index:

A method for measuring "structural" urban design qualities at the Block and District scale

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The Ramblas, Barcelona exemplifies the ideal urban design qualities measured in this method

Why create an Urban Design Index?

The basic argument:

1. While urban design has an ephemeral quality, the spatial-material outcomes of urban design are measureable
2. Things that are measured "matter" to decision makers ("D3M")
3. Therefore, if urban design was measured it would matter more.

What makes a great urban place?
7 Key Urban Design Elements

There is a high level of agreement in the urban design literature & preference research on the most important structural elements that work together to make a great urban environment.

These can be summarized in 7 "ingredients" or elements that can be measured, providing a useful metric for comparing the relative qualities of different places, or for comparing change (actual or proposed) in a single place.
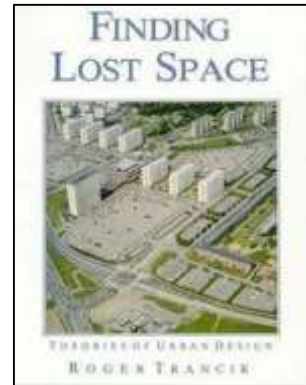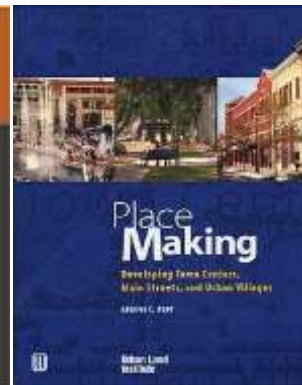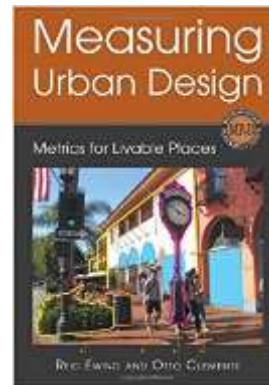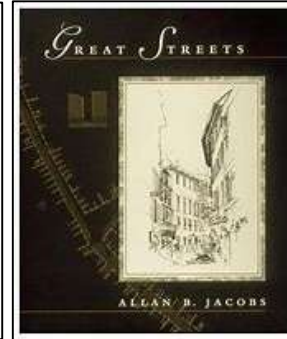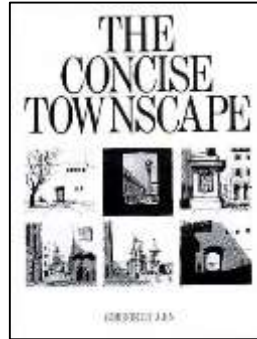
What makes a great urban place?
7 Key Urban Design Elements

These "ingredients" or elements are:

1. **Sufficient Density**
2. **Mixed Uses**
3. **Car-Free ("Positive") Ground Coverage**
4. **Pleasant Streetscapes**
5. **Intricate Facades**
6. **Comfortable Enclosure**
7. **Active / Transparent Frontages**

STREET DESIGN
The Secret to Great Cities and Towns

VICTOR DOVER
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foreword by HRH The Prince of Wales
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WILEY

What makes a great urban place?
7 Key Urban Design Elements

Las Ramblas, Barcelona

comfortable enclosure

pleasant (green/generous) streetscape

Active (permeable) frontages

Sufficient density

intricate facades

mixed uses

Positive (car-free) ground coverage

What makes a great urban place?

Important Things that are NOT Measured in the Index

- **Heritage features** – *protected or restored*
- **Landmark elements** *(fountains, monuments etc.)*
- **Views and vistas**
- **Architectural form** *(no matter how exquisite)*
- **Public art** *(good, bad or indifferent)*
- **Special trees or horticulture**

These "special" elements of urban design either elude measurement, are place-specific or are "allusive" (artful and idiosyncratic); their exclusion from the Urban Design Index **does not mean** they are not important components of urban places – just that they are hard (or impossible) to measure consistently!

Element 1: Sufficient Density

"Critical mass" that supports concentrated urban vitality and pedestrian activity.

- Density below 0.5 FAR (gross) is usually not sufficient to generate a lively street or urban environment;
- Density above 1.0 FAR (2.0 FAR for a downtown area) is preferred;
- Density above 5.0 FAR can feel oppressive and/or block access to sunlight

Scoring: <0.5 FAR = 0 pts;
            0.5-1.0 FAR or >5.0 FAR = ½ pt;
            1.0-5.0 FAR = 1 pt.

FAR +/- 0.3

FAR +/- 3.0

Element 2: Mixed Uses

Mixed Uses create the potential for safer, more lively, dynamic places "24/7."

- **Residential uses in close proximity with shops, schools, restaurants and offices create more active, pedestrian-friendly and safe places.**
- **Mixed uses should be within the same building (preferred) or directly adjoining buildings.**

Score: **% of total building footprint on a block with 2 or more of residential, retail/food, assembly/entertainment & office uses**

>40% = 1 pt;

10—40% = ½ pt;

<10% = 0 pt

Element 3: Positive (Car-free) Site Coverage

- **Greenspaces (including accessible green roofs), tree canopy and pedestrian spaces create conditions for walkable, pleasant and sustainable urban spaces;**

- **Surface parking lots and vehicle-dominated spaces detract from these conditions.**

Positive Site Coverage Ratio = site area covered with green spaces (*ground or roof*) + tree canopy + pedestrian areas DIVIDED BY area of surface car parking/loading/driveways

Ratio Score: >2.0 = 1 pt;

                    0.5 – 2.0 = ½ pt;

                    <0.5 = 0 pt

Element 4: Pleasant Streetscape

Attractive and comfortable streetscapes have continuous street trees forming light, consistent shade and wide, generous sidewalks allowing sociable walking, sitting, or street activities.

Sidewalks should be <u>at least</u> 2m wide (3m+ in busy areas), and trees should be spaced less than 15m apart (*or form a continuous canopy if planted further apart*) to achieve a pleasant and comfortable pedestrian streetscape.

Scoring: >50% of street frontage w. sidewalk + street trees = 1 pt;

25-50% sidewalk + street trees = ½ pt

<25% sidewalk + street trees = 0 pt

Element 5: Façade Intricacy (or Complexity)

- Front faces of buildings welcome people into shops, homes, gathering places, schools etc.
- Intricate "inside/outside" interfaces along public streets or in publically-accessible private spaces creates opportunities for a positive, active and interesting urban environment.

Degree of intricacy is measured by total façade length (linear metres) per area (hectares). High scores can be achieved either through a fine grain of publically-accessible streets, lanes, mews etc., or by highly articulated façade designs with alcoves, courtyards, passages etc.

Scoring: >400m/ha = 1 pt;
              200-400m/ha = ½ pt;
              <200m/ha = 0 pt

Element 6: Comfortable Street Enclosure

A moderate degree of continuous spatial enclosure creates a comfortable urban environment, with a balance of visual interest and access to daylight for pedestrians.

- "Moderate enclosure" formed by 2-6 storeys

    May include stepped facades or podiums of taller buildings or single-storey buildings with a 2-storey high façade.

Scoring: >50% 2-6 storey frontage = 1 pt;

            10-50% 2-6 storey frontage = ½ pt;

            <10% 2-6 storey frontage = 0 pt

Element 7: Active/Transparent Frontage

"Active" and/or "Transparent" building frontages create interesting, open and lively interface between public streets/plazas and the interior of buildings. Blank walls or parking lots facing the public street detract from this quality.

"Transparent" frontages > 50% of the ground floor building face in windows, displays, doors and/or openings.

"Active" frontages >50% frontage in front doors & porches, outdoor seating areas or retail displays, public art installations etc.

Scoring: >75% active/transparent frontage = 1 pt

25-75% active/transparent frontage = ½ pt

<25% active/transparent frontage = 0 pt

Scoring Principles: Indicative / Non-prescriptive

- **The urban design elements and scoring should not be specific to particular architectural style or design detail** (*while these may be important in many peoples' preferences, they are not universal or prescriptive*). Rather, they should emphasize the <u>structure</u> and <u>key elements</u> ("the bones") of good urban design (*there are many ways to flesh these out, but this is the ephemeral aspects of urban design which defy measurement*)

- **The scoring system should be simple to apply to both existing urban areas and to comprehensive design proposals**, using readily available GIS maps (COSMOS in Surrey) and "street view" images for existing areas and site plans and elevations for design proposals.

- **Scoring should allow for scaling the range of values appropriate to the local context** – not precise or prescriptive. Scoring schemes can be tailored to local context or expectation.

For example, for the "Sufficient Density" metric, in a hyper-dense city centre a full point might be awarded for densities about 5.0 FAR, while in a small town centre a full point might be awarded for densities above 1.0 FAR. These scoring scales can be adjusted based on local surveys or expert panels.

Urban Design Index: Scoring System (standard)

Criteria	Theory	Components	Scoring
Sufficient Density	A critical mass of density (expressed as Floor Area Ratio) is needed to support active urban environments. Between 2.0 and 5.0 FAR total block density is optimal.	Total Floor Area Ratio (FAR) for the block (not including public streets)	1 pt. Net Density 2.0 – 5.0 FAR 0.5 pt. Net Density 0.5 – 2.0 or >5.0 FAR 0 pt. Net Density <0.5 FAR
Mixed Use	Mixed residential and non-residential development in close proximity create more active urban places.	% of area with mixed use (residential and non-residential uses) in the same building or in directly adjoined buildings	1 pt. Mixed Use >40% of block 0.5 pt. Mixed Use 10 – 40% of block 0 pt. Mixed Use <10% of block
Positive Site Coverage	Portion of the land covered by green spaces (including accessible green roofs, pedestrianized areas and tree canopy create positive places, while land covered by surface parking/vehicle areas detract.	Ratio of site covered by green space (ground or roof) + pedestrian plazas/walkways + tree canopy minus % covered by surface parking	1 pt. Positive Coverage Ratio > 2:1 0.5 pt. Positive Coverage 0.5:1 to 2:1 0 pt. Positive Coverage < 0.5:1
Pleasant Streetscape	Streets and public rights of way with generous sidewalks on both sides lined with continuous street trees are positive.	% of perimeter of the block (public streets) with continuous sidewalks (>2m wide) and continuous street trees (< 15m spacing)	1 pt. >50% Sidewalks & street trees; 0.5 pt. 25—50% sidewalks & street trees 0 pt. <25% sidewalks & street trees
Façade Intricacy	A high density of front building facades along public streets and publically-accessible private sites contribute to active and interesting urban places.	Linear m of front facades of buildings facing public or publically-accessible space per hectare of block area	1 pt. >400m facades/ha. 0.5 pt. 200—400m facades/ha. 0 pt. <200m facades/ha.
Comfortable Enclosure	A certain degree of spatial enclosure (2-6 storeys is optimal) creates comfortable and sheltered public streetscapes.	% of public streets lined with buildings 2 storeys or higher (including single-storey buildings with 2-storey expression)	1 pt. >50% 2-6 storey frontage 0.5 pt. 10—50% 2-6 storey frontage 0 pt. <10% 2-6 storey frontage
Active Frontage	Building frontages that are "active" or "permeable" (abundant windows, openings, entrances and active uses at the ground floor) along public streets create a positive urban environment. Blank frontages and parking between street and building detract.	% of public streets lined with active or permeable building facades at the ground floor directly adjoining pedestrian-only space	1 pt. >75% active/permeable frontage 0.5 pt. 25—75 % active/permeable frontage 0 pt. <25% active/permeable frontage
Total Score	Each of the components above contributes to the overall urban design quality of a particular area: either a single block, or for a larger area made up of multiple blocks.	The sum of these components is considered to provide a useful measure of urban design quality	**Sum of the points for each of the Criteria – expressed as total points and as a percentage out of 7, with "letter grade"**

Case Study: Surrey City Centre

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	DENSITY	COVERAGE	MIXED USE	STREETSCAPE	FACADES	ENCLOSURE	PERMEABILITY	SCORE	
	Block FAR	Positive Ground Cover Ratio	Mixed Use %	% Sidewalks & Street Trees	Façade m/ha	2-6 storey Frontage %	Active Frontage %	TOTAL / 7	Grade
Block 1									
	5.00	5.18:1	22.3%	65.4%	360	76.2%	90.5%	6.5	A
Block 2									
	0.44	0.76:1	15.0%	62.6%	132	10.3%	14.3%	2.5	F
Block 3									
	0.28	0.17:1	0.0%	70.5%	91	0.0%	6.2%	1.5	F
Block 4	0.44	0.16:1	0.0%	71.0%	80	7.8%	25.3%	2.0	F
Total	3.43	0.51:1	5.8%	66.9%	154	26.6%	37.2%	4	D

These scores are as of May 2017 (air photo in COSMOS) and are likely to improve as re-development proceeds in Blocks 2 and 4

Case Study: Cloverdale
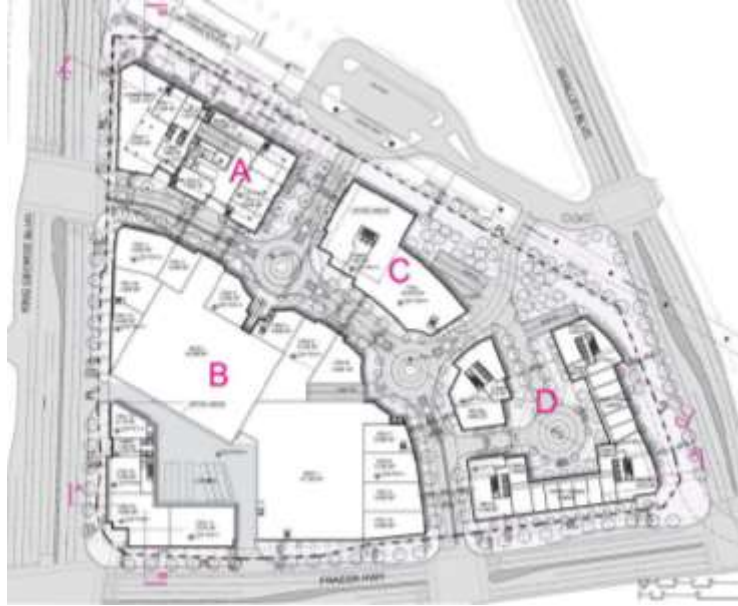
Case Study: Cloverdale Town Centre

	DENSITY	COVERAGE	MIXED USE	STREETSCAPE	FACADES	ENCLOSURE	PERMEABILITY	SCORE	
	Block FAR	Positive Ground Cover Ratio	Mixed Use %	% Sidewalks & Street Trees	Façade m/ha	2-6 storey Frontage %	Active Frontage %	TOTAL / 7	Grade
Block 1									
	0	3:1	0%	100%	0	0%	0%	2	F
Block 2									
	0.91	0.56:1	70.2%	92.5%	452	29%	35%	5	B
Block 3									
	0.98	0:1	44.6%	67.8%	691	14%	45%	4.5	C
Block 4									
	0.67	0.14:1	21.2%	50.6%	812	34%	47%	4	D
Block 5									
	0.49	0.22:1	18.1%	26.9%	289	18%	30%	2	F
Block 6									
	0.55	0.02:1	0%	31.9%	198	21%	35%	2	F
Block 7									
	0.61	0.08:1	23.7%	75.2%	429	51%	62%	4.5	C
Block 8									
	0.61	0.28:1	8.9%	57.4%	574	18%	50%	3.5	D
Total	0.55	0.19:1	21.9%	61%	371	23%	37%	3.5	D

Note: These scores are as of May 2017 (air photo in COSMOS) and are likely to improve as re-development completes on Blocks 1 and 2

Urban Design Index: Scoring System (City Centre New Dev't)

Criteria	Theory	Components	Scoring
Sufficient Density	A critical mass of density (expressed as Floor Area Ratio) is needed to support active urban environments. Between 2.0 and 5.0 FAR total block density is optimal.	Total Floor Area Ratio (FAR) for the entire block (not including public streets)	1 pt. Net Density 2.0 – 5.0 FAR 0.5 pt. Net Density 0.5 – 2.0 or >5.0 FAR 0 pt. Net Density <0.5 FAR
Mixed Use	Mixed residential / retail / assembly / office uses in close proximity create more active urban places.	% of area with mixed use (residential and non-residential uses) in the same building <u>or</u> in directly adjoined buildings	1 pt. Mixed Use >50% of block 0.5 pt. Mixed Use 20-50% of block 0 pt. Mixed Use <20% of block1 pt.
Positive Site Coverage	Portion of the land covered by green spaces (including accessible green roofs, pedestrianized areas and tree canopy create positive places, while land covered by surface parking/vehicle areas detract.	Ratio of site covered by green space (ground or roof) + pedestrian plazas/walkways + tree canopy <u>minus</u> % covered by surface parking	Positive Coverage Ratio > 3:1 0.5 pt. Positive Coverage 1:1 to 3:1 0 pt. Positive Coverage < 1:1
Pleasant Streetscape	Streets and public rights of way with generous sidewalks on both sides lined with continuous street trees are positive.	% of perimeter of the block (public streets) with continuous sidewalks (>3.0m wide) <u>and</u> continuous street trees (< 12m spacing)	1 pt. >80% Sidewalks & street trees; 0.5 pt. 50-80% sidewalks & street trees 0 pt. <50% sidewalks & street trees
Façade Intricacy	A high density of front building facades along public streets and publically-accessible private sites contribute to active and interesting urban places.	Linear m of front facades of buildings facing public or publically-accessible space per hectare of block area	1 pt. >500m facades/ha. 0.5 pt. 250 - 500m facades/ha. 0 pt. <250m facades/ha.
Comfortable Enclosure	A certain degree of spatial enclosure (2-6 storeys is optimal) creates comfortable and sheltered public streetscapes.	% of public streets lined with buildings 2 storeys – 6 storeys to podium cornice (including single-storey buildings with 2-storey expression)	1 pt. >67% 2-6 storey frontage 0.5 pt. 33-67% 2-6 storey frontage 0 pt. <33% 2+ storey frontage
Active Frontage	Building frontages that are "permeable" (abundant windows, openings, entrances and active uses at the ground floor) along public streets create a positive urban environment. Blank frontages and parking between street and building detract.	% of public streets lined with active or permeable building facades at the ground floor directly adjoining pedestrian-only space	1 pt. >80% active/permeable frontage 0.5 pt. 50—80 % active/permeable frontage 0 pt. <50% active/permeable frontage
Total Score	Each of the components above contributes to the overall urban design quality of a particular area: either a single block, or for a larger area made up of multiple blocks.	The sum of these components is considered to provide a useful measure of urban design quality	**Sum of the points for each of the Criteria – expressed as total points and as a percentage out of 7, with "letter grade"**

Case Study: PCI "King George Hub"

	DENSITY	MIXED USE	COVERAGE	STREETSCAPE	FACADES	ENCLOSURE	PERMEABILITY	SCORE	
	Block FAR	Mixed Use %	Positive Ground Cover Ratio	% Sidewalks & Street Trees	Façades m/ha	2-6 storey Frontage %	% Active Frontages	TOTAL / 7	Grade
Total (Standard Scoring)	7.30	55%	13:1	90.5%	442	80%	90%	6.5	93% (A)
Total (City Centre New Devt Scoring)	7.30	55%	13:1	90.5%	442	80%	90%	6	86% (A)

Case Study: Surrey Civic Centre (Centre Block)

Ground Floor

Roof Plan

| | Office/Office Core | | SFU | | Retail | | Public Realm |

Case Study: Surrey Civic Centre (Centre Block)

	DENSITY	MIXED USE	COVERAGE	STREETSCAPE	FACADES	ENCLOSURE	PERMEABILITY	SCORE	
	Block FAR	Mixed Use %	Positive Ground Cover Ratio	% Sidewalks & Street Trees	Façades m/ha	2-6 storey Frontage %	% Active Frontages	TOTAL / 7	Grade
Existing Centre Block	0.44	15%	0.76	62.6%	132	10.3%	14.3%	2.5	36% (F)
Centre Block Design	7.50	60%	8:1	67%	580	45%	90%	6.0	86% (A)

Benefits of an Urban Design Index for Local Governments

- The method provides a relatively **quick and consistent** method for measuring urban design quality using data completely available on COSMOS (GIS and Street View)

- The measures and scoring system can be **calibrated and validated locally** through simple surveys

- Provides a measure for existing urban areas such as Town Centres and City Centre to **benchmark** against other comparable areas to inform policy and planning decisions

- Allows for measuring **change over time** to indicate the degree of success in achieving policy objectives

- Can be used to measure the **effect of proposed developments** on urban design outcomes in advance, to provide data to support staff recommendations

Benefits of an Urban Design Index for Local Governments
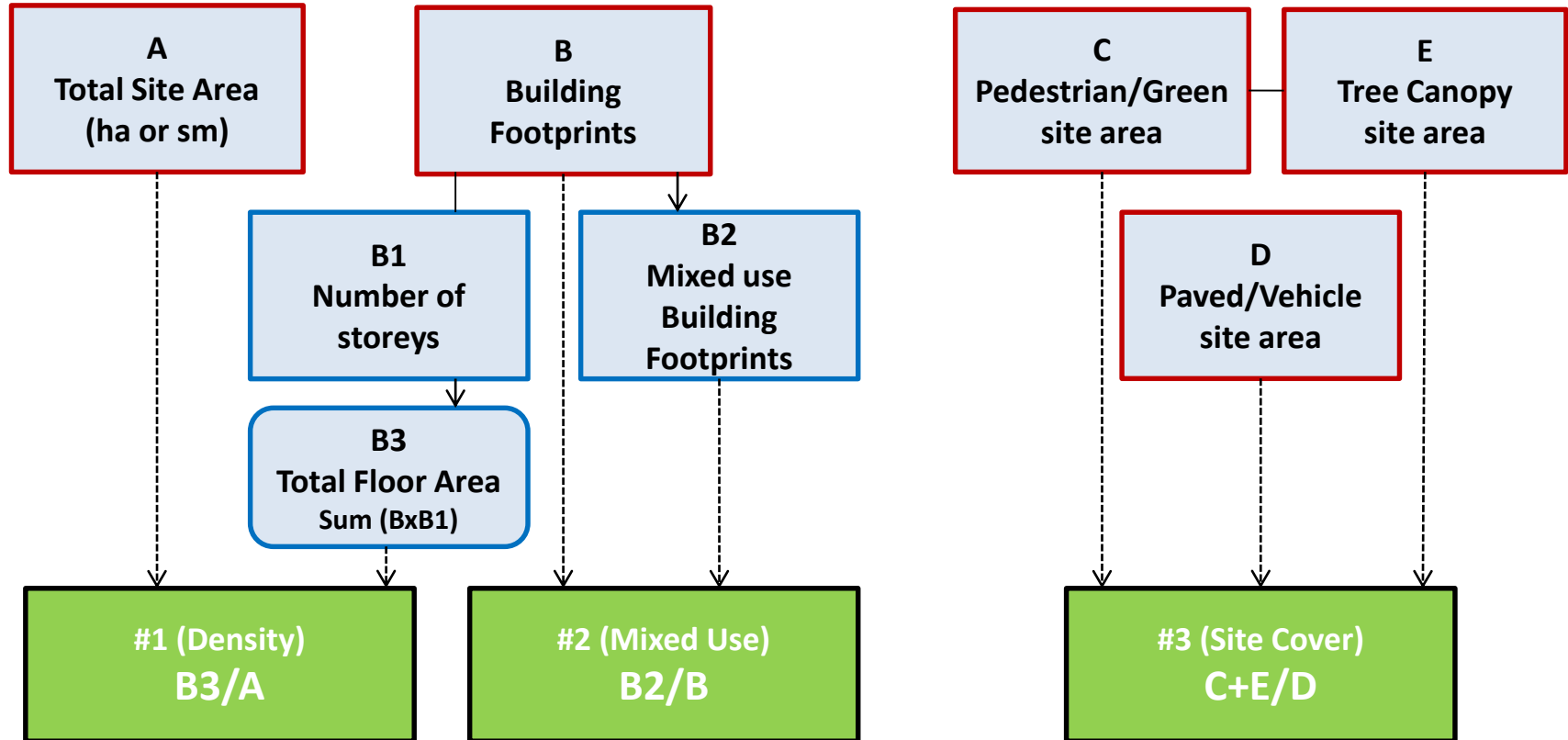
Urban Design Staff

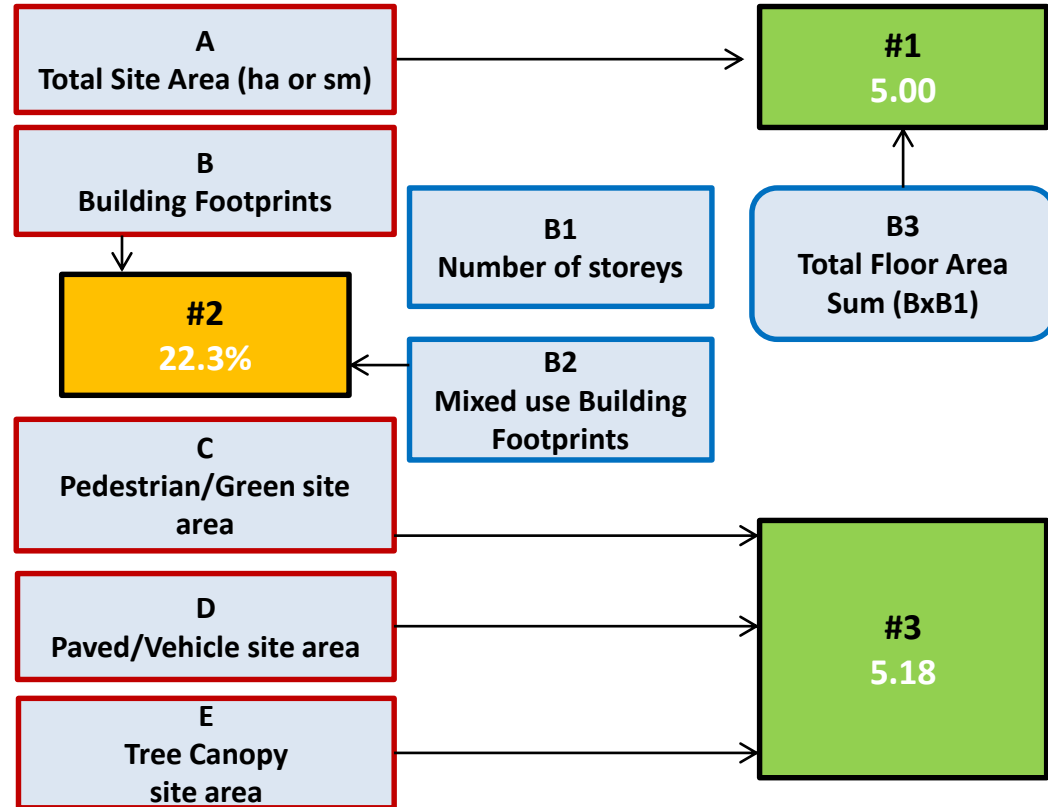**What is measurable has "weight" in decision-making and resource allocation!**

Nuts and Bolts

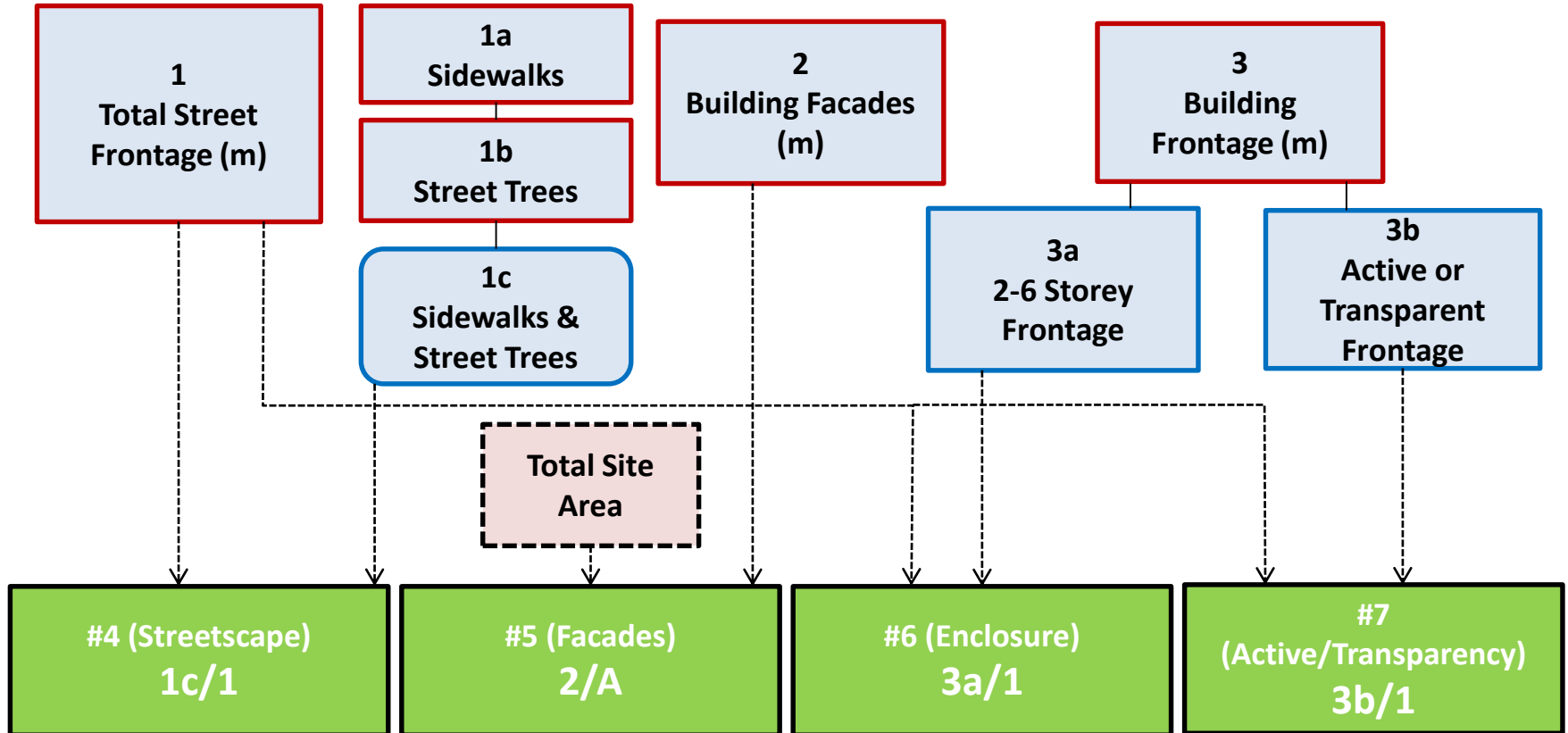**Step by step process in developing the Urban Desing Index scorecard**
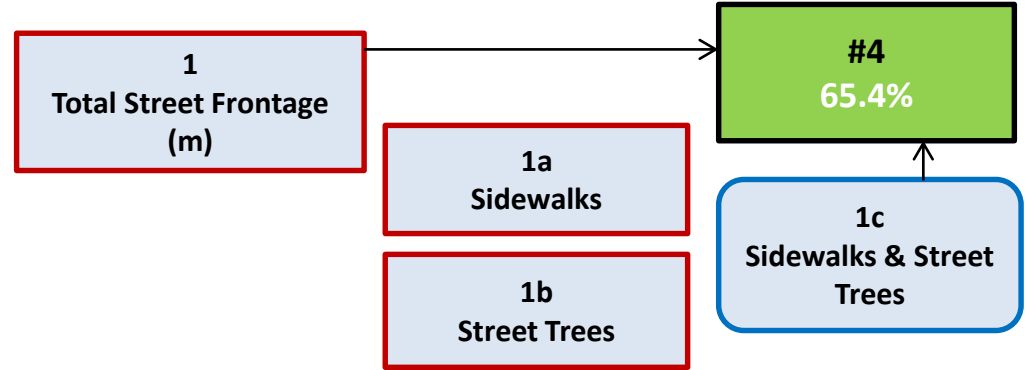
Mapping and Calculating Values (Area Elements)
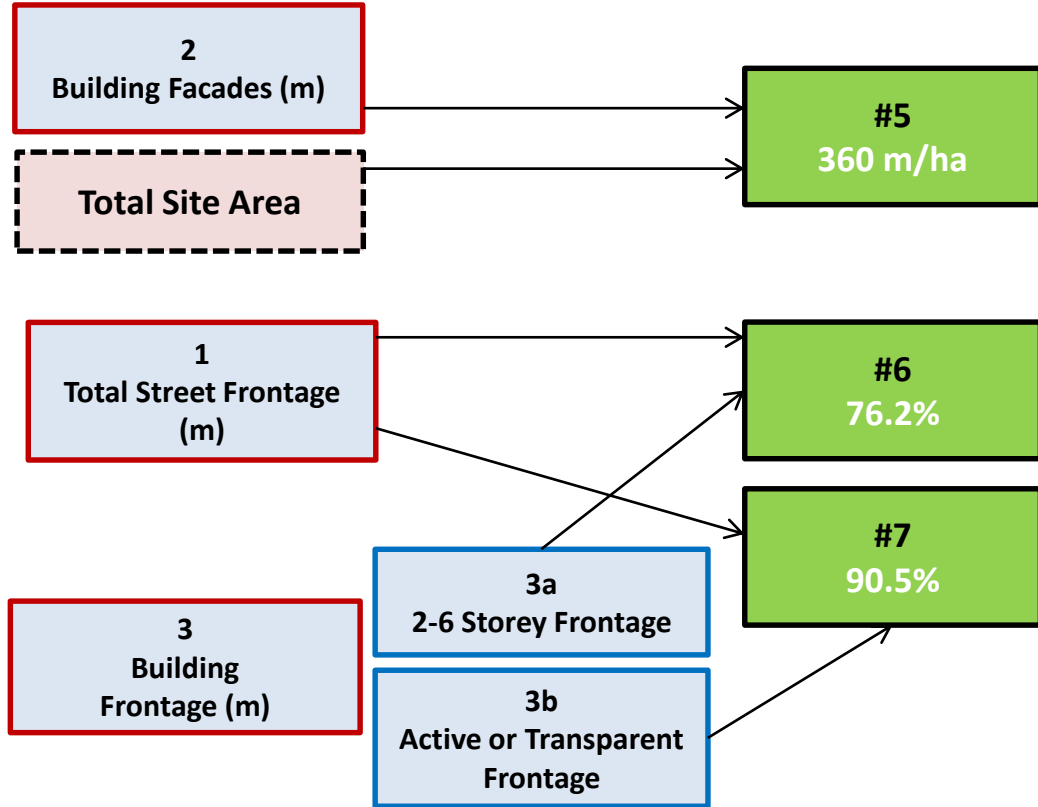
Mapping and Calculating Values (Area Elements)

Mapping and Calculating Values (Linear Elements)

Mapping and Calculating Values (Linear Elements)

Mapping and Calculating Values (Linear Elements)

Thank You!

Questions & Comments?